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Practicing Action Science: Methods of Inquiry and Intervention



Like the social scientists discussed in the previous chapter, action scientists can be regarded as practitioners at work within their own community of inquiry. They too follow a set of norms that articulate what problems and methods are legitimate for study, that guide the setting and solving of problems, and that tell them what to do and what not to do as they go through the problem-solving process. What is most distinctive about the action science community, however, is that it enacts communities of inquiry within communities of practice. As Part One described, this means that the action scientist shares the concerns of the scientists discussed in the previous chapters, while simultaneously taking into account those of the practitioner. In generating knowledge, action scientists thus adhere to norms of falsifiability, and they aim to grasp the logic of action. But they adapt these norms to the constraints posed by the human mind and the action context, and they extend them to reach into the normative realm. Just what these norms look like in practice is what we will consider here.

So far we have traced the practice of applied and basic

researchers within the empirical-analytic and the hermeneutic-historical traditions. In so doing we have found that the practice norms of different communities within these two traditions prevent researchers from asking the kinds of questions that practitioners cannot ignore and from solving the kinds of problems that they continually face. Because action science attempts to extend its knowledge requirements to meet those of practitioners, it claims to be characterized by norms that can better negotiate these dilemmas of conflicting requirements. The present chapter will examine this assertion by reflecting back on the action science examples in the previous chapters, as we just did with the basic and applied researchers.

Transforming What Happens to Be

Like all researchers, action scientists take up the question of how some phenomenon happens to be. Yet as they do so, their search is guided by a concomitant interest in how they might eventually transform what they discover. So when Schön (1983) asked what happened in the town planner's case, he highlighted those facts assumed to be within the planner's control and therefore subject to choice, no matter how tacit (see Chapter Seven). He looked at the role that the planner had fashioned for himself in relation to other roles open to him, and he found that there were several such roles: "Like his predecessor, he could have made himself into a writer of plans, covering the walls of his office with maps and charts. Or he could have become a community organizer and advocate. He chose, instead, the intermediary role" (1983, p. 221). In a similar vein, Harmon's inquiry into existing accountability arrangements (see Chapter Seven) went after those factors that would need to be taken into account, should we choose to redesign them: the premises underlying accountability rules, our current notions of accountability and causation, and so forth (1981, pp. 117-137). In both instances, choice was assumed, and what led to those choices was pursued.

Thus far this line of inquiry is not very different from what we have seen previously (Chapter Seven). Like previous research it inquires into the causes of an important social prob-

lem, and, like applied research in particular, it goes after factors thought to be within an actor's control. Even its inquiry into underlying assumptions and values is not new, for Milgram (1974) also probed for the conflicting values and requirements at stake in obedience. But once action scientists are on their way to figuring out what happened, they then go on to ask, "What might have happened if things were fundamentally different?" For Harmon this meant asking what might happen if organizations adopted decision-rules that significantly departed from the predominant one of hierarchy. For Schön it meant asking what would have happened if the town planner had had a "very different theory of action" (1983, p. 230). It is at this juncture that their inquiry diverges from that of basic or applied research, not because they ask "what if" but because of their readiness to take the question beyond the domain of what now exists. Milgram asked "what if," but because he assumed that what exists is necessary for existence, he confined his inquiry to variations that never departed from it. In contrast, the instructor in the passivity experiment in Chapter Four actively sought and tested fundamentally different authority relations to see if what now exists might be transformed.

Nevertheless, as action scientists pursue these questions, they are guided by the norms of their community in much the same way as other researchers are guided by their norms. The facts they find and the alternatives they invent are not the result of an arbitrary search; rather they result from using a normative lens that allows these researchers to *see* them. It is the value of personal responsibility that led each of the action scientists previously discussed to find and highlight factors within an actor's control and to invent alternatives predicted to enhance it. In Harmon's case, for example, he saw the "crucial institutional task" as limiting the use of hierarchy by means of mechanisms less likely to diminish the personal responsibility of actors (1981, p. 128). A second value is that of justice, and it led Argyris to focus on how the young consultants were striving to solve their own mismatch by designing one for the officers (see Chapter Five). These are core values in action science, and as such they influence what is looked for and what is found.

This is not to say, however, that previous researchers

were unconcerned by questions of value. Jordan (1981) cited “ethical reasons” (p. 16) behind KEEP’s policy to make school practices compatible with the students’ culture, suggesting some notion of justice and responsibility. The difference is that these normative views are so tacit that their implications in a particular case are often unanticipated. As a result they are often fraught with inner contradictions that go unnoticed until practitioners bump into them. Such was the case with Heath’s teachers when they discovered that their newly adopted rules collided with their own sense of what was right, leaving them dissatisfied with the results. It was only then that the teachers reconsidered their initial position, and they rejected its implicit notion of justice that had led them to adopt rules at the expense of their own values, while not asking others to do the same. Of course, it is impossible to anticipate all such possibilities ahead of time, and this raises an equally important difference. Once value conflict was uncovered, the action scientists actively confronted it rather than simply bypassing it. Recall that Argyris asked the consultants to consider the justice of requiring the officers to act in ways they themselves could not act, whereas in Heath’s and Jordan’s projects no data were provided to suggest that the question of justice was pursued. What was peripheral in previous inquiry thus becomes central in action science.

This suggests that in framing their research, action scientists move into both familiar and unfamiliar domains. As they ask the question—“How does it happen to be?”—they keep in mind and eventually take up the question, “How might we transform what we discover?” To answer this question, they use a normative lens to find the facts that will allow them both to describe and to transform what now exists.

At this point the question asked of previous research can be asked of action science: What kinds of solutions do we get from this line of inquiry? To constitute a solution, the findings must first be organized in accord with the norms of the action science community, just as the previous researchers constructed their solutions to satisfy their norms. Since in action science the aim is to understand in the service of social practice and to pose alternatives that might transform what we discover, the solu-

tions devised by action science must be threefold, with each of the constituent parts informing the others. Action science must first offer an explanation that describes what happened in a way that implies how it might be changed. It then must formulate an alternative that transforms what was described. And finally it must develop a pathway for getting from here to there.

The threefold solution provided by Schön in his case study of the town planner illustrates these constituent parts and their relationships. To describe the planner's dilemma, Schön first brought to the foreground what he named the planner's "balancing act" — a set of strategies used to negotiate conflicting obligations toward developers, on the one hand, and the regulatory boards, on the other. Schön recounts that "the planner tries to criticize the developer's plans without discouraging him. He tries to be stringent in his review of plans and at the same time permissive. He tries to lead the developer along the right lines without reducing the developer's responsibility for his proposal. And he behaves authoritarily while presenting himself as devoid of authority" (1983, p. 221).

Once he had described what happened, Schön began to account for what he had found. He explained, "We can see these problems, and the resulting balancing act, as a consequence of the way [the planner] has chosen to frame his role" (p. 221). At the same time, Schön ruled out the alternative explanation that it was the intermediary role itself that required these strategies. He reasoned, "It is true that his twofold objective is inherently conflictual, requiring that he negotiate with developers without infringing on the board's authority, but this is not by itself sufficient to create the conditions for the balancing act" (p. 226). In particular it did not explain why he kept these objectives private and managed the conflict between them unilaterally. To Schön it was the way in which the planner *framed* his role that required him to act thus. But what accounts for the way he chose to frame his role? Schön suggested that it was the planner's theory of action that contributed to and reinforced his role frame and at the same time made it unlikely he could discover the frame he was using. According to Schön, the planner's theory of action (Model I) consisted of a

set of values and strategies that limits reflection and requires individuals to set and solve problems privately and unilaterally. Yet he added that it was a self-reinforcing system: "One could say either that he has framed his role and problems to suit his theory of action, or that he has evolved a theory of action suited to the role and problems he has framed" (p. 228).

In many respects this explanation parallels those offered in traditional research. Schön first provided a rich description of what happened, only then moving on to rule out alternative explanations. He then began to construct increasingly abstract explanations that could subsume the facts he found and account for what he described. As he did so, however, he fashioned his account so that it implied what the planner ought to change, should he so choose. It is at this point that Schön began to depart from the norms of traditional research. He implied that it was not only the planner's strategies that required change but the values by which he set his problems as well. To Schön, these were the critical variables in his account, because they were what led the planner to get stuck "between those who propose and those who dispose" (p. 234).

With this explanation set, Schön then built on it by proposing an alternative—"a very different theory of action, one conducive to the public testing of private assumptions" (p. 230) and one that might yield a very different set of facts. To describe it, he began with an abstract model (Model II) composed of a different set of values and strategies from those followed by the planner, and he then went on to spin out a series of hypothetical consequences predicted to follow from the model in this particular case. Most important among them was a greater capacity for reflection, one that extends to examining one's role and makes it less likely that errors will go undetected. In designing this kind of alternative, Schön thus built on the planner's own interest in self-reflection. As Schön described him: "The planner is an individual who likes to reflect on his practice. Indeed, his willingness to participate in our research grew out of this interest" (p. 228).

Even so, such an alternative asked the town planner to reconsider the values he held and the ends he had set in his fram-

ing of his role. And if Schön's explanation is correct, this is something that the planner cannot do, since his theory of action limits his reflection to the strategies he uses. Therefore, Argyris and Schön (1974) designed a learning process aimed at managing this paradox and at helping individuals to inquire into and redesign their theories of action.

As this suggests, Schön's solution is complete only after he has explained the planner's dilemma, while providing clues for finding ways out of that dilemma. He has posed an alternative that not only builds on what he has described but fundamentally transforms it. And he has devised a pathway for moving from here to there that is aimed at managing the paradoxes of change. In one respect such a building process resembles the way applied research builds on basic research. Both action science and applied research construct explanations in light of alternatives, and their alternatives logically follow from their explanations. For the most part this is what Heath and Jordan did in trying to solve the problem of school failure and what Hackman and his colleagues did with the problem of satisfaction and productivity at work. But Schön's solution diverges from these in two important respects. First, it reconsidered and questioned the ends pursued, as well as the means for achieving them, and it provided a learning process by which participants might inquire into and reconsider the values and ends at stake. So far we have seen that this is a domain into which neither basic nor applied research has proceeded. The second departure, made possible by the first, is that the solution put forth an alternative that fundamentally differs from what now exists. To date, the theory of action Schön proposed is rarely used. But in putting it forth, he provided the town planner with a way of better managing the conflicting requirements inherent in any practice.

So what are the implications of these kinds of solutions? Up to now, the solutions of basic and applied research have adhered to norms that require them to stop short of considering the kinds of issues practitioners are required to face. Action science claims to better manage these conflicting requirements between science and practice by adhering to key scientific re-

quirements, while adapting them to the conditions under which practitioners must act and extending them to address questions that practitioners must ask. We turn now to consider these requirements, how action scientists satisfy them, and the implications of this for practitioners.

Action Science as a Science of Practice

As Part One outlines, action science is an inquiry into social practice, broadly defined, and it is interested in producing knowledge in the service of such practice. Thus, what counts as a solution for action science both overlaps with and diverges from prevailing scientific criteria. Like the empirical-analytic tradition, action science requires that knowledge include empirically disconfirmable propositions that can be organized into generalizable theory. But at the same time it also requires that these propositions be falsifiable in real-life contexts by the practitioners to whom they are addressed. Like applied research, action science requires knowledge to be useful. Yet in so doing it emphasizes the designing and implementation of social action, and it rejects the current dichotomy between basic research and applied research. It instead asks that its knowledge illuminate basic issues in ways that are at once generalizable and applicable in particular cases. And unlike basic or applied research in either the empirical or hermeneutic traditions, action science requires that knowledge speak to the forming of purposes, not just to the means for achieving them. As a critical theory it aims to produce knowledge that evokes critical reflection among practitioners, so that they might more freely choose whether and how to transform their practice. Let us now consider our action science cases in light of these criteria.

- *Knowledge should include empirically disconfirmable propositions that can be organized into theory and falsified by practitioners in real-life contexts.* In the case of the consulting firm, Argyris predicted that when giving feedback, consultants would not act differently from the officers. This proposition came from an overarching theory that predicts that virtually all individuals will hold a Model I theory-in-use and will consequently make evaluations without illustrating or testing them.

In this particular case, Argyris thus anticipated that the consultants would make their evaluations in the same way as the officers had. To test this proposition, he formulated it and put it forth so that the consultants it addressed could reject it. In other words, he made it known, he stated it at a level of inference that could be easily connected to the consultants' own observations of what occurred, and he put the consultants in control of the conditions under which the test was conducted (see Chapter Five). A later part of this chapter articulates further how such tests can be undertaken in the face of threats posed by real-life contexts. For now it is sufficient to note that this requirement asks that propositions be characterized by features that allow practitioners to disconfirm them. These include making propositions public, providing the directly observable data on which they are based, making them connectable to these data, and designing conditions that are conducive to validly testing them.

In contrast, most research within the empirical-analytic tradition generates propositions that are so abstracted from what occurs that it is difficult for practitioners to reconnect them in order to independently judge whether they fit the facts of what happened. Ordinarily such data are either quantified or based on individuals' self-reports, accounts that themselves consist of conclusions quite disconnected from the data of what occurred. Conversely, ethnographers generate propositions that are easily connectable to their observations. But as the ethnographic case studies that we discussed earlier suggest, these researchers did not regard them as hypotheses that ought to be publicly tested with their participants (see Chapter Six). Either way, the practitioners to whom these propositions were addressed did not have the opportunity to reject them if they believed them to be false or to adopt them if they accepted them as valid. Since action science is at once interested in generalizable knowledge and in improving social practice through reflection on action, it fashions its propositions to fit this purpose. Thus the consultants in the consulting firm, the town planner, and the seminar participants were each given the opportunity to reject or accept the propositions made about them.

- *Knowledge must be useful in action.* In formulating his

solution, Schön (1983) developed an explanation and an alternative that could cover a wide range of facts and situations, while simultaneously addressing the particular case of the town planner. Consequently, the town planner could come to see how he had handled the particular dilemma of conflicting obligations toward developer and regulatory board. But equally important, since this knowledge was abstracted from a particular case, it also allowed him to see how he would be apt to negotiate *any* situation that poses conflicting requirements. If his theory of action is Model I, as Schön suggested, then he would be likely to manage all such situations unilaterally and to negotiate all such conflict privately, thereby limiting his capacity to uncover his mistakes and to reflect on his role. The multiple levels of inference at which this knowledge is put forth allows individuals to package a lot of complexity economically (it is abstract and generalizable knowledge), while enabling them to use it in a specific instance (it identifies what actors actually do at a concrete level so that it can be recognized in action). At the same time this feature allows action science to contribute to knowledge that is relevant to practice in general, not just to the town planner's practice in particular. If Schön's formulation is correct, then any practitioner who holds this theory of action ought to limit her reflection in the same way.

- *Knowledge should speak to the forming of purposes, not just the means by which to achieve them.* To be truly practical, a science of practice must take up the question of choice, and the question of choice necessarily involves the forming of purposes, as well as the choosing of means to realize them. Yet once we consider purposes, questions of value can no longer remain peripheral. They are part of a package that cannot be unbundled. Action science thus extends its inquiry into the normative realm; yet in so doing, it seeks to submit normative claims to rational criticism, so that practitioners can reject them as they are able to reject empirical claims. The difference lies in the criteria that determine whether a claim ought to be adopted or rejected.

As a kind of critical theory, action science justifies its own normative position on the basis of the principle of internal

criticism. This means that its own normative claims are evaluated on the basis of the normative views implicit in the “epistemic principles” of the practitioners to whom they are addressed (Geuss, 1981; also see Chapter Two). But since these principles are often implicit, action scientists must first make them explicit, so that propositions can be evaluated in light of them. In the consulting firm case (see Chapter Five), Argyris illustrated how such a process might actually unfold. He began by pointing out that implicit in the consultants’ demand for a policy on feedback was the principle of justice. Once the consultants confirmed this, he put forth the view that by this very principle, their own normative position was unjust. It advocated a policy that required of others what they did not require of themselves: feedback that they themselves and the two officers lacked the skills to provide. It was therefore unjust on two counts: It demanded feedback that the consultants themselves did not give, and it required the officers to solve their mismatch by imposing one on them. On this basis and in light of empirical data on the consultants’ actions, Argyris then took the normative stance that they ought to reconsider their policy, recognize the gaps in their feedback skills, and work toward learning how to fill them in. This position, advocated in a context of free and open inquiry, could be evaluated by the consultants and freely adopted or rejected by them. To the extent that the consultants found their initial claim unacceptable, they abandoned it, and the researcher’s claim was affirmed.

As a result of such a process, the consultants’ awareness of their own principles was expanded and the inconsistencies among them illuminated. Yet equally important, the process itself provided a means by which these practitioners could inquire, in an ongoing way, into the different ends at stake in a problem and rationally critique the conflicting normative claims embedded in them. To the extent that such a process is adopted, it becomes less likely that practitioners will *unknowingly* advocate policies that would satisfy one interest while violating another. Such deliberations would become public, their guiding principles would become explicit, and their normative claims would become subject to critique on the basis of these principles

and of valid information considered in free and open inquiry. In this way, the taking of a normative stance should enhance rather than constrain a practitioner's free choice.

All communities of inquiry hold norms that bind the inquiry of its practitioners, and action science is no exception. The difference we have seen here is that action science seeks to modify key scientific norms, so that the knowledge it produces might advance science and practice at one and the same time. In so doing, the action scientists in the previous chapters extended their inquiry to include the question: What might happen if things were fundamentally different? And unbound by prevailing strictures to leave questions of value alone and the world untouched, they extended their search to a consideration of ends as well as means and to the discovery of fundamental alternatives. As a result, the solutions they devised contributed to knowledge that could illuminate basic issues in science and practice.

At this point we have considered only how the action scientist frames his inquiry. We do not yet know how the action scientist actually goes about producing the knowledge that makes up his solutions. Since the methods of action science are as distinctive as the norms that frame its inquiry, the remainder of the chapter describes what these methods are.

Action Science: Rules and Methods of Inquiry

So far we have seen that action science moves into both familiar and unfamiliar domains of inquiry in the problems it sets and in the solutions it seeks. Its methods follow suit. They are designed to take on problems that are deemed important, while ensuring that the knowledge generated is at once valid and useful in action. While this requires rigor, the methods of action science are rigorous in a special sense. They emphasize the public testing of knowledge claims in accord with an explicit set of rules, but they adapt these to the action context and extend them to include all the normative, interpretive, and empirical claims that actors necessarily make as they try to understand the world in order to act. It is in this sense that we speak of ac-

tion science as enacting communities of inquiry in communities of social practice. It aspires to help participants realize the norm of “responsible belief” in the realm of practical deliberation. We now turn to describing how action science methods and rules do this.

To put it most succinctly, action scientists engage with participants in a collaborative process of critical inquiry into problems of social practice in a learning context. The core feature of this context is that it is expressly designed to foster learning about one’s practice and about alternative ways of constructing it. It therefore pushes back some of the constraints inherent in real-life contexts in order to enable participants to come to know their practice as they have defined it and to experiment with the new moves and competencies characteristic of a new definition. This means that the aim is in part to make known what is known so well that we no longer know it—the uncovering of tacit knowledge so that it might be critiqued. And in part the aim is to make known what is unknown—the discovery of alternatives so that they too might be critiqued. The process of critical inquiry in action science is a form of public reflection and experimentation that follows rules that can themselves be used in action contexts in order to ensure the validity and usefulness of the inquiry.

Like all methods, those of action science are designed to achieve their own particular aims in the face of the threats and obstacles most relevant to them. In the domain of action science these threats and obstacles are several. As already described, the first is that the data of action science are action, action is meaningful, and the meaning of action is ambiguous (see Chapter Two). The difficulty here is that participants will invariably select and focus on different segments from any stream of action, and they will often impose different meanings on the same segments, thereby threatening the intersubjective agreement necessary for public testing. Action science must therefore devise some process (1) that will allow participants to make explicit the data they select and the meanings they impose and (2) that will enable them to negotiate the differences in meaning that arise so that they might reach agreement. In

large part the process of critical reflection is itself geared toward doing just this. It is a process by which participants can draw on the conceptual tool of the ladder of inference to make explicit the data that they select and the inferential steps that they take to reach their conclusions (see Chapter Two).

But this process itself generates a second set of threats. The process of reflection can be so threatening to participants that it evokes defensive responses that in turn threaten validity. It is not sufficient to simply reach agreement because this can be accomplished through a process of coercion and submission, as well as through a process of open and free inquiry. Like all sciences, action science aspires to enact the latter process. The problem is that, once threatened, participants will often respond to the demands of reflection in ways more characteristic of the former. To understand this more fully, consider the demands that free and open inquiry exert. Participants must be able to retrieve largely tacit inferential processes; they must be able to deal openly with challenges and conflicting views; they must reveal information that might expose their own or others' vulnerabilities; they must be able to recognize and acknowledge when they are wrong; and they must feel free to choose among competing views.

These requirements can be simultaneously experienced as both desirable and threatening to participants. They will foster learning, but they will also put participants at risk of disagreements, conflict, embarrassment, and failure, evoking defenses to minimize such risks. The dilemma is that these defenses come in forms that themselves threaten the process of inquiry. Thus, participants might conceal upsetting information, minimize or cover up conflict, go along with views they actually oppose, hesitate to submit their own views to criticism, and so on. The reflective process is therefore as laden with the potential for anxiety and defensiveness as it is with the impetus to learn. Action science must take these threats into account, building on participants' desire to learn while minimizing the threats posed by their defenses.

A third set of threats comes with the nature of the action context. Although the learning context is designed to push back

some of the constraints of real-life conditions, it also attempts to follow rules that are generalizable to any action context. This means that validity must be ensured under conditions in which unilateral control of variables is neither possible nor desirable. There are too many variables involved, and efforts to unilaterally control them would either fail or, to the extent they succeeded, only confound the situation further. Thus action science must find some way of reliably choosing among competing hypotheses in the midst of high complexity and low control.

What follows in the remainder of this chapter is a description of the methods and rules that govern and sustain processes of reflection and experimentation in the face of these threats to validity. As with the methods and rules of basic and applied science, those of action science guide the processes by which data are collected, hypotheses tested, and data analyzed. What is distinctive to action science is the nature of these rules and the fact that it aims to help participants to learn them, so that they can enact them as shared norms for inquiry in a learning context.

Talk as Data: A Window onto the Logic of Action. Along with ethnography and linguistics, action science believes that action is informed by rules or tacit theories and that talk is an important form of social action (see Chapter Two; also see Grønn, 1983; Searle, 1969; Austin, 1962). According to this view, talk is not simply anecdotal data but is a window onto the logic of action. The question for the action scientist therefore is not whether talk is action but what kind of action is it? More precisely, we wish to make explicit the largely tacit propositional logic of the form "In situation *s* (as the actor constructs it), do *a* to achieve consequence *c*." This means that we must elicit data on what individuals actually say and do as they interact, as well as data on what they are thinking and feeling at the time. It is from such data that we can reconstruct the rules or propositions that must be in individuals' heads to produce the behaviors and consequences we see.

Action science has a range of methods designed to collect these data in a reliable fashion and to do so in the service of participants' learning. These include: (1) observations accom-

panied by audiotaping, (2) interviews, (3) action experiments, and (4) participant-written cases. Most often action scientists rely on all these methods for different purposes and as a means of cross-checking and testing what is found with each of them. But common to each method are three features characteristic of action science. The first is that data are generated in a way that makes participants feel causally responsible for them. Action scientists thus actively seek to minimize researcher control over what problems are studied, what data are selected, and the means by which they are selected or generated. At the same time they also seek to examine the impact of any control that is exerted. For instance, tape recordings are made both with and without the action scientist present, thereby providing a way to explore the possibility that the researcher's presence is responsible for previous results (the participants' actions). In addition, in choosing problems for study, participants are encouraged to pick ones that are critical to them and to their own learning. This at once serves to facilitate the learning process and minimizes the potential for knowing distortions, because participants are committed to reporting reactions or recollections as accurately as they can so that they might learn.

Nevertheless we recognize that such data still hold threats to validity. Participants might misreport what occurred or what they feel, either knowingly to prevent embarrassment or unknowingly due to forgetfulness, selective memory, and so on. There are, however, three aspects of action science that when used together minimize this risk. The first is that we ask that participants report what they and others actually did and said as best as they can recollect it, and not simply give their conclusions or perceptions of what occurred. Second, we are interested in the rules behind behavior; and we assume that given the nature of rule-learned behavior, individuals cannot consistently play at a set of rules that they do not know or have competence in. Therefore, while they might not report precisely the particulars of what was said, they are unlikely to be able to misrepresent the rules that underlie the way they reason and act. Third, we regard this assumption as an hypothesis to be tested; and since there are many methods and occasions for data

collection, ample opportunities exist to detect these kinds of errors and to test this working assumption. Most important, some of these methods include direct observations that allow us to cross-check participants' reports.

One such method is the action experiment in which we have direct access to individuals' actions and can inquire what they are thinking and feeling at the moment. But this methodology contains its own threats, since the researchers risk, even seek, to "contaminate" these results by their presence and actions in an effort not only to probe individuals' actions but to help them learn a new set of skills. In a later section on hypothesis testing we will take up the question of how we contend with the researcher's impact in greater depth, but the key feature that we wish to emphasize here is true of all data-gathering procedures. Researchers actively inquire into the nature of their impact and design opportunities to probe for this, often relying on participants to gather data themselves, uninfluenced by the researchers' presence. The aim therefore is not to eliminate researcher impact altogether, but to give participants a high degree of control over the data-gathering processes and to design ways to discover the responsibility and impact that the researchers do have for the data that is collected.

A second feature of data collection is that each method is designed to elicit data on how individuals actually act and on what they are thinking and feeling at the time. Observations are thus combined with interviews or with intervention activity, so that the action scientist can get data on participants' reactions. Written cases ask that participants divide a page in half, recreate on the right side the actual dialogue of the relevant actors, and recount on the left side what they were thinking and feeling at the time but did not say. Similarly, interviews are designed to elicit from participants, not just their conclusions about situations but also what they and others actually said and did in the situation, as well as what they thought and felt at the time. And, finally, action experiments are designed to observe how participants act, while at the same time probing for and unfreezing the reasoning and reactions that keep these actions in place.

As this suggests, action scientists regard talk not only as action but as the means by which people can report what they are thinking and feeling as they act. It is from these data that we can reconstruct how actors must have constructed the situations in which they acted.

Although necessary for our purposes, this dual focus on talk-as-action and talk-as-report raises the controversial issue of self-reports: How reliable are such reports? The running controversy over this question can be described most simply by placing the different views at two polar extremes. On one side of the issue, social scientists hold that self-reports are decidedly unreliable. Individuals tell more than they know, unknowingly distort cues, and generally cannot say what led them to think or act as they did, even though they think that they can. According to this view, human beings are unaware of their reasoning processes and unaware that they are unaware. They therefore may be glad to tell you their reasons for their actions, but these may not be the reasons that in fact form the basis for their actions (Nisbett and Ross, 1980; Nisbett and Wilson, 1977; Langer, 1976). Social scientists who take the other side of the issue hold that self-reports are reliable commentaries on phenomena that are relevant and that really do exist. Individuals are the best authority regarding their thought processes, they have access to these processes, and this in fact is what defines their essence as human beings. According to this view, human beings are aware of their reasoning processes and aware that they are aware. They therefore may make mistakes, but their views can be reconciled with those of an observer's, the reasons that account for their actions can be ascertained, and it is these reasons, not mechanical causes, that are critical in explaining social behavior (Harré and Secord, 1972).

Action science believes that both views are accurate but only in certain domains. Our task is to develop theories that distinguish what processes we can report and what methods are best for exploring them (see Ericcson and Simon, 1980). The theory of action perspective attempts to do this by distinguishing between espoused theories and theories-in-use and by providing a methodology for reconstructing both. Recall that es-

poused theories are those theories of which actors are aware and on which they draw in order to explain their behavior. They can be elicited relatively easily by asking people why they acted as they did, but they may or may not really inform their actions. Theories-in-use, in contrast, comprise a set of mostly tacit propositions that do inform one's actual behavior, yet these may or may not be congruent with one's espoused theories. Ordinarily actors are unaware of their theories-in-use, which puts action scientists in the position of having to figure out what data will allow them to infer these theories, while not confounding them with individuals' espoused theories. Clearly it is not sufficient to ask "why" questions. We have just said that these are apt to elicit an individual's plausible yet not necessarily accurate espoused theories, simply because they are the most readily retrieved. We therefore must find some way of gaining access to internal processes that will allow us to answer "why" questions without actually asking them.

We get some helpful hints on how to proceed from an unlikely source: those who believe we are not likely to gain such access. Even though they are skeptical, Nisbett and Wilson (1977) suggest that accurate retrieval of one's reasoning might be enhanced by interrupting processes in the moment, alerting participants to their cognitive processes, and coaching them in introspective procedures. Action scientists draw on each of these tactics but have elaborated them in the form of a set of rules, described below, that tell participant and researcher what internal processes to look for and how to regard different responses.

- *Rule 1:* Interrupt interactions on-line, direct attention to internal processes, and generate the impetus to explore them. Although willing to make suggestions on enhancing retrieval, Nisbett and Wilson (1977) consider such suggestions to be "ecologically meaningless." Apparently they assume that individuals will not sit still for such probing techniques, unaware of their relevance. This may be true in ordinary social or research situations. But because the research process in action science is designed for participants' learning, such techniques become relevant, even quite meaningful. The action scientist focuses on

areas of critical import to participants and relies on a range of interventions to trigger participants' interest in examining their internal processes. The passivity experiment described in Chapter Four illustrates this in that the action scientist initiated the inquiry by pointing out that participants were designing their own injustice. Since these results were unintended and the participants would not have knowingly set out to produce them, they were quite intent on retrieving the internal processes that might in part help account for the results. At the same time, we recognize that this provides no assurance that participants will in fact retrieve or report internal processes accurately, so this rule alone is not sufficient. It encourages, but alone does not ensure, reliable reports.

- *Rule 2:* Elicit the attributions and evaluations being made about self, other, or situational factors (such as tasks, time, and so forth). Since we are interested in understanding how participants understand their social world, we probe for the attributions they make about themselves, others, and situational factors. These are the data that they use to construct the problematic situations in which they act. A researcher therefore might ask for participants' reactions and in so doing uncover a range of private attributions and evaluations that were made at the time of a particular incident. The consulting students in the passivity experiment, for example, made attributions about their own "stupidity," others' "smartness," and the interventionist's "toughness." These reports are of a different status than "I withdrew because I thought that it was best to learn by observing." This latter report may reflect what the participant is thinking, but it may or may not be an accurate explanation of what led him to withdraw. The former reports, however, give us a window onto how individuals *see* the situations in which they act. This allows us to reconstruct the conditions under which they act, as they see them, so that we might then construct the proposition: "When I attribute that I'm stupid, I withdraw and cover up my stupidity." This latter proposition is not of the same type as the plausible, yet often unreliable, explanations individuals give for their own behavior. It is based on what this participant actually did, under conditions experienced and reported by him.

• *Rule 3*: Regard causal explanations as hypotheses to be tested. As unreliable as self-explanations can be, we cannot a priori assume that they are inaccurate. Instead they should be regarded as worthy of test like any other hypothesis. One such test involves searching for data that might falsify the proposition. Counselors, for instance, often say that they take an approach to their clients that will allow them to come to their own insights. But this explanation overlooks the fact that their questions often “lead” clients to insights that they already hold in their heads. Once these disconfirming data are identified, the counselor and researcher can begin to search for new hypotheses that might better account for what the counselor actually does. At this point the researcher might redirect his search toward the attributions the counselor makes about himself and his client as he asks leading questions. Researcher and counselor might discover, for instance, that the counselor was concealing negative attributions, along with predictions that these would be upsetting to the client. The counselor might report thinking, “This guy’s got a real grudge going. He doesn’t see his role in it at all. But if I ever said that, he’d hit the roof!” At the same time he might also be thinking about himself: “I don’t know what I’d do if he got that angry here. I don’t think I could handle it, but I’d better not let him know that or he’d leave.” With these data we can begin to construct a very different account of the counselor’s leading questions—one that gets at how he acts in the face of the inferences that he makes about his client and his own competence. We thus might arrive at the following proposition: “When at the limits of your competence, lead in and act as if you know where you are going in order to cover up that you don’t.”

The emphasis of this section, however, is not on the different ways of testing the causal accounts individuals give of their actions. We have addressed this previously (Chapter Two), and we will have more to say in a subsequent section about the range of ways to design tests in an action context. This section aims to explain why such accounts ought to be regarded as hypotheses to be tested and to show how they can be tested in ways that are useful to the practitioner’s and the researcher’s learning alike.

- *Rule 4:* Slow down and focus on the inferential steps individuals take in going from the data to their conclusions, since the very skillfulness of their inferential processes can cut individuals off from them. If we are to gain access to how individuals construct the situations in which they act, we need to find some way of getting at these processes. One way is to slow down the pace of these processes and to virtually retrace the steps that individuals take in moving from the data of what occurred to their attributions about what happened. By drawing on the ladder of inference, we can help individuals retrieve the data that they selected, the cultural meanings they imposed on the data, and the attributions and causal theories they constructed. This way we can help individuals spell out the steps involved in these tacit processes, making it easier for them to test their inferences and enabling them to discover any systematic gaps or biases embedded in them. For instance, individuals might find that they tend to focus on one kind of data while ignoring other kinds. Or alternatively, they might see that they are predisposed to take predictable kinds of inferential leaps from the data.

- *Rule 5:* Slow down and focus on individuals' emotional reactions. Individuals can also be helped to slow down and retrieve their automatic emotional responses. While it is not unusual for individuals to register a sense of distress, it is often difficult to identify what it is they are feeling and in relation to what. Yet this kind of data is also important if we are to fully understand how individuals experience and act in the situations they face. With these data we can more fully grasp what individuals feel they are up against, as well as how they manage such reactions.

The problem, however, is that these reactions are so automatic that we stop attending to them in much the same way that we lose track of our reasoning. If we are to reconnect with both our emotional and cognitive processes, we have argued, it helps to slow down, look at what happened, and retrace what was thought *and* felt at the time. But often this is not a simple task. To publicly retrace and make public these processes involves risks that themselves evoke emotional and defensive reac-

tions that hinder the retrieval of these processes and make it difficult to report them to others. The action scientist's inquiry is thus directed at helping participants manage these reactions in a way that can sustain inquiry (see Chapters Ten and Twelve).

What we wish to emphasize here is that all action science data-gathering processes are designed to enhance and build on participants' own commitment to learning. Thus, the problems, which are selected by the participants, are ones of critical import to them. The data gathered are largely in their control, and the focus is mainly on data that can be directly observed. Participants are aided in retrieving internal processes. The interventionist strives to find inconsistencies and puzzles in participants' actions in order to engage their interest in attending to the internal processes that might in part help solve such puzzles. These rules thus serve to enlist participants' help in ensuring validity. They make participants co-investors in that norm since their own learning depends on it.

Data Analysis: Mapping out Social Action. So far we have described the way in which data are collected, and we have said that we wish to make explicit the propositional logic embedded in social action. In analyzing these data and in representing the knowledge constructed from them, action scientists must meet the criteria of their practice. This knowledge must therefore be falsifiable in an action context, usable on-line by actors, and informative of alternatives. To satisfy these criteria the action scientist draws on three analytic tools. The first includes the highly abstract explanatory and normative models that guide the direction of the analytic process. These tell the researcher what data to highlight and what data to ignore, as well as which causal sequences are important and which ones are less so. As we saw in Schön's analysis of the town planner's dilemma, Models I and II serve this function in analyses of individuals' theories of action. The second tool is the ladder of inference described in Chapter Two. It serves a triple function. First, it makes it possible to go from the data of a concrete case to more abstract models, so that these models can be falsified. Second, it makes it possible to connect generalizable knowledge to a particular case. And finally, it enables individuals to reflect on ac-

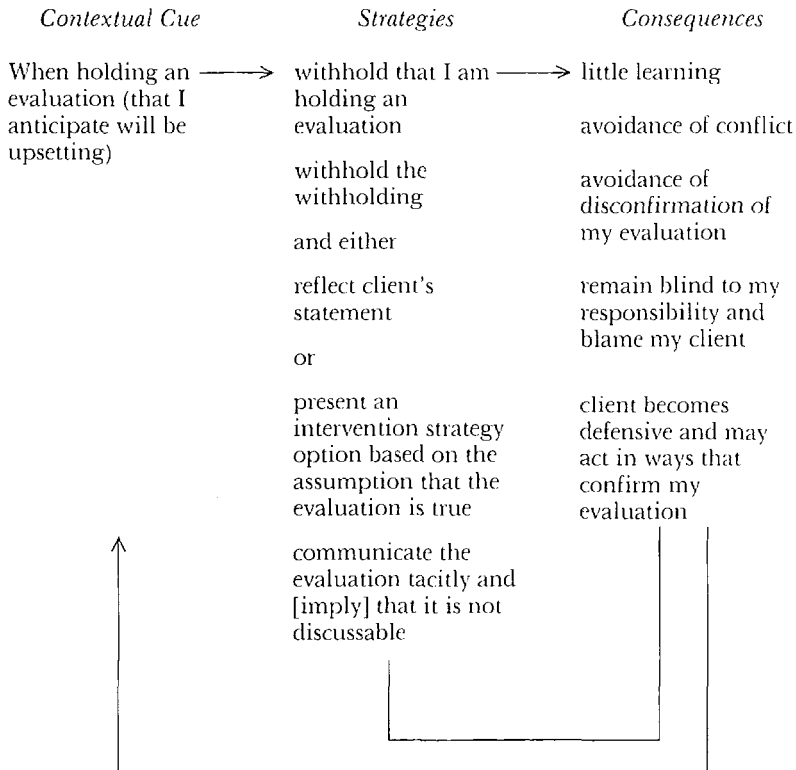
tion by providing a tool that can be used to retrace and make public the inferences they draw from what happens to the conclusions they draw from events.

A third device is mapping, which is used to analyze a particular problem and to represent knowledge so that it becomes useful to those it addresses while going beyond their particular case. Ordinarily such maps are midrange representations, not as abstracted from a concrete case as are Models I and II. As such, these maps usually provide a more elaborate description of a problem—for example, the difficulties involved in implementing a matrix structure. But like the more abstract models, these maps describe the tacit logic that informs social action and the implications of this for the behavioral worlds of the actors. What a particular map looks like depends on the territory being covered. A map might describe the propositional logic embedded in one consultant's practice, the behavioral world created by a group of consultants, and so on. Nevertheless all maps represent certain aspects of the terrain, in much the same way as all topographical maps must represent in a particular way the physical configurations of different regions. The map maker knows that, regardless of the particular region, some of its aspects must be described according to certain specifications, while others can be ignored. Similarly, maps of social action vary, depending on the level of analysis and purpose at hand, but they must all capture certain aspects of social action and do so in a certain way. We will now consider what can differ and what must remain constant.

- Maps can describe different levels of analysis. At the individual level, maps can simply specify a single rule in an individual's practice. A tacit rule in one counselor's practice, for instance, went like this: "Hold the belief that clients know best except when I know better and the corollary that I know best when I know better." This rule not only served to make explicit a tacit rule in her practice, it served to explain how a counselor intent on being client centered could unknowingly act quite counselor centered. Building further, this same counselor went on to develop a more complex map of her own practice, one that described an interrelated set of propositions that told her

how to act in the face of negative evaluations and a fear of evoking defensiveness (see Figure 5).

Figure 5. Map of a Counselor's Practice.



If we decompose this map, we can see that it describes an interrelated set of rules, the conditions under which they are used, and the consequences that are apt to follow from using them. By identifying a single cue or condition and a pattern of responses, this counselor can more readily recognize those occasions or circumstances under which she is apt to violate what she intends. As a result she can begin to identify and to inter-

rupt these responses, at first in a setting where she can learn new responses and later on with her clients. Moreover, represented as they are here, her practice rules are quite generalizable and should be useful to other counselors in training who might find themselves in the same dilemma. The map is therefore abstract enough to go beyond the circumstances of her particular case, while being concrete enough to describe with some precision what she does under the conditions specified. It is in this sense that we refer to maps as comprising midrange concepts.

At the organizational level, the interrelated factors that create, maintain, and reinforce a complex social system can also be mapped. One such map depicted the web of factors that prevented a matrix organization from implementing its structure as intended. As Figure 6 illustrates, the map began by describing the initial conditions the members faced, from work-related constraints to inconsistency to a high degree of complexity and ambiguity (column 1). Next it showed how the two prevailing sets of rules under these conditions were those of passivity and proactivity, conceptualized along a continuum that specified the individual rules that comprised these sets (column 2). At the same time it explained by way of feedback loops how the two responses combined to reinforce one another and the initial conditions. Finally, it described how this set of interrelated factors generated multiple binds that were themselves then managed by their prevailing rules. This escalated the interactional dynamics and reinforcing the initial conditions still further (columns 3, 4, and 5). In describing these factors, the map made explicit the mostly tacit processes that prevented this particular group from implementing an effective matrix team. But the literature on matrices suggests that such a map, if tested in other organizations, might be found to be quite generalizable to them as well.

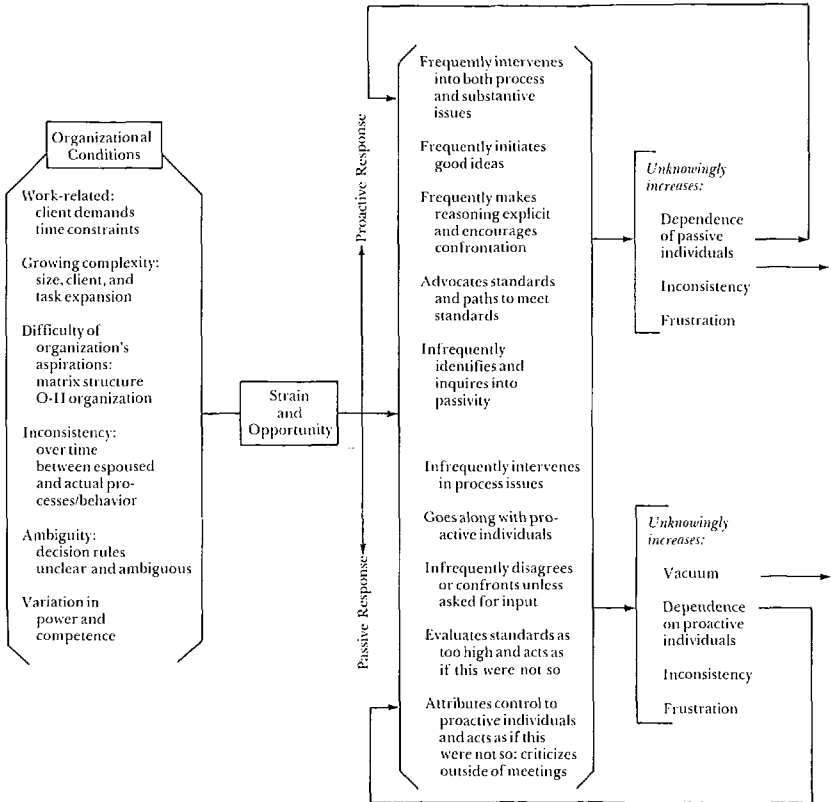
- Maps can be either diagrammatic or verbal representations of action. So far the maps we have discussed have been diagrammatic, representing graphically the interrelationships among key variables. Even though they cover a great deal of complex material, such diagrams are simple enough to be man-

aged by an actor and visually vivid enough to be recalled. They therefore allow actors to store and retrieve this knowledge while acting. But for other purposes, verbal representations can be equally retrievable and more useful. A kind of map called *scripts*, for instance, allows us to more richly describe a particular rule that, as an abstract construct, necessarily subsumes a sequence of moves and expectancies that remain implicit. One way of making them explicit is by scripting the sequence involved in a rule's enactment. To illustrate: Easing-in is a rule designed to avoid provoking defensiveness. It tells an actor to ask a series of questions in such a way that the questions lead the recipient to the insight in the actor's head. This rule is scripted here through a description of the sequence of expectancies and moves hypothesized to be in an actor's head when he produces that sequence:

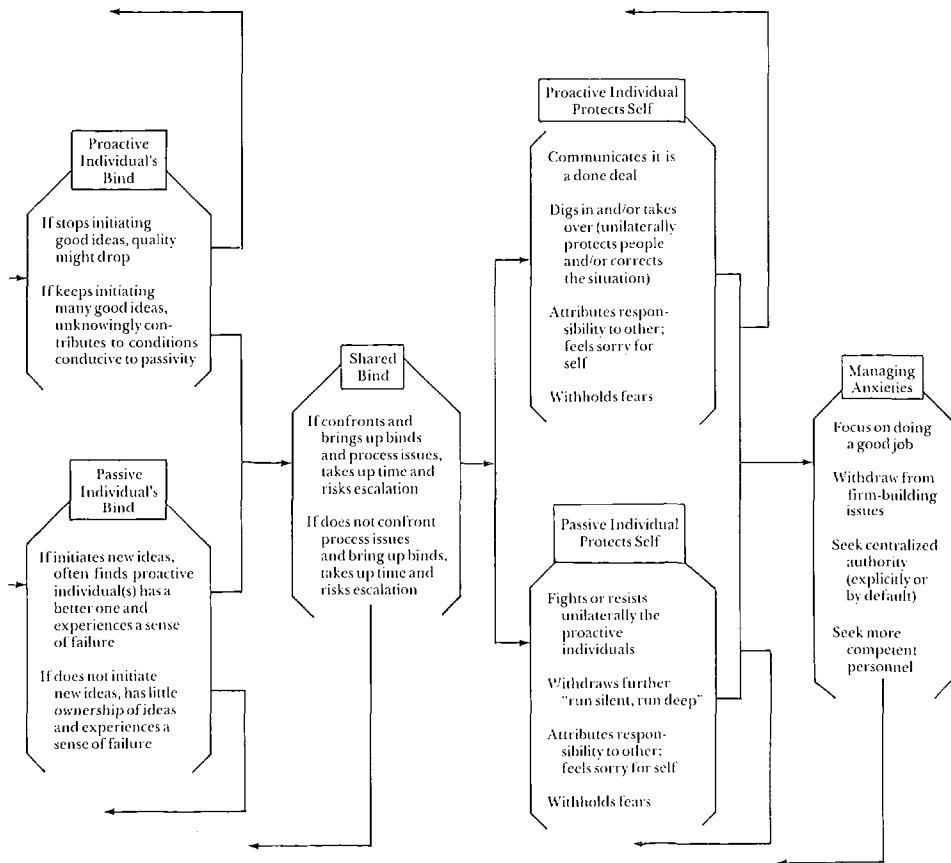
The Easing-In Script

1. I know how I want you to behave and I am not going to tell you directly.
2. I will not tell you that this is the case.
3. I will ask you questions which, if you answer as I anticipate, will lead you to an understanding of my position.
4. I will expect that you will see all this without my saying it overtly.
5. I will expect that you will not discuss it.
6. I will expect that you will go along.
7. If you have questions or doubts about my intentions, I will expect that you will not raise them and will act as if you do not have any doubts.
8. If you do not behave as I expect, I will
 - a. give you more time to think "constructively" by continuing my questions.
 - b. eventually become more forthright about my views.
 - c. attempt to argue you out of your views.
 - d. conclude that your defenses are too high to permit you to learn or too difficult for me to handle.
 - e. compromise and/or withdraw and act as if I am doing neither.

Figure 6. Action Map.



Source: Lawler and others, 1985, pp. 86-87.



Unlike the easing-in construct, this script decomposes the tacit reasoning processes necessary to produce it. In so doing it enables actors to see what they could not previously see: the discrete logical steps involved in their actions. Once aware of these steps, actors view their actions in a new light. Although they had intended to be client centered, sensitive, and noncontrolling, this script reveals the extent to which their tacit logic clashes with these intentions. As such, the script provides them with the impetus to reconsider their theories and to reflect further on their practice to see if other surprises might be found.

- Maps can be either descriptive, such as the one just discussed, or normative (prescriptive), a distinction that depends in part on one's perspective. An observer may describe the rule I follow, but I follow it as if it were a prescription. From an action science perspective, the script for combining advocacy with inquiry is a normative one that poses an alternative set of expectancies and moves to the easing-in script:

The Script for Combining Advocacy with Inquiry

1. I know how I believe that you (or I) should behave given the difficulties identified, and I will communicate* that to you.
2. I will act in ways to encourage you to inquire* into and to confront* my position.
3. I will expect* that you will inquire into and confront my position whenever you believe it is necessary, and I will tell* you that this is what I expect.
4. I will check* periodically to see if this is the case. I will hold you responsible for continual designed congruence between your actions and your thoughts.
5. If I infer incongruence between thoughts and actions, I will test* it with you openly.
- 6a. If I learn* that the incongruence is unintentional, then I will act to help you by going back to number one.
- 6b. If I learn* that the incongruence is intentional and you

*Indicates that these actions should be performed consistently with Model II rules.

are knowingly hiding this fact, then I will feel that I cannot trust you and will go back to number one.

By scripting this rule, individuals can see what it takes to produce it and how different it is from easing-in. Even though both scripts involve asking questions, the script given here reveals that the expectancies and intentions behind them are quite different.

- Maps are often nested within one another at different levels of abstraction and analysis. The organizational map described earlier contains maps of individuals' rules, organized into a more comprehensive pattern that showed their interrelationships and their impact on organizational outcomes. Similarly, individual rules themselves subsume a sequence of expectancies and moves that can be captured by scripts. We therefore find maps within maps, each with its own range of usefulness. What form the action scientists or participants choose depends in part on what is being explained and to what end. The diagrammatic form can capture with relative simplicity an enormously complex set of interrelated variables. It is thus retrievable and applicable in a way that a precise quantitative analysis or a description of everyone's moves and expectancies cannot be. It would simply contain too much information to keep in one's head while acting. Alternatively, if a particular individual wishes to produce or to alter a rule such as easing-in, a script of the sequence it informs becomes useful. The overarching decision-rule for mapping might therefore be stated as: Be as precise and complete as usefulness allows and requires for the purposes at hand.

- Maps can be falsified by those they address. Maps are a set of hypotheses to be tested, and as such they are designed to be falsifiable in an action context. The inferences embedded in them are made explicit and connected to data that are easily recognizable and observable by participants, so that the inferences can be submitted to a range of tests by them. One such test is to present the map to participants, along with the data on which it is based, actively seeking disconfirming data and alternative views. Another test is to make predictions about future

events that logically follow from the map. We might predict, for instance, that the actors in a matrix will experience more and more binds and will increasingly distance themselves from their responsibility. And a third test is to design an intervention predicted to alter the interactions and the consequences depicted in the map. If the map is accurate, then we ought to be able to predict the impact of altering one aspect of it on other variables described in the map.

- Maps contain an inner logic with a predictable plot line. While themes may vary, the basic plot line of maps remains the same. Such plots ordinarily begin with the initial conditions that actors face. They then go on to describe the rules or sets of rules that individuals follow under these conditions in order to contend with them. And finally, they identify the impact of these rules and conditions on variables relevant to actors, including the initial conditions themselves. In this way maps can be said to describe the teleological and causal mechanisms involved in interactions, as well as the self-reinforcing features embedded in this causality.

- Maps take into account the constraints posed by the human mind. All maps share certain characteristics that enable individuals to store and retrieve them while acting on-line and to use them for actually producing or altering the actions represented in them. First, they are abstract and generalizable enough to cover a range of behaviors and instances, so that they can be stored economically without overwhelming actors with complex detail. Second, although abstract, maps are easily connectable to the data of what occurred, and they can be illustrated by representative examples that are vivid enough to be retrieved while acting (cf. Tversky and Kahnemann, 1973). Third, since actors lose sight of their behavior while acting but can identify internal or situational cues (Jones and Nisbett, 1972), the initial conditions specify these cues so that actors can more easily identify the situations in which they are apt to get into trouble. At the same time, by describing action rules, maps enable observers to identify and point out to unaware actors when they are in fact using them. This combination of recognizable cues and rules allows action to be interrupted for

purposes of reflection. An actor can more easily retrieve what was happening at the time of the rule's use and reflect on the consequences the rule yields. If she then so chooses, she might reconsider how she constructed the situation before her (the conditions she faced), and she might invent an alternative rule, experimenting with it to see what she gets. In this way maps not only serve to describe and prescribe but to facilitate reflection on what is described and experimentation with alternatives.

Hypothesis Testing: Discovering Mistakes in Action. Action contexts are a formidable domain for ensuring the validity of tests. They are characterized by a multitude of interacting variables that cannot be isolated and manipulated one at a time. Compounding this, individuals in everyday life follow a set of rules for understanding and acting in the world that pose multiple threats to inferential accuracy and to the designing of valid tests. When individuals manage data, for example, they tend to retrieve biased samples (Tversky and Kahnemann, 1973), to see situational factors and not their own behavior (Jones and Nisbett, 1972), to lose sight of much of the data on which their inferences are based (Carlston, 1980), and to apply asymmetrical standards to supporting and opposing evidence (Lord, Ross, and Lepper, 1979). In making inferences, they tend to skew them in a self-protective direction (Langer, 1976), and the more severe the consequences, the more defensive the attributions (Harvey, Harris, and Barnes, 1975). They tend to test their views privately (Argyris and Schön, 1974), and they rely primarily on confirming strategies (Mynatt, Doherty, and Tweney, 1978). Finally, when acting, they do so on the basis of private understandings that are assumed to be true, thereby creating self-fulfilling prophecies without knowing it.

Under these conditions we might easily despair of ever conducting valid tests with participants in an action context. But there is another side to this equation that works in favor of testing and that lays the foundation for rules that can ensure the validity of such tests. First of all, although it is complex, the action context is an ideal setting for repetitive and ongoing testing. We do not need to determine the status of a particular

proposition once and for all in a time-limited, “one-shot” way. Instead we have multiple opportunities to construct test after test to eliminate competing hypotheses. Second, while it is true that participants follow a set of rules that jeopardize validity, it is rarely the case that they wish to do so. Quite the opposite, once they are aware of these rules, they are usually interested in acquiring those put forth by the action scientist as norms for inquiry in the learning context. Some of these were identified earlier as the rules governing processes for gathering and analyzing data, and we will now consider additional ones used to test hypotheses in an action context (see Part Three for a description of the learning process by which participants acquire them).

- *Rule 1:* Combine advocacy with inquiry. Perhaps the overarching rule of inquiry for action science is this one, because it requires that individuals regard their views as subject to critique and test, and it asks that they at once make them public and invite others to inquire into them. What form an inquiry takes depends on the view being put forth. An individual might make an attribution about someone and seek to test it with him. Or, alternatively, someone might claim that a certain strategy will yield certain outcomes and seek others’ reactions. By itself this rule is not sufficient, since the way a view is put forth and reactions are offered affects whether a test is genuine. This rule must therefore be enacted in accord with those that follow.

- *Rule 2:* Illustrate your inferences with relatively directly observable data. This rule asks that when participants make a claim, they provide the data upon which it is based. If the assertion is of the form “John is acting unfairly,” then they are asked to provide the data of what John said or did that led them to this view. Similarly, if someone asserts that “being supportive would make John more forthcoming in his views,” they are asked to illustrate, often by means of a role play, the supportiveness hypothesized to help John be more open. In this way other participants have a means by which to judge for themselves whether the claims hold. They can see if the data about John suggest unfairness to them. They might come forth with new data or new explanations of the data that would fal-

sify or dispute the claim. And they can determine whether the role play had the effect that was predicted by describing their responses to it and/or by seeing whether it helped John to become more open.

At first participants find it hard to retrieve the data of what occurred while acting, but since all sessions are tape recorded this does not present a significant obstacle. More important, we have found that with practice individuals can develop skill at retrieving data more accurately on-line. It may be that, as theories-in-use change and protective reasoning is reduced, retrieval is enhanced and becomes more reliable. In any event the data provided by audiotaping provides an ongoing check.

- *Rule 3:* Make your reasoning explicit and publicly test for agreement at each inferential step. Along with the previous two rules, this rule helps create conditions for public testing, this time by aiding the open probing and negotiation of different meanings. It asks that participants make explicit the inferential steps that led from the data to their conclusions, publicly seeking agreement at each step. The corollary is to return to the data in the face of conflicting meanings and retrace the steps taken to see where the meanings diverge. In making these steps public, participants can more readily detect the leaps of logic that they and others might make. They can ensure that they understand correctly the meanings others intended. They can see where they begin to disagree on what they believe is happening. And they can return and retrace their steps in an attempt to reach agreement.

- *Rule 4:* Actively seek disconfirming data and alternative explanations. One common inferential error in everyday reasoning is the strategy of seeking confirming data (Mynatt, Doherty, and Tweney, 1978). One way to counter this is to follow a rule that explicitly asks that disconfirming data and views be elicited. But often such a rule involves asking people to produce potentially negative information, since they might have to say that an individual's strategy made them defensive or that their own views are false. It is therefore not an easy rule to enact, since it must be accompanied by a willingness to take seriously these kinds of data and alternative explanations. By "take

seriously,” we mean that the actor must actively inquire into the new data or explanations and design ways of understanding the discrepancies by either designing tests of the competing views or reexamining the different inferences being made from the data. It would not be sufficient, however, to leave it at “you have your view or data and I have mine.”

- *Rule 5:* Affirm the making of mistakes in the service of learning. This rule in part is designed to create conditions conducive to enacting the previous rules. Illustrating views, making one’s inferences explicit, and seeking disconfirming data all put participants at risk of discovering they are wrong. Of course this is the purpose of experimentation, but the problem is that it evokes our defenses against failure. One way to counter these defenses is to regard mistakes as the raw material of learning, worthy of consideration and exploration. The difficulty here, however, is that participants are predisposed to take a different view of errors, one that involves regarding them more as crimes worthy of punishment. Not surprisingly, such a frame can act as a formidable obstacle to enacting these rules. We will see later that the learning of them is largely contingent on reframing what it means to make mistakes and what it takes to learn.

- *Rule 6:* Actively inquire into your impact on the learning context. Unlike most social scientists, the action scientist wishes to influence the inquiry at hand. For instance, she wishes to enact as norms the rules under discussion, thus helping participants to learn them. In a different vein, the action scientist can also make mistakes that affect participants, at times hindering their learning. In the passivity experiment in Chapter Four, for instance, George thought the interventionist’s actions might inadvertently be doing more to reinforce his and his fellow students’ responses than to alter them. This rule asks that action scientist and participants alike inquire into such possibilities and understand the nature of the impact that they do have: Is it what they intended? Do they like the results that their interventions yield? This rule recognizes that the interventionist cannot eliminate the possibility of influence altogether and that he does not wish to do so. The aim of action science is to serve participants’ learning and to enable them to change by virtue of the

researchers' influence. The task therefore is not to diminish the interventionist's influence but to inquire into whether the influence is intended and whether it is the right influence to exert. This inquiry, of course, is pursued in accord with the other rules presented here.

- *Rule 7:* Design ongoing experiments to test competing views. Often individuals will disagree in their assertions about what is happening and what ought to happen. In the passivity experiment George asserted that the interventionist was reinforcing passivity, thus giving his view of what would happen if the interventionist continued to act in the same way. At the same time he thought another approach would be better and put forth his idea of what should happen. In both instances the interventionist had a different view, yet rather than impose his own view or regard the differences as nonnegotiable, he designed ways to test them. In the first instance, he suggested that they see what would happen as a result of his moves: "One way is to test it and see what happens in the interaction as we're going." In the second instance he asked George to role play his alternative to test whether it had the impact he predicted and whether it yielded results that might foster the learning he sought.

Similarly, some social scientists have questioned the validity of a protocol that action scientists use to test the claim that individuals hold Model I theories-in-use. Since this view raises an important issue, we will describe the protocol here, examine the questions it raised, and look at the test designed to see if the negative view of the protocol was confirmed. The protocol in question was the X and Y case, a learning instrument developed to test whether participants hold a Model I theory-in-use. (For a more detailed discussion, see Argyris, 1982). The case offers examples of what a superior, Mr. Y, said to a subordinate, Mr. X:

1. "X, your performance is not up to standard."
2. "You seem to be carrying a chip on your shoulder."
3. "It appears to me that this has affected your performance in a number of ways. I have heard words like *lethargy*, *un-*

committed, and *disinterested* used by others in describing your recent performance.”

4. “Our senior professionals cannot have those characteristics.”
5. “Let’s discuss your feelings about your performance.”
6. “X, I know you want to talk about the injustices that you believe have been perpetrated on you in the past. The problem is that I am not familiar with the specifics of those problems. I do not want to spend a lot of time discussing something that happened several years ago. Nothing constructive will come from it. It’s behind us.”
7. “I want to talk about you today and about your future in our system.”

Once participants have read the case, the interventionist asks them to evaluate how well Mr. Y performed his task of helping X to “shape up or ship out.” Participants uniformly evaluate Y as ineffective; and, as they do so, the interventionist creates a collage of their diagnoses and modifies it until all participants agree that it represents their views. At this point the interventionist then infers the causal theory embedded in their diagnosis: “If someone is blunt, insensitive, and so on, then the recipient will feel misunderstood and defensive, and little learning will occur,” and he tests for agreement among participants to see if this represents their view. Once they confirm that it does, the interventionist then identifies a puzzle: If participants told Y their diagnosis, they would be enacting the very causal theory that they criticize Y for enacting with X. Telling someone he is blunt and insensitive is itself blunt and insensitive, and by this microcausal theory it would be expected to cause defensiveness and inhibit learning.

Typically, participants react by defending their actions and reasoning processes, and the interventionist treats each objection as an hypothesis to be tested, encouraging participants to role play what they would actually say to Y. When they do so, they discover that they use either a forthright or an easing-in strategy, but in each case they find that they communicate what was in the diagnosis and create the very conditions that it

predicted and that they wished to avoid. Even when the interventionist predicts this will occur and the participants know these predictions, believe they are false, and strive to disconfirm them, they still discover that other participants evaluate them as having acted in ways consistent with them.

The X-Y case has now been used with thousands of individuals in scores of groups (see Argyris, 1982). In each case participants have acted in the ways predicted by Model I, indicating that little to no variance exists at the level of theory-in-use. Social scientists are understandably skeptical of this result, and it is this lack of variance that raised the question of whether it might be an artifact of the X-Y case. According to this view, it is not that everyone is programmed with a Model I theory-in-use but that the X-Y case elicits responses that confirm the theory. To summarize, this critique is composed of the following kinds of assertions: The protocol extracts a few sentences from different points in a conversation, and each sentence is thus isolated from its context. The protocol gives only Y's side of the conversation, and this may induce people to react negatively to Y. And, finally, Y acts in ways that have the cultural meanings of "authoritarian, controlling, and disapproving," putting the respondents in a state of apprehension as to how they should feel in X's place. Because of this, respondents feel indignation with Y, and their responses are more a consequence of this emotional state than of an underlying Model I theory-in-use. One way we might respond to these possibilities is to point to the other kinds of evidence that support the theory. For example, when individuals write out cases of situations in which they have been involved, they reveal the same theory-in-use. Similarly, tape recordings or observations of spontaneous interactions in organizations show the same features. It is difficult to see how researchers could be held responsible for data that are produced by individuals who are working alone and who may never have been in an action science project.

Nevertheless, to test the possibility that the X-Y case elicits confirming data, we developed another protocol, the A-B case (see Exhibit 1). Unlike the X-Y case, this one presents a single episode rather than excerpts from several points in a con-

Exhibit 1. A-B Case.

Context: B is a supervisor at a community center. B is concerned about A, who is a volunteer counselor. A used to be a client of the center, and lately she has again been coming in for help. B is concerned that A's personal difficulties may be interfering with her performance as a counselor. B decides to talk to A in the hope that A will agree to limit her counseling work.

- B:* It seems like it might be time to start thinking about whether your roles—whether both counseling here and being a client, is kind of becoming a problem.
- A:* Why is it a problem?
- B:* I'm not saying it is. I guess I'm just curious to hear your thoughts on it. Is it confusing to you? I imagine it might be.
- A:* No. Why should it be? It's not confusing.
- B:* I'm not trying to attack you in any way whatsoever. I'm merely just asking a question. We haven't talked about any of this stuff for a really long time.
- A:* Fine. That's fine, and my answer is no, it's not a problem.
- B:* Well, I've heard from C that sometimes you say that you come here needing help, and you're frustrated because nobody is free to see you. And then you decide, "Maybe I should be working now." Do you really feel like at those times you are at your best to be a counselor, that you're able to put your stuff aside?

versation, and it provides both sides of the conversation rather than only one. Unlike Y, the supervisor B appears to make an attempt to be caring and supportive and to reduce the risk that A will perceive her as authoritarian, controlling, and disapproving. At the same time, B is still an authority, she disapproves of what she believes A is doing, and she does not drop the issue when A says there is no problem. Some social scientists have argued that this in itself creates an inherently Model I situation. In our view it may create an inherently threatening situation, but it does not need to be handled in a Model I fashion. Individuals in positions of authority must find some way to evaluate and handle the possible incompetence of subordinates. The question is how they fulfill this responsibility, and what choices they make as they do so.

Despite the contextual differences in the case and B's easing-in strategy, the results were the same as in the X-Y case. Participants evaluated B negatively, they used a micro-causal theory of defense to diagnose the case, and they violated that theory once they acted, whether they eased in or were forthright. All the data suggested that their theories-in-use were Model I, and the same inconsistencies found in the X-Y experiment were found here. It therefore does not appear that the X-Y case is responsible for eliciting confirming data.

This chapter describes action science as an inquiry into social practice. The questions it asks, the facts it goes after, and the solutions it devises are designed to generate knowledge in the interest of such practice. At the same time we have said that action science aims to enact communities of inquiry in communities of practice by helping participants to realize the norm of responsible belief. But to do so requires that the action scientist enact the rules of inquiry just described in real-life contexts, and this in turn means that practitioners must use those rules. At present, practitioners adhere to everyday rules of inquiry that clash with those of action science and they are unaware this is the case. Thus the action scientist must help practitioners become aware of the rules they now use and teach an alternative set, so that practitioners might skillfully enact them on their own. How the action scientist does so is the question that the remainder of this book addresses.

