Chapter Three
INTRODUCTION TO HEURISTICS

I. THE IDEA OF HEURISTIC

The classic story about heuristics tells how Archimedes jumped out of the bathtub and ran naked through the streets of Syracuse, shouting “I’ve found it.” As he had watched water slosh out of the tub, he had suddenly realized that something that weighed the same as his body but was more dense would make less water slosh out of the tub. Hence, if the supposedly golden crown of his friend King Heiron was actually made of a cheaper silver alby, it would displace more water than an all-gold crown, because silver is less dense than gold. So he could tell whether the crown was made entirely of gold without melting it.

What Archimedes actually shouted, of course, was not “I’ve found it,” but “Eureka,” the first-person singular perfect of the Greek verb heuriskein, meaning “to find.” From this word comes the English word heuristic, which denotes the study of how to find things out—the discipline, as it were, of discovery. The Archimedes story is a good place to start thinking about heuristic. Archimedes had a problem. Bobbing in the bathtub gave him the solution. And so heuristic is the science of finding new ways to solve problems, the science, as it were, of bathtubs. Thus, in computer science, heuristic programming refers to programming that takes an experimental approach to problem solution rather than an analytically exact one.²

Most modern writing about heuristic comes from mathematics. Mathematicians often have particular problems to solve: how to solve the normal distribution integral (hint: you can’t do it analytically), how to create a perfect pentagon, how to categorize all the possible types of disconnection in six-space, and so on. Mathematicians often know or suspect the answer they seek but need to be sure of how one gets there. Even when they don’t know the answer, they usually have a clear idea of what an answer looks like. In such a context, heuristic means thinking creatively about how to get from problem to solution. Often one builds out from the problem on the one hand and from the solution on the other until the two halves meet in the middle like a bridge built from two banks.

The greatest modern writer on heuristic, the probabilist George Pólya, wrote his brilliant How to Solve It precisely about such mathematical problems. Pólya presented a large number of tricks and schemes for making difficult problems solvable. He thought there were four crucial steps to problem solution: understanding the problem, developing a plan to solve it, carrying that plan out, and looking back from the solution. Each of these steps involved a number of questions and tasks:
1. **Understand the Problem:**
   - What is the unknown? What are the data? What are the “conditions”? 
   - Draw a figure. Introduce suitable notation. 
   - Separate the parts of the conditions.

2. **Devise a Plan:**
   - Have you seen this problem before or something like it? 
   - Do you know another problem with the same unknown? 
   - If you have a related problem and its solution, how can you use that here? 
   - Can you restate the problem? Solve a part of it? Solve an analogous problem? Solve a bigger problem of which it is a part?

3. **Carry Out the Plan:**
   - Check each step. Are they really correct? Can you prove it?

4. **Look Back:**
   - Can you check the result? Can you derive the result differently? 
   - Can you use the result to solve another problem?

Most of Pólya’s book is a “dictionary of heuristic”—really a set of meditations on various topics relevant to discovery. Some of these topics are strategies for problem solving: auxiliary problems, decomposing and recombining, mathematical induction, variation of the problem, working backward. Others are extended essays on the questions listed under items i—I above.

But in the social sciences we often have a different situation. We often don’t see ahead of time exactly what the problem is, much less do we have an idea of the solution. We often come at an issue with only a gut feeling that there is something interesting about it. We often don’t know even what an answer ought to look like. Indeed, figuring out what the puzzle really is and what the answer ought to look like often happen in parallel with finding the answer itself. This is why many if not most writers of social science dissertations and books write the introductions to their dissertations and books last, after all the substantive chapters have been written. Their original research proposals usually turn out to have just been hunting licenses, most often licenses to hunt animals very different from the ones that have ended up in the undergraduate thesis or the doctoral dissertation.

This difference between mathematics and the social sciences means that I do **not** necessarily assume here that the reader is someone at the beginning of a research project, looking for new ideas. Most teaching on methods assumes that the student will start a research project with a general question, then narrow that to a focused question, which will dictate the kind of data needed, which will in turn support an analysis designed to answer the focused question. Nothing could be further from reality. Most research projects—from first-year undergraduate papers to midcareer multiyear, multi-investigator projects—start out as general interests in an area tied up with hazy notions about some possible data, a preference for this or that kind of method, and as often as not a preference for certain kinds of results. Most research projects advance on all of these fronts at once, the data getting better as the question gets more fo-
cused, the methods more firmly decided, and the results more precise. At some point—the dissertation-proposal hearing for graduate students, the grant-proposal stage for faculty, the office hour with the supervising faculty member for any serious undergraduate paper—an attempt is made to develop a soup-to-nuts account of the research in the traditional order. Now emerges the familiar format of puzzle leading to literature review leading to formal question, data, and methods. Even then, the soup-to-nuts menu is likely to be for a different meal than the one that ends up in the final paper.

As any senior researcher can tell you, the typical grant-funded project has some of its final results in hand by this midpoint in the research process. Put another way, you can’t tell a granting agency what you are going to do until you’ve very nearly finished doing it. And indeed, many faculty use grant funds from one project to do their next project, which they apply for when it is nearly done—to get funds to do the project after that. (That is, expecting you to know exactly what you are going to do ahead of time is completely unrealistic in the social sciences.) So the first version of a traditional proposal is pretty tentative. The real reason for forcing research into that format is that the format makes it easier to see what remains to be done and what hasn’t worked so far.

All of which means that I am not assuming that the reader is reading this book in hopes of getting an idea, which will then lead to focused questions, and data, and so on. The gambits I discuss can be useful at any time in a project, because data, methods, and theory will all be recast again and again throughout the course of any research project.

This talk about senior researchers may seem to suggest that my argument is losing its original focus on the beginning student. So a word is useful here about the stages of an intellectual life. It turns out that heuristics do different things for us at different ages.

I noted in my remarks To the Reader that a common problem among students is a feeling that one has nothing to say. And the principal theme of this book is resolving that problem by finding bases for new ideas. The problem of having nothing (new) to say is for the most part a problem that arises because you, the student, are doing social science for the first time. So you find the huge variety of things that could be said almost as overwhelming as the huge diversity of things that have been said.

In this common situation, heuristic helps you deal with both problems. On the one hand, it gives you tools to question what has been said, transforming it into new ideas and new views. On the other hand, steady practice of heuristic will teach you rules for separating good things that could be said from bad ones, as we shall see in Chapter Seven.

Having a hard time deciding what to say is to some extent a problem of people who don’t have a ready-made stance toward social life. We all know many people who do have such a ready-made stance, for that is the position of people who have a strong political interest of some kind. Whatever the issue raised, people with such political interests have a stance on it, a way of thinking about it. Often they even have stock questions and puzzles about it (as in the femi-
nist’s questions “what about women and social networks?” “what about a gendered concept of narrative?” and so on). These flow from their relatively one-sided view of social life, which is somewhat easier and in some ways less intellectually self-defeating than a position that tries to see a problem from all sides. The proverbial view from nowhere is willy-nilly characteristic of people just starting out in social science or of people who don’t yet have particular commitments, and it is much harder to work with than the more comfortable view from a point.

This comfortable one-sidedness, which only strongly political people have from the start, is a quality we all achieve after our early outings as social scientists. It is a kind of second stage of our development. You don’t necessarily become dominated by this or that political concern, but you decide you’re a Marxist or a Weberian or Foucauldian, and voilà—for any given problem you have a viewpoint and even some standard questions. At that point, you need heuristics not so much to get started as to free yourself from the restrictions of your point of view. Otherwise, you are always writing papers in the form of “a neo-institutionalist view of church organization” or “Bourdieu’s habitus as an educational concept” or “Marxian theories of education” and wondering why no one outside your camp gets excited.

The reason you want to free yourself from those restrictions is of course that there are always lots of other people around who aren’t Marxists or Weberians or whatever you are. Those people always seem to have their own well-worked-out views of issues and problems and data. If you can’t learn to think in their modalities, you can’t talk to them. So now you begin to use heuristics not just to loosen up your own views. You try to master the basic viewpoints and even the heuristic repertoires of other stances toward the social world. This is the third stage of a social scientist’s intellectual development. We look for this in good students when we say, “OK, now what’s the game-theory approach to that question?” and then follow with “Would a Weberian be comfortable with that?”

You have come of age as a social scientist when you know all of the diverse second-level repertoires of concepts and questions so well that you use heuristic strategies to set various points of view against one another. This is the fourth and final level of social science work. You start using the different standard stances to question one another; each becomes the others heuristic. This is to some extent what I meant by the discussions of mutual criticism between methods in the preceding chapter. Each stance begins to challenge all the others.

More important, you can do something at this advanced stage that many never manage. You can combine stances into far more complex forms of questioning than any one of them can produce alone. An example from the arts will show what I mean. In the early 1780s, Mozart found some Bach manuscripts and was amazed by them. He decided to learn to write Baroque-style music, and his C Minor Mass shows that he could indeed write such music as easily as he could write the classical style for which he is more famous. So in the opera Don Giovanni, he defined different characters by writing music for them in different
styles. The arias for Donna Elvira—the most traditional of the five women Don Giovanni hustles in the opera—are written in a rigid Baroque style that would have struck any listener at the time as completely old-fashioned, just right for the old-fashioned woman Donna Elvira is meant to be. Don Giovanni’s music is much more current, befitting his energetic but sleazy self, while the music of his servant-fix-it man, the scamp Leporello, is written in the rhythms of the peasant dances of the time. For Mozart, different styles are not a problem but a resource (see Allenbrook 1983). Only a master of many styles can make them talk to each other in this way. At the highest level of social science, this is what serious heuristic can accomplish.

In short, heuristic is useful to all of us, each at our own levels in the social sciences. But while the basic repertoire of heuristics can be deployed in a number of ways and at a number of levels, it is still a unified repertoire. I begin, then, by discussing in the rest of this chapter the two simplest means for producing new ideas: the additive heuristic that we call normal science and the use of heuristic “topics,” or commonplaces.

II. THE ROUTINE HEURISTICS OF NORMAL SCIENCE

George Pólya argued that “[t]he aim of heuristic is to study the methods and rules of discovery and invention” (1957:112). That might make us think that discovery can be made utterly routine; we learn some rules, turn a crank, and voilà—discoveries! But Pólya clearly meant something more as well. Heuristic does go beyond the routine ways we have for producing discoveries. Yet before seeing those, we need to think for a moment about the routine roads.

Thomas Kuhn has provided what for many people is the standard account of discovery, both routine and nonroutine. When Kuhn wrote The Structure of Scientific Revolutions, he aimed to replace what we might call the big-edifice model of science. On this model, science at any given time is a big structure of accepted facts, theories, and methods. Scientists are perpetually making new conjectures, testing them on reality with various methods, and then finding them rejected or accepted. If accepted, they become part of the edifice; if not, they don’t. The model is gradualist and incremental. Science grows bit by bit, like a big brick building being put up on a firm foundation. We might occasionally replace sizable walls, but we spend most of our time tuck-pointing or building small additions.

To Kuhn as to many others, this vision of science seemed inaccurate. Most major scientific theories seemed to burst on the world like the revolutions of Copernicus, Newton, Darwin, and so on. They were hardly gradualist. Kuhn resolved this dilemma by separating normal science from paradigm-changing science. He argued that science is organized in paradigms, within which research happens incrementally. Little results pile up. New parts of the building are built. Decayed bricks are replaced. But as this normal science goes on, some stubborn realities refuse to fit. These anomalies pile up to the side. They are attributed to mistaken observation, errors in analysis, and so on. Once the pile of anomalies becomes very large, someone sees that by looking at everything differently—different method, different theory, different interpretation of find-
nings—one can account for everything the old paradigm covered as well as for all the anomalies. Kuhn called this transformation a paradigm shift. It embraces new methods, new theories, even new definitions of the facts of the real world. It means tearing the old building down and building a new one with the leftovers, the anomalies, and some new materials.

As this description implies, the central heuristic rule of normal science—science within paradigms—is simple addition. If one is an ethnographer, one studies a new tribe or a new situation. If one is a historian, one chronicles a new nation or a new profession or a new war. If one is an SCA analyst, one uses a new independent variable or sometimes even a new dependent variable; one gets a new data set with which to study an old problem or asks an old question in a new way; one tries a new model. If one is a formalist, one changes the rules a bit and recomputes the equilibriums or the parameters of the consequent structure or whatever. If one is a small-N analyst, one adds a few more cases or goes into more detail with the cases one has or perhaps adds a new dimension of analysis.

There are several versions of this more-of-the-same heuristic. The simplest is more data: we take the same ideas to a new place. To be sure, the ethnographer with a new case and the SCA scholar with a new data set are usually not just adding another example. Usually there are minor differences that enable the new data to improve old ideas rather than simply repeat them. But for the beginning social scientist, the normal-science heuristic of “it works here, but will it work there?” is a perfectly fine opening for a research project.

The second version of addition is the addition of some new dimension of analysis. Usually this is a minor dimension. Major recastings are the objects of the stronger heuristics I discuss below. But under this heading we have, for example, the huge number of SCA studies of the form “I know that x leads to y; suppose now I introduce controls for s, r, and u.” For example, women are less likely to end up in the natural sciences and mathematics. Will this be true if we control for native ability? for college major? for parental encouragement? for choice of high school classes? and so on. Or consider the long-standing historical finding that the revolutionary political parties of the nineteenth century usually had their origins among artisans rather than among unskilled town laborers or agricultural laborers. Was this also true in areas where artisans were few? Was it true in Catholic as well as Protestant regions? east of the Elbe? and so on.

Finally, addition sometimes takes the form of adding a new model or methodological wrinkle or theoretical twist. For an ethnographer of science, this might be taking a more careful look at the exact language that was used in interviews, to see whether the order in which scientists said certain things revealed new aspects of their assumptions. For a rational-choice modeler, this might be trying four or five different forms of “game,” rather than just one or two, to understand a particular bargaining structure. For an SCA analyst, it might be putting exponential terms into the equation, to see whether certain independent variables had not only linear but also nonlinear effects.
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All of these—from simply adding data to adding a new dimension for analysis to adding a new methodological or theoretical wrinkle—are basically minor, incremental additions. They are the tuck-pointing and reshingling and addition-building of normal science. They are the conservative strategy for social scientists, and it should come as no surprise that graduate students—the most conservative of all social scientists (because they have the most at risk)—should be assiduous practitioners of the additive heuristic. Libraries are filled with unpublished doctoral dissertations that carry out such additive projects. Scholarly journals receive dozens of submissions based on them.

Such studies are profoundly useful. One brilliant contribution does not fully establish a new argument. Adding new cases or variables or rules is always a useful first step in the full evaluation of ideas. And so it is right and fitting that most of us begin our careers with the additive heuristic, and it is not at all surprising that many of us never leave it.

But the ultimate aim of heuristic is to improve on such normal science. Remember Polya’s definition: “The aim of heuristics is to study the methods and rules of discovery and invention.” Invention is what we seek, not just addition. How exactly does one go about creating rules for invention?

III. TOPICS AND COMMONPLACES

There is, it turns out, something of a tradition about invention. It is not found in the sciences but rather in the field of rhetoric. We often use “rhetoric” as a negative word, to label tricks of language or argument. We think of rhetoric as false or at least deceptive. But the ancient writers on rhetoric—people like Isocrates, Aristotle, Cicero, and Quintilian—were mainly concerned with training people as knowledgeable speakers in public settings or as articulate experts in legal settings. And so for them, rhetoric was a good thing, both positive and creative.

The ability to come up with dozens of arguments was central to the classical writers’ vision of rhetoric. (Ideally one could do this on one’s feet, talking, but in practice speeches were written ahead of time and rehearsed extensively.) Rhetoric textbooks customarily began with a section entitled *inventio*. (*Inventio* is the Latin word; the Greek for this was *heuresis*, from the same root as *heuristic*. See Clarke 1953:7.) This section covered the many ways to think up or invent arguments. The most general ways to do so were called topics and included extremely abstract things like “sameness,” “difference,” and “genus and species.” More concrete sources for arguments were called commonplaces, which were familiar notions, like the idea that criminals did or did not keep committing the same crime—common beliefs that often came in pairs, one on each side of an argument.

Apprentice speakers learned huge lists of topics and commonplaces and their subdivisions. Mastery of such lists was considered the foundation for effective argument. It is hardly surprising that in time there were complaints that oratory had become boring. What had been meant as a guide to inventing new ideas had become a machine producing endlessly familiar ones.
We social scientists have such rhetorical forms, topics, and commonplaces ourselves. The most famous—as familiar to high school students in America as the six parts of a classical speech were to similar students two millennia ago—is “compare and contrast.” (It was on Aristotle’s and Cicero’s lists, too.) “Pros and cons” is another enduring rhetorical form, also on most ancient lists, as it is in the repertoire of most scholars today. Each of these rhetorical forms can be invoked in the heat of argument to provide a prefabricated layout for a discussion. And each can sometimes become very mechanical.

But the use of rhetorical forms and topics as means to invention suggests that there might be similar forms and topics for social science invention. These would be lists of topics that could be applied to any argument at any point to generate new things to say. The idea is simple. You have a tried-and-true list of abstract categories or concepts, and when you find yourself running out of ideas about some aspect of social life, you go to the list and see what it suggests to you. The problem is that you must first get some good lists of categories or concepts to use as topics.

Bearing in mind the fate of these lists in ancient times (that is, people took them too seriously, and the lists got very boring), we are not going to be particularly worried about whether our lists are the right lists or the true lists. It doesn’t matter whether they are justified ontologically or epistemologically or whatever. (I wasted at least two years of graduate school trying to decide on the “right” abstract concepts and came to no conclusion at all. What I should have thought about was which lists seemed more fruitful, not which were “right.”)

Here I will mention four such topical lists—two classical and two modern—that I myself have often found useful: Aristotle’s four causes, Kant’s list of categories, Kenneth Burke’s five keys of dramatism, and Charles Morris’s three modes of language. There’s no particular reason these should be your topics lists. Indeed, I’ve used other lists from time to time. But these happen to be the ones that have most often proved useful to me. They are also lists that have recurred in the works of many writers under many different labels. But let me reiterate that this is not necessarily because they are “right” (although it would be hard to come up with a concept of cause that didn’t fit Aristotle’s analysis one way or another.) Rather, it’s because they are useful. They help us make quick switches in our intellectual attacks on problems. You have already been introduced to one of these lists, by the way; I used Morris’s modes of language to organize the first chapter of this book.

A. Aristotle’s Four Causes

I start with Aristotle’s four causes. It’s a simple list:

- material cause
- formal, or structural, cause
- effective cause
- final cause
When we say, “The Republicans lost the election because they lost the women’s vote,” we invoke material cause. In this case, something happens because of the social materials that went into making or unmaking it. Demography is par excellence the social science of material cause. It concerns numbers of people of varying types and the ways in which those differing numbers shape social life.

By contrast, we might say with Georg Simmel (1950) that all social groups with three members are inherently unbalanced, because two of the three always ally against the third (something those of us who were only children in two-parent homes know very well). Here we are saying something not about social material but about social structure. It is the shape of the triad that gives it its peculiar properties. This is structural cause.

Aristotle’s effective cause is the most familiar of his four. The effective cause of something is what brings it about, what forces it to happen. So we say that a strike caused employer retaliation or that a newspaper caused a war. These are statements about a direct kind of forcing.

By contrast, final cause refers to the aims of events. When we say the cause of universities is the need for education, we are attributing the existence of universities to their final cause (which today we often call function, although that’s not exactly what Aristotle meant). When we say the reason for pollution laws is the need for clean air, we speak of final cause. Note that a lobbying group is likely to be the effective cause of those laws, even as a configuration of larger political interests and oppositions is likely to be their structural cause. And the numbers and distribution of those interests are the laws’ material cause. Every event has causes of all four kinds.

Another example can show how using the four-cause list helps us think up new questions to ask. Consider unemployment. One can think of unemployment in terms of its material. The unemployed: Who are they? What are they like? What kinds of qualities do they share? Does unemployment concern a kind of person or a transitory state for many different kinds of people? This is to think of unemployment demographically. Or one can think of unemployment in terms of its proximate, effective causes: How do layoffs work? Who decides who gets fired or laid off? What are the incentives for choosing unemployment? What are the economic forces driving lowered employment? Or one can view unemployment in terms of its formal, structural properties: Could it be the case that unemployment is a general structural quality of a certain production system and that merely random forces decide who in particular is unemployed and why? Or one can view unemployment functionally, asking whether it does something useful for somebody (for example, does it help employers by lowering wages for those remaining in jobs, because they can be threatened with unemployment if they complain?) and whether that somebody, directly or indirectly, maintains it because of this utility.

As you can see, the Aristotelian list is very useful. Time and again, you can come up with something new by switching to a new type of cause from the one that you are implicitly using. It’s also true that you can often come up with
something new by switching from one to another *logical* concept of cause, from *sufficient* cause (something sufficient to bring another thing about) to *necessary* cause (something without which another thing cannot occur) and vice versa. But the Aristotelian list is probably more useful, which perhaps explains why it reappears with so many different names and guises; it can always be used in a tight spot to come up with a new attack on a problem.

**B. Kant’s List of Categories**

The Kantian categories, although much more abstract than Aristotle’s four causes, are also a useful list of topics. Kant thought there were some basic frameworks through which all experience was filtered. There are twelve of these categories, and they make another useful list of aspects of a problem to think about. Kant organized them under four basic headings: quantity, quality, relation, and modality. In what follows, I give the categories commonsense meanings, not the formal philosophical ones Kant gave. Our aim is not to get Kant right but to make him useful for us.

### Quantity
- unity
- plurality
- totality

### Quality
- reality
- negation
- limitation

### Relation
- substance/accidents
- causality/dependence
- reciprocity

### Modality
- possibility/impossibility
- existence/nonexistence
- necessity/contingency

The Kantian quantity categories are unity, plurality, and totality. These suggest a number of essential ways to rethink a research question. Unity raises the issue of the *units* of our analysis: What are they? Why? How are they unified? What, for example, is an occupation? It’s obvious what holds doctors together as a unit, but what about physicians’ assistants? What about janitors? waiters and waitresses? Are these really units?

Plurality raises all the concerns of *number*. Are there few or many units? Does it matter how many there are? Could different people count them differently? So, for example, how many occupations are there? Does it make a difference whether we lump wait staff and cooks together? What about baby-sitters and elder-care workers? Or social classes: how many of them are there?
Totality raises the problems of the *overall nature* of a subject. Is it a unified whole? How would we know? In what ways is it divisible or indivisible? Social class is a famous example here. Is there a power elite, as C. Wright Mills thought? How unified are elites and ruling classes? Are social classes unified wholes or loose units that fade continuously into one another?

The Kantian quality categories are reality, negation, and limitation. These, too, suggest important ways to change our first conceptions of a research problem. The reality category raises the subtle but important question of *reification*, of mistaking an abstraction for a reality or—what is very common in bad social science thinking—imagining that because we have a name for something, it is therefore real. Take the famous concept of socialization, which is supposed to refer to all the training by which an infant and, later, a child becomes an adult. It is by no means apparent that this word refers to anything other than the sum total of experiences a young human has. Put another way, it isn’t clear what experience a young person has that could not be said to be socializing that person for something or other. Nor is it apparent when socialization stops and life begins. There is in fact absolutely nothing that is denoted specifically by this concept; it is simply a reification following from the (fallacious) functional argument that because people acquire skills, there must be some special process—different from the rest of life—that “trains” them. Thus, the reality category invokes for us a crucial heuristic discipline, forcing us to ask whether the nouns we use in social science refer to real things.

Negation, too, is a centrally important topic. I shall later discuss several heuristics based on negation: problematizing the obvious, reversal, and the like. I shall also discuss the central heuristic importance of making sure that your idea is capable of being wrong. We should never forget to think about negation.

Finally, limitation is a crucial heuristic tool. Much of normal science actually takes the form of *setting limits* to generalizations, exploring what sociological positivists like to call scope conditions. Under what conditions is some argument true? At what times do certain forces take effect? These and a hundred other questions all arise from thinking about limitation. So, for example, we might find that many things that we think are long-standing traditions are in fact invented at particular moments. Under what conditions do people invent traditions: When their nationhood is threatened? When a nation is newly formed? Are there particular kinds of people who are more likely than others to invent traditions? Are they leaders of social movements? fallen aristocrats? Are there ways to differentiate invented and “real” traditions? All of these questions arise when we try to set limits on the concept of invented tradition.

The Kantian relational categories are even more important, and all have famous lineages in philosophy. The first of them is substance/accidents—the division of the world into given things (substance) and the properties of those things (accidents). In some parts of social science, the substance/accidents category provides no useful basis for heuristics. When we say that a person is a certain age, for example, we know very well that the person is the substance and the age is the property. But if I ask myself what, say, sociology is, it is not
at all clear (unless I fall into reification) what the substance is and what the accidents. Is sociology a name for everybody with certain kinds of degrees and training? Then education defines the substance of sociology, and other things—people’s political values, types of employment, sociological ideas and concepts—become accidents. But I could just as easily define sociology as people who hold certain kinds of jobs, in which case the jobs define substance, and political values, sociological ideas and concepts, and education itself become accidents. Note that this kind of analysis begins to suggest that the whole distinction of substance and accidents is probably a mistake (as, indeed, a large body of social theory believes). At the very least, reflecting on substance and accidents can help you change your way of seeing something.

The second of the relational categories is causality/dependence. Causal questions are obviously central to any heuristic, as we have seen in Aristotle’s celebrated list of causes. I won’t consider causality further here but simply refer the reader back to that discussion.

The third relational category is reciprocity. This, too, provides a helpful way to rethink social scientific questions. Often we find ourselves in a cul-de-sac, trying to decide which of two things causes the other. We know that higher levels of education are associated with higher income, but which causes which? Higher levels of education lead to higher income over the course of life, but availability of higher income allows the transmission of educational advantage across generations. There is a kind of reciprocity here between income and education that forces us to be much more specific about whose income, whose education, and what temporal orders are involved. The category of reciprocity reminds us to consider such chicken-and-egg models. Many, many systems in social life take this circular format of reciprocal causality. They can be self-reinforcing systems that stabilize themselves, or they can be runaway systems that blow up. (Loosely speaking, one arises from positive feedback, the other from negative.) The reciprocity category reminds us to think deeply about such systems.

Finally, the Kantian categories of modality are possibility/impossibility, existence/nonexistence, and necessity/contingency. Possibility reminds us that it is easy to come up with social science arguments that are impossible and that, therefore, we need to check our ideas constantly for possibility. This is particularly true because much social science is motivated by a desire to improve society. But certain kinds of improvements are logically impossible. It is impossible, for example, for everyone to be successful if being successful entails some form of superiority to others. At least it is impossible unless we define all forms of success as being absolutely idiosyncratic. Yet social science is filled with arguments that implicitly believe everyone can be successful. So we must always reflect on the range of possibility in constructing our arguments.

The category of existence raises questions much like those of the category of reality. There are many types of social actors: doctors, left-handed people, the insane, and so on. Which of these types actually have existence as groups rather than as simple types? Indeed, what does it mean to say “have existence
as groups”? There are many famous examples of this set of heuristic problems. It is easy, for example, to talk about class. But do classes exist? And what does it mean to say that classes exist? Are we talking about self-consciousness of class? about coordinated action? about simple common experience? Or take occupations. Are they simple categories of people? bodies of work? organized associations of workers? What does it mean to say that an occupation exists? Clearly the most famous examples of contemporary social science involve gender and race. Are women a group? In what sense? The heuristic questions raised by the category of existence are thus like those of the reality category. They lie in questioning nouns we commonly use to denote social groups and asking what kinds of things those nouns actually label.

Finally, the category of necessity/contingency raises obvious heuristic questions about how events relate to one another. In one sense, these are like the questions of the limitation heuristic: are certain relationships necessary, or are they contingent on other things (that is, limited)? But contingency is a much more complex phenomenon than mere limitation. It invites us to ask about the multiple dependencies among social processes, about the many paths that social processes can take. And necessity invites us to focus on necessary causality and its implications. When half the young men of England, France, and Germany disappeared in the trenches of World War I, a generation of young women couldn’t marry—because there was no one alive for them to marry. The resultant family structure and indeed the resultant larger social structures of employment and opportunity shaped European society for generations. Like contingency, necessity pervades the social process. A good list of heuristics will never omit it.

The Kantian categories thus provide another useful list of heuristics. As with Aristotle’s four causes, we can let the philosophers worry about the philosophical validity of this list. For us it is a useful checklist of things to think about. As it happens, Aristotle had a category list, too, which cut up the world a little differently. Aristotle included two things that Kant made separate: space and time. Both of these are themselves useful heuristic reminders. Always ask yourself what the spatial and temporal settings of your problem are. How can they be changed? Which aspects of them are necessary or sufficient to determine which parts of the problem? Are there regularities to your question in space (either social or geographical)?

C. Burke’s Five Keys of Dramatism

Moving to the modern setting brings us to the five keys of dramatism set forth by the famous literary critic Kenneth Burke in his book *A Grammar of Motives*: action, actor, agent, setting, purpose. We can use this list, too, as a heuristic aid to rethinking any particular problem.

Since this is a modern list, I can give a famous example. In his splendid book *The Culture of Public Problems*, Joseph Gus-field reconceptualized drunk driving. He said (among many other things) that accidents caused by drunk drivers are really a transportation problem, a problem of the setting, the locations where people drink. The San Diego police had consulted Gus-field about a sud-
den rise in accidents involving alcohol. He pointed out that if you built four major hotels on vacant land near interstate highways, all of them filled with bars and all of them inaccessible by foot, it was pretty likely that you were going to see more automobile accidents involving alcohol. If people get drunk where they can walk home (as in the pub in England), they are much less likely to drive drunk.

Behind this intellectual trick lay an analysis of alcohol-based accidents in terms of Burke’s five keys of dramatism: Are fatal accidents best understood as a matter of

- **action**—driving a certain way, doing (or not doing) certain things (like fastening seat belts)
- **agents**—certain kinds of actors (It turned out plenty of older drivers were drunk on the road, but they were less likely to get into accidents, possibly because they had more experience driving drunk and so were more skilled at it.)
- **scene**—where people drink, how they get there, and how they leave (This was Gusfield’s way of attacking the question.)
- **agency**—vehicles and roads (If cars wouldn’t move unless seat belts were fastened around passengers, fatalities would be reduced.)
- **purpose**—why people decide to drive when, where, and how they do (Some people drive to get somewhere; others— young men, for example—drive to show off...)

Another excellent example of Burkean thinking is the famous paper of Lawrence Cohen and Marcus Felson that introduced the so-called routine-activities theory of crime (1979). Prior theorists of crime had emphasized criminals (that is, positive actors) as the key to crime. Cohen and Felson noted that crime takes three things: an actor (this had been the focus of prior research), a target, and an absence of guardians. We can think of an unguarded target as a certain kind of scene in Burkean terms. The central thrust of Cohen and Felson’s argument is that changes in scene caused the crime increase after 1960. More consumer goods were in the home, they were lighter in proportion to their value (and hence more portable), and the entry of women into the labor force meant fewer people were at home to watch over property. The authors actually compared the weight of dozens of goods in Sears, Roebuck catalogs over the years, as well as the percentages of homes with no one home the first day the census taker called in 1960 and 1971. These and many other equally curious factors paralleled the huge increase in property crime from 1950 to 1975. Once again, a Burkean move raised a whole new theory, in this case of the sources and causes of criminality.

Burke’s list is really just another version of the famous old reporters’ list of topics: Who? What? Where? When? How? Why? And one can also see in it a fairly strong echo of Aristotle’s four causes. Remember that the utility of all of these lists lies less in their novelty than in their heuristic power. Reporters use the who-what-when list to remind themselves to touch all the bases. We are more
interested in using lists to remind us that our theories often focus excessively
on one or another aspect of what we study. When we need to think anew, it’s
usually a question of figuring out what aspect of our analysis could be changed
to produce a whole new view.

**D. Morris’s Three Modes of Language**

A final topics list is Charles Morris’s three aspects of symbolic systems: syn-
tactic, semantic, and pragmatic. This list was of course used in Chapter One.
Syntactic relations are relations between elements of the system. Semantic rela-
tions are relations between system elements and things to which they refer.

Pragmatic relations are relations between symbolic statements and the con-
text of action in which they are made. What is radical about my argument in
Chapter One is its noting that many of my colleagues believe that pragmatic
approaches to explanation are the only “real” ones. I used the Morris triad to
start us thinking about explanation more broadly than is customary. That is, I
used the Morris argument heuristically.

It can of course be used in other contexts. There is no necessary reason, for
example, to think that it applies only to symbolic systems. You could think
about the syntax of markets (internal market relationships) over against the
semantics of the connections between groups in the market and their existence
outside it. And you could go on to think about what actors in markets are doing
(saying) and what the actions (the pragmatic context) of those market asser-
tions are. One way of stating Marx’s analysis of work is to say that there was a
fundamental error in the belief of liberal economic theory in the separability of
the syntax of markets (that is, the wage relationship) and the semantics of the
social groups in those markets (workers and capitalists as they were outside the
market). Liberal theory said these things could be separated; Marx showed, in
endless empirical detail, that they could not. Maybe this is far-fetched, but see-
ing market relations as related to social relations outside production in the
same way linguistic syntax is related to meaning and reference makes the tradi-
tional analysis of work suddenly look alive. We can think of new questions to
ask.

**WITH THE MORRIS LIST,** I come to the end of my own current set of topical lists.
Social scientists use many such lists through their careers. I have often used
knowledge, feeling, action (from Plato, Aristotle, Kant, and any number of oth-
ers) as a useful commonplace list. Many of us have used various lists of social
functions—Talcott Parsons’s adaptation, goal attainment, integration~ and pat-
tern maintenance, for example. Most of us also use the disciplines from time to
time as a commonplace list: What will the economists think? What would an an-
thropologist say? Sometimes there’s no faster way to come up with a new idea
than to wonder how somebody from a different discipline would think about
your issue. This is particularly so because, as I noted in the preceding chapter,
academic disciplines are organized around different dimensions of difference.

The reader will want to use these and many other lists. But in closing my dis-
cussion of topics and commonplace lists, I want to underscore two cautions.
First, do not reify these lists. Despite the philosophical fame attached to some of them, we don’t need to assume their correctness or truth. They are simply useful lists of reminders of things to think about, reminders to use when you get stuck. Don’t worry about their reality or truth.

Second, don’t overuse them. Classical rhetoric died because students began to treat it as a meat grinder. So everything from tenderloins to rib eyes to pure gristle was turned into ground beef. Don’t use these lists as some kind of comprehensive system that you put each of your research questions through. Just use them when you get stuck. Use them to stimulate your thinking. When you find that stimulation, turn to working out the details of the new argument. Don’t run through every last heuristic list for every last idea and then try to put everything together. You’ll never get anywhere.

Put another way, a little heuristic goes a long way. You are far better off making one major leap and then working out all the details and subparts of that leap than you are trying to work out the myriad minor leaps and subleaps that could be taken. Take the time to work out the details of a major heuristic move. As we shall see in the next chapter, most brilliant articles and books are built on one particular move. The author made a big move, then spent a lot of time working out the details.

Notes:
1. The conventionally correct pronunciation of τριπλίκες according to Anglophone classicists is HEH-oo-ray-ka, not the popular culture's you-REE-ka. In fact, nobody really knows how ancient Greek was pronounced.
2. There is not yet a clear usage defining the difference between heuristic and heuristics. It is agreed that heuristic is the adjective, as in ‘a heuristic inquiry.” But for the noun, things are unclear. Polya used heuristic to denote the discipline of discovery generally but had no shorthand word for a single heuristic move, nor any plural for a collection of several such moves (1957). Many writers now speak of a heuristic when referring to a particular heuristic rule (“the analogy heuristic,” and so on). This is the usual usage in computer science. There, heuristics serves as the simple plural for the singular heuristic. I shall try to follow both of these usages here, in parallel with the standard usage of logic. One speaks of logic as the discipline, modal or formal logic as individual logic systems, and logics as collections of several such logic systems. So here with heuristic(s).