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84 Analytic induction: methodology

Analytic induction (AI) is a research logic used to collect data, develop analysis, and organize the presentation of research findings. Its formal objective is causal explanation, a specification of the individually necessary and jointly sufficient conditions for the emergence of some part of social life. AI calls for the progressive redefinition of the phenomenon to be explained (the explanandum) and of explanatory factors (the explanans), such that a perfect (sometimes called "universal") relationship is maintained. Initial cases are inspected to locate common factors and provisional explanations. As new cases are examined and initial hypotheses are contradicted, the explanation is reworked in one or both of two ways. The definition of the explanandum may be redefined so that troublesome cases either become consistent with the explanans or are placed outside the scope of the inquiry; or the explanans may be revised so that all cases of the target phenomenon display the explanatory conditions. There is no

methodological value in piling up confirming cases; the strategy is exclusively qualitative, seeking encounters with new varieties of data in order to force revisions that will make the analysis valid when applied to an increasingly diverse range of cases. The investigation continues until the researcher can no longer practically pursue negative cases.

1. The Methodology Applied

Originally understood as an alternative to statistical sampling methodologies, "analytic induction" was coined by Znaniecki (1934), who, through analogies to methods in chemistry and physics, touted AI as a more "scientific" approach to causal explanation than "enumerative induction" that produces probabilistic statements about relationships. After a strong but sympathetic critique by Turner (1953), AI shed the promise of producing laws of causal determinism that would permit prediction. The methodology subsequently became diffused as a common strategy for analyzing qualitative data in ethnographic research. AI is now practiced in accordance with Znaniecki's earlier (1928), less famous call for a phenomenologically grounded sociology. It continues primarily as a way to develop

explanations of the interactional processes through which people develop homogeneously experienced, distinctive forms of social action.

The pioneering AI studies centered on turning points in personal biographies, most often the phase of commitment to behavior patterns socially defined as deviant, such as opiate addiction (Lindesmith 1968), embezzlement (Cressey 1953), marijuana use (Becker 1953), conversion to a millenarian religious sect (Lofland and Stark 1965), abortion seeking (Manning 1971); and youthful theft (West 1978, a rare study focusing more on desistance than onset). Recent studies have addressed more situationally specific and morally neutral phenomena, including occupational perspectives exercised in particular work settings (Katz 1982, on lawyers; Strong 1988, on doctors; Johnson 1998, on union representatives), and distinctive moments in the course of everyday life (the experience of time as passing slowly, Flaherty 1999; laughter in a funhouse, Katz 1999).

There is no particular analytical scale to the phenomena that may be addressed with AI. The research problem may be macro social events such as revolutionary

social movements, mid-scale phenomena such as ongoing ways of being a student in a given type of educational institution, or everyday micro-social phenomena such as expressive gestures that can be seen clearly only when videotape is reviewed repeatedly.

1.1. How AI transforms Theory

AI transforms and produces a sociological appreciation of phenomena along recurrent lines. The explanandum often is initially defined as a discrete act or event, for example the ingestion of a drug, exceeding a specific tenure on a job, or the commission of a fatal blow. The target phenomenon is progressively redefined to address a process: a persistent commitment, for example, being addicted to a drug; the maintenance of a perspective, such as a way of being involved with the challenges of a job; or a phase of personal change, as in the emotional transformation experienced when becoming enraged. Explanatory conditions, often originally defined from the outside as biographical and ecological background factors, are redefined to specify the interactions through which people, by learning, recognizing, or becoming aware of features of their pasts

and circumstances, in effect set up the motivational dynamics of their own conduct. The methodology of AI thus dovetails with the theoretical perspective of symbolic interaction ("SI"; Manning 1982; article in this Encyclopedia, 82: 109, "Symbolic Interaction: Methodology"), which stipulates that a person's actions are built up and evolve over time through processes of learning, trial-and-error, and adjustment to responses by others. Although authors do not necessarily present their findings in these categories, a common theoretical result of AI is to highlight each of three types of explanatory mechanisms. One points to the practicalities of action (e.g., learning distinctive *techniques* for smoking marihuana). A second relates to matters of self-awareness and self-regard (e.g., *attributing* physical discomfort to withdrawal from opiates). The third refers to the sensual base of motivation in desires, emotions, or a sense of compulsion to act (e.g., embezzling when *feeling pressured* to resolve a secret financial problem). Perhaps the most ambitious long-term objective of AI is to develop the most economical set of inquiries capable of unveiling the distinctive processes that constitute any experienced moment in social life.

1.2. *As used in Ethnography*

In the 1950s, reports of AI studies often took the form of tracing how negative cases led, step-by-step, to the final state of the theory. By 1980 an AI study was more likely to be presented in the style of an ethnographic text. Ethnographers find the principles of AI useful for guiding data gathering and shaping analysis. Often starting as outsiders and typically concerned to document social reality as lived by members, ethnographers redefine categories toward homogeneity "from the inside." When a sense of redundancy develops in interviews and observations, they commonly seek unusual data that will serve implicitly as negative cases when explicit analysis begins. Ethnographers are better positioned to trace *how* social life develops than to control rival variables as a means to argue *why* particular types of actions occur. In turn, they gravitate away from predictive theory and toward documenting regularities in the evolution of significant forms of behavior.

The methodological strategy of AI also dovetails with ethnography's narrative style. Because the logic of proof in AI relies solely on the richness or variety of

cases that have been shown to be consistent with the final explanation, not on counting confirming cases, the researcher demonstrates the evidentiary strength of the theory by showing how variations of the explanans, A, B and C (A^{1-n} , etc.) fit with instances of the explanandum, X (X^{1-n}). Similarly, a common format for ethnographic writing is to entitle an article or chapter "the career of...", "doing...", "becoming a...", and then, in separate sub-sections, to describe the various ways that each of the explanatory conditions and the resulting phenomenon take shape. The author implicitly lays out the "coding" or interpretive procedures that have been applied to the data set. A separate section may be devoted to cases of desistance, or transitions to non-X. For example, in a study of drivers becoming angry, a variety of cases describes how experiences of being "cut off" emerge, how drivers come to see themselves in asymmetrical relations with other drivers, how they mobilize for revenge; and how each of these explanatory conditions is negated in cases showing anger subsiding (Katz 1999).

2. Limitations and Advantages

The logic of AI implies ideal conditions for data

gathering that are rarely satisfied. The researcher should not be committed to a pre-set or conventional definition of the explanandum. Funding sources, however, usually are motivated by problems as defined by popular culture and as documented by official statistics. The researcher should constantly alter the data search as analysis develops. The practicalities of ethnographic projects, however, often press toward a less flexible involvement in the field. Data should track the emergence and decline of the explanandum, the data should remain constant through repeated inspections, and there should be an inexhaustible series of instances against which to test hypotheses. Such data may be created through unobtrusive video-recordings of situated action, but the range of phenomena that can be described contemporaneously through phases of emergence and decline, in situ, in massive number, and without reactivity either during original recording or infinite reinspection, is severely limited.

2.1. Critiques and Rejoinders

Even so, an appreciation of how AI could exploit ideal evidence helps in assessing the central criticisms

that have been addressed to it. One frequently cited weakness is that AI specifies only necessary but not sufficient conditions. Another is that it produces tautological explanations. If indeed the researcher only looks for factors common in the etiology of X, narrowing definitions and shedding cases when encountering negative cases, the explanation may only specify pre-conditions that are necessary but not particularly distinctive to X, much less sufficient to cause it. Cressey's claim that a "nonshareable problem" and "rationalization" explained a specified form of embezzlement was especially vulnerable on these grounds, especially since he never described the situated action of embezzlement. But if, as has often been the case, the researcher finds data describing transition points from non-X to X, as well as data describing progressions from X to non-X (e.g., desistance studies), claims of sufficiency may be precisely tested.

As to tautology, when the explanatory conditions are social-psychological matters of interactive behavior, as opposed to psychological and internal matters of thought and outlook, they can be coded independently of X. Note that any true causal explanation of behavior *should* turn

up some potentially tautological cases. The very idea of causal sufficiency is that, with no existential break, the simultaneous presence of A, B, and C instantly produces X; in some cases *there should not be* any evidence that permits the coding of A, B, and C independent of data describing X. It should be expected that in some cases the development of the explanatory factors will be depicted as continuous with the emergence of the target phenomenon. But AI also leads the researcher to hunt for case histories in which, alternatively, each of A, B, or C had been absent and then came into existence, leading to X; as well as cases in which X had been present and then, alternatively, A, B, or C declined or ended, leading to non-X. AI is especially attuned to exploit contrasting states in temporal as opposed to cross-sectional data. The best examples of AI present evidence in just this sequential form, for example showing the development of addiction after an explicit and abrupt recognition that a longstanding pattern of distress has been due to repeated opiate withdrawal (Lindesmith 1968).

2.2. Generalization, Prediction and Retrodiction

Although AI studies, in order to allow the

definition of explanatory elements to develop, cannot proceed from probabilistic samples and produce meaningful statistics attesting to representativeness, they are fundamentally geared toward generalization. By seeking negative cases, the researcher tests the explanation against claims that in times, places and social circumstances other than those defining the initial collection, the explanation will not hold. As the explanation is redefined, it becomes both more nuanced and more wide-ranging in demonstrated validity. External validity depends on internal variety, not on the quantity and logically pre-derived uniformity of the data set. For this reason, an AI study reporting data that are monotonous, abstracted and static will be methodologically weak.

AI cannot produce predictions in the sense of specifying the conditions at time 1 that will result in particular behaviors at time 2. The causal homogeneity that the method demands depends on subjects' defining their situation in common ways, and no study has ever found "objective" conditions that will perfectly predict people's understandings of their biographical backgrounds and ecological contexts. The methodology does, however,

support what might be called "retrodiction": assertions that if a given behavior is observed to have occurred at time 2, specific phenomena will have occurred at time 1. While AI has never attempted to produce natural histories that specify the *order of sequencing* through which given social forms emerge (first condition A, then condition B, then condition C), it always makes claims of one or more, individually necessary and jointly sufficient pre-conditions of the explanandum. Thus, for example, AI will not attempt to predict who will become a murderer, but if one finds a case of enraged homicidal assault, AI can support assertions as to what must have happened on the way to the assault (in this example, an emotional transformation from humiliation to rage, a recognition of being at a last stand for defending self-respect, and optimism about practical success (Katz 1988). Much of what is said to be valuable about prediction, such as the potential for intervention and control, remains available when results support retrodiction. Indeed, perhaps the most useful focus for policies of intervention is the identification of a narrowly defined precondition that is distinctive to a troublesome behavior, even if that single condition alone is not sufficient to cause the

problem.

2.3. Unique Contributions

By redefining phenomena from the actor's perspective, and by discovering and testing an analysis of how given forms of social life come into existence, AI makes unique contributions that may be appreciated without gainsaying the contributions of statistical research. As it redefines the explanandum from a definition initially taken from conventional culture, AI typically reveals the social distance between insiders and outsiders and the realities of culture conflict. Although rarely touted as "policy research," the upshot is a documented portrayal of some segment of social life that is systematically misrepresented by the culture that supports power. To the extent that social control, as influenced by populist voting and as implemented through officials' quotidian actions, is based on stereotypes about problematic behavior, AI can play a significant role in policy reform over the long term, especially if its ethnographic texts become widely used in university education. For scholars of cultural history and cultural differentiation, AI can document the changing variety of

experiences in some area of social life (e.g., the variety of experiences in illicit drug use, professional acumen, or the behavior of laughter). Perhaps most generally, AI can specify the "essence" of sociological phenomena in the sense of documenting what is entailed in a given line of action and form of social experience.

3. Prospects

Over its 75 year history, AI has shed a rhetorical claim to priority as the logic that should guide sociological data collection, metamorphosing into a pervasive if typically implicit strategy for analyzing qualitative data. Within the philosophy of science, the methodology's ill-considered claim of "induction" has been replaced by a concept of "retroduction," or a double-fitting of analysis and data collection (Ragin 1994). Similarly, it has been recognized that "retrodiction" but not "prediction" captures the thrust of AI's explanatory power.

The prospects for AI rest on three grounds. First, there is broad consensus that explanations, whether probabilistic or "universal," are likely to work better, the better they fit with subjects' perspectives. AI

focuses most centrally on the foreground of social life, reaching into subjects' backgrounds to varying lengths but always requiring careful examination of the contents of the targeted experience. It thus balances a relative indifference in much statistical research to the specific content of the explanandum, which is often left in such gross forms as official labeled, "serious" (FBI "Part One") crime, or self-characterized "violence." Second, the findings of AI indicate that if social research imposes definitions on subjects regardless of the meaning that their conduct has to them, it will risk perpetuating artificial stereotypes and supporting power relations ill-suited to effective policy making. Finally, and most broadly, the utility of AI depends on two persistent features of sociological thinking. One is a fascination with the endless variety of distinctive forms into which people shape their social lives. The other is the observation that each subjectively distinctive stretch of personal experience comes with a tail of some biographical length. If one may never predict behavior with perfect confidence, still the forms that characterize small and large segments of lives are not superficial matters that emerge wholly made and with

random spontaneity. Even as people constantly bootstrap the foundations for their conduct, they ground the objectives of their action in rich depths of temporal perspective; they act with detailed, often hard-won practical competence; and they consider the matter of how their conduct will appear to others with a care that is seasoned, even if it is routinely exercised in a split-second of consequential behavior. AI's quest for systematic knowledge is no less secure than is the understanding that social life takes shape as people crystallize long-evolved perspectives, elaborate familiar behavioral techniques, and weave cultured interpersonal sensibilities into situationally responsive, experientially distinctive patterns of conduct.

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