Analytic Induction, in <u>International Encyclopedia of the</u>
<u>Social and Behavioral Sciences</u>, Smelser and Baltes, eds.,
2001.

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...," or "doing...," or "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 <u>the</u> 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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