Abstract: Gintis argues that disciplinary models of human behavior are incompatible. However, his depiction of the discipline of anthropology relies on a broad generalization that is not supported by current practice. Gintis also ignores the work of cognitive anthropologists, who have developed theories and methods that are highly compatible with the perspective advocated by Gintis.

Gintis's argument that disciplinary models of human behavior are incompatible relies on broad generalizations of disciplinary models that are not empirically justified. Gintis's treatment of anthropology is especially thin and describes a stereotypical view of *culture* that is not used by contemporary anthropologists to a significant degree.

Despite the centrality of the concept of culture to anthropology, there is currently no consensus about what culture is within anthropology, not even within the subdiscipline of cultural anthropology. One branch of anthropology, cognitive anthropology, has already offered a view of culture similar to the one advocated by Gintis (D'Andrade 1995). For the remainder of this review, I will summarize a definition of culture used by cognitive anthropologists in order to argue that much of the work done towards unifying disciplinary views of human behavior and culture has already been done by cognitive anthropologists.

Despite disagreements about the nature of culture, there is agreement that culture refers to something learned rather than inherited (Brumann 1999). The concept of culture is usually invoked to understand the behavior and thought patterns of groups. However, only individuals can learn, and they are the only source of cultural data (Handwerker 2001). Therefore, any definition of culture must begin with the knowledge that human beings possess, and how individual human beings learn and process information. Because culture is learned primarily through other people, it is also the result of social interaction and is shared. This results in culture being both socially and individually constructed.

The way individuals construct cultures begins with the formation of cognitive models of reality. Humans are limited in their ability to recall discrete units of information (Miller 1956). However, humans have an almost unlimited ability to "chunk" together bits of information into schematized models of particular domains of information (D'Andrade 1995). There is not a one-to-one correspondence between a particular model and a particular domain. Rather, multiple models are at work in concert at any given time. Some models are more likely than others to be invoked at a given moment because of a weighting process that develops over time after repeated experiences with a domain (Strauss & Quinn 1997). This weighting process is mediated by emotions that are evoked during these experiences. Models invoked during experiences that are associated with positive emotional feedback are more likely to be used in the future. The opposite can be said for negative emotional feedback (Strauss & Quinn 1997). Cognitive anthropologists define the complete set of an individual's cognitive models, including the models' associated emotional weights and behaviors, as the raw material of culture (Handwerker 2001).

Instead of a unitary, internally consistent "seamless web" that contains unambiguous rules for behavior (DiMaggio 1997), cognitive anthropologists see culture as fragmented and inconsistent. At any point in time, individuals may have internalized cognitive models that are contradictory. These models, although guides for behavior, can never have a one-to-one correspondence with behavior outputs because of their heterogeneity. Rather than acting as a blueprint for behavior, culture acts like a "toolkit" of strategies which individuals use to choose among behavioral options depending on momentary external circumstances (DiMaggio 1997).

The cognitive models that individuals have at their disposal at any point in time develop as a result of past experiences and are constantly being modified with new experiences. Cognitive models influence the behavioral choices that individuals are forced to make in the context of external circumstance. These behavioral choices then provide individuals with additional experiential information from which ideas and emotions are subsequently generated and modified. Because no two individuals have exactly the same experiences, no two individuals have the same set of cognitive models. And no one person has the same set of cognitive models from one moment to the next, because individuals are constantly behaving and processing additional experiential information (Handwerker 2001).

Although individuals are the only source of cultural data, and the raw materials of culture pertain to individuals, culture is created through social interaction. "Cultural models" refers to models that are to some extent shared by members of a population (Dressler & Bindon 2000). However, since cognitive models are the result of a creative process within individual brains, culture is not a "thing" that can be transferred from one person to another (Handwerker 1989). Because an individual's set of cognitive models is the end product of life experience, and because members of populations often have similar, if not identical, experiences, this produces patterning of cognitive, emotional and behavioral traits. Also, as individuals interact with members of their social networks, they experience the world vicariously through those other network members. This enables individuals to hold ideas and emotions about experiences and behaviors without actually experiencing them directly. Therefore, the cognitive models and emotions of each individual human being depend in some part on the cognitive models, emotions, and behaviors of other members of their social networks.

Individual human beings do not passively accept models from their social network. Rather, they accept the models that work, modify those that do not, and "share" these modifications back into their social network in a dynamic, continually evolving creative process. When models developed through previous experience are unable to account adequately for new stimuli, individuals switch from "automatic" to "deliberative" cognition, which they use to actively and innovatively restructure their own models to better account for new stimuli (DiMaggio 1997). Subsequent interaction with a social network leads to the spread of the innovation throughout the network if the innovation is successful at resolving similar inadequacies in the models held by other network members (Tomasello 1999). The "spread" of innovations throughout a network is actually individual brains making similar cognitive adjustments after interactions with members of their social networks. Thus, culture can be shared, but only metaphorically and imperfectly (Handwerker 1989).

This view of culture is highly compatible with Gintis's objectives. This decades-old tradition of scholarship based on the findings of cognitive science and centered around the collection of cultural data should be considered before the reinvention of the wheel.

The flight from reasoning in psychology

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Abstract: Psychological science can benefit from a theoretical unification with other social sciences. Social psychology in particular has gone

through cycles of repression, denying itself the opportunity to see the calculating element in human interaction. A closer alignment with theories of evolution and theories of interpersonal (and intergroup) games would bring strategic reasoning back into the focus of research.

Gintis observes the incompatibility of the multitude of mini-paradigms in the social and behavioral sciences and judges this state of affairs to be scandalous. His argument is that if there are so many incompatible paradigms, many of them must be wrong. This may be so, but it does not represent the worst possible state of affairs as long as some of these paradigms are correct. If the many paradigms were replaced by a single one, and that one turned out to be false, the damage would be great indeed. To move toward a unification of the social and behavioral sciences, Gintis proposes a "take-the-best" heuristic that recombines paradigm fragments that have proven empirically useful and that are compatible with one another. This will not amount to a true scientific revolution *sensu* Kuhn (1962), because that would require an entirely new look at the whole field and an overthrow of the dearest theoretical assumptions across the board.

As a psychologist, I agree with Gintis's claim that psychology must shed its distrust of reasoning, and especially strategic reasoning in social contexts. To avoid the topic of thinking is no way to resolve the rationality question. Every generation of psychologists seems to reclaim the irrelevance of reasoning using the tools of the day. First came the idea that if rats and pigeons can be trained to perform complex behaviors, parsimony demands that complex human behaviors be explained by animal learning models (Skinner 1971). Then came the idea that social behavior is "unbearably automatic" (Bargh & Chartrand 1999). Unbearable indeed. The idea that higher reasoning can be dismissed because some critical behavior can be elicited in the laboratory without the participant's awareness is the logical fallacy of affirming the consequent. Finally, the current rush toward neuroscience is yet another flight from reasoning (Kihlstrom 2006). Despite its undeniable scientific interest and importance, brain imagery can reveal only correlates of reasoning, not reasoning itself.

Why does reasoning have such a bad name in psychology? One consideration is that strategic reasoning implies the ability to outthink and deceive others. The capacity of research participants to be one step ahead mentally is always a concern in the laboratory. To allay this concern, experimenters seek ways to circumvent strategic reasoning, and then mistake what is left for the whole of psychology. A related consideration is a common misunderstanding of the relationship between determinism and human choice. The point of strategic reasoning is to be unpredictable when so desired. Yet, when determinism is taken to entail predictability, unpredictable behavior seems undetermined, and therefore either random or "freely willed." The implication of free will and the reference to intentions or desires seems like a throwback to Aristotelian thinking, according to which the apple falls to the ground because it wants to.

I believe these worries are ill-founded. Even in a fully deterministic world, strategic reasoning can occur. Perhaps such reasoning is unpredictable in principle, much like the nonlinear mathematics of chaos theory, or it is just sufficiently unpredictable by those conspecifics it is designed to deceive. If it is the latter, its purpose is served, and we can get on with the task of modeling it. Likewise, intentions need not be mere by-products created by brains that are *really* only in the business of generating behavior (Krueger 2003). Recent advances in neuroscience show that tetraplegics can be fitted with prosthetic devices that receive neural signals associated with conscious intentions and translate them into motor behavior (Hochberg et al. 2006).

In his effort to build a comprehensive "model of individual human behavior," Gintis has surprisingly little to say about

how strategic reasoning can retake center stage. As he notes, however, the study of "rationalizability" is one place to begin. True, with enough assumptions, almost any behavior may come to appear reasonable. What is needed is a compass that helps chart a course between unprincipled post hoc rationalization and the equally barren strategy of demonstrating irrationality with experimental designs that equate any significant finding with the presence of a bias or an error (Krueger 1998).

Many social-psychological phenomena that presumably illustrate the fallibility of social behavior and cognition can be rationalized with the tools of decision analysis or game theory. To illustrate, consider the classic finding of bystander apathy (Darley & Latané 1968). The more potential helpers there are, the less likely is an individual to assist a person in need. Orthodox social-psychological analysis focuses on victims facing life-and-death emergencies and bystanders who have little to lose by helping. However, a full model requires the bystanders' costs and benefits, as well as the number of bystanders, to be variables.

Game theorists have derived precise predictions for behavior in the volunteer dilemma. A person caught in this dilemma hopes that others will bear the cost of intervening, but would intervene herself if she knew that no one else will. According to one solution (Diekmann 1985), a bystander will help with a probability of

$$1 - \left(1 - \left[\frac{1}{N} \times \frac{c}{b}\right]^{(1/(N-1))}\right).$$

Notice that this probability becomes smaller as the cost of helping, c, or the group size of bystanders, N, increases, and as the benefit to the helper, b, decreases. This is a mixed-motive solution that maximizes the expected value for the bystander. Incidentally, this solution also predicts Darley and Latané's (1968) finding that a victim becomes slightly more likely to receive aid from *someone* as the group becomes larger.

Other classic and contemporary findings can be rationalized along similar lines. Gintis's emphasis on the evolutionary rationality of conformity and imitation is another good example. Although the reorientation of the social and behavioral sciences proposed by Gintis may not (yet) amount to a Kuhnian revolution, it may turn out to be a decisive first step to overcome disciplinarian parochialism. We can begin today by reading – at least from time to time – one another's journals.

The limitations of unification

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Abstract: There are two roadblocks to using game theory as a unified theory of the behavioral sciences. First, there may not be a single explanatory framework suitable for explaining psychological processing. Second, even if there is such a framework, game theory is too limited, because it focuses selectively on decision making to the exclusion of other crucial cognitive processes.

Can the behavioral sciences be unified? The target article suggests that it is critical to develop a single theoretical framework that can be used to explain phenomena across the behavioral sciences and to develop new questions. The article