Are Ethnic Groups Biological "Species" to the Human Brain?

Essentialism in Our Cognition of Some Social Categories[1]

by Francisco J. Gil-White

If ethnic actors represent ethnic groups as essentialized "natural" groups despite the fact that ethnic essences do not exist, we must understand why. This article presents a hypothesis and evidence that humans process ethnic groups (and a few other related social categories) as if they were "species" because their surface similarities to species make them inputs to the "living-kinds" mental module that initially evolved to process species-level categories. The main similarities responsible are (1) category-based endogamy and (2) descent-based membership. Evolution encouraged this because processing ethnic groups as species—at least in the ancestral environment—solved adaptive problems having to do with interactional discriminations and behavioral prediction. Coethnics (like conspecifics) share many strongly intercorrelated "properties" that are not obvious on first inspection. Since interaction with out-group members is costly because of coordination failure due to different norms between ethnic groups, thinking of ethnic groups as species adaptively promotes interactional discriminations towards the in-group (including endogamy). It also promotes inductive generalizations, which allow acquisition of reliable knowledge for behavioral prediction without too much costly interaction with out-group members. The relevant cognitive-science literature is reviewed, and cognitive field-experiment and ethnographic evidence from Mongolia is advanced to support the hypothesis.

FRANCISCO J. GIL-WHITE is Assistant Professor of Psychology and visiting scholar at the Solomon Asch Center for the Study of Ethnopolitical Conflict at the University of Pennsylvania (Philadelphia, Pa. 19104-6196, U.S.A. [fjgil@cattell.psych. upenn.edu]). He was educated at the New England Conservatory of Music (B.M., 1993), the University of Chicago (M.A., 1995), and the University of California, Los Angeles. Among his publications are "How Thick Is Blood? The Plot Thickens: If Ethnic Actors are Primordialists, What Remains of the Circumstantialist/Primordialist Controversy?" (*Ethnic and Racial Studies* 22:782–820) and (with Joseph Henrich) "The Evolution of Prestige: Freely Conferred Status as a Mechanism for Enhancing the Benefits of Cultural Transmission" (*Evolution and Human Behavior* 22, in press). The present paper was submitted 6 XII 99 and accepted 30 I 01.

1. Parts of this paper were originally presented at the Human Behavior and Evolution Society meetings in Salt Lake City, Utah, in June 1999, where it won the New Investigator Prize. I wish to thank, first of all, my Torguud and Kazakh friends for their forbearance and assistance with my research. In particular, I thank my host, Choglomiin Tsoodol, and his extended family for their devotion to

Constructivist studies in recent anthropology have made an intellectual and moral contribution by repeatedly demonstrating that neither supposed "races" nor ethnic groups—or "ethnies"[2]—are natural kinds in any biological sense. Biologists have reached the same conclusion (Boyd and Silk 2000). However, establishing the ontological fact may have clouded our understanding of local epistemologies. Anthropology today is faced with facts that are very embarrassing to current theorizing. "The news is full of ethnic cleansing and genocide while anthropologists stress that ethnicity is 'invented' and set out to 'decentre' the notion" (Levine 1999:165). We may be failing to take seriously that ethnic actors are themselves essentialists. Even though ethnies and races do not have essences, we still need to investigate why ordinary people often believe that they do and how this affects their behavior. Except for Hirschfeld's (1996) pioneering work, anthropologists have ignored these questions (though concern with essentialism is growing in social science, particularly psychology [Haslam 1998, Miller and Prentice 1999]).

In a recent assay of the relative value of constructivist and essentialist perspectives, Fischer (1999:473) communicates a perception that anthropologists eschew essentialist descriptions of ethnic groups as objects of analytical study but throw the baby out with the bathwater in failing to recognize essentialism as a self-evident worldview for most ordinary people:

> Essentialism is a dirty word in anthropology these days, used to denote an insidious neocolonial strategy of social containment. . . . scholars working in the constructivist tradition have forged an intellectually and politically liberating style of analysis built around antiessentialist critiques (Spivak 1987,

2. I prefer the term "ethnie" to the more common "ethnic group" because these are "groups" only in certain special cases. Generally speaking they are categories rather than groups of people, and the usage of the word "group" has served only to mislead theorists, who often appear to confuse, for example, processes such as ethnic mobilization with ethnogenesis.

1994; Bhabha 1990, 1994; Gupta and Ferguson 1992; García Canclini 1995). . . . Despite its general disrepute within the academy, an essentialist view of culture underwrites many contemporary ethnic movements the world over.

This statement sets up a contest between theoretical positions: some scholars defend the essentialist and others the constructivist view. Lately, it implies, there are more constructivists who abhor essentialists than the reverse. The represented contest is asymmetrical in other ways. Essentialists supposedly are naive *naturalizers* for whom ethnies are natural in a fundamental, ontological sense, and constructivists are supposedly *analysts* who in their wisdom recognize that ethnies are not "natural" but "constructed." Constructivists boldly identify themselves, but their supposed opponents apparently publish no articles (cf. Fabian 1999:490)! But if constructivism is the only game in town and constructivists are talking to themselves about nonexistent foes, we need a more substantive target for debate.

Constructivists are interested in how ethnies are put together. Postcolonial studies have enlightened us on the political and economic factors that encourage essentialism as an instrument in the social arena. Nevertheless, one hardly finds accounts of ethnic construction that do not refer us to a relatively long, intergenerational, and emergent process rather than real-time teleological calculations, and constructivists often appear to confuse the *fact* of ethnic-group construction with a *consciousness* by ethnic actors of such constructive processes (Gil-White 1999). Ordinary people seem stubbornly oblivious to constructivist theorizing, and, despite extraordinarily different conditions of history and learning, they nevertheless appear everywhere cognitively predisposed to accept a biological illusion of essentialized naturalness for some of the groups they belong to. Thus, if essentialism is involved in ethnic-group formation, then "'essentialism' is one of the things 'constructivists' try to understand" (Fabian 1999:490)—or ought to.

The represented debate between constructivists and essentialists is, depending on context and author, either parallel or isomorphic to the represented debate between "circumstantialists" (a.k.a. "instrumentalists") and "primordialists." Circumstantialists see ethnies as the consciously *instrumental* (for political/economic gain) constructions of rational actors, whereas primordialists supposedly believe that ethnies are natural and eternal historical entities, with hermetically impermeable social boundaries. Once again, circumstantialists quickly announce themselves, but the primordialists they supposedly rise against—as caricatured here—are much harder to find, because, as before, they do not really exist. Once again, there is a confusion of one theoretical question with another: in this case instrumentalists confuse the (implausibly) instrumental construction/choice of an ethnic identity with the (more plausibly) instrumental choice to mobilize the identity politically. And once again we must ask why, despite the fact that ethnic groups are neither eternal nor naturally given, ethnic actors nevertheless represent them this way (the data we have suggest that they do so the world over [Gil-White 1999]).

These days "good" anthropologists do not essentialize groups, and therefore no self-proclaimed essentialists are found in anthropology journals. But ordinary folk are not good anthropologists or sophisticated constructivist scholars. Quite to the contrary, they are naive essentialists, and I will try to explain why. This requires an effort that is ethnographic and cognitive-psychological. As Levine (1999:166) says, ethnicity is a poor concept unless we can describe and explain its cognition. Hirschfeld's (1996) lead deserves to be followed, and the present effort is in that spirit.

What Is a "Group"?

The attempt to explain ethnic groups and ethnic cognition must situate itself relative to other social categories. What makes ethnic groups distinctive? How are they different from other social categories such as "religion" and "class"? In fact, *are* they?

In psychology, although some distinctions have been made between so-called primary (face-to-face) and other kinds of groups, the fields of stereotyping and group perception are strongly biased by the explicit or implicit assumption that the term "group" represents a scientific category (for a review of theory and evidence see Sedikides, Schopler, and Insko 1998). Thus, for example, a large literature has focused on groups with no history or content, formed in the lab on the slimmest and least ecologically valid of categorical distinctions (e.g., flipping a coin). In these experiments, allocators who (1) will suffer no material consequences from their decision and (2) distribute rewards with zero (or else very weakly symbolic) value have shown a demonstrable—but minuscule—bias favoring the in-group (Tajfel's [1970] celebrated "minimum-group paradigm" experiments; for a review see Diehl 1990). These results are widely considered relevant to the explanation of processes of discrimination and conflict in more ecologically relevant social categories such as ethnic groups (Turner et al. 1987). However, recent experiments with ethnic groups, more realistic stakes, and a procedure that makes the allocators' costs and benefits contingent on choices made by allocators show that allocators may favor the *out-group* (Gil-White 2001a). And the in-group bias in the original minimum groups is easily made to disappear with what appear to be minor framing variations (Mummendey et al. 1992). In sum, a straightforward application of the results of the minimum-group literature to ethnic groups and other similar moves are valid only if "group" is a useful scientific category, which is likely to be true only if the astonishing variety of social distinctions that qualify for the label "group" are meaningfully unified in human perception and experience.

Are they? The only theoretical effort to confront this issue head-on, attempting to develop an encompassing gestalt theory of "groups," originates with Campbell

(1958). Campbell argued that a collection of individuals is perceived as a group to the degree that this collection has the characteristics of an *entity*. Out of this conceptual effort a recent but growing literature has constructed the following argument (Hamilton and Sherman 1996, Hamilton, Sherman, and Lickel 1998, Yzerbyt, Rocher, and Schadron 1997, Yzerbyt, Rogier, and Fiske 1998, Yzerbyt, Corneille, and Estrada 2001): Social categories fall somewhere along an "entitativity continuum," with some being more entitative than others. Since individual humans are the prototypical entities and since they are essentialized, social categories that are high in entitativity are processed by analogy as individual persons and, as a result, become essentialized. The attribution of this category essence is then used in causal reasoning to explain the behavior of the members of the social category, leading to the emergence of social stereotypes. Properties taken to contribute to the perceived entitativity of a social category are proximity, similarity, and common fate of its constituents and structure among them.

This argument is not without problems. The concept of entitativity needs conceptual clarification, and the empirical tests typically pit not a highly against a less entitative social category but rather a social category against an *aggregate* (Yzerbyt, Rogier, and Fiske 1998 is a case in point, but so are most of the studies in their review). It is unremarkable that differences in processing will be found between aggregates and social categories, and the exercise sheds no light on the impact of entitativity on essentialism and stereotyping. At an intuitive level, it seems implausible that entitativity is closely related to essentialism: firms, for example, are highly entitative, but they are not essentialized—and they are characterized by much weaker stereotypes than much less entitative social categories such as ethnic groups. This paper will present evidence that the entitativity of a social category does not predict that it will be essentialized. Finally, the use of the word "essence" in the above literature is self-consciously derived from the categorization literature and its recent focus on natural-kind categories; however, the claim of essentialism among the above authors appears implicitly to have become a stand-in for "stereotyping" or "causal reasoning" even though these are not the same thing. The usage does a disservice to the explicit pedigree of the term "essentialism." After all, one can use a predictive stereotype for a social category without seeing it as an essentialized *natural* kind.

What about the alternative to the gestalt approach? Perhaps there is specialized mental machinery for processing particular social categories in distinct and relatively discontinuous ways. This hypothesis flows naturally from the categorization literature, which has gotten much mileage from focusing on the structure of *categories* as a window into the way in which the brain parses the world. The focus here is on the different assumptions and biases, as part of an integrated *schema*, that particular categories activate or *prime* and what such cleavages of cognition reveal about the modular and evolved design of the human brain. Particularly interesting here is the distinction between "natural" and "artifact" categories, which are processed in different ways (Rosch 1978; Rosch et al. 1976; Keil 1989; Gelman and Markman 1986, 1987; Gelman and Wellman 1991; Gelman and Medin 1993; Medin and Ortony 1989). Some have taken this as an inspiration to argue that certain social categories are processed more like "natural kinds" and other social categories more like "artifacts" (Rothbart and Taylor 1992, Hirschfeld 1996). My own argument is in this vein.

I will argue (cf. Tooby and Cosmides 1992, Pinker 1997) that domains important to our survival and reproduction in the past have probably selected for machinery specifically dedicated to processing the domain-relevant inputs. Each of these dedicated "mental organs" or "modules" is described in a cognitive sense (not necessarily implying *physical* brain modularity) as a set of processing biases and assumptions activated by the domain-relevant inputs. If this view of the brain is useful for understanding most domains of perception and cognition (see Pinker 1997), then we should hardly expect social groupings to be the exception, and we should investigate any interesting discontinuities in our perceptions of social units. In particular, we should investigate possible mental machinery specific to processing ethnies.

Incidentally (and puzzlingly), evolutionary and cognitive scientists have, by and large, not made this sort of argument for social group perception and have limited their proposals to a domain-general categorization and stereotype-formation faculty and to an also relatively domain-general hypothesized "groupish" adaptation as evidenced in Tajfel's experiments (e.g., Pinker 1997:312–13, 513–14). The exception is Hirschfeld (1996), who has advanced the argument and interesting evidence that the cognition of phenotypic categories (i.e., so-called race groups) is modular—in particular, that it is essentialist. (However, Gelman and Hirschfeld [1999] now argue for a more domain-general essentialism not tied to any particular kind of group and responsible for all sorts of "essentialisms," from the fetishism of certain objects to the perceived naturalness of certain social categories.) More recently, Lickel et al. (2000) have tried to identify the broad cuts in an intuitive taxonomy of "groups."

I will defend the hypothesis that ethnies (and similar social categories) are processed by the machinery which evolved to deal specifically with "natural living kinds" of the "folk-species" rank-level such as BEAR or MOUSE. Other social categories will typically not be processed in this way.

The "Ugly Duckling" Hypothesis

Cognitive studies with children (see Gelman 1996 for a review) and ethnobiological work in anthropology (Medin and Atran 1999, Atran et al. 1997, Atran 1990, Berlin 1992, Brown 1984, Hays 1983, Hunn 1977, Berlin, Breedlove, and Raven 1974) increasingly support the hypothesis that there may be a universal cognitive adaptation for processing living kinds as categories endowed

with "essences." This claim is still controversial (for exchanges on this question see Gelman and Hirschfeld 1999; Hatano and Inagaki 1999; Au and Romo 1999; Atran 1995, 1998; Maffie 1998; Matan and Strauss 1998; Carey 1985, 1996), but there is no space for that here. I will present evidence for the hypothesis, accept it provisionally, and go on to build the further hypothesis that humans think about ethnies with the same evolved, essentialist machinery that processes the biological world. I introduce here an outline of the argument.

Important aspects of specialized biological thinking are displayed in the familiar tale *The Ugly Duckling*. A swan's egg accidentally falls into a duck's nest and is incubated to term by unsuspecting Momma Duck, who, following gestation, raises it. Everyone, including the adventitious hatchling itself, takes it for a duck (even if all agree that it is an ugly one). In time, it grows into an obvious swan, revealing everyone's mistake.

What is the moral of the story? Superficially, the importance of reserving judgment because appearances may deceive. The baby swan was wrongly called an "ugly duckling" on the basis of appearance, but it laughed last after turning into a beautiful adult swan (by implication far superior to a mere duck). But more interesting than the explicit lesson are here the unnoticed *assumptions* (unconsciously taken as obvious givens) that allow the story to work. The egg came from a swan's nest, so its parents were swans, and therefore no amount of duck rearing can turn the hatchling into a duck; it will develop normally as a swan no matter what it learns and no matter what others think it is or even what the "duckling" itself thinks it is. It is a swan—that is its *nature*.

Like most fables with anthropomorphic animal characters, *The Ugly Duckling* is not, I suggest, really (or merely) about ducks and swans. Its replicative success across time evidences its efficiency and relevance: it is a simple parable of human life. Moreover, underneath the explicit moral is a story about the effects of rearing environment on one's living-kind-derived nature—that is, none. Its passive acceptance as a plausible story suggests that we find it incontrovertible that if animal A rears animal B, this will not turn the latter into anything other than a B. Could the metaphorical implication—that one's ethnic "nature" is also a matter of blood-descent rather than enculturation—be equally plausible to humans?

Consider a modern example: The Weimar Jews were quite assimilated to German society in speech, custom, and dress, had fought as Germans in World War I, and, without relinquishing a Jewish identity, often considered themselves genuine Germans. But in the ensuing anti-Semitic rampage not merely those who preserved Jewish ascriptions and traditions for themselves but even those with a small fraction of Jewish ancestry (sometimes as little as one-eighth) were slated for persecution. Nazi anti-Semitism openly essentialized its victims, attributing to them a corrupt nature. Not all were convinced by this ideology to the point of justifying the persecution of Jews, but the question remains: Why was it so plausible to Nazi converts that even a little bit of Jewish "blood"—unknown perhaps even to their bearers and against all the powers of German enculturation—would pass on this supposedly corrupt nature? Perhaps because we intuitively process ethnic groups as if they were "species," reasoning implicitly that the corresponding nature is passed down reproductively and, hence, in the "blood."[3]

If humans come equipped with mental machinery for naively processing ethnic groups as species, this is obviously a grave mistake from the scientific point of view. An ethnic so-called nature, after all, is nothing if not a set of *culturally transmitted* norms and behaviors, and therefore believing these literally to result from biological descent is an ontological error. But a bad ontology may be a useful epistemology. Suppose that (1) people have cultural norms very similar to those of their parents, (2) the norms of their parents are those of their ethnic group, (3) norms differ rather sharply across ethnic boundaries, and (4) ethnies are at least normatively endogamous and fairly endogamous in practice. If these obtain, treating an ethnie as a "living kind" will generate the right behavioral prediction most of the time: your "nature" (the norms you automatically and sometimes even unconsciously adhere to) is a function of your "kind" (the ethnie you belong to), which in turn is the "kind" of your parents (since ethnies are largely endogamous). Keeping track of these "kinds" is important, for attempted interactions with aliens with different standards of performance will more likely lead to failed than to mutually profitable interactions. In the case of the Weimar Jews, many—perhaps most—of their interactional norms were no different from German norms, but the argument is that what *primes* this form of thinking is perception not of norm differences but of an endogamy boundary, which then promotes the *assumption* of "natural" differences.

The hypothesis that humans have evolved to process ethnies as species relies on the following assumptions and argument:

1. Humans have social-learning biases for conformism (Miller and McFarland 1991; Kuran 1995; Asch 1956, 1963[1951]), and these create locally centripetal forces in culture that tend to give stability to a given population's norms (Boyd and Richerson 1985; chap. 7; Henrich and Boyd 1998).

2. Even groups living in the same environment can stabilize different clusters of interactional norms—rulelike ideas that govern how individuals will transact social exchanges of all sorts (i.e., "the rules of the game" [cf. Barth 1969]). Different equilibria are possible because, for many domains, that all members follow the same rules is vastly more important than their specific content (e.g., driving on the left- or the right-hand side of the road).

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3. But why did one-eighth Jewish "blood" count more than seven-eighths German "blood"? Perhaps because essences conceived as bad are "polluting" and we tend to believe that small amounts of contaminants can pollute large quantities of clean substances ("negativity dominance" [Rozin and Nemeroff 1990]).

3. Interacting with people who do not share one's norms creates significant fitness costs because the game of reciprocity is more difficult to play when the players have different expectations and rules. Humans have evolved to be sensitive to these costs (Robert Boyd, personal communication).

The argument is as follows: The evolution of conformism as a social-learning adaptation led to the emergence of local cultures stabilized for parochial norm equilibria (see assumptions 1 and 2), that is, localized and distinct ways of playing the "games" of social life. Interaction beyond the norm boundary is costly (in time and energy wasted) because coordination is difficult when interaction partners are playing different games or have different rules for the same game. Humans should be sensitive to such costs (see assumption 3). People learned through trial and error to interact preferentially inside the norm boundary, particularly when mistakes are especially costly, as in the case of the marriage of one's children (which in simple, pre-state societies establishes long-term reciprocal and political relationships between in-laws). As a result, the norm boundary became, over time, synonymous with the ideological boundary of endogamous preferences. A corollary of this—given that interactional norms typically can be truly mastered only if acquired during early development—is that good performers of the group's norms were almost always those descended from other group members. This led to the illusion that biological descent *caused* such performative mastery and would thus have tended to link full membership in the norm group with descent. Given the importance of norm boundaries for interactional decisions, norm groups acquired salient labels for ease of reference and discrimination. Finally, because interactional discriminations are adaptive to all concerned, there was an advantage in broadcasting group membership in order to signal what set of norms one adhered to and thus facilitate such discrimination. This led to ethnic signaling through dress, scarification, etc. (McElreath, Boyd, and Richerson 2001).

In sum, the above processes ultimately endowed emergent ethnic groups with all of the salient and diagnostic characteristics of a species: (1) a distinctive "morphology" (the ethnic signaling component), (2) many inter-correlated hidden "properties" (the stable norm equilibrium), (3) within-category mating and descent-based membership, and (4) saliently labeled categories in cultural discourse. Thus, in Sperber's (1996:chap. 6) terms, given preexisting mechanisms for recognizing species and processing them in particular ways, emergent ethnic groups very likely met the input conditions that primed such mechanisms, becoming part of the "actual domain" of the living-kinds mental module. When a human perceived an ethnie, it counted it and processed it as a species. Over time, because processing ethnies in this manner yields similar adaptive benefits to those which obtain in species reasoning (see below), the brain evolved to improve the fit and make ethnies part of the "proper

domain" of the living-kind module, completing the *exaptation*.[4]

Allport (1954) first suggested that reasoning about ethnies was essentialist but provided only a vague description of what he meant. Atran (1990:74, 78) and Boyer (1990, 1994) briefly hinted that ethnic and racial essentialism could result from *biological* domain reasoning, but they did not develop an argument or make a strong adaptationist case. The argument I have summarized claims that our brains process ethnies as species *on purpose* because, in the ancestral environment, this was adaptive. One can, of course, accept the empirical claim that humans essentialize ethnic groups while rejecting my explanation for it. Hirschfeld (1996:21–26, 35, 116, 160, 175) and Gelman and Hirschfeld (1999) have specific disagreements with claims that ethnic essentialism is the product of biological domain thinking and provide an alternative account (see below).

If it is true that we naively and intuitively process ethnies as species, this is likely to improve our understanding of the behavior of ethnic actors in different contexts. This is an increasingly urgent concern of anthropologists, sociologists, and political scientists, for obvious reasons. In these literatures, the prejudice of "circumstantialists" (a.k.a. "instrumentalists") is that ethnies are socially "constructed" as people rationally follow their associative interests. But if ethnies recruit their members, mate, behave, and perceive each other as natural living kinds, then they are not constructed from the individual political decisions of rational actors in relatively short time-scales. They are constructed—though not for that any less real, mind you—with ideologies of descent-based membership that constrain the constructive process. The present argument thus supports some of the prejudices of "primordialists" (see Gil-White 1999).

Natural Kinds in Context: A Brief History of Categorization Theory

If a radically constructivist view of ethnic categories is correct, we should expect such categories to be fuzzy and malleable, for otherwise the project of constructing them in political time-scales would fail. Ethnic actors should see membership in an ethnie as ambiguous and negotiable. In contrast, if ethnic actors are essentialists, they will represent ethnic categories as having nonnegotiable necessary and sufficient conditions of membership. However, the issue of fuzziness in categorization is not straightforward, and I must preempt an important and tempting confusion: the idea that the fuzziness of a category may be established from fuzzy guesses when people sort perceptual stimuli (see also Gil-White 2001c).

Critical to species categories, I will argue, are necessary and sufficient conditions of membership. An X is

4. An exaptation is the harnessing of a preexisting structure to serve a novel function, in this case a mechanism for processing natural living kinds that began accepting ethnic groups as an input.

an X is an X. But knowing this does not mean that we always know an X when we see one—at least not at first. We may initially guess wrong but, upon learning relevant background facts, recognize our mistake and revise the initial classification. What this implies is that appearances may guide our fuzzy guesses when we try to sort new stimuli into categories but that these same appearances will—in the case of species categories—not impose themselves on our concept representation, which is unequivocal rather than fuzzy.

In our fable, consider that despite a different appearance, the ugly duckling's family nevertheless considered it a duck because they believed it a descendant of Momma Duck. Because they thought they knew its descent, appearance was irrelevant. The moral of the story makes the converse point: even if it talks like a duck and walks like a duck (albeit an ugly one), it could very well still be a swan. Thus, initial guesses may fail, but having established descent, we will confess our mistake and revise our categorization completely (i.e., the ugly "duckling" is not even *partly* a duck—it is not a duck at all).

Similarly, though people may make fuzzy guesses when assigning people to ethnic categories (if they have imperfect background information about them), this is fuzziness and ambiguity in *identification procedures*. It does not imply ambiguity in *concept representation* (category structure) if the fuzziness disappears when people are given the missing information. Claims by constructivists that ethnic categories are fuzzy (ambiguous, malleable, etc.) may result from confusing identification with representation (see Gil-White 2001b). Below I briefly review how these insights about species categories evolve out of a recent revolution in cognitive psychology. Following that, I present Mongolian data on ethnic-group cognition for comparison.

FROM CLASSICAL CATEGORIES TO FUZZY ONES

From the time of Aristotle until recently, all categories were thought to have necessary and sufficient conditions (Smith and Medin 1981:chap. 3) and hence to be "abstract containers, with things either inside or outside the category" (Lakoff 1987:6). An "object" is always either "A" or "not A." This is known as the "classical" view, and it has been challenged of late.

Ludwig Wittgenstein (1953:66–67) recently developed the concepts of "family resemblances," "centrality," and "gradience." The members of some categories (e.g., GAME), he noted, did not all have certain properties in common, and for them no set of necessary and sufficient conditions could establish category membership. The English category RELIGION, for instance, includes such things as Shintoism, shamanism, and even Confucianism, at one end, and Islam, Tibetan Buddhism, and Zoroastrianism at the other. The promotion of a moral code, magic, stereotyped rituals, belief in supernatural entities, belief in the afterlife and the "soul," priesthoods, and creation stories are all *characteristic* of RELIGION, but tokens of the class which lack any of these can be found.

Not one item in the list is a defining (necessary and sufficient) property, though some may have greater weight than others. Thus, an "object" is a member of the category if it possesses some critical sum of these weighted features.

Beyond membership, some members may be more *typical* of the category than others. Notice, for example, the misgivings of an expert on shamanism (Humphrey 1996: 49):

> For a time it seemed to me best to write a book somehow without the words "religion" or "shamanism." "Religion" seemed wrong for ideas and beliefs which are never set out as general theory and make use of relatively few abstract concepts, for which there is no holy founder, no organized institution, no moral dogmas, and no authoritative corpus of books. Above all, there is no tortuous justification of earlier beliefs enshrined in ancient texts.

In Humphrey's intuitions and those of most competent English-speakers, practices that are institutional, theological, prophetic, historicized, and moral—*in addition* to being ritualized, magical, and supernatural—are more comfortably "religion." Nevertheless, ritualized practices that attempt to influence and codify reverence for supernatural forces (without the above additions—e.g., shamanism) still strike us as somehow "religion," if less comfortably so. Islam, then, is a "central" or more typical member of the category, whereas shamanism is not. Rosch and Mervis (1975) gave experimental meaning to "family resemblances," showing that *typicality* for a token member results from having more of the more common features in the set (which can be generalized as a higher sum of the weighted features).

Finally, some categories are characterized by "gradual" membership. For example, crisply separating POOR from RICH is impossible, and the same goes for YOUNG versus OLD, BLUE versus GREEN, TALL versus SHORT, etc. Some people are clearly young (babies) and some old (nonagenarians), but the boundaries of such categories are not clear. To age is, as it were, *gradually* to lose membership in the category YOUNG and gain it in OLD.[5] Zadeh (1965) began the work of integrating fuzzy sets into a general set-theoretical framework.

Eleanor Rosch's empirical and theoretical work, with that of others, revolutionized the way we think of categories and led to the current understanding that not all categories have the structure "A or not A." She introduced the term "prototype" to stand for the "cognitive reference point" or most central member (or subcategory of members) of a category and demonstrated the corollary "prototype effects": some members of a category are learned, recognized, etc., more easily, which is consistent with their being more *representative* or *typical* of the category (Lakoff 1987:41). At first category structure was inferred directly from these prototype effects, but Rosch

5. A similar criterion should operate for results that are "statistically significant," by the way, but the classical view has strangely prevailed over what should obviously be a fuzzy category.

(1978) eventually recognized that demonstrating prototype effects did not, in fact, reveal category structure, as different concept representations may be consistent with the same prototype effect.

For example, if we establish that some tokens of a category are more typical because people tell us they are better examples of the category or because these tokens are identified more quickly, does this show that the category in question has a probabilistic structure such as YOUNG PEOPLE? That is, will some category members have higher percentual membership (e.g., be *younger*) than others? Not necessarily. Armstrong, Gleitman, and Gleitman (1983) examined typicality ratings and reaction times for members of the category ODD NUMBER and found that subjects indeed felt that some numbers, such as 3 or 7, were more *representative* of ODD NUMBER than others, such as 109 and 2,003. However, "if subjects are asked directly whether typical odd numbers are or can be *more odd* than atypical ones, they will flatly deny it" (Keil 1989:30, my emphasis). This result shows that even classical categories with necessary and sufficient conditions, such as ODD NUMBER, may show typicality effects.

Rosch (1978:40–41) cogently argued that the demonstration of prototype effects constrained the range of possible category structures to those which could account for them but in the same breath maintained that necessary and sufficient conditions could not. As we see above with the case of ODD NUMBER, however, it seems that they can, and so classical categories may not be as rare as was initially believed when prototype effects began proliferating (Medin and Ortony 1989). Typicality effects are not incompatible with newer understandings of classical categories, for they may result from *processing during identification* of members rather than concept representation (Smith and Medin 1981:40–43, 57–60). Thus, though some token members may be considered more typical and therefore be processed better and recognized more quickly, it is still possible that for some categories membership is a yes/no distinction. Natural kinds, despite demonstrable prototype effects, appear to be classical categories with necessary and sufficient conditions of membership.

NATURAL KINDS AS CLASSICAL CATEGORIES

Locke's (1964[1690]) distinction between nominal and real essences has led to one between nominal and natural kinds (Keil 1989:36–37). Nominal kinds reflect more or less arbitrary conventions of usage or else have definitions based on their purposes for human use (e.g., artifacts such as PENCIL), whereas natural kinds (e.g., FISH) at least carry the intuition that they carve out important causal domains and processes in the natural world. When natural kinds are revised—or rather, when we revise our ideas about which objects out there in the world should be excluded from, or included in, a natural kind—we feel this less as a definitional shift than as a gain in under-standing of the category itself, whose definition we *discover* rather than arbitrate.[6]

In natural kinds typical appearances defer to our intuitions of "deep," nonobvious explanatory properties causally responsible for category inclusion. Consider that humans seem ready to accept, if the information is conveyed by an expert source (e.g., a biology teacher), that a dolphin is not a FISH, even though a cursory inspection suggests that it is. Similarly, we happily leave fool's gold to fools, even though we ourselves need an expert to decide which is which. Artifact categories, however, are a different matter; try to imagine someone accepting the statement by a librarian that what looks like a book is really a magazine. Malt (1989) has systematically investigated these intuitions and found that for borderline cases on the basis of appearance, people feel that they need experts to sort natural kinds, but with artifacts such cases are felt to be a matter of opinion (e.g., the statement "According to experts, this is a shirt" is silly, but "According to experts, this is a fish" is not).

Criteria of identification (i.e., appearances) supply—for most instances (and in particular those typical of the category)—a rough-and-ready way of guessing that an object is inside the category (if it looks like a duck, we'll guess "duck"). The guesses (1) are probabilistic, (2) are graded by the number of category-relevant characteristics that are readily apparent in a given object, (3) imply judgments of typicality, and (4) will generate prototype effects. However, just as in ODD NUMBER, these effects do not imply fuzzy or ambiguous definitions, for appearances do not determine criteria of inclusion in natural kinds (Gelman and Markman 1987:1532):

> Natural kinds are categories of objects and substances that are found in nature (e.g., tiger, water, cactus). . . . natural kind terms capture regularities in nature that go beyond intuitive similarity. . . . Natural kinds have a deep, nonobvious basis; perceptual features, though useful for identifying members of a category, do not always serve to define the category. For example, "fool's gold" looks just like gold to most people, yet we accept the statement of an expert that it is not gold. . . . Because natural kinds capture theory-based properties rather than superficial features, some of the properties that were originally used to pick out category members can be violated, but we will still agree the object is a member of the kind if there is reason to believe that "deeper," more explanatory properties still hold.

Because in natural kinds we seem to privilege something deeper than mere appearances, some have proposed that we intuitively conceive of inner "essences":"Almost everyone has had the intuition that things are not always what they seem and that there is something deeper and more basic to a kind than what is immediately apparent. One way to capture this intuition is to

6. Even if by "arbitrate" we mean the emergent "Saussurian" consensus which is the result not of any act of legislation but of more or less mutually reinforcing patterns of practice.

argue that things have essences that are often difficult to discern immediately" (Keil 1989:36). Thus, inclusion in a natural kind follows from a necessary and sufficient condition—possession of the essence (or, by extension, from evidence of *meeting the conditions for having the essence*). Surface characteristics are responsible for typicality effects but not category inclusion, for we treat the former as the typical *manifestations* or *consequences* of the essence rather than direct evidence of essence possession. What this implies is that the categories are not fuzzy even if our appearance-based guesses may sometimes be. For species categories, Keil (1989) has demonstrated that young children faced with gradual pictorial transformations of one species into another (e.g., lion into tiger) are very reluctant to designate an animal as simultaneously belonging to both. They *will* consider the animal to have been transformed, but this happens abruptly, for the children "saw the animals as fully changing in kind across the critical pair of adjacent pictures" (1989:237–42). This suggests that even fuzzy transformations cannot overwhelm a strong intuition that the categories are not fuzzy.

All of the preceding arguments apply to both natural-kind substances such as GOLD and natural *living* kinds such as MOUSE. What is specific to the cognition of "species" categories is our intuitions about (1) how the category essence is acquired/transmitted, which has implications for (2) how it can be established that something has one essence rather than another. In species categories, the possession of an essence of X, I argue, promotes a strongly held intuition that one mates with X and produces Xs in reproduction. Thus, whether a token has an essence of X answers to the questions (1) Does it produce Xs in reproduction? (2) Is it descended from Xs? and (3) Does it mate with X?

Identification Versus Categorization in Mongolia

My study population consists in the main of Torguud seminomadic pastoralists (a small Mongol ethnic group in western Mongolia). They move around in the district of Bulgan Sum, Hovd, Republic of Mongolia, and winter near the district "center," a town on the Bulgan River. The town has about 2,500 inhabitants, some of them farmers on the periphery. Beyond is the desert-steppe, where about 5,000 nomads eke out a living. The Bangyakhan clan winters in a large floodplain valley of the Bulgan River not far from the district center. Some male herders make regular two-week trips out into the Gobi, where the snow is less thick and the sparse grass more accessible, but a few (perhaps 15%) remain fully nomadic even during the winter. They also assist their livestock with fodder collected in late August/September. In the summer months they move to high ground, in the Altai Mountains, changing their location constantly as pastures are depleted (they may make as many as ten moves in a four-month period). The high ground is very green

high-altitude forest-steppe criss-crossed by innumerable glacial rivers and streams. Apart from Torguuds, there are other Mongol ethnic groups in the area, as well as a large population of Kazakhs (perhaps 30% of the local population), with the greatest local ethnic contrast being that between Mongols and Kazakhs. Although there are a few Kazakh families in what is essentially Torguud territory, on the whole Torguuds and Kazakhs are territorially segregated—even Torguud and Kazakh town dwellers live in separate parts of town.

This site was chosen because it offers desirable controls for a number of variables. Since I intended to study essentialism, I worried about plausible confounds that could lead people to give essentialist answers (race, class, ecology/occupation, religion) and thus cast doubt on the interpretation that respondents were reasoning about ethnic categories per se. However, all of the plausible confounds are accidentally controlled for in this site. In terms of phenotype, the two groups have overlapping distributions without a sharp phenotypic cline (see Gil-White 2001*b*). Thus it is unlikely that local actors essentialize the ethnic groups because they are faced with sharp phenotypic or "racial" differences. Class is also not an issue, because there is no socioeconomic structural ranking of the groups. In terms of ecology, both groups include nomads and town dwellers, and the pastoral nomadism of the two groups is much the same, right down to the species they herd. Finally, the two local religions (Tibetan Buddhism among Mongols and Islam among Kazakhs) are both proselytizing rather than essentializing religions (unlike, say, Judaism or Hinduism). Any essentialism found in this site is thus more likely related to the nature of ethnic-category cognition than to local correlates of ethnicity.

The questionnaire I constructed for the study was as follows:

1. If the father is Kazakh and the mother Mongol, what is the ethnicity of the child?

2. The father is Kazakh, the mother Mongol, *but* everybody around the family is Mongol and the child *has never even seen a Kazakh* outside of the father. The child will learn Mongol customs and language. What is the ethnicity of *this* child?

3. A Kazakh couple has a child that they don't want. They give it in adoption to a Mongol couple when the child is under a year old. Around the Mongol family there only are Mongols, and the child grows up *never meeting or seeing a single Kazakh*. He is never told of the adoption *and thinks that his biological father and mother are the Mongol adopters*. He grows up learning Mongol customs and language. What is the ethnicity of *this* child?

I administered this questionnaire orally to 59 Torguud subjects in 1997 and then to an entirely new sample (again of Torguuds) of 41 subjects in 1998, varying the methodology slightly to explore what might have been possible confounding biases in the first experiment. In the 1998 replication the biological parents were Mongol and the adopters Kazakh, the child was female, and the questions were randomized. Only question order seems

to have mattered. In 1997 the order was deliberately designed to *inhibit* primordialist answers and provide a stronger test. It appears to have worked, because randomization increased descent-based ascriptions in question 3 for the 1998 sample (fig. 1; see Gil-White 2001*b* for details).

The responses to question 1 show that Mongols (like other pastoralists) are patrilineal (Khazanov 1994:143). However, this usually refers to clan and subclan ascription and material inheritance; here we see that fathers also transmit ethnic ascription. The question was open in that they were not forced to choose among predetermined options,[7] but in another sense it was forced by presuming that children have an ethnic status at birth. However, if respondents considered membership a matter of one's absorbed culture, perhaps they should have objected that "it depends" and explained on what. No such answer was ever given.

The wording in question 2 pits the patrilineal rule against enculturation in an ethnic out-group, presenting a descent-versus-culture conflict. In question 3 there are absolutely no ties, except for the fact of birth, to the biological parents. The answers to questions 2 and 3 show that my respondents categorize the child according to descent. In question 3 this implies that one can be an X and not know it (*à la The Ugly Duckling*). This is especially clear in 1998, where the randomized questions do not imply to subjects (as the 1997 sequence "1, 2, 3" does) that I expect and want enculturation-based answers. The prevalence of descent in question 3 rules out a "rearing" patrilineal model.

Of particular importance here is that biological descent is for most a necessary and sufficient criterion of inclusion, even though members are typically *identified* by recourse to prominently displayed cultural traits. When the adopted child is called a "Mongol" (1998 sample) this is despite the fact that my informants agree that the child will not look or behave anything like a Mongol and thus will violate the phenomenological expectations associated with a Mongol. The child may thus be human fool's gold. If she existed, a naive local traveler would doubtless classify her as Kazakh. But learning that the biological parents were Mongol would lead to a revision of the guess and a recognition that surface features had misled one as to the "'deeper', more explanatory properties" (much as the baby swan's foster siblings at first mistook it for a duck). Thus, we see here the same disjunction between identification procedures and categorization criteria that occurs with natural kinds. Since the "deeper explanatory properties" concern issues of biological descent, we appear to be dealing here with a "species"-type category. I do not believe that these results from Mongolia are idiosyncratic; the ethnographic literature suggests that all over the world—no matter how culturally marked ethnic actors may be—the "rule" for making ethnic ascriptions is based on blood much more than on enculturation (Gil-White 1999).

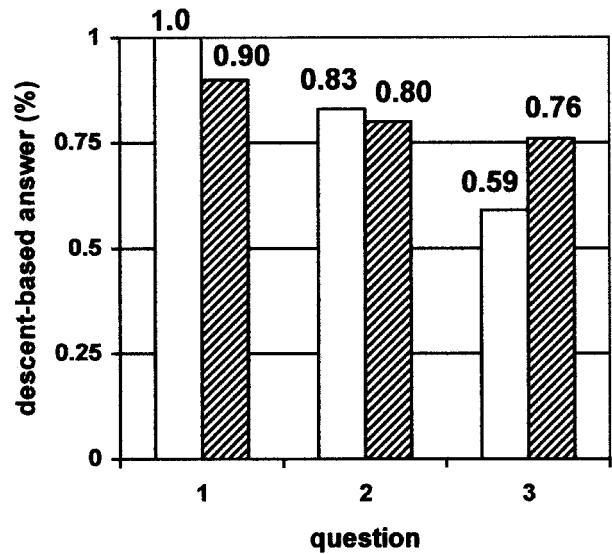Some may object that perhaps my informants are rea-

FIG. 1. *Descent versus appearance* (*percentage*). White bars, 1997 *sample* (n = 59); shaded bars, 1998 *sample* (n = 41).

soning not about ethnic groups but about what they believe are "races." Hirschfeld (1996) has shown essentialism in the cognition of "race." There are some problems of comparison because of differences in the details, but one of Hirschfeld's manipulations was an adoption situation very similar to mine, and his results amount to finding that children reason that "race" will be unmodified by early adoption into the out-group family—the same interpretation I have given to my results. I think that my respondents *do* "racialize" the ethnic groups, but we must then explain why this occurs even when there are no sharp phenotypic differences (Hirschfeld was testing the starkest possible contrast, the white/black distinction). I initially chose Bulgan Sum in part because phenotypic differences between local Kazakhs and Mongols seemed few and I wanted to test people's reasoning about *ethnicity*, controlling for phenotype (among other natural controls), and see if results similar to Hirschfeld's could be obtained. I conducted an initial pilot test in 1998 and a more rigorous study in 2000 (see Gil-White 2001*b*) to see if people could distinguish Kazakhs and Mongols on the basis of appearance. This study found so much overlap that local phenotypic differences are probably not responsible for racialist thinking. To know for sure, we need a negative result in experiments such as Hirschfeld's using physical differences of the order found in Bulgan Sum.

A final point concerns the issue of fuzziness. The first and second questions present respondents with an opportunity to say that the child is an ethnic mix. However, the issue was resolved one way or the other, and overwhelmingly with patrilineality. The exceptions confirm the rule. A few respondents in the first study answered

7. A very few even answered "half-breed."

that the child was *erliiz* (half-breed). Subsequent investigation yielded the clarification that he was a *Mongol erliiz* and not of mixed ethnicity. The term *erliiz*, then, though translated as "half-breed," connotes mixed ancestry but not mixed ethnicity (the concern with not allowing mixed ethnicity is a common phenomenon [see Nave 2000]). This too speaks of a reluctance to see the category boundary as a fuzzy one.

The Species "Essence" in Human Cognition

One could argue that so far there is no demonstration of Torguuds' processing their local ethnic categories as "species." What the data show is that one assumes the ethnic ascription of one's biological parents. It could be that, for them, an ethnic group is simply a descent group and that the question "What is the child's *ündesten*?" (*ündesten* is the Mongolian word used to describe groups at the level of contrast between Mongols and Kazakhs[8]) is understood simply as "What is the child's descent group?", as in "Which group is he/she biologically descended from?" Indeed, the root morpheme of *ündesten* (*ündes*)means "root." To show that ethnic groups are processed as natural kinds one must go beyond the above evidence to show that putative essences are attached to the labels. I will provide such evidence, but, for it to be appreciated, we must first consider how species essentialism works.

Most of the cognitive psychological work on human reasoning about living kinds has been conducted in Western settings with Westerners. More cross-cultural work is needed, but what little we have is suggestive. Giyoo Hatano and Kayoko Inagaki have done much important work with Japanese children (see Hatano and Inagaki 1999); there is also a study done with Yoruba adults (Jeyifous 1986), and Atran (1998; Atran et al. 1997) has compared the living-kind cognition of Itzaj Maya and Americans. This work is so far consistent with the hypothesis that many important aspects of living-kind cognition constitute human universals. I describe below what I take these universal features to be.

PSYCHOLOGICAL ESSENTIALISM

Relative "similarity" has no objective basis because an infinite number of things can be predicated of any object and therefore unconstrained comparisons between objects A, B, and C cannot tell us which two are more similar (Goodman 1972, Watanabe 1969). Thus, the similarity we see between any two things depends entirely on what our brains consider material and immaterial about them—what matters is not the shared predicates but the *represented* shared predicates. "For example, both tennis balls and shoes share the predicate 'not hav-

8. *Ündesten* is a good translation for "ethnic group." Not only is the word used at the same level of contrast but it has the same polysemic ambiguities, shading into "race" at one end and "tribe" at the other.

ing ears', but it is unlikely that this predicate is part of our representation of either tennis balls or shoes" (Medin and Ortony 1989:182). Medin and Ortony speak of "psychological essentialism" as the stance that places two "objects" in the same category if they are believed to share the same constitutive and inalienable *hidden essence* (even when they are superficially different). They believe that this is what governs category inclusion in natural kinds.

The argument does not commit us to the belief that essences actually exist. For some natural kinds, such as "substances" and "elements," chemical or atomic constitutions may qualify as legitimate essences, but the Darwinian revolution made it clear that biological natural kinds cannot be characterized as having real essences (Mayr 1964). In any given population, for any given genetic locus, either (1) there is variation now or (2) there will be variation at some point in the future, and such variation does not ipso facto force an unusual variant or mutant out of the category which names the population (in fact, typically it does not).[9] However, we may nevertheless think in essentialist terms. Psychological essentialism is a claim about people's categorization processes, not about the world these processes organize; it is "not the view that things have essences, but rather the view that people's *representations* of things might reflect such a belief (erroneous as it may be)" (Medin and Ortony 1989:183).

Medin and Ortony argue further that the description of an essence may be a complete mystery to us, but this is no detriment to essentializing a category, for we will simply assume that the essence—whatever it is—is there. They call this assumption the "essence placeholder" (1989:184–85), and they note that it forces a way of conceptualizing the category: whatever category members look like and do, it is *because* of that unseen underlying "essence" or "nature" (whatever it is).

ESSENCES AND DEVELOPMENT IN LIVING KINDS

Gelman and Wellman (1991) investigated how the assumption of an underlying essence may create expectations about development in living kinds. Will children take species membership to imply an innate, developmental potential? "A tiger cub has the potential to grow into something large and fierce, even though when born it is small and helpless. To explain developmental changes of this sort, we as adults often appeal to some-

9. Macromutations, or chromosomal mutations (e.g., the accidental doubling of the number of chromosomes during reproduction, as seems to have happened for some plant species), can lead to spontaneous speciation, but the overwhelming majority of speciation processes are gradual. Even "punctuated" speciation is gradual—it is just rapid compared with periods of stasis—and even with macromutations we cannot know in advance what sorts of changes will justify naming a new species, which is always a post facto maneuver (notice, for example, that some humans, e.g., Down Syndrome individuals, have more or less than the total number of chromosomes typically found in humans without being any less "human." Thus, as modern biologists, we cannot really pretend that an essence is specifiable for any biological species.

thing like an intrinsic category essence that is responsible for how they grow . . . the belief in an essential nature or a determining but [at an early age] non-manifest predisposition" (1991:230). Gelman and Wellman presented children with examples of animals (e.g., tiger) that were raised with other kinds of animal (e.g., horses) in the complete absence of their own kind. In responding to questions concerning the form and behavior of these animals as adults, children relied more on category than on environment. For example, they answered that a tiger raised with horses (and never having seen another tiger after the early transfer) would display tiger traits and behaviors as an adult rather than horse traits and behaviors. Children seem aware that the nature of an animal is relatively impervious to the environment of development and that adult traits and behaviors not present in the earlier stages of ontogeny are the product of the animal's intrinsic developmental program rather than elicited by, or acquired from, an environment of conspecifics already exhibiting the traits and behaviors in question.

This is the central point of the *The Ugly Duckling*. It is not merely that the ugly duckling is really a swan because the parents are swans but also that being a swan it will *develop* into a particular kind of adult regardless of varying environments of rearing.

ESSENCES AND REPRODUCTION

How is a living-kind essence acquired? To what extent do we see the process of reproduction as uniquely responsible for transmitting a species essence? A partial answer emerges from a test conducted to determine the importance of appearance in species categorization. Rips (1989) had a sample of adults listen to a story about a "sorp," a flying animal equipped with feathers, which makes nests, etc.—everything typical of a bird. This sorp falls into some toxic waste and is transformed: it sheds its feathers, acquires transparent, membranous wings and a brittle, iridescent outer shell, etc.—everything typical of a flying insect. The transformed sorp eventually meets a *normal* female sorp and mates, and this leads to the laying of eggs which produce normal sorps. When subjects were asked to classify the transformed sorp on a scale from 1 (insect) to 10 (bird), they rated it a 6.5 (i.e., most thought that the transformed sorp was more likely to be a bird than an insect). Asked whether it was more typical of an insect or a bird, they rated it a 4, and asked whether it was more like an insect than a bird they rated it a 3.5.

This shows, first of all, the independence of similarity and categorization. If participants in this study were merely comparing the features of the transformed sorp with those of the concept "bird" to see whether there was a critical mass of matches (as in, e.g., Collins and Loftus's 1975 spreading-activation model or Smith, Shoben, and Rips's 1974 feature-comparison model), they would have concluded that the transformed sorp was not a bird. Second, it shows the importance of what I believe is the necessary and sufficient condition for categoriza-

tion in a natural living kind: biological descent. Despite the transformation, the strange sorp is nevertheless the offspring of normal sorps and produces normal sorps in reproduction—therefore, it is still a bird and not an insect. An interesting modification to Rips's experiment would perhaps add asexual reproduction yielding transformed offspring. I predict that respondents would in this case say the transformed sorp was an insect (experiments currently under way will answer this question).

Whereas Rips tested adults, Keil (1989:chaps. 8, 9) conducted experiments pitting descent relations against appearances with children and found that by age 10 they had strong intuitions that membership in a species category is a matter of descent, regardless of current appearance or transformations. Yoruba adults in Nigeria, with no exposure to Western-style schooling in biology, reasoned similarly (Jeyifous 1986). It seems that descent from a species member is taken as necessary and sufficient for possession (through inheritance) of the biological kind essence and that one property assumed of any biological kind essence is ability to reproduce the kind.

ESSENCES AND INSIDES

Gelman and Wellman (1991:215) carefully distinguish between insides and essences as follows:

The insides of an item are the matter residing physically behind or under its outer layer (e.g., the bones, heart, and blood of a dog, the stuffing and wires of a chair). Insides are concrete and ultimately observable, yet typically remain unobserved. An essence is the unique, typically hidden property of an object that makes it what it is. . . . Essences generally are never observed, and in fact may remain unknown. . . .

Both insides and essences are difficult to define precisely. Do a dog's insides begin under the fur, under the skin, under the flesh, or indeed even interior to the skeletal framework? . . . Essences are often unspecifiable, and by their nature require an inference about some deeper organization or disposition.

The distinction is salutary because humans probably do not equate the insides with the essence as if they were coextensive. However, it seems very likely that we think of essences as somehow *located* "inside." Whatever it is that makes a thing what it is—its essence—we imagine it not as lying on the surface of the thing but as somehow inside it, even though we may deny that the essence amounts to nothing more and nothing less than the thing's insides.

Simons and Keil (1995) have shown that young children know very little about the insides of living things (although they do anticipate that the insides of living kinds will be "natural" and different from those of artifacts). Moreover, children's understanding of how the insides are related to biological function is completely unspecified, as was the same understanding for adults before the development of modern biology. And yet, Gel-

man and Wellman (1991) found that with insides-relevant items, including species categories, children reason that the function changes when the insides rather than the outsides are removed and that identity is more likely to change when the insides rather than the outsides are removed. This is consistent with the idea that they believe the essence is inside and that removing the insides will take the essence with them, thus altering the nature of the thing. Earlier studies by Keil (1989:217–31) show that children will entertain that interventions can transform an animal from one kind to another if the intervention involves the insides rather than merely the outsides. The interview transcripts strongly suggest that insides are critical to species-category membership.

Are Torguuds Essentialists?

To show that Torguuds are essentialists, the data must reveal their cognition of groups such as Kazakhs and Mongols to share important similarities with the features of essentialism described above, provided we can agree that the preceding section presents a plausible picture of species essentialism.

TORGUUDS ON DEVELOPMENT

A sample of "hard" primordialists in the 1998 study (i.e., those who, even in question 3, believed that ascription depended only on the ethnicity of the biological parents) were asked an additional question (Gil-White 2001b). I reviewed the details of question 3 (which in the 1998 study has Kazakhs as the adopters) and then asked, "This adopted child, will he become *exactly* like the Kazakhs, or will he be somewhat different?"

When respondents answered that the child would be somewhat different (a common locution was "No, he can't/won't become *exactly* like the Kazakhs"), I asked, "How will the child be different?" Almost invariably, the response to this was that the child's features would be like those of a Mongol, revealing that subjects had understood the question as it was intended, in terms of similarity to Kazakhs *as a group* and not to the adoptive parents in particular.[10] Then I asked, "And how will the child *behave*? Will the child behave *exactly* like the Kazakhs, or will he behave somewhat differently?" A majority of respondents (17 of 23) replied that the child would behave not quite like the Kazakhs but somewhat like a Mongol.

This suggests that, in addition to believing ethnic ascriptions to result from descent, Torguuds consider this to be more than mere labeling of one's ascent. Apparently, being a Mongol or being descended biologically from Mongols implies resisting enculturation into an out-group to a certain degree, even when such enculturation is all one knows and even when one has had no

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10. Of course, the belief that the child will necessarily be different phenotypically is more ideological than empirical, as there is substantial phenotypic overlap between the two groups.

contact with the group from which one is biologically descended. This is consistent with believing that a Mongol, by virtue of being descended from other Mongols, has a Mongol essence which confers an innate potential that will play itself out developmentally "on its own steam," as it were (as in Gelman and Wellman 1991). The intuition that the adopted child will be different and behave somewhat differently remains despite the fact that my subjects accept the extreme premise, namely, that the child in question 3 will have learned Kazakh language, norms, habits, and customs and will have had not the slightest exposure to Mongols and no awareness of Mongol descent.

I also asked a small sample—all primordialists in question 3—after how many generations of intermarrying the adopted child's descendants in the male line would become Kazakhs. The answers ranged from two generations to "never," but the samples of essentialists ($n = 8$) and nonessentialists ($n = 6$) are here much too small to draw conclusions. However, one observation appears significant: fully half of the essentialists responded that the child would *never* become a Kazakh, and this was the modal response for this group. In contrast, not one of the nonessentialists gave such an answer. This suggests that essentialism is connected to an intuition of "intrinsic" nature and therefore inalterability.

CONSCIOUS THEORIES AND INTUITIVE "THEORIES"

As my fieldwork progressed and I experienced people's beliefs outside the rigid context of the interview format, I came to believe that my questionnaires were good tools for revealing people's *conscious* but not their *intuitiive* "theories." I use the term "intuitive theory" to substitute for "theory" or "naive theory" as the term is used in cognitive psychology, where it refers to the organizing and constraining (but subjectively unnoticed) content that underlies human concepts and categories. By "conscious theory" I mean an elaborated belief that organizes knowledge and that the individual is aware of having. The responses my questions elicited, I submit, result from an interview context that forces people to use their conscious theories—presumably the joint result of their cultural upbringing and their personal experiences—in a very explicit way. In a previous paper (Gil-White 1999) I called conscious theories regarding the ethnic membership charter "ethnic transmission and acquisition models." That my questionnaire investigates such models and not intuitive theories is no cause for despair. Conscious theories are important evidence, and a theory that human cognition is innately designed for *intuitive* processing of ethnies as natural living kinds makes the nontrivial prediction that a majority of cultures in the world will turn out to have blood-based models of ethnic transmission and acquisition. However, if the design of the human brain is what we are after, conscious theories can be misleading, for they typically do not *replace* our intuitions (cf. Atran 1990:x). For example, it has been demonstrated that, when thinking intuitively, people who understand a law of statistics which is in conflict

with their innate biases for interpreting probabilities and distributions will use the innate bias, although they will recognize that they have made a mistake when the problem they were asked to consider is rephrased in terms of the statistical law (Kahneman, Slovic, and Tversky 1982:495–97). These mistakes are "errors of application." In what follows I recount a few anecdotes that uncovered such errors.

My friend Tsoloo (Tsoh-lòh) is a bright 21-year-old Torguud who served as my guide in one of my brief forays into Kazakh territory. He was never formally subjected to my questionnaire (except for the essentialism questions), but he developed a keen interest in my research; he watched me administer the questionnaire to many Torguuds, Uryankhais, and Kazakhs and shared his views of their answers with me. Tsoloo is what I call a circumstantialist, and a vociferous one. To him, the right answer to question 3 is that the child is a member of the *adopting* ethnie. He also insisted repeatedly that the right answer to my question "Will this adopted child be *exactly* like the [adopting ethnie] or somewhat different?" is that the child will be *exactly* like the adopting ethnie—how could it be otherwise? It bothered him considerably that many people gave essentialist answers. To him it was all quite simple: if you have the customs of an ethnie and live with them, you are a member of that ethnic group, and if you are raised by that ethnie from birth you will be no different from them no matter who your parents are. He is even a *hard* circumstantialist, that is, a rational-choice theorist, who maintains that adults can choose to make the ethnic shift by living with and acquiring the customs of another ethnie.

But this was when we were talking about my questions; when discussing other topics, he often seemed like an essentialist. For example, he is afraid of the Uryankhai because he believes they can all cast curses. The Kazakh can also cast curses, according to him, but cannot be touched by anybody's curses because of their strong religion, Islam. (This makes them theoretically more dangerous than the Uryankhai, but in fact they are supposedly less prone than the Uryankhai to cast curses because they are not bad people.) Now, of course, one could argue that this is all compatible with his circumstantialism because he may believe that being able to cast curses like an Uryankhai or a Kazakh and being more or less well-disposed towards others is a matter of being a good Uryankhai or Kazakh performer in cultural terms and of being reared amongst people with certain views. In fact, he listed the impossibility of putting curses on the Kazakhs as an example of their being *buruu nomtoi* ("with the wrong book," where "book" is a euphemism for "culture"). But these conversations somehow never *felt* circumstantialist to me.

I was wondering about these things one day as Tsoloo, his friend Tulgai (also a circumstantialist), and I crept on our horses up to the barren and rocky mountaintops in order to cross back into Torguud country. To investigate the matter, I initiated the following exchange:

"Tsoloo, I have a question: if I learn the Uryankhai customs, can I then put curses on people like an Uryankhai?"

"No, you can't."

"Why not?"

He paused. "You have to be Uryankhai."

"But you said that if I had the customs of an ethnic group I would be a member of that ethnic group. So why can't I cast curses like an Uryankhai if I learn all their customs?" I was explicitly reminding him of the model he had resorted to when considering my questionnaire and therefore stacking all the odds against his persisting with an essentialist answer.

"You can't," he said.

"That's right, you can't," joined Tulgai.

"Well, why not?"

Tsoloo paused for a second and said, "You . . . have to be born to an Uryankhai." The two were agreed on this point.

"So unless one of my parents is Uryankhai, I can't put curses on people?"

"True."

"That means that if I was adopted at any early age by the Uryankhai, I would be just like them but I would not be able to cast curses . . ."

"True."

"Is it the same with the Kazakhs?"

"The same."

At this point Tulgai rode off to kill a marmot, and Tsoloo and I were left alone to continue our conversation. I paused for a second in order to consider what a tantalizing contradiction Tsoloo had just provided and how completely unaware he was of it. Had he been any other circumstantialist it would have been striking but not *this* striking. Tsoloo had seen me administer the same questionnaire at least a dozen times, and we had discussed it together and thought a lot about it. And only a few hours before I had administered the questionnaire twice with him present. Yet, he was completely unaware that his current answer was at variance with the position he had been explicitly maintaining all along, and the fact that my last question closely mimicked the question I actually use to probe essentialism did not clue him to what was going on. Tsoloo was not thinking theoretically; he was thinking *intuitively*. I was very excited at this insight but instead showed myself mockingly upset.

"Tsoloo, you lied to me," I said with a wink and a smile.

"Why?"

"Because you have been telling me all along that if a child is adopted from birth into another ethnie he will be just like the adopting ethnie. But that is not what you think. Suppose that the child born of Mongol parents and adopted by Kazakhs was a Torguud Mongol. Well, then he would be a lot like the Kazakhs but not exactly like them, because he would not be able to cast curses. You see?"

"Oh . . .!" He looked down at his horse and took his free hand to his mouth in thoughtful expression I had seen many times. An embarrassed smile crept over his

face, and then he looked at me, nodding with a smile that he accepted defeat graciously.

"You actually think that child would be a little bit different, but that is not what you told me when we talked about my experimental questions."

"Yes . . . yes, I see. Aha . . ." He looked up the road with a curious expression. He seemed to be pondering the intricacies of his own mind.

"Let me ask you this: if an Uryankhai child was adopted by Torguuds, just as in question 3, would he be able to cast curses or not?"

"Well [a significant pause] that child doesn't know that his real parents are Uryankhai . . . he would be *able* to, but he wouldn't know it."

"I see. If he knew, he might cast curses, but since he doesn't, he won't."

"True."

I paused again, then explained a difficulty. "This is a problem for my research, Tsoloo. You gave an answer based on *customs* when I asked you the experimental question, and you said the child would be exactly like the adopting ethnie. But that's not what you really think. What if other people who answered like you also think like you? You seem to believe the adopted child will look and talk exactly like the adopting ethnie, and yet . . . and yet, you believe that the child, *inside*, is somehow still different."

"Yes, yes. That's right!" He seemed excited that I had chosen just the right words to explain his thoughts. (I had of course carefully chosen those words.)

"Maybe some of the people who answered like you also think this way, that the child is somehow still different *inside*."

"That is what they *all* think," he said, very convinced.

"You think so?"

"I am sure."

Notice that, in Tsoloo's mind, to have that thing which confers the hidden potential of an A and which is "inside," you have to be a biological descendant of an A. Later, thinking about our conversation, Tsoloo confided in me that he had made a mistake and amended his explicit views about cursing to coincide with his conscious model.

I considered using my conversation with Tsoloo as a template to structure informal conversations with others in order to test intuitive essentialism. This proved impossible because such an instrument requires that others agree with Tsoloo's premise that Uryankhai can all cast curses, etc., and there was too much variability in this domain of belief.

My data on Kazakhs are of much lower quality than those for the Mongols because I spent less time with them and at first I did not realize that one had to remind them explicitly that the child in question 3 would acquire both Kazakh culture *and* religion. However, I think I can safely claim that Kazakhs are, by and large, circumstantialists (as measured by my questionnaire) so long as they understand that the adopted child will become a Muslim in addition to assuming the other aspects of Kazakh culture. Kazakhs in Xinjiang, China, told Bes-

sac (1965) that the children they stole from Mongolian and Tibetan communities were fully Kazakh upon their conversion to Islam, and the Kazakhs I worked with had immigrated only a generation ago from Xinjiang.

However, here too I found that conscious models and intuitions can differ. When I asked Kazakhs alone, a majority was circumstantialist. On one occasion, however, at a *bayr* (party), a large group of Kazakh old men took an interest in my research, and I asked the questions publicly of the whole group. The old men answered in chorus, and they turned out to be heavily circumstantialist and not at all essentialist. But there was one lone dissenter, a young man, who protested furiously and gave contrary, primordialist and essentialist answers each time. Later, while I was pondering how interesting it was that the Kazakhs should be ascriptive circumstantialists, a large circle of young men sitting to my right began protesting furiously to me that what the old men had been saying was not true. Prominent among them was the lone dissenter from the earlier choruses. Apparently he was nowhere near being alone, merely the only one who had the courage to withstand the embarrassment of appearing publicly as a deviant. Another young man was also quite angry and doing a lot of talking. The argument was familiar: the child was a Mongol because the biological parents were Mongol. Her culture did not matter in the least. I turned to them and said,

"So I, for instance, can never become a Kazakh? If I stayed here and learned Kazakh and Kazakh customs, married a Kazakh girl, and became a Muslim, I would still not be a Kazakh?"

One spoke for all of them when he replied, "Even if you do everything like a Kazakh, and everybody says you are a Kazakh, you still aren't a real Kazakh because your parents are not Kazakh. You are different inside." And he pointed to his chest. All the others were nodding. "That girl in your question, you know? Everybody would say that she was a Kazakh, but she would not be a real Kazakh."

My main interlocutor and I talked about other things for a while, and then I brought us back.

"Can I ask you another question?"

"Okay."

"You say that I can never become a Kazakh even if I convert and do everything like a Kazakh, because my parents are not Kazakh, true?"

"True."

"But is this also true for the girl in my last question? Is it true for the girl who is adopted at a very young age?"

"Yes. People will say that she is a Kazakh, but she is not a real Kazakh."

"Because her parents are not Kazakh?"

"Exactly."

"She is also different inside?" I pointed to my chest.

"That's right."

This time I had not been the one to supply the word "inside." And this time too, being an X "inside" was a matter of being descended biologically from X. When I was back at Khurmet's (my 22-year-old Kazakh host's) yurt, I had him alone for a moment, so I asked him,

"Isn't it interesting that the young guys thought so differently from the old guys?"

"Yes," he said with a quizzical smile.

"Tell me something: when I asked you my three questions the other day, you answered like the old guys. The young guys told me it was true that the adopted girl would be called a Kazakh but did not agree that she would be a real Kazakh because she was different inside. What do you think? Do you think the girl will be a real Kazakh?"

He thought for a second and then said, "This is what I think: I think that the girl is Kazakh *ündesten* like I said before. . ."

"But is she *jinkhene* [real] Kazakh *ündesten*?"

"Yes. I think she is *jinkhene* Kazakh."

"And you think she will be exactly like Kazakh people?"

"Yes. She will be exactly like Kazakhs . . . but . . . I also think, you know . . . that she will be different inside." He pointed to his chest just as the other man had done. "Inside she is a Mongol," he concluded.

Astounding, I thought. Khurmet thought she was a *real* Kazakh but a Mongol "inside." A contradiction? Perhaps. Apparently Khurmet has a conscious theory of what makes a real Kazakh, but *intuitions* are different. They tell him that the girl in my example would still somehow be different inside, despite all outward appearances and ascriptive practices. These experiences convince me that the formal questionnaires significantly underestimate the degree to which people are *intuitively* inclined to think about ethnic groups in essentialist terms.

"ETHNIE" AS A PRIVILEGED CATEGORY

Do other descent categories show similar essentialism? If all do, then there is nothing *particular* about ethnies, as distinct from other descent categories. Some have argued that ethnicity is just kinship writ large, and van den Berghe (1987:[1981]) has presented the most complete statement. But if ethnicity is not primarily processed as a kinship category (merely being occasionally rendered as one for the purposes of mobilization), then there should be differences in the processing of ethnic and kinship categories.

The Torguuds of Bulgan Sum divide themselves into five *khoshuun*,[11] which have most of the properties usually associated with clans. Each is a named group (Bangyakhan [my host community], Taajinkhen, Beelinkhen, Khovog, and Khoshuud); membership requires biological descent from other members; each has a sacred "totem" (a mountain) particular to it; each is small enough that everyone knows everyone else; and the members occupy a common territory. I am unaware of any putative epon-

ymous ancestors,[12] and there are no rigid rules of clan exogamy. In fact, the clans are highly endogamous, and it is virtually impossible to find two people among the Bangyakhan who are not related to each other in one way or another. The exogamous units are named patrilineages *within* the clans, called *omog* (although many people lost track of which *omog* they belonged to in communist times). To investigate whether clans are processed as are ethnic groups, I presented 14 individuals with the setup for question 3 but substituted clan names for the ethnic groups. The child-giving family was Bangyakhan and the adopting family Beelinkhen. All the other details were the same: the child did not know of the adoption, never met any Bangyakhan, learned Beelinkhen customs, and would speak with a Beelinkhen accent. Then I asked, "Will this child be *exactly* like the Beelinkhen, or will she be somewhat different, somewhat like the Bangyakhan?" I had earlier pretested, with a different sample, to see whether most Bangyakhan thought that there were cultural differences among the clans. Almost everybody in that sample did, even though they considered them very minor and were absolutely incapable of listing them (except for noticeable differences in speech to which I can attest myself and perhaps some wedding songs).

A very interesting thing happened: question 3 suddenly became very difficult to understand. Every time I asked the question "Will this child be *exactly* like the Beelinkhen, or will she be somewhat like the Bangyakhan?" people began talking about *individual* differences. This answer was typical: "Well, she will have the biological parents' face and character, but everything else will be like the adoptive parents." It was very hard to make them see that the question had to do with being exactly like the Beelinkhen (versus somewhat like the Bangyakhan) *as a group*, rather than exactly like the adoptive Beelinkhen parents versus somewhat like the biological Bangyakhan parents. This is a misunderstanding that virtually *never* occurred (perhaps no more than twice) when the categories used were Mongol and Kazakh. The novel difficulty is in itself telling. Moreover, every single time I finally succeeded in conveying the meaning of the question as I intended it, my subjects responded that the child would be exactly like the Beelinkhen.

On one occasion, I administered the question to my friends Tömörbaatar, Mukhtar, Batsükh, and Tsoloo. They all answered nonessentially. My furious scribbling piqued their curiosity, so I explained that I was interested

11. In the canonical model that scholars use, the sequence ethnic group, tribe, clan, patrilineage is often rendered *ündesten, yastan, khoshuun, omog.* However, many of my informants in Bulgan Cum used the sequence *ündesten, yastan, omog, eleg.*

12. Many Torguuds in Bulgan Sum are descendants of immigrants from neighboring Xinjiang and therefore probably descendants of Torguuds who migrated from Central Asia to the Volga steppes around the year 1600 and then back to Jungaria (in modern Xinjiang) in 1771 with other tribes, collectively known as the Kalmyk. Most of those who returned to Jungaria were Torguuds (Khodarkovsky 1992:232). Krader (1963:11) said that there was a transition from genealogical to named clans among the Kalmyk in the early 20th century, but he was writing about the Volga Kalmyks who remained in Russia. Since the descendants of those who returned also now have named rather than genealogical clans, it is possible that this transition occurred much earlier.

because people didn't always answer like this when the groups used were Mongol and Kazakh, instead of Beelinkhen and Bangyakhan. Seeing is believing, so I asked the question again but with the original Mongol/Kazakh setup (which these respondents had never heard). This time my four respondents split two ways. Tömörbaatar and Tsoloo gave nonessentialist answers (but see above for a deeper examination of Tsoloo's thoughts), and Mukhtar and Batsükh gave essentialist answers. Mukhtar, in particular, was adamant: there was no *way* a child of Mongols adopted by Kazakhs could become exactly like the Kazakhs. Both essentialists agreed that the child would speak and have Kazakh customs but insisted that her thoughts and character would be Mongol.

Batsükh's answer illustrates the distinction well. Later I went up to him and asked:

"Look, you initially told me in the 'clan' question that the child would take after the biological mother and father in terms of character, but is that a *Bangyakhan* character or the character of the biological mom and dad?"

"Biological mom and dad."

"Okay. And you also told me in the Mongol/Kazakh question that the child would not become just like a Kazakh, but would have a Mongol character. But is that a Mongol character or just the character of the biological mother and father?"

"A Mongol character." Then I asked him to clarify the clan question again for me so that he could see precisely the distinction I was after. His answer did not change.

I conclude that ethnies are not processed as large kin groups (though they are often popularly *rendered* as such, and this is interesting). Kinship seems to prime schemas that deal with individually varying differences such as one will find in the personalities of different individuals *within* an ethnie. Ethnicity seems to prime essentialism about qualities general to all members of the kind.

Why Should Ethnies Be, Cognitively, Species?

I have made an empirical case that Torguuds essentialize ethnies in the manner of species. If this is a panhuman proclivity of our psychological *design*, as I claim, then natural selection must have favored it. I will argue that there are good reasons to believe this. First of all, species essentialism motivates inductive generalizations about hidden properties, so that we will assume that anything *nonobvious* learned about one beaver, say, will be true of all beavers. This is adaptive because beavers in fact *do* share many nonobvious properties and such generalizations reduce the costs of learning. In ethnies, I will argue, inductive generalizations yield similar benefits.

INDUCTIVE INFERENCES IN SPECIES

Let us assume that shared appearances are typical of members of a species but not determinative of membership (e.g., African wild "dogs," coyotes, foxes, and wolves are not dogs). Let us further assume that what *is* determinative of membership is the essence, whatever it is. Finally, let us assume that essences are cognized as "hidden," "more than meets the eye," and therefore causative of a great many hidden properties and characteristics that are common to all category members but not immediately apparent (e.g., coyotes are "wily"). It seems reasonable, then, that (1) knowledge that an item is a member of natural kind A will lead to the automatic assumption that it has an A essence; (2) learning that this item has *hidden* property P should lead to the assumption that P is either caused by or a part of the essence and thus to the generalization that P is true of other A's; and (3) As that do not look like the target item will be thought of as having property P anyway, and non-A's bearing a strong similarity to the target will nevertheless be thought of as lacking P (unless the property is also specified for their natural kind as well).

Studies involving 4- and 3-year-olds (Gelman and Markman 1986 and 1987, respectively) have confirmed these propositions and Gelman and Markman's explicit hypothesis that natural kinds will favor categorical rather than appearance-based inductive inferences. For example, children did not make inductive inferences from a target cat with a white stripe down its back to a skunk even though they looked almost identical, but they did generalize to another cat that looked quite different from the target.

Why do natural kinds promote inductive generalizations of nonobvious properties? Gelman and Markman (1986:184–85) observe that natural-kind categories have rich, correlated structures and that many of the properties that correlate strongly are nonobvious at first and therefore "extend far beyond our original categorization. For example, giraffes share a particular diet, life expectancy, gestation period, DNA structure, and so forth—attributes that are impossible to know by casual inspection. . . . The highly correlated structure of natural kinds suggests that new features learned about one category member will often be projected onto other category members as well." A Darwinian unpacking of this statement might go like this:[13] Any animal that relies heavily on learning will benefit by reducing the costs of the learning process. If we can reliably learn about whole suites of objects merely by examining one of them, then evolution would have failed us if it had not provided mechanisms for doing so. Of course this argument applies to artifact categories (which are also characterized by rich, correlated structures) as much as to natural kinds. What makes induction in natural kinds special is that inductions are easily made for *nonobvious* (i.e., "hidden") properties, and this is because members of natural kinds in fact do share many nonobvious properties.

Now consider artifacts: If I showed you a ceramic pitcher and told you that it breaks easily (a hidden property), you would be wrong to infer that this is true of all pitchers, since they can be made of wood, stone, coconut shell, metal, and, in modern times, unbreakable plastic

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13. Quine (1977:166) first observed the usefulness of natural-kind induction and its likely Darwinian explanation.

(cf. Gelman 1988). The things that members of an artifact category typically share are perceptually obvious: their parts and their interconnections are constrained to be similar because they must fulfill the same function; the hidden properties (such as the properties of the materials they are made of) can vary widely so long as the artifact itself fulfills the same function. Thus, if I show you that a ceramic pitcher breaks easily, you would generalize that to ceramic anythings (because ceramic is a "substance"), but you will not think of this as a "pitcher property" (for evidence, see Gelman and O'Reilly 1988: 881).

Recently, Atran et al. (1997) tested to see whether people made inductive generalizations for "hidden" or nonobvious properties (e.g., susceptibility to a disease, possession of a protein) equally at all levels of the biological taxonomic tree. They found that people have a strong preference for making such generalizations at the *species* level even though, as shown by Rosch et al. (1976), this is not the "basic level" (established on perceptual grounds) for biological taxonomies. Although a domain-general mechanism does indeed seem responsible for the rank-similarity of the basic level in all sorts of taxonomical domains, the biological domain has the idiosyncrasy that *nonobvious* properties maximally cluster not at its basic level (the "life-form" level, e.g., BIRD, FISH) but at the species level. Our cognition thus apparently favors inductive generalizations in species because this is where it makes most sense, and the cognitive idiosyncrasy suggests that we indeed have a privileged biological domain of cognition. Atran et al.'s finding that people socialized into two very widely divergent cultures show the same absolute privilege for the species level when making inductive inferences supports the hypothesis that the living-kinds or "folkbiology" module is a human universal.

INDUCTIVE GENERALIZATIONS IN ETHNIES

Processing an ethnie as a species, with the attendant penchant for assuming that any hidden properties true of one member will be true of all, is adaptive because members of an ethnie—like members of a species—share many important "properties" (norms) specific to the ethnie. This claim of norm clustering may be counterintuitive for anthropologists and sociologists, post-Barth (1969), who have decided that ethnic groups and "cultures" are not coextensive, and therefore I elaborate.

Barth's (1969) views on the relationship between ethnicity and culture are widely accepted. He is often presented as debunking the idea that ethnic boundaries organize culture. Following his critique, anthropologists are now very skeptical that ascriptive boundaries closely correspond to "culture" boundaries (e.g., Fried 1975; Tooby and Cosmides 1992; Hirschfeld 1996:21–22). Such interpretations of Barth are, however, dead wrong. What Barth debunked was the idea that ethnic boundaries organize the *totality* of culture in a holistic way—that is, that ethnic boundaries are closely coextensive with discontinuities in "trait inventories" arbitrarily compiled.

But practically in the same breath he insisted that what ethnic boundaries do enclose is "ethnic organization" (Barth 1969:12) and that the cultural content most relevant to ethnic groups is (1) the diacritical features that signal membership and (2) "basic value orientations: standards of morality and excellence by which performance is judged" (p. 14). So long as we agree that standards of morality and performance are "culture," Barth is not really subtracting all culture from ethnicity, as if ethnic ascriptions were truly arbitrary, but rather insisting on *a* kind of culture as most relevant to ethnicity: standards of performance and the diacritics that signal membership inside a performance-norm boundary. As Barth (1994: 17–18) himself has recently observed, this part of his argument is often ignored:

> The issue of cultural content versus boundary, as it was formulated [by Barth (1969)], unintentionally served to mislead. Yes, it is a question of analyzing boundary processes, not of enumerating the sum of content, as in an old-fashioned trait list. But locating the bases of such boundary processes is not a question of pacing the limits of a group and observing its markers and the shedding of members . . . central and culturally valued institutions and activities in an ethnic group may be deeply involved in its boundary maintenance by setting internal processes of convergence into motion; and we need to pay special attention to the factors governing "individuals' commitments to the kind of personhood implied by specific ethnic identities" (Haaland 1991:158).

Coming back to our main thread, concepts of personhood, as such phenomena are realized through the observation of performative norms with interactional consequences, are *nonobvious*—hardly things that are readily apparent on casual inspection of an ethnic actor. If Barth is right, then, fully socialized members of an ethnic out-group (and even of the in-group!) will have many strongly correlated hidden properties. These hidden properties are extremely important, for they determine how easy or difficult it will be to coordinate with another human being. Barth argues that this is precisely why ethnic groups form: they demarcate "ways of being" (a commonly held view [see Smith 1986:41; Deutsch 1953]). According to Barth, we must define ethnic groups in terms of the actors' own ascriptions because these imply commitments to certain interactional norms: "If they say they are A . . . they are willing to be treated and let their own behavior be interpreted and judged as A's and not as B's" (Barth 1969:15). Coethnics therefore understand each other to be "playing the same game."

But why do norms cluster in intercorrelated clumps? Barth explains the maintenance of ethnic boundaries in terms of the punishments that accrue to those who fail to fulfill the normative expectations of their coethnics. Such punishments enforce in-group conformity and maintain normative differences between ethnic groups, which differences in turn—because actors assume they are signaled in ethnic diacritics and ascriptions—entail

constraints on interethnic interaction (Barth 1969: 17–18). Although Barth says nothing about conformism resulting from coordination costs, this suffices for boundary maintenance and is probably originally responsible, without punishment, for the emergence of intercorrelated clustering of interactional norms.

Norm conformism[14] allows humans to maximize the number of potential interactants in their local community with whom to engage in mutually beneficial cooperative and coordinated endeavors. Much evidence from psychology (e.g., Miller and McFarland 1991; Kuran 1995; Asch 1956, 1963[1951]) suggests that we are indeed norm conformists. To drive on the left side of the road when in Britain because that is what the British do would be sound advice even if there were no 'bobbies' to inflict polite scoldings, and the wisdom it contains is routinely repeated as common sense in the proverb "When in Rome, do as the Romans do." Notice also that the proverb and example contain wisdom about what to do when one is an *immigrant*. In an ancestral environment composed of wise conformists, immigrants would absorb the norms of the host community, and this would prevent the blending-of-norms effect that immigrants would otherwise have on cultural variation (Henrich and Boyd 1998), ensuring in this way that at least some important interactional norms would regularly clump discontinuously across the human landscape. Thus, it seems plausible that after the emergence of the conformist adaptation, the ancestral environment became populated with more or less well-defined, discontinuous norm clumps. There are two reasons that thinking of such incipient ethnic groups as "species" is advantageous in these circumstances:

1. Interactions with those socialized into different interactional patterns and expectations will not as often be felicitous, and the costs incurred—in energy and time wasted—will concede the evolutionary advantage to any mutants who manage somehow to discriminate (I am indebted to Robert Boyd, personal communication, for this argument). A naive species theory of the ethnic world would represent ego's norm group as one natural kind and other norm groups as different kinds with different natures, making the interactional choices favored by a necessary self-similarity bias rather clear.

2. To the extent that out-group members are not irrelevant, adaptation to a norm-clumped world presents the dual challenge of avoidance and prediction. It is certainly best to be able to predict as much as possible about out-group members without having to obtain this knowledge through too much costly interaction with them. Since conformist behavior will ensure that members inside the same "conformist sampling horizon" (i.e., inside the same norm boundary) will show strong intercorrelations for many nonobvious behavioral patterns and expectations, inductive generalizations (from the one to the

14. This corresponds to what Kelman (1958) famously divides into the three steps of "compliance," "identification," and "internalization" and is distinct from informational conformism, for which see Boyd and Richerson (1985) and Henrich and Boyd (1998).

many) will usually be a good way of cheaply obtaining and using such valuable information.

These adaptive considerations can now be articulated with a plausible story of how ethnic groups came to look like species. Even putting aside the costs of different rearing, adoption, and conjugal practices, which must loom large for parents, we must consider that in simple societies marrying off one's children begins a long-term alliance with affines. Parents were bound to learn through trial and error that coordination in long-term reciprocity was more difficult and costly with people outside the norm boundary. Incipient ethnic groups thereby become normatively endogamous in part because of parental enforcement. Next, because much of culture is acquired at a young age and is developmentally stable, expert practitioners of a group's norms—when groups are endogamous—would tend to be those born of two member parents, creating the illusion that their cultural mastery was biologically inherited. Finally, such incipient groups began labeling and conspicuously marking themselves with cultural "phenotypes" to improve the accuracy of the interactional discriminations (McElreath, Boyd, and Richerson 2001).

Thus, it is plausible that such groups came to prime the living-kinds module, for these traits are all highly diagnostic of biological species. Because the priming of this module would have had the positive adaptive consequences reviewed above, there was no selection to discourage it. In Sperber's (1996) terms, species (and not ethnies) originally constituted the proper domain for the living-kinds module, but then ethnies also became part of its actual domain by satisfying the module's input conditions. Because this had adaptive consequences, ethnic groups are now part of the living-kind module's proper domain—even if they are not species or even races.

Is the Ugly Duckling Hypothesis Robust?

THE UGLY DUCKLING COMPARED WITH OTHER PROPOSALS

The Ugly Duckling hypothesis predicts that categories that *look* like a species (i.e., meet the brain's "input criteria" of a species) will tend to be essentialized, especially when the perceptions of descent-based membership and category-based endogamy, in particular, are strong. A corollary is that inductive generalizations of nonobvious properties—which essentialist intuitions motivate—will be more easily made in categories that look like species.

An alternative hypothesis posits a smooth entitativity continuum (Hamilton and Sherman 1996, Hamilton, Sherman, and Lickel 1998, Yzerbyt, Rocher, and Schadron 1997, Yzerbyt, Rogier, and Fiske 1998, Yzerbyt, Corneille, and Estrada 2001). The more a social group looks like the prototypical "entity"—a human individual—the more it is essentialized, because we essentialize human individuals. The constituents of a human—its organs or

cells—are all closely bunched together (proximity), they all die together if major organs cease to function (common fate), and they are divided into specialized, hierarchically organized functions in order jointly to contribute to the human's survival and reproduction (structure).[15] The more a social category has these properties, this argument goes, the more we will essentialize it.

My work in Bulgan Sum does not support this hypothesis. My respondents appeared to process clans and ethnies in different ways. Despite some similarities between clans and ethnic groups, entitativity seems much higher for clans. The Bangyakhan clan members all know and interact closely with each other, migrate together, and live in a relatively small territory (compare this with the "Mongol" territory of the Republic of Mongolia, Inner Mongolia, parts of southern Siberia, and Chinese Turkestan). Besides, these clans have some structure, for they are composed of different exogamous patrilineages and are closely coextensive with the smallest administrative unit, called a *brigade*. So these clans rank higher than ethnies in entitativity if one accepts the privileged variable of "structure" in the proposal by Hamilton, Sherman, and Lickel (1998). Despite all this, however, essentialist thinking seems absent at the level of the clan but quite evident for the ethnie. It seems more plausible that essentialized categories are perceived as entities than that meeting the objective criteria of entitativity causes essentialism. Thus, to ask, as Hamilton and Sherman (1996:348) do, "When we think about the range of social groups that we encounter and perceive in everyday life, what is it that gives some of these groups more essence . . .?" is not the same as asking what makes groups (objectively) "entitative," as they believe. Many groups that we do not essentialize (e.g., firms) are much better examples of entities than is the average ethnic group. And "races", which we do essentialize (Hirschfeld 1996), are vast collections of individuals with virtually nothing in common. It is hard to think of a category less like an entity than a so-called race.

I argue that the ultimate cause for essentializing ethnies but not clans is that norms cluster at ethnic but not at clan boundaries, so selection has favored essentialism of ethnies. But in terms of *proximate* causes (priming inputs), what is it that makes ethnic groups "good to essentialize"? Perhaps in Bulgan Sum endogamy is one of the key differences. Even though the Bangyakhan are highly endogamous as a clan, this is not a rule but a preference expressed at the individual level, and parents never interfere when children wish to marry someone in another clan or, indeed, in another Mongol "tribe." The rule, for most, is that their children may marry any Mongol they please, but they may not marry a Kazakh. It could be that the endogamy *rule*, as opposed to the pattern, is better at priming the living-kinds module,

15. I have omitted "similarity" (originally proposed by Campbell 1958) because structure in fact demands internal differences and therefore similarity of constituents is not a hallmark of an entity—certainly not of a human one.

promoting essentialist thinking at those cleavages where one *may not*—rather than typically does not—out-marry.

The distinction between ultimate and proximate causes above is generally important and useful. Rothbart and Taylor (1992:21) argue that *inalterability* (the fact that membership is neither initially chosen nor changeable) and *inductive potential* (the idea that one member of the category is informative about all members) are what suggest a social category as an essentialized natural kind to human cognition. In species categories, I have argued, possession of the essence is necessary and sufficient to category membership, and the only way to acquire it is through biological descent. Thus, Rothbart and Taylor's *inalterability* is, from this perspective, closely linked to reproduction and is primed by (1) descent-derived membership and (2) category-based endogamy. But *inductive potential* as such seems to play no proximate role in priming (i.e., activating) the living-kinds module. Otherwise, why the extreme, essentializing paranoia of the Nazis about untrustworthy "aliens" in their midst? The Weimar Jews were the product of several generations of acculturation to Germans. If inductive potential drives categorization, then it should have been difficult and counterintuitive to group the Weimar Jews as a naturalized category apart from Germans and imply that these were unknown "aliens," because Weimar Jews were mostly very similar to Germans and for most purposes posed no risks of miscoordination. However, classing them as a "nature" apart proved regrettably easy for many. This is not an isolated case. Across the world, a medieval Chinese dynast likewise sought to eradicate an ethnic group that had become completely acculturated to and indistinguishable from the Chinese. In fact, many ethnic Chinese were killed in this genocide because the executioners could not always be sure and were ordered to kill when suspicious (Golden 1992). These and other examples suggest that inductive potential does not really drive categorization. Rather, social categories with normative endogamy and descent-based membership will be naturalized as having different, not-fully-knowable essences, which assumption then motivates our inductive generalizations. What this means is that inductive potential is an *ultimate* cause (a selection pressure shaping our brains over the eons) rather than a *proximate* cause (an input stimulus that activates a schema in the brain) of social-category essentialism. Novel environments can undermine the original utility or function of a cognitive adaptation because, in the new setting, what primes the adaptation no longer correlates with the evolutionarily relevant variables. This seems to occur regularly in the case of state structures with institutionally absorbed and culturally assimilated—but persistently endogamous and self-ascriptive—groups. Such state structures did not occur in the socially uncomplexified ancestral environment, where a group outside one's endogamy boundary *was* almost certainly composed of strange foreigners. This explains the modern "mistake" of essentializing an acculturated group as "different" merely because it continues to marry within the group.

Also absent in the ancestral environment were sharp

"racial" differences between neighboring groups (these are the product of modern migrations [cf. Hirschfeld 1996:13; van den Berghe 1987(1981)]). Norm conformism in the ancestral environment would have led to a landscape peppered with the self-ascriptive norm clusters that we now like to call ethnic groups. The fact of their norm differences explains why we essentialize them, but since neighbors were very similar in *biological* phenotype, why then are we apparently so prepared to essentialize "races"?

As I have argued, members of different norm communities have resorted to marking themselves (with paint, dress, etc.) in order to broadcast membership. A recent model suggests that this adaptively improves efforts to identify members of one's norm community and avoidance of strangers with whom interaction is costly because of miscoordination (McElreath, Boyd, and Richerson 2001). It is plausible, then, that natural selection acted on our psychology so that we interpret sharp differences in *cultural* phenotypic markers as signaling different essences. It is also plausible that dramatic differences in skin color, hair type, etc.—which would have been absent between neighbors in the ancestral environment but are common today because of modern migrations, colonialism, etc.—are interpreted by our brains as ethnic diacritics. In other words, we essentialize races because we mistakenly "think" they are ethnic groups. We thus process "races" as ethnies even though not by the longest stretch of the imagination can they be characterized as representing norm or behavioral boundaries of any kind, which is the original reason for exapting the living-kinds module. (This point also undermines the idea that inductive potential promotes the naturalizing of a social category, for their is no inductive potential whatsoever to a racial category qua "race.") Darwinians should recognize this as a "big-mistake" hypothesis for racialist thinking (the resulting pun is not really intended but entirely appropriate).

Hirschfeld (1996) has demonstrated that biological phenotypic differences (i.e., "racial" differences) lead children to essentialize, and he acknowledges that this promotes inductive generalizations. However, he does not argue, as I do, that norms have anything—directly or indirectly—to do with it. On the contrary, he thinks that we have evolved machinery to essentialize "human kinds" even though, according to him, there is no clustering of cultural information that such essentialist inductions would help bootstrap (1996:21–22). In this context it is difficult to see what purpose or function social-category essentialism serves. Why did it evolve?

I think that the essentialized processing of such categories as castes and feudal classes is again due to the fact that the proximate priming inputs satisfy our evolved adaptations to distinguishing ethnic groups. Castes and feudal classes are occupationally specialized and outwardly marked, have many norms particular to them, and, most important, have descent-based membership and normative endogamy. Even if such groups did not exist in the simple societies of the ancestral environment, when they arose in modern times they

primed our species module—or the "ethnicity module" built on top of it.

THE UGLY DUCKLING CROSS-CULTURALLY

It is not yet possible to assess the cross-cultural validity of the hypothesis because methodologies specific to investigating models of ethnic cognition have not been widely used. However, one can certainly evaluate existing data on their own terms. In a previous paper (Gil-White 1999) I examined the most important cases put forth to support the claim that an ethnic group is an instrumental association with chosen membership (which would deny all of the basic points argued here). These include the following ethnic transitions: Fur into Baggara in the Sudan (Haaland 1969), Pathan into Baluch in Swat, Pakistan (Barth 1969), and Kachin into Shan and other ethnic transitions in Burma (Leach 1977[1954]). For each of these, despite the (now famous) claims of their authors about people freely choosing to switch ethnies, the ethnographic data that they present show that no such transition takes place in the first generation (i.e., migrants from one ethnic community into another are considered until their deaths as members of the community of origin). The earliest any such transition can be completed is in the second generation, and this almost always requires a tie of blood through intermarriage. Other ethnographic cases of ethnic-group membership switches tell the same basic story: Dinka into Nuer in the Sudan (Kelly 1985), Gungawa into Hausa in Nigeria (Salamone 1974:109, 117, 236–37), Turkana into Samburu in Kenya (Hjort 1981), and Arabs into Malays in Malaysia (Nagata 1981).

In the most thoroughgoing examination of such transitions, Levine (1987) documents in Nepal a great deal of instrumental accommodation by different groups of people to the caste and ethnic categories that best serve their interests in the sociopolitical environment in which they find themselves. But even in such a fluid place, Levine documents the following: (1) Many political manipulations and accommodations involve using labels that are only for outsiders or government officials; at the local level the ethnic distinctions remain intact, as do the patterns of normative endogamy that support them. (2) When genuine transitions from one ethnic category to another take place, these are typically not completed in political time-scales but usually require several decades and—most important—intermarriage. Furthermore, changes in caste or ethnic status very often lag considerably behind the political/residential/economic accommodations. Thus, for example, "Chetris may disapprove of marriages with lower castes and be pleased by caste fellows' marriages with Thakuris, but there are recognized ways to integrate the offspring of intercaste unions. The rule given is that, after three generations of repeated intermarriages, the person is a full member of the caste group with whom the marriages occurred, whether lower or higher" (Levine 1987:81).

The cross-cultural data are therefore apparently in harmony with the claim that normatively endogamous, self-

ascriptive groups with descent-based membership will promote the intuition that they possess a group nature or essence and that this essence cannot be acquired without ties of blood, perhaps not even without several generations of it. As one Kazakh informant put it to me, "It takes seven generations for the [foreign] blood to be cleaned." The only case I have found in which ethnic switches occur without ties of blood is among the Kazakhs of Xinjiang, where the adoption of (often stolen) young children sufficed (Bessac 1965:378–79). However, my own in-depth work with Kazakhs from this general region reveals an intuitive cognition not inconsistent with the arguments presented here.

One might object that this neglects the United States—perhaps a major exception (at one time, after all, it even had an official "melting pot" ideology). I readily admit that ethnic affiliation, for many U.S. citizens, is less salient than a national identity as Americans, and this points to the salutary effects that a consistent ideology promoted at the state level can have on the production of cultural models that supersede in part our native intuitions. But the history of the United States is not inconsistent with the hypothesis presented here. The relevant factors are, here, (1) the rampant intermarriage among the European ethnic groups, (2) the failure to keep alive ethnic norms to a significant degree (see Alba 1990 for both points), and (3) the absence of a clear, uniparental descent-rule for ethnic identity in cases of intermarriage (for the importance of this to the maintenance of boundaries, see Nave 2000). These three facts, in the light of the Ugly Duckling hypothesis, will be expected to produce just such a weakening of ethnic identity and a reformulation of a new ethnicity coincident with the new endogamy boundary (i.e., "whites"). Despite all this, the intuitions—such as they are—that American whites have about their European ethnicity nevertheless rely on "blood." Americans who say that they are half Irish, one-quarter Italian, and one-quarter Mexican are not explaining the degrees to which they have mastered these different cultures or choose to participate or affiliate with them but making a calculation based on the ethnicities of their grandparents.

A BETTER EXPLANATION FOR ETHNIC CONFLICT?

The most prominent psychological perspective on intergroup conflict has been social identity theory, which began by finding that people will discriminate against any out-group, however defined (even if it is "those who flipped 'heads'" versus "those who flipped 'tails'" [Tajfel 1970, Diehl 1990]). This has been interpreted as a general answer for the root of ethnic hatred and other forms of conflict. However, even supposing that this demonstrates a general tendency to discriminate against out-groups rather than an idiosyncrasy of the experimental setup (see Mummendey et al. 1992), it still leaves us with the question: why ethnic hatred and warfare but, for example, no architect/lawyer riots? Why don't students from different universities attack each other with rocks and assault weapons and protest interuniversity mar-

riages? Clearly, social categories are not all the same, and a purported bias against any and all out-groups cannot, by its very generality, explain why conflict should be so different across different kinds of group boundaries.

The Ugly Duckling hypothesis can be the basis of a better explanation for why ethnic groups are unique. Let us provisionally accept that (1) ethnies are interactional-norm groups, (2) people essentialize ethnies, and (3) ethnic membership is neither chosen nor alterable without subterfuge (lying about origins) because of ideologies that membership is a matter of descent. Now let us suppose further that people, *inside* their own group, are good at learning whom to trust. For example, I know that people inside my group who break in-group norms (break promises and contracts, are not shamed by the right things, etc.) are "bad" and should be avoided because interactions with them are costly. Now turn to the out-group: Members of the out-group are always violating my in-group's norms. From my perspective, their behavior is "wrong," and therefore they are "bad" people because I will judge them with the same mechanism that judges norm breakers in the in-group. Being tolerantly cosmopolitan rather than ethnocentric confers no advantage on me because the costs of miscoordination with out-group ethnics are very similar to the costs of being cheated by coethnics who "should know better"—in either case attempted reciprocal interaction fails. Thus natural selection has favored my interpreting the fact that they break my norms as a moral lapse rather than a cultural difference. This means that my baseline attitude towards out-group ethnics, in the best of times, is one of at least mild distrust. Since I essentialize them, I think that their "moral lapses" result from their corrupt nature, which cannot be helped. This stance is likely to make me slide in the direction of misunderstanding and hatred when the time comes to interpret the motivations of out-group members with whom I am in conflict. These mechanisms allow ethnic conflict to descend quickly into murderous hate, and the naturalization of the conflict can make it very stable.

This account can also explain why the contact hypothesis has failed. This hypothesis states that contact between members of different racial, ethnic, or cultural groups fosters positive intergroup attitudes. However, empirical tests have found that contact achieves this end only when a long laundry list of joint conditions are met: "the contact must involve cooperative activities; the participants must have equal status; they must also be similar on nonstatus dimensions; they must hold no negative views of each other at the outset; the outcome of the interaction must be positive; and so on" (Miller and Prentice 1999:219; see Stephan 1985). In other words, experimental manipulations that meet all the above conditions improve intergroup attitudes—*contact* doesn't. From the perspective of the Ugly Duckling hypothesis, this is not surprising. Contact, after all, reminds us that out-group members have the "wrong" norms and do the "wrong" things.

Conclusion

The evidence from Mongolia supports the hypothesis that humans process ethnies as natural living kinds (theoretical considerations suggest that they do so at the "species" level). My Torguud subjects have a blood-based model for assigning individuals to ethnies. Beyond this, they consider such assignment to carry implications for ethnic category-based behavior even without any exposure to other members of their ethnic category, and they seem to believe that the ineffable "something" responsible for this is carried somehow "inside." All of these parallel essentialist thinking in natural living kinds, suggesting that my subjects' thinking about ethnies is not only primordialist but essentialist and that there is no difference between an ethnic group and a species from the point of view of the schemas that are primed to process them. Processing endogamous norm groups as species, I have argued, was adaptive in the ancestral environment because (1) it allowed us to learn a lot about out-groups in a very inexpensive way, in particular by making inductive inferences about nonobvious properties, and (2) it made possible processes of discrimination that prevented us from incurring the costs of coordination failure. The reason these benefits have been obtained specifically by processing these groups as species results from the fact that ethnies exhibit the most diagnostic features of species: group-based endogamy and descent-based membership. This made it easy for a blind evolutionary process to exapt a preexisting architecture by simply failing to discourage the priming by ethnies of the living-kinds module. This is not, I think, how we think of social categories in general but only how we think of those categories which, as in ethnies, exhibit the strongly diagnostic features of biological species, such as feudal classes and castes.

Comments

RITA ASTUTI
London School of Economics, Houghton St., London WC2 2AE, U.K. (r.astuti@lse.ac.uk). 14 V 01

Gil-White's article raises some very important and challenging issues. The overall project is to explain why so many people around the world make the metaphysical error of believing in essentialism. While entirely sympathetic in principle with this endeavour, I don't think that the evidence presented takes us much closer to understanding why actors—unlike "constructivist" scholars—persist in essentializing the differences between human groups.

Gil-White's hypothesis is motivated by the straightforward evolutionary assumption that "domains important to our survival and reproduction in the past have probably selected for machinery specifically dedicated to processing the domain-relevant inputs." Since the ability to distinguish between social groupings must have been important for past survival and reproduction, one may assume the existence of a "mental machinery specific to processing ethnies." Furthermore, since in the ancestral environment humans organized themselves into groups which had all the salient and diagnostic characteristics of animal species (crucially, endogamy across norm boundaries), humans would process these groups as animal species. Doing so proved adaptive, and human brains capable of processing ethnic groups as species were thus selected.

This may be a plausible story, although it is possible to sketch alternative evolutionary accounts (e.g., Hirschfeld 1997:75–78). However, such a story only generates the hypothesis that humans are endowed with a certain "mental machinery"; it crucially does *not* offer any evidence for the machinery's existence. So, what evidence does Gil-White provide to support a nativist claim about the "panhuman proclivity of our psychological *design*" to essentialize "ethnies" in the manner of species?

The evidence consists in the results of a questionnaire administered to a group of Torguud and Kazakh seminomadic pastoralists. Its formulation raises several methodological problems. First, the respondents were asked to reason about the ethnic identity of a child born of an interethnic marriage. This is puzzling, because if endogamy is what primes actors to perceive ethnic groups as animal species, intermarriage should be inconceivable. However, if intermarriage *is* conceivable (as Gil-White's data show), it follows that actors do *not* define ethnic groups as animal species. Second, respondents were asked about the ethnic identity of a child born into one group but adopted and raised by another; but this is problematic, since the participants were told that, rather than asked whether, the adopted baby would learn the customs and language of the adoptive group.

The majority of Torguud participants reasoned that ethnic identity is fixed by birth rather than nurture and revealed that ethnic ascription carries with it the expectation of "innate potential." These results are very interesting, but they do no more than provide an ethnographic example of essentialist reasoning about ethnic groups. Similar examples can be found elsewhere in the anthropological literature, and Gil-White is thus certainly right in claiming that his results are not idiosyncratic. However, his claim that "all over the world" people base ethnic ascriptions on blood much more than enculturation is more contentious and is disproved by his own data: the same questionnaire applied to neighbouring Kazakhs shows a majority of respondents reasoning that ethnic identity is acquired performatively through enculturation. My own ethnographic (Astuti 1995a, b) and experimental work (based on a version of the adoption task devised by Solomon et al. [1996] and used also by Bloch, Solomon, and Carey [2001]) with the Vezo of Madagascar (Astuti 2001a) offers further robust evidence that ethnic and racial groups are not universally essentialized (for converging ethnographic evidence see, e.g., Fox 1987, Linnekin and Poyer 1990, Gow 1991, Bloch 1993, Carsten 1995).

Even incontrovertible evidence of cross-cultural universality would in any case be insufficient to prove Gil-White's claim that human cognition is innately designed to process ethnies like animal species. As Carey notes (1995:270–71, with reference to Sperber's [1994] and Atran's [1994] claim that folk biology is a first-order cognitive module), the existence of cross-cultural universality in *adults* is not conclusive evidence for the existence of an innate domain-specific cognitive module, since universal convergence in adult knowledge could result from theory-building capacities applied to a world that, across cultures, provides consistent and convergent evidence; in other words, universal patterns among adults could quite plausibly be "constructed." It follows that evidence of innate cognitive modules should be based on empirical studies of infant knowledge that emerge well before infants can conceivably have acquired it from the environment and appear to constrain the way infants learn.

This is also the point of departure for Hirschfeld's work on essentialist reasoning about race (1996), which Gil-White cites with approval. Hirschfeld bases his empirical work on children for the simple reason that no amount of cross-cultural evidence of adult reasoning would support his claim that humans are endowed with an innate predisposition to essentialize human kinds. Although Gil-White does not report work specifically with children, he does mention that his younger Kazakh informants (no age specified) claimed that ethnic identity is fixed at birth, by contrast with a majority of (adult) responses that were nurture-based. This raises the possibility that he has captured a significant moment in the construction of the adult theory out of early childhood intuitions that people are born to be what they are (see Astuti 2001*b* for findings along these lines about Vezo children). It also suggests that Gil-White will need to turn to the younger members of Mongol and Kazakh society to support his elegant albeit as yet just-so evolutionary story.

SCOTT ATRAN
Institute for Social Research, University of Michigan, Ann Arbor, Mich. 48106-1248, U.S.A. (satran@s.imap. itd.umich.edu). 30 III 01

Cognitive anthropology's demise as a major player in current anthropology owes, in part, to the superficiality of the psychological mechanisms employed to explain the cross-cultural patterns revealed in the pioneering studies of Berlin, Conklin, D'Andrade, Frake, Kay, Romney, and others. Analyses followed widespread views of minds as vast, amorphous neural networks with little content-specific, innate structure. Minds were seen as organized by all-purpose, domain-general mechanisms: similarity structures of perceptual attributes, contrastive features, binary oppositions. This afforded little insight into how minds form representations of the world or how individual minds causally link up in the populationwide distributions of representations (along with artifacts and behaviors generated by representations) that we call "culture."

Cognitive psychology today focuses more on domain-specific mechanisms than on general-purpose "intelligence." These mechanisms presumably evolved over millions of years of biological and cognitive evolution to deal with specific recurrent problems in ancestral environments ("task demands") such as recognizing inert objects (rocks), reducing biodiversity to manageable proportions (species), or anticipating agents (intentions of potential predators or prey). This "computational mind" consists of a variety of distinct information-processing devices. Each has a particular "content bias" that targets some particular domain of stimuli in the world (input sets): for example, rigid three-dimensional bodies that move by physical contact (mechanics), self-propelled actors that contingently coordinate interactions without physical contact (agency), or behaviors and appearances of nonhuman living kinds (species relations). The particular inferential structure of each domain-specific processor takes exemplars of the stimulus set episodically encountered in a person's life and spontaneously projects these relatively fragmentary samples onto richly structured categories (output classes) of general relevance to our species (objects and kinds of folkphysics, folkpsychology, folkbiology, etc.).

Hirschfeld (1996) has proposed a domain-specific "folksociology" based on groundbreaking experiments showing early development of race concepts in childhood. Gil-White amplifies and challenges Hirschfeld's insights with preliminary cross-cultural data. Both researchers focus on a puzzle and problem of human existence: people everywhere aggregate into essentialized groups, such as racial and ethnic groups, whose apparent regularities are thought to be caused by some deep underlying nature unique to the group and not transparent from observation (perhaps even unknowable). People cognitively privilege essentialized groups as providing the most dependable or trustworthy context for forming and inferring beliefs about themselves and others and for taking life-enhancing collective action based upon those beliefs (mating, war, economic cooperation). The puzzle is that people willfully ignore massive evidence of biological or cognitive incoherence. The problem consists in the profound, wide-ranging consequences of this myopic aspect of our cognitive endowment for sociopolitical life.

Mere belief in the group's causal unity creates a "looping effect" (Hacking 1995) whereby people strive (or compel others) to conform to group norms and stereotypes. This brings causal coherence to a group where initially there was none. It promotes convergent behaviors and interactional discriminations among the in-group (normative endogamy, patriotic ideals) and generates reliability in behavioral predictions about one's group relative to behaviors of members of other groups. The initially false or arbitrary presumption of a group essence makes adaptive sense. Our ancestors lived in an uncertain world of potential friends and enemies as "runaway social competition" made hominids their own worst predators (Al-

exander 1989). A self-reinforcing interactional bias would have fostered in-group convergence and cooperation. This would have reduced the risk, energy, and time involved in interacting with out-groups, which were more likely to contain potential enemies (or behaviors too noisy to be economically assessed as friend or foe). Ethnic exclusivity has an evolutionary downside: it biases interaction with out-groups toward enmity, increasing the risk of conflict and injury. On balance, benefits outweighed costs in ancestral environments. But in today's rapidly interconnecting world, the survival value of exclusive ethnic groups—armed with more destructive power than any Pleistocene relative could imagine—is not apparent.

Gil-White attributes the cognitive bias toward essentializing human kinds to an "ethnicity module" that he characterizes as an exaptation of what I have dubbed "the living-kind module" for species detection (Atran et al. 2001). Other essentialized human kinds—race, caste, class—are supposedly derivative. Once domain-specific mechanisms for discriminating and establishing normative group behavior were in place, any number of perceptible groupwide features could serve as input to the ethnicity module for marking ethnic boundaries.

I find Gil-White's evolutionary perspective compelling but doubt that humans evolved an ethnicity module that targets some real-world domain of "norms." I suspect that essentialization of human groups by race is cognitively privileged—not because of an evolved "race module" or "cultural construction" but because (1) putative racial (and perhaps linguistic) characteristics readily meet minimum perceptual triggering conditions for firing the living-kind module (much as pornographic pictures meet minimal triggering conditions for firing sexual desire) and (2) species essentialization of human groups *creates* (through a looping effect) human kinds together with inferential means for making reliable predictions about them (if only as self-fulfilling prophecy). Norm markers for ethnic boundaries are culturally created and manipulated to trigger the living-kind module in certain contexts (much as erotica is created to manipulate sexual desire for advertising and other cultural ends). Derivative norm markers may be even more critical—and more "real"—for group differentiation than the normative behaviors they are supposed to signal. For some important markers there may be no underlying normative behavior or consensus to speak of, such as wearing coat and tie or reciting the Pledge of Allegiance or even (as our studies show) the Ten Commandments (Atran n.d.).

MICHAEL BANTON
The Court House, Llanvair Discoed, Chepstow NP16 6LX, U.K. (michael@banton.demon.co.uk). 18 III 01

There are folk concepts of ethnic difference. Whether there can also be an analytical concept of ethnicity (one which those who follow Marvin Harris would call *etic* as opposed to *emic*) is still uncertain.

There are folk concepts in law, as in the protections for members of ethnic minorities under Article 27 of the International Covenant on Civil and Political Rights. In English law the question of whether the wearing of turbans by Sikhs was protected by statute gave rise to a definition of an ethnic community. That definition did not protect the wearing of dreadlocks by a Rastafarian, while its application to Roma/Gypsies, or "Travellers," was complicated by the question of permanency of residence. The new European Union race directive refers, clumsily, to "persons of racial or ethnic origin."

In Greece, the home of the concept, many criteria are evoked as evidence for the reality of Greek ethnicity, yet Roger Just (1989:76) concluded that it was "a somewhat retrograde step that ethnicity should ever have entered into the *analytical* vocabulary of the social sciences." Banks (1996:186) agrees that the concept "may not be out there in the world of social relations."

Gil-White shows that Mongols have a folk concept of *ündesten* which is maintained by the rule of endogamy, by the high exit cost incurred by anyone leaving the group, and by awareness of the proximity of Kazakhs as forming a group following a similar mode of living but with a different religion and language. He contends that members of the Mongol group cognize *ündesten* in an essentialist manner and that such cognition could serve an evolutionary function. It is difficult (as can be glimpsed in Gil-White 1999:801) to keep such an argument separate from the assumption that ethnic alignment must be something "out there in the world of social relations," something with an objective reality that can be grasped by an analytical concept. At the heart of the problem is the multidimensionality of social groups. A given group may be distinguished by its members' outward appearance, language, religion, ethnic origin, and other characteristics, including the sharing of norms emphasized by Gil-White or the minimal criteria of Tajfel's experiments. Groups have to be maintained by human activity. Some of us have held that similar processes underlie the maintenance of different kinds of group, but that is not to deny the possible importance of differences in the material from which groups are constructed. Multidimensionality is one of the factors associated with the historical continuity of groups. The relative salience of particular characteristics and their influence upon actual relations varies from case to case. An analyst may also single out one dimension for its relevance to some theory.

Multidimensionality also bears on the question, raised by Gil-White, of why ethnies get racialized even when there are no sharp phenotypic differences. The concept of racialization was introduced in English (Banton 1977: 18) as a name for a mode of categorization whereby nations and peoples were called races, with the implication that identifying them as races opened up a superior way of understanding what went on. If the language of race was used to identify a group, it was racialized; the criteria were *emic* (in Harris's sense). Since then its application has been extended to circumstances in which a way of representing groups is believed

to have the same function as use of the vocabulary of race. This rests on the analyst's belief in the importance of a racial dimension as something *etic*, but it is difficult to justify this when the people in question use only proper names to identify those allegedly racialized.

So many very different kinds of intergroup relations get classified as ethnic conflict (another folk concept!) that it is unprofitable to seek a comprehensive explanation (Banton 2000). Gil-White's hypothesis might form part of an explanation of some of them. His very stimulating contribution touches on a variety of issues that deserve separate consideration.

PASCAL BOYER
College of Arts and Sciences, Washington University, St. Louis, Mo. 63130, U.S.A. (pboyer@artsci.wustl.edu). 6 IV 01

Gil-White's excellent argument may require some empirical and theoretical additions. First, as he points out, his own questionnaire-based studies are only a first step. This is a domain where people's behaviour is mainly driven by implicit (and not always consciously accessible) assumptions, so we will need experimental studies (of the kind pioneered by Hirschfeld [1996]) of implicit assumptions and their developmental trajectory (see, e.g., Astuti 2001a, Bloch, Solomon, and Carey 2001). These, on the whole, confirm that intuitive, essentialist assumptions drive inferences about some social groups, although there remain many details to fill in.

Second, the cognitive underpinnings of essentialist inferences should be made more specific. Human minds can be reasonably described as comprising a number of functionally distinct, domain-specific inference engines, each of which focuses on particular kinds of information picked up from an environment and produces specific kinds of inferences (Cosmides and Tooby 1994). Although the delivered inferences may be consciously accessible, the inferential processes are generally not. A single inference engine can be activated by two ontologically distinct domains (we interpret the structural features of artefacts as connected to their function and do the same for animal body-parts, although animals and artefacts are not in the same category) and a single object can activate different inference engines (interaction with one's children activates parenting programmes but also an intuitive psychology to make sense of what they do, an intuitive physics to predict their collisions with objects, etc.). Different inference engines may be activated in the interpretation of a single input: a sudden noise may activate two incompatible interpretations, as the result of an agent's behaviour or a purely mechanical event.

It is probable that ethnic groups too trigger several parallel inference engines in this way. As Gil-White suggests, a causal-essence inference engine (probably evolved to afford quick induction about living kinds) is activated whenever people represent a group as descent-based and endogamous. These are two crucial input conditions (generally true of living things) that yield inferences about an undefined yet causally powerful underlying quality or essence, its similarity in exemplars of the same category, and its immutability. But the causal-essence inference engine also delivers potential inferences that do not match actual features of ethnic groups. For instance, it suggests that intercategory reproduction is impossible when it is clear that it is perfectly possible to mate across ethnic lines—indeed, that exogamy is as much a cause as a consequence of the groups' stability and cohesiveness.

Conversely, many common intuitions about ethnic groups are delivered not by the causal-essence inference engine but by others. Representing "impure" and despised castes or groups as different by virtue of birth requires some essentializing, but then people also have the intuitions that (*a*) members of these groups carry some dangerous, invisible substance ("pollution"), (*b*) contact with them can transmit that substance, and (*c*) the amount or frequency of contact is irrelevant. These inferences are typical of what could be called the contagion-contamination system, an inference engine that produces strong feelings of aversion to (even very remote) contact with likely sources of pathogens (decayed corpses, dirt, excrement, etc.). As Rozin, Haidt, and McCauley (1993) have shown, easy acquisition of such disgust reactions is vital to generalists like rats and humans. More generally, pathogen avoidance is made very efficient by the three intuitions listed above. In some contexts, some groups can be described in a way that activates this system, and people spontaneously draw such inferences about them. But this is not (or not only) causal essentialism.

Finally, humans are extremely good at using coalitional affiliation to carry out collaborative endeavours by efficiently allocating trust among cooperators (Kurzban 1999). Some consequences of having ethnic categories may be computed by this coalitional system. For instance, after being attacked by one member of the group one can retaliate by attacking another member. This elementary intuition is easily acquired by children the world over and is one of the conditions of coalitional affiliation. Such intuitions are not intrinsically about essence-based groups, since they work very well in the maintenance of small coalitions in any group.

Different historical circumstances may make particular kinds of inferences more efficient in the explanation of a particular interaction. Thus people may well entertain several not necessarily congruent potential representations of the ethnic landscape at once, though Gil-White is right to suggest that a causal-essence version is usually most salient.

SUSAN A. GELMAN
Department of Psychology, University of Michigan, Ann Arbor, Mich. 48106, U.S.A. (gelman@umich.edu). 2 IV 01

Gil-White's piece on essentialism provides arguments and data that demand our attention. That essentialism,

so common among middle-class U.S. children and adults, is also found among the Torguud pastoralists of western Mongolia is an important empirical result. People in both cultures predict that innate potential is more powerful than environmental influences (Gelman and Wellman 1991, Hirschfeld 1996, Springer 1996) and appear to link essences to something internal and hidden (Diesendruck, Gelman, and Lebowitz 1998). Commonalities in essentialism across these different groups place constraints on the crucial question of where essentialism comes from. The data further undermine the position that "natural kind concepts . . . [are] self-conscious and cultivated intellectual achievements" (Fodor 1998:154).

Gil-White insightfully notes that not all social categories are essentialized (e.g., at this point in the United States, race is essentialized but occupation is not). His proposed explanation is that we have evolved in such a way that we process ethnic groups as if they were species when two priming conditions are met: that the groups are endogamous and that they are descent-based. I suspect that endogamy cannot be the whole story. For one thing, endogamy cannot be a priming condition for essentialism unless it is perceived and understood. In this regard, I suspect that children may essentialize social categories even before they acquire knowledge of endogamy. (More generally, strong claims about the priming inputs for essentialism will require a closer look at people's *beliefs* about these factors.)

A second point is that, among the social groups that Gil-White examines, endogamy is confounded with several other factors, including immutability of group membership, sharpness of group boundaries, inductive potential, possession of numerous obvious similarities, and (belief in) possession of numerous nonobvious similarities. The essentialized (Mongol-Kazakh) distinction apparently can be characterized by all of these properties; the nonessentialized (Bangyakhan-Beelinkhen) distinction apparently can be characterized by descent-based membership alone. Thus, we have a cluster of properties nearly all of which intercorrelate and any one of which could be priming essentialism.

Third, there would appear to be counterexamples to Gil-White's prediction. Gender is marked by neither endogamy nor descent-based membership, yet clearly it is essentialized (Gelman, Collman, and Maccoby 1986, Taylor 1996). Similarly, some people essentialize traits such as intelligence or shyness (Heyman and Gelman 2000) although they are not endogamous. Another problematic example is caste essentialism in India. Using a switched-at-birth task, Mahalingam (1998) finds that upper-caste adults essentialize caste differences but low-caste adults do not. They tend instead toward social constructivist sorts of accounts, despite the presumed descent-based membership and endogamy of caste. In these cases, we need to look for an explanation outside of normative endogamy or descent-based membership. And if we need to look elsewhere to explain gender, traits, and caste, then it becomes plausible that we need to look elsewhere to explain essentializing of ethnic groups as well.

The evolutionary/biological component to the model, though artfully presented, seems unnecessary to account for the data. Although all cognition is surely "in the brain," the worry is that this approach may preclude close examination of relevant proximate factors, including language. An example of my concern is Gil-White's discussion of Atran et al.'s (1997) finding that people with two markedly different cultures (U.S. and Itzaj Maya) favor species-level inductive generalizations despite radical differences in knowledge base. Gil-White concludes that this result "supports the hypothesis that the living-kinds or 'folkbiology' module is a human universal." However, what fails to receive mention is that the species level is also the most inclusive level to receive monolexemic names (e.g., "trout" vs. "rainbow trout") in *both* languages (Coley et al. 1999). The cross-cultural commonality may reflect a preference for induction from names of a given sort rather than an innate module (see Gelman et al. 2000 for further discussion).

Gil-White has numerous insightful things to say about issues of measurement, two of which are particularly crucial for studying essentialism: (1) Identification procedures are distinct from categorization (see also Diesendruck and Gelman 1999, Gelman and Medin 1993, Kamp and Partee 1995). (2) Implicit measures may yield different results from explicit, metacognitive judgments. This latter point raises a host of vexing questions: How can we know when we are studying conscious versus intuitive theories? Which sorts of theories reflect more stable, more powerfully predictive, or more representative beliefs? How coherent or consistent are people's belief systems (see also Rosengren, Johnson, and Harris 2000)?

One of the great strengths of Gil-White's article is that it generates a fertile set of predictions and conceptual contrasts. Further tests of the theory are certain to yield rich insights into the nature of folk essentialism.

DAVID L. HAMILTON, STEVEN J. SHERMAN, AND JEREMY D. SACK
Department of Psychology, University of California, Santa Barbara, Calif. 93106, U.S.A. (Hamilton and Sack)/*Department of Psychology, Indiana University, Bloomington, Ind. 47405, U.S.A.* (Sherman) (*hamilton@ psych.ucsb.edu*). 10 IV 01

Gil-White begins by asking, "What is a group?" Our work has also pursued an answer to that question, and, as with Gil-White, the actual concern is "What is a group *as perceived by observers*?" We have, however, focused on different aspects of the question. Gil-White's primary concern is why ethnic groups are perceived as species. Our research has focused on when an aggregate is perceived as a group, how, and with what consequences, and our analysis has emphasized perceived entitativity.

Entitativity is the unity, coherence, bondedness among individuals that causes them to be perceived as a group. Our research (see Hamilton and Sherman 1996, Hamilton, Sherman, and Lickel 1998, Hamilton, Sherman, and

Castelli 2001, Hamilton, Sherman, and Rodgers n.d., Sherman, Hamilton, and Lewis 1999) has investigated both the antecedents of perceiving entitativity (the cues used to infer that an aggregate is a group) and the consequences of perceiving entitativity (greater integrative processing of information about the group, effects on memory and judgment, perceptions of collective responsibility among group members). We have referred to groups' falling along an "entitativity continuum" reflecting variation in the extent of their perceived "groupness" (Hamilton, Sherman, and Lickel 1998). Lickel et al. (2000) have obtained ratings of 40 groups documenting that their "groupness" varies widely. In addition, Lickel et al.'s analyses have identified five distinct types of groups: intimacy groups (family, friends, street gang), task groups (committee, jury, co-workers), social categories (women, blacks, Jews), loose associations (people living in the same neighborhood, people who like classical music), and transitory groups (people waiting at a bus stop). These types differ not only in degree of perceived entitativity (decreasing across types as listed) but also in the properties (interaction among members, common fate, similarity, etc.) that contribute to that perception.

Gil-White argues that perceiving ethnies as species serves important evolutionary functions. We too believe that the mental representation of group types serves important functions, but we focus on social-motivational functions and have suggested that the three main group types (intimacy, task, and social category) serve the needs for affiliation, achievement, and social identity, respectively (Hamilton, Sherman, and Castelli 2001).

Of particular relevance here is the fact that social categories are only one of several types of groups about which perceivers have well-developed cognitive representations. Moreover, whereas essentialist thinking is most likely to be applied to social categories (or at least some of them; we don't think about the "essence" of, for example, a social club or a committee), they are lower than both intimacy and task groups in degree of perceived entitativity. Thus, the two concepts are distinct.

These differences become more apparent when we consider their implications for group stereotypes. Some researchers (Rothbart and Taylor 1992, Yzerbyt, Rocher, and Schadron 1997) have proposed that stereotyping often includes endowing a social category with some essence that justifies its differential perception. These applications of an essentialist approach are considerably broader than Gil-White's analysis, but the viability of this approach requires specification of the conditions under which the idea of an underlying essence will guide people's perceptions of a group (Hamilton, Sherman, and Rodgers n.d.).

Another complexity is the following: A family is a prime example of an intimacy group as perceived by our subjects and is very high in perceived entitativity. It would also be high in essentialism and seemingly meets Gil-White's criteria for being perceived as a natural kind. Yet sweeping (stereotypic?) generalizations about members of a family seem intuitively less likely than broad

characterizations of social categories. People seem more comfortable making generalizations about what blacks are like than about what members of the Filan family are like. The inductive potential afforded by a group that is high in both entitativity and essentialism can, as in this example, be rather limited.

Analyses of essentialism may be quite useful in understanding group perception, at least under some conditions, and Gil-White's application to the perception of ethnies as species is laudable and thought-provoking. However, this is a narrower and more focused analysis than is required to answer the more general question of a how a group is perceived to be a group. Entitativity is a more general concept than essentialism, and recent research indicates important distinctions between them (Hamilton, Sherman, and Rodgers n.d.).

Identifying the role of essentialist conceptions in perceptions of groups, the conditions that promote them, and the boundary conditions on their use remain important matters for future investigation.[1]

TIM INGOLD
Department of Sociology and Anthropology, University of Aberdeen, Aberdeen AB24 3QY, Scotland, U.K. (tim.ingold@abdn.ac.uk). 28 III 01

Gil-White's argument is so manifestly absurd that I cannot believe it is meant to be taken seriously. It must be a spoof. As such, it is a brilliant parody of what currently parades under the banner of evolutionary psychology. We human beings, evolutionary psychology tells us, are universally equipped with mental machinery, hard-wired in the brain—processing devices or "modules" that organize our perception of the world. These modules have been constructed to design specifications established by natural selection as adaptations to the conditions of life faced by our early ancestors and transmitted across the generations as a stable "biological endowment." But the conditions encountered by people today differ markedly from those under which the panhuman mental architecture originally evolved. Hence a module adapted to process perceptual inputs from one source may be "primed" by inputs from another, quite different source—so long as these happen to be inputs of a kind the module can handle. These latter inputs, then, will be dealt with in much the same way as the former, yielding analogous representations. For example, in a world where people are distinguished by divergent patterns of customary behaviour, observations of human variation will be processed by the module originally designed to process observations of variation among living things. This module is constructed in such a way as to group living things into natural kinds, each endowed with a species-specific essence. Thus people will come to be similarly categorized, as ethnic groups akin to species.

This argument embodies several assumptions. First, there is an identifiable "essence" common to all human beings. In evolutionary psychology, it is commonly denoted by the venerable concept of "human nature." Second, this essence is an internal property of the individuals that carry it. It is "in the genes" and thus to be distinguished from their outwardly visible or "phenotypic" characteristics. Third, for every human life-cycle it is given from the start, as a legacy from our shared evolutionary past, and remains immune to the historical circumstances that the person encounters in the course of his or her development in an environment. Consequently, fourth, it is passed on from generation to generation by descent. Now, these four assumptions are precisely those that, according to advocates of evolutionary psychology, have been built by natural selection into the cognitive machinery by which people the world over perceive living beings (including fellow humans). Evolutionary psychologists are convinced that the belief in an internal, inherited and context-independent species essence is part of an evolved cognitive adaptation in humans. Yet this very belief is axiomatic to evolutionary psychology itself. Seeking an essentialist account of human nature, evolutionary psychologists have set themselves the task of trying to discover what is universal to human beings. And what they have discovered is that all humans are essentialists! In effect, evolutionary psychology has constructed humanity in its own image.

Gil-White astutely mimics the stylistic devices that evolutionary psychologists habitually use to cover up the circularity of their thinking. Here are a few rules for anyone wishing to play the same game: First, market your theory under the label of a familiar just-so story. Thus we have the "Ugly Duckling" hypothesis. Second, make yourself out to be pretty smart, easily able to outwit the simpletons among whom your research is being carried out, whose reasoning is allegedly swayed by their evolved intuitions. In one passage, Gil-White perfectly captures this swaggering self-confidence. Describing an attempt to trip up one of his key informants as a strategy for revealing the intuitive basis of the latter's thinking, he writes, "I was very excited . . . but instead showed myself mockingly upset. 'Tsoloo, you lied to me,' I said with a wink and a smile." Whom is he winking and smiling at? Not at the unfortunate Tsoloo, with whom he pretends to be upset. He is winking and smiling at *us*, his presumed readers, fellow conspirators in the game of evolutionary psychology. The subliminal message is "*We* know, because *we* can discriminate between people's conscious theories and the intuitive outpourings that reveal what we are really after, namely, 'the design of the human brain.'" Third, to avoid being caught out by your opponents, who might otherwise observe that your own thinking is subject to the very unreflecting intuitions you attribute to others, cover your tracks with meaningless but apparently technical jargon. Gil-White offers a priceless example of the genre: "After the emergence of the conformist adaptation, the ancestral environment became populated with more or less well-defined, discontinuous norm clumps."

The final and most important rule, of course, is to ignore all evidence that does not fit your hypothesis. If you are a species essentialist, why bother with evidence? One or two cases suffice to prove a universal. Gil-White satirizes the point, perhaps unintentionally, with reference to the work of Atran and his colleagues. They claim to have shown that people of "two very widely divergent cultures" privilege the species level when making inductive inferences. This, it is suggested, "supports the hypothesis that the living-kinds or 'folkbiology' module is a human universal." The suggestion is ludicrous, since if it takes only two positive instances to confirm the existence of a universal, then by the same token it would take only one negative instance to refute it. There is, indeed, abundant ethnographic evidence that in many societies persons and organisms are *not* identified by fixed, inner attributes. They are identified, rather, by their positions vis-à-vis one another in unfolding fields of relationships. For evolutionary psychologists, such modes of identification are simply beyond comprehension.

"Ordinary folk," writes Gil-White, "are not good anthropologists. . . . Quite to the contrary, they are naive essentialists." I am not sure whether these remarks are to be taken literally or tongue-in-cheek. Perhaps we should respond with a wink and a smile. *We* know that the people among whom we work are, invariably, far from naïve and that we have to struggle to match the sophistication with which they understand the world around them. But evolutionary psychologists are species essentialists to the core, and the naivety of their sociological and scientific outlook occasionally beggars belief. Ironically, they are prey to just the kinds of fallacies that they (mistakenly) attribute to ordinary people. For that very reason, as Gil-White intimates, they do not make good anthropologists. One only has to read this paper to see why.

DAVID D. LAITIN
Department of Political Science, Stanford University, Stanford, Calif. 94305-2044, U.S.A. 12 III 01

Gil-White here addresses a fundamental problem that faces all students of ethnicity: given the weak relationship between blood and ethnicity, what accounts for the powerful popular beliefs that this relationship is strong and that ethnicity is natural? The phenomenon to be explained might be called "everyday primordialism" (Fearon and Laitin 2000). Gil-White's provocative thesis is that the prevalence of everyday primordialism is an example of a human Darwinian adaptation of a "machinery" that has us all coding ethnies as if they were species.

Two bits of data in the paper, however, diminish the cogency of this thesis. First, in his questionnaire administered to Torguud subjects, Gil-White asks a hypothetical about the offspring of a Kazakh father and a Mongol mother. It seems that every respondent accepted the terms of the question—that is to say, none refused to

accept the premise of the question by saying that it was against nature even to imagine that a Kazakh and a Mongol would have a common offspring. Surely some would have if asked about the offspring of a giraffe father and an elephant mother.

Second, not all respondents were essentialists; essentialism existed in different degrees among them. Gil-White's most trusted informant turned out to be a closet primordialist (believing capacity for magic to be inherited), but even he thought that many cultural characteristics were learned, and by implication the predictions you could make about a Mongol child raised by Kazakhs would not be nearly as good as those made about Mongols raised by Mongols. Again the adaptation of species-thinking for ethnies is not quite perfect. In the case of the swan in *The Ugly Duckling*, as recounted by Gil-White, in the end it proves itself to be a genuine swan, not an almost-duck that has retained an innate capacity to do perhaps one unique swanlike thing.

Granted some power to the species analogy (after all, everyday primordialist beliefs that ethnic essences exist somewhere inside people and that they emerge spontaneously are powerfully illustrated in this paper), is there another way to make sense of Gil-White's data? I would suggest that he underestimates the gains from trade (in goods and in wives) between ethnic groups. The transaction costs of such long-distance trade are high, given the difficulty of knowing the honesty of any particular agent of a foreign ethnie. The barefooted empiricist strategies of ordinary people for characterizing the "other" lend themselves to generalizations that are resolutely primordialist. While some or even many people will see these group characteristics as species-like, it is not necessary for all to do this or for anyone to accept the full consequences of the analogy (indeed, the existence of intermarriage defies these consequences).

If all humans wanted to maximize their chances of honest and understandable transactions, they would marry and trade only within their ethnic group. But there are considerable gains from trading, even if it means knowing less than one would like about the character of the person one is dealing with. One way to reduce transaction costs is to engage in a form of species-analogizing (see Fearon and Laitin 1996). Species analogizing, because it is useful, has a powerful grip on the human imagination, but it is unevenly distributed and breaks down in key areas (such as the possibility of marriage or the allowance of full assimilation after seven generations). It need not be transmitted across generations as a Darwinian cultural trait; rather, it is a rational response to the problem of asymmetric information when there are gains to trade.

One test of Gil-White's Darwinian approach in comparison with the more rationalist approach I am suggesting would be to examine whether everyday primordialism is constant over time. My surmise (based on an ordinary-language exposition of the term "identity" performed by Fearon [2000] but also consistent with Gellner's [1998:20] theory of nationalism) is that the rigid rules of ethnic categorization that seem so obvious in today's world are fairly recent inventions. In the era when religious membership was a hegemonic social category, transactions across the religious divide allowed for different modes of addressing asymmetric information. Ethnicity and rules of ethnic descent may therefore have played a far less prominent role in the way people thought about others. If the salience of everyday primordialism is variable over time, as I conjecture it has been, the case for Darwinian selection will be less strong.

My counterinterpretation of Gil-White's data has at least one important observable implication, and this concerns the issue of agency. Gil-White writes that "natural selection acted on our psychology so that we interpret sharp differences in *cultural* phenotypic markers with different essences." Although he argues that his position is consistent with Barth's, there is a major difference. If this proclivity for essentializing ethnic difference has been selected for, why do ethnic entrepreneurs need to expend such effort policing the boundaries of their groups and seeking to humiliate those who violate those boundaries, as, for example, in the "Romeo and Juliet" legend?[1] Everyday primordialism requires work. Giraffes need no policing to restrain them from seeking to pass for or mate with elephants.

The varied distribution of essentialist beliefs over space and time and the need for vigilant policing of ethnic boundaries lead me to doubt Gil-White's thesis that the essentializing of ethnic others is built into the machinery of human evolutionary adaptation.

MA RONG
Institute of Sociology and Anthropology, Peking University, Beijing 100871, People's Republic of China (*marong@pku.edu.cn*). 2 IV 01

Gil-White's article provides an insightful review of the literature on ethnic categorizing in anthropology and psychology along with experimental interview data from the Torguud Mongol area to demonstrate that ethnies are essentialized as "natural kinds" such as species. The argument sounds plausible, but there are several points that need to be clarified.

First, it can be accepted that the two "most diagnostic features of 'species' [are] group-based endogamy and descent-based membership." But in comparing "ethnies" to "species" it must be pointed out that human groups are different from "natural kinds" such as animals, birds, or fish, which, in general, cannot mate and have offspring (with very few exceptions, such as the horse and donkey) as human groups certainly can. Endogamy is a regulation established by human norms and not restricted by natural essences. Any ordinary herdsman or farmer can tell the difference. My field research in Inner Mongolia and Tibet (where there is much intermarriage) indicates that recognizing "ethnies" as "species" is not precisely the

1. Who pays the costs of policing in ethnic boundary maintenance and why are problems not easily solved. For an attempt to address them from a game-theoretic viewpoint, see Laitin (1995).

way local residents think. Therefore, the argument about the two diagnostic features does not support the point that ethnies are species.

Secondly, the classification of species in the natural world is processed not on a single plane (as different columns in a table) but as a "tree" with species, subspecies, etc., as branches whose diagnostic features distinguish them from each other on the same level or between levels. Classifying human groups is also complicated, with races, ethnic groups, subgroups, clans, and families, depending on the different terms people use. Considering "species" and "ethnies" similar categories while ignoring this complexity is simplifying the issue.

Third, although we are still improving our knowledge of species in the natural world and modifying systematic botany and zoology, there is usually expert consensus on categorizing, and the experts' conclusions are accepted by society. Categorizing human ethnic groups is complicated by their artificial aspects. There are many stages in the continuum of group identity from family to humankind, and ethnic groups may be placed at different points on this continuum under different conditions. For example, Mongolians are categorized into several ethnic groups in the Republic of Mongolia but as one group in China. Officially, there are 56 "ethnic groups" in today's China, but there were over 200 groups applying to be identified as "ethnic minorities" in the 1950s. The present 56 ethnic groups were the results of the recognition process established by the government in the 1950s, and there are still some groups that are not recognized as separate ethnic groups and are fighting for recognition (e.g., the "Blue Dressing" in Guizhou [cf. Fei 1988: 164–67]). As with other terms for classifying human groups such as "nation," there are also local types in different parts of the world (Smith 1991:11).

Fourth, ethnic groups change much more easily and more rapidly over time than species. Some groups have disappeared and some have emerged in the space of several generations, while the evolution of species took thousands of years. Besides, members of a species cannot change their membership from one species to another, but members of ethnic groups can and do. There have been many cases in contemporary China in which people changed their "ethnic status," usually from Han majority to a minority, in order to receive the benefits (exemption from "family planning," privileges in school and job recruitment, etc.) that the Chinese government offers to ethnic minorities.

Gil-White presents data from his field studies in Mongolia as evidence to support his hypothesis. Several points need further discussion: (1) Religion plays a very important role in group identification. This point has been made repeatedly in the literature on ethnicity (e.g., intermarriages occurred mainly within three religious groups in Rhode Island [Kobrin and Goldscheider 1978]). The distance between Mongols and Kazakhs is created not only by an ethnic boundary but also by a religious boundary (Tibetan Buddhist/Muslim). Religion is more important and should be used to explain the ethnic boundary. There are many intermarriages between ethnic groups that are Muslim (Uygur, Kazakh, Kirgiz, Tajik) but few between Mongolian and Muslim groups in Xinjiang. (2) No explanation is given for the reported difference in ethnic categorizing between older and younger generations. If we consider the political/ideological environments in which they grew up, the picture becomes clearer. The older generation grew up with the communist ideology that class was more essential than ethnicity. The younger generation grew up under a new nationalism that strongly emphasizes the essences of ethnies. (3) "Something inside" is the term used to describe the essence of an ethnic group by the respondents in Gil-White's study, but what is this "inside" exactly? The capacity for casting curses is not a general example for examining "essences," because Mongolians and Tibetan Buddhists believe in curses but other ethnic groups (such as Han Chinese, Confucianists) may not. Blood ancestry can be traced, but the "essential difference" of Weimar Jews was only the opinion of the Nazis, not a general or universal opinion, and cannot be used to support the "Ugly Duckling" hypothesis.

Finally, there are differences in norms between ethnic groups, but they also have many norms in common. Norms and behaviors may be different but not "wrong" or "bad." The spirit of Confucianism is that all groups can be taught norms and everyone is born good. The great success of the Chinese dynasties was the acceptance of the Confucianist norms by frontier "barbarians" who were never considered essentially "different." The world is diverse, and a general conclusion may be reached only after careful study. *The Ugly Duckling* is a bedtime story and cannot serve as a scientific hypothesis.

MYRON ROTHBART AND MARJORIE TAYLOR
Department of Psychology, University of Oregon, Eugene, Ore. 97403, U.S.A. (*mickroth@oregon. uoregon.edu*). 29 III 01

Gil-White has given us a wide-ranging, thought-provoking paper. We particularly appreciate the careful descriptions of the answers provided by Mongolian respondents to questions probing essentialism. However, we disagree with Gil-White's view that humans have evolved a mental module dedicated to processing information about species-level categories. We have problems with (1) the characterization of this type of processing as modular, (2) the rationale that it would be adaptive for ethnies to be processed by such a module, and (3) the view that essentialist thinking is determined by the activation of the module rather than by social beliefs and social context.

First, although a module can be posited without requiring that all nine of Fodor's (1983) original criteria for modularity be met (Baron-Cohen 1995), at a minimum "module" suggests that the processing of the input cannot be influenced by the person's knowledge or beliefs (i.e., informational encapsulation) and that it is rapid,

automatic, and unconscious. Does Gil-White really want to make these claims about the processing of ethnies?

Second, the justification for the adaptive value of processing ethnies as species is weak. Gil-White focuses on the costs of coordinating between groups that "play the 'games' of social life" differently and argues that it is adaptive to avoid social interaction with out-group members. However, it is possible to argue that the exact opposite behavior, seeking out such interactions, could be highly adaptive. Out-group members offer new ideas and contrasting perspectives—exactly the type of input that reduces the likelihood of bad decisions associated with insular processing (e.g., groupthink) and that can promote technological and cultural innovation. Historical analysis indicates that creative productivity tends to cluster in periods and places in which there is sufficient ethnic diversity to encourage cross-fertilization of ideas and beliefs (e.g., Greece in the 5th century B.C., Florence in the 15th century, Paris in the 19th century). According to Simonton (1999:213), "the mere exposure to different lifestyles and divergent values enables individuals to expand the range and originality of their ideational variations."

Third, Gil-White's focus on ethnicity as the basis for "species"-like essentialism is misguided for several reasons: (1) it focuses on the reality—rather than the perception—of group boundaries and inductive potential; (2) it views essentialism as all-or-none rather than as continuous (even though his Mongolian data seem to suggest the latter); (3) it fails to recognize the dynamic nature of social perception, wherein the essentialist view of a given group can increase or decrease in strength depending on changes in social context; and (4) by placing so much weight on endogamy and descent as determinants of essentialism, it fails to recognize that the strength of essentialist perception for a given target group can vary both across different groups of perceivers and from individual to individual.

Gil-White argues that ethnies are most likely to be viewed as species because of endogamy, descent-based membership, and within-group behavioral similarity, which represent surface similarities to species. Although race does not neatly fit these criteria, Gil-White realizes that race is often strongly essentialized and therefore concludes that race is mistaken for ethnicity. Clans, on the basis of his Mongolian data, are not considered ethnies and not essentialized. On the other hand, caste and class can be essentialized, again presumably because of their mistaken similarity to ethnies. We find this logic tortured. Moreover, we view this attempt to identify which groups will and will not activate the "species module" as overly narrow and static. It ignores the possibility that under the appropriate social conditions, for example, clans might well be essentialized and social classes not. If severe and extended conflict developed between the clans over, say, grazing territory, would not the changing intergroup conflict lead to deep, hostile attributions that would also be essential in their character? Essentialism can take place at the dyadic, family, clan, class, gender, ethnic, or national level, and we view it

as a mistake to restrict it to one or a few types of social categories. We continue to believe that two factors strongly related to essentialism are *perceived* unalterability and *perceived* inductive potential, both of which are powerfully influenced by social beliefs and context. Because of the boundaries and barriers associated with group membership, descent-based categorization, *ceteris paribus*, is more likely to be essentialized than others, but again the perceived homogeneity/inductive potential of the group varies as a function of individual and group beliefs. Gil-White uses the example of the Weimar Jews as evidence against the argument of inductive potential as a causal factor. In our view, inductive potential is itself a complex function of social reality and social perception, not simply a product of descent-based categorization. The reality of Western European Jewry was extremely diverse, including Bolsheviks and bankers, highly assimilated German scientists and impoverished medieval Polish religionists. It was Nazi ideology that imposed unity on this diversity by ascribing to Jews, among other things, a sinister and universal desire for world domination. In our view, perceived homogeneity and intergroup boundaries are established by social belief and social context, and it is these factors, not the activation of a "species" module, that contribute most strongly to essentialist beliefs.

TAKEYUKI TSUDA
*Center for Comparative Immigration Studies,
University of California, San Diego, La Jolla, Calif.
92093-0521, U.S.A.* (*ttsuda@weber.ucsd.edu*). 15 III 01

Gil-White's article defies many of the assumptions prevalent in current anthropological studies of ethnicity by adopting a cognitive, evolutionary, and utilitarian perspective. After hearing so much about the deessentialized, contested, situational, invented, deterritorialized, and culturally unbound nature of ethnicity, it is refreshing to see someone conducting serious research on ethnicity in such a "traditional" framework. As Gil-White notes, few scholars have in fact advocated an essentialist approach that naturalizes ethnicity as primordial, biologically inherited, and ontologically predetermined, suggesting that the constructivists are constructing a straw man to highlight what is new about their perspective. More important, however, as he points out, constructivists do not fully realize that most of our informants perceive ethnicity (emically) in a highly essentialist manner. They often seem to assume that the people they write about are just as theoretically sophisticated as they are and share the same theoretical insights (in this case, that ethnicity is socially constructed).

Many anthropologists will take issue with Gil-White's model for the evolution of such essentialist ethnic thinking. It is based on the assumption that humans began to engage in inductive overgeneralization about the cultural traits of ethnic outsiders because it was the most efficient way of perceiving and comprehending them.

One wonders whether the evolution of this type of ethnic cognition follows the law of natural selection, since human thought in general does not always aim to maximize cognitive and interactional efficiency. It is doubtful that cognitive patterns that are less instrumentally beneficial and adaptationally advantageous than others will always become extinct, especially where they do not threaten the social survival of a group. Ultimately, such social evolutionary theories tend to be based less on empirical, historical evidence than on purely logical reasoning.

Thus Gil-White seems to present us with an essentialized (naturalistic/biological) explanation for why people essentialize ethnic groups. Therefore, he simply shifts the focus from previous anthropological explanations of essentialized ethnic groups on the etic level (as an externally observable social fact) to individuals' essentialized ethnic consciousness and perceptions on an *emic* level. This is consistent with the increased recent attention to ethnic identity (emic) as contrasted with ethnic group formation and characteristics (etic). Gil-White claims that because ethnic groups are perceived to possess a relatively immutable "nature" and essence, most individuals around the world do not and cannot freely choose and switch their ethnicities in response to sociopolitical benefits (contrary to what the constructivists claim) until they reach the second generation and begin intermarrying. However, despite the current popularity of the concept of ethnogenesis, I doubt that even radical constructivists would argue that ethnicity can be completely manipulated and invented. Because Gil-White's essentialist explanation for people's essentialized emic consciousness and their resulting etic ethnic behavior can be easily problematized in these ways, I am afraid that he may be adding to the (virtually nonexistent) essentialist literature on ethnicity and thus providing ammunition for those he opposes.

I also wonder about the cross-cultural applicability of the analysis. Despite the numerous brief citations of other research that Gil-White musters to support the generalizability of his ethnic model, he himself notes that his theory does not really apply to the United States, where ethnic affiliation is becoming less salient than a national American identity (many scholars argue that precisely the opposite is happening). It seems that the real reason many individuals in the United States (and, by extension, other multiethnic complex societies) no longer essentialize ethnic affiliation is that they have developed multiple and hybrid ethnic affiliations (only very briefly mentioned in the article) that defy easy classification, allowing them to present themselves somewhat differently in different situations. Gil-White's evolutionary model of ethnic consciousness seems to presume that individuals belong primarily to one ethnic group and do not contend with multiple memberships and loyalties. If so, it would apply only to a limited number of simple societies in which ethnic groups are still relatively isolated, consider each other to be mutually exclusive, and remain endogamous. However, there are not many simple societies of this type today.

This is the problem with an analysis that is built upon a dichotomy of ethnic constructivism versus essentialism, since most people's ethnic behavior and consciousness fall somewhere in between. Although individuals do construct and manipulate their ethnic identity to a certain extent, they do so under the essentialist constraints of socialized and "inherited" cultural and racial characteristics which prevent the free crossing of ethnic group boundaries.

Reply

FRANCISCO J. GIL-WHITE
Los Angeles, Calif., U.S.A. 26 V 01

My commentators in general consider that the empirical results are important, demand an explanation, and point out deficiencies in previous theorizing. With one exception, their criticisms engage the ideas seriously.

Methodological issues and hypothesis testing. Laitin observes that my respondents easily granted "that many cultural characteristics were learned, and by implication the predictions you could make about a Mongol child raised by Kazakhs would not be nearly as good as those made about Mongols raised by Mongols." So, he intimates, they are not as essentialist as all that. But if I make people explicitly agree with the premise that the adopted child will acquire all of the customs, habits, language, and traditions of the Kazakhs, I make it impossible for them to say that the child will be a *lot* like a Mongol (it's in the nature of the exercise). However, despite granting this extreme enculturation premise, subjects resisted the idea that the child would be quite like the Kazakhs (even absent any contact with Mongols or knowledge of true ancestry). To assume that there is a Mongol "essence" is to think that the child has the potential and tendency *naturally* to behave like a Mongol, but people know that humans learn. The burden of demonstrating essentialism should not be that of showing people to be fools who deny learning.

Astuti finds problematic (but does not say why) that in question 3 "participants were told that, rather than asked whether, the adopted baby would learn the customs and language of the adoptive group." The point was to see whether enculturation or descent was more important for ethnic ascription. By telling participants that the adopted child was thoroughly socialized into the adopting ethnie's culture, I set the contrast that would test that question. Astuti finds "interesting" that my respondents privilege birth over nurture, so the unstated problems are apparently not fatal.

She finds the interest of the result mitigated, in any case, by the fact that it is no more than one ethnographic case of essentialism and characterizes my claim that the descent privilege for ethnic ascriptions is universal as "contentious" and disproved by my own data with the Kazakhs. But scattered exceptions—to say nothing of a single contradictory case such as the Kazakhs (if they

were indeed such)—will hardly *disprove* a prediction about an expected pattern. We do need to establish empirically the relative frequency of ethnic essentialism, and I am ready to accept that my theory may find its predictions unsupported by cross-cultural data. But we must be clear on what my main claim is: it is not quite that most *ethnies* will be essentialized. Any claim that ethnies will do *x* or *y* will become—given the plethora of contending definitions and extensions used by scholars—as many different claims in their minds. I have used the term "ethnie" merely to communicate a rough understanding that is in the overlap of all the definitions and extensions used, but my claims and predictions do not use or need the term, and they are quite specific. The prediction is that those social categories which show normative endogamy and descent-based membership will be the ones more likely to be essentialized and essentialized more strongly. The prediction is about such categories, not narrowly about what any particular scholar may insist is an "ethnie," and is thus applicable to castes and any other category that has the stated properties. (Similarly, my evolutionary argument requires that we agree that norms will cluster and that clusters tend to become endogamous, not that we agree to call these clusters "ethnies.") Rothbart and Taylor seem to think that I have argued just the opposite, and they complain that different kinds of categories, not just ethnies, can be essentialized. But we are in complete agreement on that point. Laitin, for his part, presents the variability in essentialist beliefs over space and time as weakening my hypothesis, but it is the *nature* of the variability that will undermine my claims. If essentialist beliefs weaken when the cues that make a social category resemble a species are attenuated, this variability, rather than disconfirming my hypothesis, will follow its predictions rather precisely.

It is obvious that I failed to be clear on these points, given that Banton focuses exclusively on the fact that scholars don't agree on the use of a particular *lexeme*—"ethnic"[1]—and on the historical changes in technical, legal, and official definitions attached to it rather than on my arguments about what will cause social-category essentialism and why. Ma, similarly, interprets my argument as being about ethnies as in fact immutable entities rather than about the cognitive biases that certain perceptions will trigger. Rothbart and Taylor focus on a definition of "module" that they favor rather than on my claims, which do not need the word "module" (which, again, was used to communicate a rough idea

rather than a fundamental theoretical point). And Tsuda thinks that my claims overreach because not all ethnic groups are as easily demarcable or impermeable as I supposedly make them all out to be. I hope I have now made clear why these objections miss the point, but I accept the blame if my presentation was suboptimal.

Astuti defends Hirschfeld's (1996) attention to child cognition because "no amount of cross-cultural evidence of adult reasoning would support his claim that humans are endowed with an innate predisposition to essentialize human kinds." Evidence from adults, she claims, even if universally consistent across cultures with my predictions, would *not* constitute support for my theory (her converse claim that one counterexample *disproves* my theory appears to be a double standard). I cannot agree with her position. If we find that, all over the world, adults intuitively essentialize normatively endogamous categories with descent-based membership *even when their explicit cultural models tell them not to*, an innatist explanation for this pattern becomes more plausible than the alternative. This does not diminish the value of developmental data; any prediction worth investigating should be attacked by gathering independent lines of evidence to see if they converge on the same qualitative answer.

What could falsify my hypothesis? Perhaps the fact that we essentialize gender, Gelman ventures. She observes that endogamy and descent-based membership cannot explain why gender is essentialized. I would make the list longer, for neither can they explain essentialism of individuals, kin groups, and objects. But how are these counterexamples to my hypothesis? I have claimed that endogamy and descent-based membership will increase the likelihood and the extent to which a social category will be essentialized, not that nothing else can cause essentialism or that living-kind essentialism is the only kind possible. Gender and kin essentialism are distinct phenomena orthogonal to my theory (cf. Atran's [1998:596] response to Solomon). The Vezo, Astuti claims, constitute a counterexample. But to know this we must not merely show them to be nonessentialists; in addition, we must determine whether for the Vezo (1) membership is a matter of descent and (2) category endogamy is normative. If this is the case, we have a genuine counterexample, and showing my theory to be unsupported is a matter of demonstrating that genuine counterexamples are more common than the predicted pattern. Though Astuti would include the Kazakhs I study as one such counterexample, I would disagree, as stated in the paper.

Failure to find caste essentialism would be a real counterexample, for castes are normatively endogamous and descent-based. The Mahalingam (1998) results that Gelman refers me to are equivocal, however. First, although lower-caste adults were not essentialists, upper-caste adults were. The historical context is relevant here. Meritocracy is taking hold in India, and the political implications of this have not been lost on the lower castes. Since the traditional caste system promotes the antithesis of upward mobility, denying its assumptions serves

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1. The semantic morass is not quite what it seems. Scholars disagree when they write down explicit *definitions* of "ethnic group" that they hope will advance a priori theoretical commitments. This naturally leads to a proliferation of definitions, for here ideology holds more sway than science and one makes a point not by showing something but by redefining the terms everybody else is using. Despite this, whatever scholars' explicit definitions of "ethnic," their *extensions* (i.e., the groups they label "ethnic") overlap greatly, apparently because they follow their intuitions in extending as "ethnic" "agglomerations of people who, at a minimum, *represent themselves* as vertically reproducing historical units implying cultural 'peoplehood'" (Gil-White 1999:813).

the legitimizing of lower-caste upward mobility and future enlarged opportunities. If correct, this predicts that lower-caste members most exposed to the recent political changes (i.e., those in urban centers) will show the strongest reluctance to essentialize caste membership, whereas those in rural areas will be more essentialist. In any case, the proper analysis must try to see whether essentialism, normative endogamy, and descent-based membership travel together. The strongest refutation of my hypothesis will come if those explicitly committed to the descent-based acquisition of caste status and to the undesirability of intercaste unions show explicit *and* intuitive nonessentialist reasoning about attributes.

Gelman sees important confounds in my data because the Mongol/Kazakh contrast has, in addition to (1) endogamy and (2) descent-based membership, the features of (3) sharp boundaries, (4) immutability of membership, (5) inductive potential, (6) possession of obvious similarities, and (7) the belief in nonobvious similarities, and any of these could be responsible for essentialism. But the Beelinkhen/Bangyakhan contrast has nothing going for it except descent-based membership. Although a laboratory study (in progress) will address what primes essentialism better than my current data, I think this objection is weaker than it may at first appear, for the items in Gelman's list are highly redundant. Items (3) and (4) are not features *in addition to* (1) and (2) but result directly from them. Item (6) causes (5). Finally, item (7) is itself a product of essentialist thinking, not its cause. So the only thing in the Mongol/Kazakh contrast in addition to endogamy and descent that might cause essentialism is "cultural differences." What, then, differentiates the ethnic contrast from the clan contrast? Endogamy practices? Only in a minor quantitative sense; the overwhelming majority of clan members marry other clan members (to the point that the government has worried publicly about inbreeding depression). Cultural differences? Again, only in a quantitative sense, although here the difference between the two contrasts is admittedly not minor. But there are nevertheless dialectic differences between the clans that even I can easily notice, and Torguuds perceive other cultural differences though they have trouble listing them. The only *dramatic and qualitative* difference between the two contrasts is the *rule* of endogamy. Parents raise no principled objection (they may have preferences) to interclan or indeed intertribal marriages, but they consider it a matter of principle that their children not marry across the ethnic boundary.

Theoretical issues. In the summary of history that Atran favors, mutual predation by human groups is what drives psychology, and essentialism reinforces both ingroup similarity, cooperation, and cohesion and intergroup demarcations. I am skeptical that this process can really be the engine of *ethnic* essentialism given that for most of history the antagonistic political units have typically been either smaller (e.g., bands, clans, tribes) or larger (e.g., some chiefdoms, empires) than ethnies. Political units are not strongly essentialized unless they coincide with ethnic boundaries. My argument is not about cooperative coalitions locked in combat but about the emergence of clustered variation in interactional norms, which results if people are unevenly distributed in the physical landscape and adapted to conform to locally common interactional norms. My account treats the imperative of navigating adaptively a world composed of norm clusters as causing ethnic-category essentialism. Atran does not comment on this argument, however, except to observe that he doubts (without saying why) that there is a domain of "norms" that could have selected for elements of human psychology.

Atran believes that social-category essentialism results not from specialized *derived* psychology but purely from the "big mistake" misfiring of an *ancestral* cognitive trait—the living-kind module—which occurs because putatively "racial" phenotypic attributes are sufficient to trick this module into perceiving a species boundary. This process results in a "looping effect" that creates "human kinds together with inferential means for making reliable predictions about them (if only as a self-fulfilling prophecy)."

I see two problems with this argument. First, phenotypic differences hardly appear *necessary* for essentialism. Torguuds and Kazakhs overlap considerably in their diagnostic traits (Gil-White 2001*b*), which is not true for the stimuli in Hirschfeld's (1996) studies, where subjects reasoned about the largest phenotypic contrast possible among humans. Closer to home, it was not long ago that the English considered the Irish a nonwhite "race." Is it really that easy to visually distinguish Irish from English? And is the phenotypic contrast between them so dramatic that—by itself—it should promote the intuition of two separate *species*? (It seems more likely that the Irish were essentialized as a separate "race" because English and Irish practiced normative endogamy.) We will not know for sure until developmental data are collected—à la Hirschfeld (1996)—for such meager phenotypic contrasts, but at first blush it does not seem likely that children will essentialize them. Nevertheless, Hirschfeld (1996:102–7) already has a result supporting the argument I defend—that culture drives evolved psychology in this domain. He found—to his surprise—that three-year-olds essentialize people of the same phenotype but dressed in different uniforms (e.g., police officer) virtually as much as they essentialize people with dramatically different phenotypes. Why this result? Because differences in clothing should prime the living-kind module? A more plausible alternative is that children are specifically looking out for *uniforms* as a shortcut for guessing which categories ought to be essentialized. Clustering of norms in the ancestral environment, after all, would have made it sensible to signal which norm-group one came from, leading to the evolution of ethnic markers (McElreath, Boyd, and Richerson 2001). Since young children presumably have yet to learn that policemen do not typically marry policewomen or necessarily—or even typically—beget police-children (or, indeed, that this is how one definitively picks out living kinds), we get Hirschfeld's interesting result. When children become adults they no longer essentialize police

officers as a natural kind because by then they have learned about the importance of descent and marriage for "living kind-ness" and about the practices of police officers in these domains. From this perspective, phenotype contrasts are essentialized by children because the brain is tricked into seeing sharp phenotypic differences as ethnic "uniforms." Hirschfeld finds that by age seven dramatic phenotype contrasts are almost unanimously essentialized, which may follow from increasing awareness of normative prescriptions against interracial marriage.[2]

The second problem is that essentialized phenotypic categories (i.e., so-called races) have *not* coalesced through a self-fulfilling prophecy into groups with any kind of inferential potential. There is simply nothing to infer from membership in a putative race *qua* "race," for so-called races are vast collections of subgroups with a dizzying array of behavioral standards and practices. It is in the subgroups—neighboring ethnies with strongly overlapping phenotypic distributions—that normative differences cluster, rather than at the boundaries of "races."[3]

Rothbart and Taylor note that interaction with ethnic out-group members could be adaptive rather than maladaptive because it brings technological innovation. I agree that acquiring superior technology from others is sensible, but I disagree that *interaction* across the ethnic boundary is thereby rendered generally adaptive. My argument is about *interactional norms*, that is, those rules that have to do with making promises and contracts, hosting a guest, consummating a marriage, raising a child, effecting a divorce, paying a debt, shaming and being shamed, etc. It is certainly adaptive for me to obtain superior knowledge in technological and empirical domains wherever it may come from, but it will be maladaptive to adopt a set of interactional norms that the people in my own community neither expect nor endorse, and it will be costly to attempt many interactions with people in other communities who play the games of life in different ways. A current study of knowledge transfer between two different ethnic communities in Guatemala (Atran et al. 1999) shows that very little and very superficial contact between members of the two local communities is sufficient for the transmission of adaptive knowledge about ecological relationships and agro-forestry practices. Knowledge flows from the biologically expert Itza' Maya to the recently arrived Ladino through only one or two human vectors, prestigious Ladino individuals who learn from prestigious Itza' individuals. Other Ladinos then acquire this knowledge from the prestigious Ladinos. This process is perfectly con-

sistent with the structure of social learning through prestige processes as defended in Henrich and Gil-White (2001). The point is that very little actual *interaction*—and certainly not very intimate interaction—is sufficient for transfers of empirical and technological knowledge between ethnic communities; one interethnic interactant will suffice. All others will be faced with either cheaply obtaining the information from this coethnic or doing so by means of costly interactions with out-group ethnics. The adaptive path is clear.

Rothbart and Taylor assert that the Nazis ideologically imposed homogeneity on the diverse Weimar Jews, who were in fact a collection of very diverse communities with different origins. Even if correct, this observation does not undermine my argument that *actual* inductive potential is not the proximate priming input that causes essentialism. If the Weimar Jews were such a motley collection of peoples, then the cleavages of inductive potential would occur at the boundaries of the different communities Rothbart and Taylor list. It is apparent, then, that it cannot have been the actual "inductive potential" inherent in Weimar Jews *qua* Jews that caused Nazis to essentialize them as one homogeneous whole, especially given that ultra-Germanized Jews were grouped with quite different communities. Thus, by correcting my characterization of the Weimar Jews, Rothbart and Taylor make my point for me in a different way: Weimar Jews were probably essentialized as "Jews" not because this resulted in greater inductive potential than alternatives but because descent-based membership and category-based endogamy were perceived as coextensive with the label "Jew."

Hamilton, Sherman, and Sack take on the issue of the domain which my theory is supposed to explain and construe my effort as that of finding out what a "group" is from the point of view of observers. But, in fact, I am skeptical that the question "What is a group?" is a useful one. The extension of "group," as used by social psychologists and other social scientists, includes a staggering diversity of things (e.g., minimal groups, face-to-face groups, ethnies, political parties, etc.) that our cognition cuts into several different joints. "Group" is a rather strange yet mainstream abstraction among scholars the use of which gives them license to argue from exotic results obtained with completely artificial "groups" (e.g., minimal groups) to the processes at work in, say, ethnic conflict (e.g., Tajfel and Turner 1979). The term "group" usually tempts social analysts to project the properties that are most strongly associated with the term and that emerged from "small-group research" (Homans 1968:259) onto massive categories that don't have those properties. As Deutsch (1968:265) notes, the usage of "group" "is consonant with the intuitive notion that a group is an entity that consists of interacting people who are aware of being psychologically bound together in terms of mutually linked interests. A group is thus to be distinguished from [a] . . . category . . . which consists of people who are classified together because of some common characteristic."

My question is: How do observers decide that they are

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2. Perhaps Rothbart and Taylor will find this logic tortured, but I find no value to parsimonious explanations that fail to account for the facts. In evolution, where selection pressures are always changing direction and magnitude and adaptive lags are common, the facts often call for explanations that fall short of optimal parsimony.
3. Marked phenotypic discontinuities occur in given localities only because of modern migrations anyway. The supposedly "racial" categories themselves all blend insensibly into each other [Boyd and Silk 2000, Brown and Armelagos 2001].

looking at one kind of social *category* and not another? A social category need not have the properties most strongly associated with "groups," and it is only recently, with the advent of ethnonationalism, that some ethnies have converged somewhat on those properties. The term "ethnic group" is therefore mostly a misnomer, promoting intuitions not about what is fundamental to ethnies but about the historically recent intersections between some political and ethnic boundaries.

Such intersections are what occupy political scientists who study ethnicity. When Laitin, in the spirit of Fearon and Laitin (1996), observes that the boundaries of the ethnic group need to be *policed* by ethnic entrepreneurs, he is thinking more about *ethnic-wide cooperation*—a prisoner's dilemma payoff matrix with incentives for cheaters—than about *coordination*—a payoff matrix without incentives to cheat but rather costs to those who fail to match their standards of behavior and signaling systems (the latter, not the former, is the substance of my evolutionary argument for our adaptations for processing ethnies). This focus on ethnic cooperation pretends that ethnies behave *qua* ethnies and treats entire ethnic categories with the intuitions that go best with small face-to-face groups, conferring on them a degree of "groupness" that they do not have. Ethnies are usually vast by comparison with the scope of *informal* political organization, social control, reputation network, etc., which typically extends only as far as the local residential community (clan, village, etc.). And the fact that some modern states are ethnonational hardly makes this situation the quintessence of ethnic organization.

Coming back to the question of perception, Hamilton and colleagues say that "entitativity is the unity, coherence, bondedness among individuals that causes them to be perceived as a group." But this communicates little unless it is self-evident that "group" is supposed to tell us something about cognitive processing. These commentators make clear that their project is finding out which antecedent inputs lead to what consequent processing biases, and this is my project too. The term "group" is at best superfluous and at worst misleading to this endeavor. Let us find out what certain inputs do or do not prime in social reasoning, without the awkward term "group" and its baggage to muddy our understanding. Instead of justifying a priori semantic commitments, let us choose our scientific terminology to fit the phenomena we discover.

If we do, it is probably best to drop "entitativity" as it is currently employed. Hamilton and colleagues' claim that ethnies are low in perceived entitativity appears to confuse the degree of (objective) entitativity that a scientist can measure with a person's (subjective) intuition that a given category is like an entity. Are ethnies low in the latter? I doubt it. It seems more likely that laypeople (and scholars of ethnicity!) process ethnies as coherent entities *because* they are essentialized and *despite* the fact that their objective entitativity is low. Hamilton and colleagues are right that essentialism and entitativity are distinct concepts, but so are objective and subjective entitativity, and the causal relationships between the phenomena denoted by any of these concepts should not be assumed a priori.

My points concerning endogamy have met with considerable resistance. Astuti says, "If endogamy is what primes actors to perceive ethnic groups as animal species, intermarriage should be inconceivable," and Boyer, Laitin, and Ma raise the same objection. The point seems to depend on the example chosen. Laitin chooses to mate a giraffe with an elephant. That is indeed a strange mating. The point would be made more forcefully with the example of a bear that mates with a fly or a whale that mates with a protozoan. But if we consider interethnic marriage like mating a dog with a wolf or a donkey with a horse the force of this objection seems to evaporate. Such matings are not only behaviorally and anatomically plausible but *occur* and produce viable offspring. Importantly, these examples concern matings between species the close relation of which is apparent in the similarities they show in morphology and behavior. Any two humans in an interethnic marriage are obviously very similar, so my just-offered interspecies examples are a much better parallel—in terms of how our cognition perceives things—than the mating between a giraffe and an elephant. The intuitions which make us think that the mating between a wolf and a dog is possible but unnatural could easily be responsible for similar reasoning about interethnic marriages. The claim I have made is that *normative endogamy* helps trigger the intuition that one sees a "species"—that is, the trigger is *not* the perception of the impossibility of an interethnic mating but the perception that such things are immoral and therefore also unnatural (or vice versa), which may be underlain to a greater or lesser degree by the actual rate of intermarriage.

The objection just addressed seems to flow from the perception that priming inputs have to be either "on" or "off." But in this as in so many other domains, the brain is probably primed on a continuum: the stronger the public normative prohibition against intermarriage in a time and place, the more closely such a prohibition is observed, and the more rigid the requirement of membership by descent, the closer the input match will be to that of a species-like category and therefore the more likely humans will be to activate the essentialism exapted from the living-kind module. That is my claim.

Gelman points out that endogamy cannot work as a priming input unless it is perceived and understood and suspects that children may essentialize social categories even before they acquire knowledge of endogamy. However, this does not undermine my claims unless the point at which humans make the link between "living kindness" and endogamy is material to the substance of my argument. Suppose that at first children assume merely that the unseen and hidden essence exists and is somehow causally responsible for typical surface features and yet-to-be-discovered "hidden" properties (i.e., all they initially have is an "essence placeholder" [Medin and Ortony 1989:184–85]). The thing which initially primes a child to essentialize may be nothing more than certain key surface appearances. For example, the assumptions

that Markman (1991) describes as responsible for object-word acquisition may automatically include, for objects that appear to be animate, the additional assumption that there is a causal essence common to all members of the class. But any specific content about what the essence is, how it works, the "hidden" properties it implies, and how it is acquired remains mostly to be filled in, for children start with little beyond the "essence place-holder" itself. If this picture is reasonable, then Gelman's suspicion that children will essentialize social categories before they learn about endogamy is likely to be correct, for endogamy is merely something that shared living-kind essence is supposed to imply, and this supposition is part of what is waiting to be filled in. When children learn that members of species categories mate only with each other and that by so doing they reproduce the kind, they learn an explicitly *causal* story for the production of tokens of the class that is then naturally tied to the causal essence that they have assumed from the start is there. To think of members of a living kind mating and reproducing is practically to *see* the essence in the process of being transmitted; children's brains are waiting for just this kind of information, and the "essence place-holder" is what makes them wait in the right way. If we find that young children deploy essentialism when presented with cues that are usually good markers for social categories that ought to be essentialized, but later—once endogamy and descent-based membership have been linked to "living kind-ness"—categories lacking these two key properties *cease* to be essentialized, this will be consistent with the present argument. The aforementioned result of Hirschfeld (1996:102–7) that three-year-olds but not seven-year-olds essentialize police uniforms almost as much as phenotypic contrasts is in perfect harmony with this argument.

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