Achuar). These apparently puzzling results could be clarified with experimental studies systematically manipulating recipient relationship, along with closer examinations of mediating cognitive processes (what goes on in the minds of relatively selfish vs. generous players within each group).

Interactionist models: Blank slate or coloring book? We believe many interesting "cultural variations" are simply dynamic outcomes of relatively universal multi-setting mechanisms calibrated to local social and physical ecologies. For example, humans everywhere have similar psychological mechanisms controlling mating (such as capacity for romantic love, attachment, and jealousy triggered by particular social stimuli). Whether a culture is relatively monogamous, polygynous, or polyandrous, however, is partly a function of features of the social and physical environment (such as resource distribution and sex ratios) (Crook & Crook 1988; Kenricket al. 2003b). Even culinary preferences, formerly considered a function of "purely cultural" factors, may emerge from fundamental psychological mechanisms interacting with local ecological factors (Sherman & Hash 2001).

Our guess is that economic behaviors likewise emerge from a set of basic human psychological mechanisms involving fairness and resource distribution, constrained in different ways by kinship, age, status, and other biologically meaningful variables (Fiske 1992; Sugiyama et al. 2002). Evolutionary theorists generally presume that few cultural differences are attributable to genetic differences between groups (consider how second generation immigrants favor the cultural norms of their parents' adopted country rather than the ancestral land). Cultural theorists, however, are often a bit quick to interpret such phenomena as favoring a blank slate view, in which more or less anything is possible. Heinrich et al. present their findings in a manner suggesting that evolved predispositions and cultural factors operate independently (one part the general human tendency not to be completely selfish, and one part learning the local norms).

Economic decisions may indeed be one part universal added to one part free-ranging culture. But the more interesting possibility involves true interaction – with universal mechanisms calibrating themselves to local ecological conditions. Exactly how these interactions unfold requires more of this truly cross-cultural comparison, in combination with experimental manipulations to elucidate underlying processes. We believe such investigations will not reveal many parts of the slate to be blank, or to be pre-painted in the genes (Kenrick et al. 2003a). Instead, interactions between genes and culture are better conceptualized as a coloring book, with distinctly drawn lines directing experience in different domains, but particular palettes chosen to complement the locally popular behavioral hues.

Let's add some psychology (and maybe even some evolution) to the mix

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Abstract: Henrich et al.'s nice cross-cultural experiments would benefit from models that specify the decision rules that humans use and the specific developmental pathways that allow cooperative norms to be internalized. Such models could help researchers to design further experiments to examine human social adaptations. We must also test whether the "same" experiments measure similar constructs in each culture, using additional methods and measures.

The work that Henrich et al. report is impressive in its cross-cultural scope and fascinating in detail. Any experimental economist implicitly operating on the premise that American undergraduates are representative of humankind must feel chastened. To some extent, this is *déjà vu* for psychologists, who have repeatedly seen cross-cultural studies complicate simple views of human nature, but the ecological reasons for cultural diversity have less frequently been explored (e.g., Gangestad & Buss 1993; Low 1990; Sherman & Hash 2001), as Henrich et al. do in their regressions (target article, Fig. 5) and case-specific ethnographic accounts (sect. 8).

As much as we appreciate their research, however, we have some qualms about the ways in which the authors interpret it. First, as Henrich et al. note, the Ultimatum Game had already debunked Homo economicus before anyone took it overseas, and yet by bashing a "selfishness axiom" that is a straw man, they may mislead readers into thinking that the proposition that motives are "ultimately" (functionally) selfish has also taken a beating. It has not. People may very well possess sincere preferences for fairness, magnanimity, and adherence to local norms, but whether such preferences have evolved because they helped our ancestors reap reputational or other long-term benefits of cooperation is a distinct question that these studies do not address. The authors apparently believe their results speak to such evolutionary issues, since the target article's concluding discussion begins and ends with repeated references to evolution, but we looked in vain for specifics about how "culture-gene coevolutionary theory" (or indeed *any* brand of evolutionizing) either informs this research or points the way forward.

The authors analyze both cross-cultural and within-society sources of variance, but leave readers wanting the two levels better integrated. Henrich et al. recognize the need for psychological theories of learning, framing effects, and various motives or preferences, in order to account for diversity at both levels, but in our view, their discussion of such psychological phenomena still lacks the specificity needed to develop testable hypotheses for future research. To their credit, they cleverly address whether risk or ambiguity aversion might explain certain results, but only within the constraints of modeling people as rational maximizers, which is arguably a non-starter. A complete account will eventually include an explanation of how the generic human mind (even if such a thing exists only in infancy) responds to environmental contingencies, and what the specific developmental pathways might be that translate ecological and societal variability into behavioral variability. For example, cross-culturally general cognitive and emotional responses may lead people to act cooperatively to the extent that they expect others to do likewise (Price 2005), with learning processes tailoring a person's cooperativeness to what is locally adaptive or reinforced. We look forward to a model that details the specific processes by which this might occur.

Over a quarter century ago, Pruitt and Kimmel (1977) complained that the field of experimental gaming, with over 1000 studies already published, was a "method bound approach, lacking in theory and with little concern for external validity" (p. 363). Are these complaints still relevant? The ecological validity issue is answered, at least in part, by Henrich et al.'s successful efforts to find predictors of game play in real world social phenomena (Fig. 5 of the target article), but the accusations of being method bound and short on theory are a little harder to shake. Are the Ultimatum, Public Goods, and Dictator Games being used in cross-cultural research because they are experimental tools that are well designed to illuminate the psychology of cooperation, or because there is already a literature on them? And is there still a paucity of theory?

Drawing psychological inferences from an experimental simulation of an isolated component of social reality is always tricky, but

it is especially so in comparative research, whether across species or societies. Henrich et al. assume, based on data gathered chiefly from industrial societies, that their games tap into the psychology of such important constructs as fairness and equity, but even in such societies, what psychological phenomena these games tap into is controversial (Camerer & Thaler 1995) and capable of surprises (e.g., DeBruine 2002). So how can we be sure we are even studying the "same" thing when different peoples play the "same" games? People do not necessarily construe even the simplest economic games as one might initially suppose (e.g., Kiyonari et al. 2000), and Henrich et al. themselves argue convincingly that culture affects how people construe the games. But where does that leave the goal of drawing inferences from cross-cultural economic games research about human cooperativeness, taste for fairness, other-regarding sentiments, and so forth?

Henrich et al. have brilliantly documented cross-cultural diversity in economic game play, and have provided strong evidence that other aspects of these societies predict much of that diversity. To clarify how players perceive these tasks and how their decisions are made, we think future research will require experiments that are more explicitly psychological in their approach, and if they are to illuminate the evolutionary origins of our species' remarkable capacity for cooperation, such experiments should test hypotheses derived from a conceptual model of social evolution built on an appreciation of the qualities of information (e.g., reliability and regularity) available to our ancestors for use in cooperative ventures.

Born selfish? Rationality, altruism, and the initial state

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Abstract: Henrich et al. propose that humans are genetically equipped with learning mechanisms that enable them to acquire the preferences and beliefs related to economic prosocial behaviors. In addition to their cross-cultural data, they cite developmental evidence in support of this theory. We challenge Henrich et al.'s interpretation of the developmental data in a discussion of recent work which suggests that preferences for altruism and fairness may have an innate basis.

> *Be warned that if you wish, as I do, to build a society in which individuals cooperate generously and selflessly towards a common good, you can expect little help from biological nature. Let us try to teach generosity and altruism because we are born selfish.*
> —Richard Dawkins (1990, *The Selfish Gene*)

In Henrich et al.'s model of economic game performance, people have preferences, beliefs, and constraints that vary across cultures and are the product of culture-gene co-evolution; only the general facility for learning the preferences and beliefs of one's culture is genetically programmed. From this model it follows that Dawkins's view, expressed in the quote above, is correct: particular preferences for generosity and altruism must be acquired through cultural learning. Henrich et al. present an impressive body of research showing wide cultural variation in performance on economic games. They also cite developmental research showing that children can imitate altruism or selfishness with equal facility. Moreover, they cite one of the few studies investigating young children's performance on bargaining games: Harbaugh et al. (2004) found that children playing ultimatum games were more selfish than adults. Henrich et al. argue that these developmental data indicate that "preferences related to altruism, conditional cooperation, and equity are acquired slowly over the first two decades of life" (sect. 9, para. 8). They conclude that preferences for fairness, altruism, and reciprocity result from the influence of economic, social, and cultural environments rather than from universal (and possibly evolved) preferences for cooperative and altruistic behaviors. We challenge Henrich et al.'s interpretation of the developmental data.

The developmental work that Henrich et al. cite involves school-age children, but research on younger children and infants suggests a possible role for innate biases regarding altruism. As the authors note, Harbaugh et al. (2004) have indeed found that children as young as seven have more selfish preferences than adults in ultimatum games. However, Hill and Sally (2004) found that six-year-olds were as generous as adults in dictator and ultimatum games. Moreover, using an even younger sample, Chow et al. (2005) found that four-year-olds demonstrated preferences for fairness and altruism in dictator and ultimatum games similar to those of American adults. These results seem inconsistent with Harbaugh et al.'s finding, but there were methodological differences among the studies that might account for the discrepancies. Notably, Harbaugh et al. used money instead of goods. Children at that age, however, may not understand the value of coins or currency, and instead treat money more like tokens in a game than like commodities in a social exchange (indeed, the initial exchanges were with tokens which were only later traded for cash). Both Chow et al. and Hill and Sally used stickers which are of obvious and immediate value to young children. The results showing adult-like sharing in children as young as four suggest that core values of generosity and fairness are in place earlier in development than had been thought. Although these studies by themselves do not show that altruistic preferences have an innate basis, they prompt a revision of the assumption that young children are naturally more selfish than adults.

More support for the notion that humans are biologically predisposed towards altruism and generosity comes from work with infants. Martin and Clark (1982) found that 1- and 2-day-old infants exhibit signs of empathy by crying when another infant cries. In a controlled experiment, Bischof-Kohler (1994) found that, when confronted with a person in need, 14–24 month-olds engaged in prosocial interventions. Warneken and Tomasello (2005) also found that in an experiment on helping behavior, 18-month-olds spontaneously performed actions whose goal could only be to help a strange adult with a problem (e.g., retrieving a dropped object). These data are problematic for a view which holds that preferences for altruism and cooperation must be slowly learned over the course of decades. Instead, they suggest an initial state already biased towards prosocial behavior. Such an initial state makes sense evolutionarily, given the advantages conveyed by reciprocal altruism on organisms with large enough brains to remember past favors. This supposition is consistent with work showing that apes and monkeys exhibit reciprocal altruism (de Waal 2000; Hauser et al. 2003).

It is hard to argue with the impressive data collected by Henrich et al., showing the role of environment and learning in acquiring specific preferences for selfish or altruistic behaviors. The data indicate that humans may well be genetically programmed for ease of acquisition of cultural norms for cooperation and altruism. But this position does not rule out the possibility that humans also have instincts for altruism. An analogy with language acquisition might be helpful. Acquiring a specific language requires substantial learning and exposure to a particular language environment. But this fact is not inconsistent with a role for innate linguistic universals that constrain the kinds of languages that can be learned. Similarly, the range of possible norms for sharing and social exchange that can be learned may be constrained by specific innate preferences for altruism. Consider the work on imitation cited by Henrich et al. (e.g., Bryan 1971; Grusec 1971; Presbie & Coiteux 1971). Those studies involved a form of the dictator game in which children were allowed to split winnings from a bowling game with an anonymous individual or a charity. The results showed that children were influenced by an adult model's previous generosity or stinginess. Although this and other work has