

## Technology and Past Minds: The Case of Jewish Niche Construction

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Judaism provides an important test case to understand the relation between cognition and past minds. I think bottom-up psychological processes tend to be overemphasized in cognitive accounts of culture and religion. Thus, the main purpose of this essay is to give the rudiments of a plausible account of downward forms of causation that also does justice to biology and cognition. It is for this reason that I focus on mechanisms of niche construction and gene-culture co-evolution. These concepts are powerful tools for explaining institutions like writing and religion, the primary cases of downward causation. I think these concepts also encourage us to leave behind a static picture of human cognition where modern day humans are simply Pleistocene creatures wearing Versace.

### Introduction

Though it is an extremely controversial line of argument for obvious (though nonetheless important) reasons, there is pretty good evidence to indicate that human mental function, and perhaps corresponding brain structures have changed in the past 40,000 years, even the past two thousand years (Smith 2007; see also Hawks *et al.* 2007).<sup>1</sup> If one approaches this history within traditional evolutionary psychology, this evidence presents somewhat of a problem.<sup>2</sup> Scholars in this field usually want to insist that we basically have a Pleistocene mind, and what has changed is not biology, but culture. But if we really espouse a concilience approach to biology and culture, this idea must be challenged. Culture is not the

1. Merlin Donald notes in a personal communication that he thinks “humans have continued to evolve, well into the period of modern occupation of the continents, and well into the period of increased population density... Many quite recently differentiated subgroups—Jewish people are probably one such subgroup, in a cultural sense, although not really genetically homogenous at this point—were subjected to unique environmental pressures for centuries, and it is unlikely that they were not subjected to some serious selection pressures. I would be very surprised if there were no major differences between such groups, especially when they can be identified as sharing certain genetic traits” (email message, September 14, 2007). More will be said about this below.
2. For some other related problems of traditional evolutionary psychology, see Buller 2005.

outer, inauthentic manifestation of biology, but an essential substance that feeds back into evolutionary history. The human brain may be “relatively” the same as it was in the Pleistocene, but of course the big question is just how relative are we talking and what difference it makes? In this essay I present an evolutionary argument that attempts to explain Jewish “intelligence,” not so much because I endorse the explanation, but because I think this is the type of problem that cognitive science presents useful tools to answer. Furthermore I think the case complicates the naïve viewpoint that sees modern day humans simply as Pleistocene hominids with the accoutrements of modern life attached to us willy-nilly. The basic point is that technological forms such as writing and cities that persist long enough over time can in principle have stable biological significance (Clark 2004).

On the one hand, since we do not have a Pleistocene brain around to study, we are left with very indirect evidence to make our case. On the other hand, we have an abundance of material artifacts and evidence over the past 100,000 years. It is quite obvious that the cognitive niches that humans have constructed over time have changed dramatically, for example, with the emergence of urban centers. Perhaps some of these significant changes are instantiated in the biological brain; for example, a great deal of research has come out in the past few years concerning the biological effect of technologies like television (Miller and Borzekowski 2007; Anderson and Pempek 2005; Escobar-Chaves *et al.* 2005; Van Evra 2004; Vandewater *et al.* 2005). It is not obvious that these technologies are persistent enough to have an *evolutionary* biological effect, but at least we now understand some very clear mechanisms to talk about the continual feedback between biology and culture.

### A Word of Warning

There is a great deal of controversy around the subject of Jewish “intelligence.” A psychologist at California State University named Kevin MacDonald was probably first to reapply principles of natural selection to Judaism. As early as 1994, he used group selection theory in a simplistic fashion to try to account for Jewish intelligence, arguing that Jews have consciously used eugenics and selective breeding throughout their history to achieve it. Though this article is in sympathy with an attempt to reconcile evolutionary biology with the study of culture and history, there have been significant doubts raised about MacDonald’s motivations—specifically his association with the far right—that urge me to distance myself from his body of work.

There are immense implications of the emerging field of the cognitive science of religion for these questions. However, any argument made on this subject will be taken up by political operatives to justify an agenda. The so-called “Jewish Question” has been at the core of much political theorizing in the modern west. Indeed, *any* materialist theory that takes up Judaism as a subject-matter, will be forced to deal with the “Jewish Question.”<sup>3</sup>

3. For the first polemic, see Marx’s *On The Jewish Question* (1843). We are not now outside of “The Jewish Question.” The scholar cannot step outside of it and understand its origins and causes. MacDonald’s morally myopic work yet again points to the dangers of applying evolutionary theory to history. Since history is primarily a narrative, it is a form of rhetoric. Evolutionary cultural historians tend to inter-spere evidence from cognitive science or evolutionary psychology into the historical narrative, and this is imagined to give it more objectivity. On the contrary, I think the cultural historical narrative should be judged on its own merits, though this does not exclude examination of scientific evidence in support of it. However, I still insist that evolutionary biologists and cognitive scientists of religion (especially) should not turn their backs on the relation between biology and history.

With regard to Judaism then, the notion of consilience is dangerous. But I insist it will do us no good to approach this subject with our back turned from the fundamental problems. I do claim that Jews on average excel at certain forms of intelligence, namely verbal and reasoning ability. I explain this by way of the theory of niche-construction and downward causation. All of these terms are open to further interrogation.

If my arguments entail a political point it is that an overly deterministic narrative that seeks to integrate biology and culture is the wrong way to go. Culture is radically underdetermined by biology, and just as biology affects culture, so too culture affects biology. Biology cannot mix itself into the detailed narratives in history, except perhaps as a rhetorical trope, because causation in historical narrative is not the same as causation in scientific inquiry.

### Ashkenazi “Intelligence”

In a story about Jacob in Genesis 30: 35 we find an excellent parable for the case to follow. This is a story about sexual selection. To make a long story short: Jacob goes far and wide to try to get the proper wife, and he winds up with two after a series of negotiations. Somewhere along the line Jacob’s father-in-law Laban tries to trick him. Laban says he will give Jacob goats of a certain color, but Laban removes the goats from the flock before Jacob will get them. Jacob in turn devises a way to breed the goats he needs. Jacob peels poplar and other sticks to make white streaks on them, and then uses these sticks to organize the breeding of the flock (33: 41). Later in the story, Jacob will be renamed Israel and become the father of the Twelve Tribes. Jacob’s miraculous fortune is owed to his use of symbolic forms (the white streaks), but also involves the skilled manipulation of economic, social, and biological domains. On the surface this is simply an example of domestication or “artificial breeding,” but as scholars since Darwin have known, artificial selection is merely *natural* selection with environmental constraints imposed consciously by human masters.

Opening this line of argument in relation to the question of Jewish intelligence I reiterate is a particularly controversial place to start, but it is so crucial to the points I want to make in this essay that I cannot avoid it. By pointing to Jewish history as an example for the process I want to highlight, I am not making the claim that it is only in the Jewish case that processes like it are in place, nor that it is the only explanation. Furthermore, in making the case for a biological account, I am not claiming that historical factors, such as the emancipation of Jews in Europe during the 19<sup>th</sup> century play no role in the story about Jewish intelligence. Quite to the contrary I am looking for a suitable way to integrate the insights from cognitive science and evolutionary theory into the study of Judaism that does justice to both biological nature and the irreducible contingency of history.

To be clear, the concept of race has been thoroughly debunked as a biological category. So, there is no such thing as the Jewish race. However, we cannot deny the existence of discrete genetic forms or inheritances in different human populations. This fact is attested in the growing phenomenon of genetic ancestry tracing. For the most part, these tests (often imprecisely) determine where a person’s ancestors came from, and often little else. Geography is a predominant factor in human history because it can isolate certain populations allowing for adaptation to particular environmental circumstances and thus producing characteristic genetic forms. In the case of Judaism, to put it bluntly, the question is whether a cultural technique of isolation could serve the same purposes as geographic isolation. Indeed, the ghetto wall and the *shtetl* were forms of geographic isolation. It is still an open question the extent to which Jewish populations were isolated in Europe over the

past 2000 years, though in the case of the Ashkenazim most researchers now come down on the side of genetic isolation (Nebel 2001 and 2005, 388).

Susan Kahn has recently noted that Ashkenazi Jews in particular have been a boon for genetic researchers because, apart from their willingness to be tested, the population also exhibits some classic mechanisms in the theory of evolution, namely 1) the founder effect, “in which a population that is descended from a small handful of ancestors historically shuns intermarriage or is forcibly ghettoized, thereby maintaining genetic lineages (including disease-causing mutations),” and 2) “the theory of genetic drift or bottleneck, which occurs when a genetic mutation becomes common because the population in which it is found dwindles due to famine, war, epidemic, or other event, as has happened frequently among Eastern European Jews” (Kahn 2005, 180).<sup>4</sup> Indeed, there is an immense literature on this subject, exploring such questions as the prevalence of Tay Sachs disease in Ashkenazi populations. Tay Sachs is a genetic disease where a fatty acid derivative called a ganglioside accumulates in the nerve cells of the brain. Cochran *et al.* (2006) argue that the disease is tied to Jewish “intelligence,” but there are also other theories that explain it, such as genetic drift, or adaptation to TB (Slotkin 2004).<sup>5</sup>

That having been said, there may be an evolutionary explanation for “Jewish Genius,” the fact that, according to Charles Murray (of *Bell Curve* fame/infamy), an extraordinarily disproportionate number of Noble Prize winners are Jewish and that Jews appear to score better on I.Q. tests than other groups on average. Though these tests are extremely controversial if we take them as a measure of intelligence writ large, it is clear they do accurately measure certain intelligence abilities.

Murray (2007, 3) notes in his study *Human Accomplishment* that there were only seven Jewish “significant figures” from 1200–1800 c.e. (see Murray 2003). After Jewish emancipation in Europe however, when they were no longer excluded and no longer excluded themselves from broader European society, there were 170 (by 1950). Murray notes that “in the first half of the 20<sup>th</sup> century, despite pervasive and continuing social discrimination against Jews throughout the Western world, despite the retraction of legal rights, and despite the Holocaust, Jews won fourteen percent of the Nobel Prizes in literature, chemistry, physics, and medicine/physiology” (Murray 2007, 3). In the second half that figure more than doubled. Since Jews constitute two-tenths of one percent of world population, these

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4. For more on the genetic picture, see the interesting literature on the so-called Levite Haplotype in Ashkenazi populations. The data points to a common (or relatively few) male ancestor for Ashkenazi Levites within the last 2000 years (Nebel *et al.* 2004). The mitochondrial evidence in Jewish women is more variable, thus “the striking dissimilarities in the genetic signatures of these women suggest that diasporic Jewish communities were established when Jewish male traders from the ancient Near East intermarried with local non-Jewish women along their trade routes” (Kahn 182, citing Thomas *et al.* 2002; for the debate on the Cohen Modal Haplotype, see Zoosmann-Diskin 2001).

5. The point of this paper is not to make moral or ethical claims, but simply propose that *some* Jews have ancestors who adapted to a particular cognitive niche, which in turn enhanced a certain type of intelligence. Obviously intelligence is far too complex a concept so that it could be fully captured by a test. Rather than making a Hobbesian point here I mean to be emphasize that human intelligence itself is plastic. If we understand the brain more like an elephants trunk, only far more plastic and adaptive, it is not hard to conceptualize the type of change I am envisioning. In the same way that skin color or eye color vary, so do intelligences. Indeed, the well-known rebuttal to a biological argument for IQ has been evidence of the “Flynn Effect” which shows that IQ scores rise with every generation since the testing began. Thus some have argued that IQ tests do not test how intelligent one is, but how modern (Gladwell 2007).

numbers seem staggering. In terms of IQ, Jews are about average on tests of visual-spatial skills, “but extremely high on subtests that measure verbal and reasoning skills,” so their overall average is about “one standard deviation higher than the north-western European average” (Murray 2007, 3; Cochran 2005, 659).

Murray (2007) notes two popular genetic explanations for these facts: “winnowing by persecution,” and “marrying for brains”. He dismisses the former as cutting both ways because “the kind of intelligence that leads to business success or rabbinical acumen” is not of much help when the “Cossacks are sweeping through town” (4). The latter explanation also does not help very much, as the data is simply not there to address how much the “attractiveness of brains” played in selecting marriage partners. Instead Murray offers the research of Cochran and his colleagues (2006), who propose that

the high intelligence test scores observed in the Ashkenazi Jewish population are a consequence of their occupation of a social niche over the last millennium that selected strongly for IQ . . . that there was an increase in the frequency of genes that elevated IQ as a by-product of this selective regime, which led to an increased incidence of hereditary disorders. (659).

The “social niche” Cochran *et al.* and Murray, point to, is the “managerial” (sales, trade, finance) occupations of urban life that Jews were confined to (or confined themselves) for approximately 900 years (Cochran *et al.*, 670). These scholars argue that the Malthusian collusion between economic, intellectual, and biological success meant that wealthier families tended to have more offspring. In turn more children tended to survive into adulthood in the “successful” entrepreneurial families. In the case of Judaism, since its inception there has been a tendency to equate biological and intellectual fecundity—an especially stark distinction from Christianity whose scholars remained celibate until Luther let the dogs out.

I recognize just how controversial the equation of economic and biological success is, and I will not go too much into the argument here,<sup>6</sup> for my purpose is simply to cite an example of a relatively isolated cultural group adapting to a socio-economic niche, for which there was presumably corresponding *cognitive* changes in the brain. In terms of the physiology, these changes may statistically apply to brain volume, volumes of specific regions, density, reaction times, and brain glucose utilization rate (662). This would be a paradigmatic example of evolutionary processes active in human history and in the development of past minds. In this case culture is not simply the explanandum to be explained away, but must be understood as part of evolution itself. Indeed, the integration and interaction of cultural technologies (such as those of different occupations) and cognitive biology goes back the very origin of *Homo sapiens*. These findings clearly point to the more plastic dimensions of the human mind/brain—its ability to adapt to different cognitive and ecological niches relatively quickly. In this case, I am less concerned with the controversial points about Jewish intelligence than I am in giving an exemplar of downward causation (Bøgh 2000).

Written language and Biblical culture, I would argue, have been the primary mechanism for the creation of the cognitive niche in which Jews have been so “successful”—namely late 20<sup>th</sup> century liberal societies. These societies are the ultimate form of what Merlin Donald calls “theoretical culture.”<sup>7</sup> In another world we might expect that those specific forms of intelligence noted in the articles above would not be very beneficial. It just so happens

6. For more on this Malthusian logic, see Clark and Hamilton 2006.

7. Though I cannot develop it here, I think the last chapter of *A Mind So Rare* (Donald 2001) has profound implications for the argument I make.

that present day Western society finds things like Nobel Prizes extremely valuable.

In all of these arguments about Jewish intelligence literacy is a crucially important factor, for Cochran *et al.* note that “the key cultural precondition among the Jews was a pattern of social organization that required literacy, strongly discouraged intermarriage, and that could propagate itself over long periods of time with little change. Literacy (which does not itself require high intelligence) was probably important in the shift from a nation to an urban occupational caste . . . ” (667; see also Botticini and Eckstein 2005). Murray even goes so far as to argue that the difficulty of interpreting the Biblical text would increase the number of “low intelligence” deserters (2007, 8). But what is it about literacy that makes it a characteristically Jewish form of intelligence, and how does it relate to verbal and mathematical reasoning? What is the connection between these managerial trades and cognitive changes in intelligence? What is the process under which a cultural niche can have such effects? In what follows I will present the rudiments of an answer by going back to cognitive origins of written language.

### The Evolution of Writing Systems in Children and History

Writing systems and the corresponding inventions of science and higher mathematics are forms of intelligence that the world had never seen before. That is, these mark a particularly distinct form of cognition and intelligence one step removed from the cognitive processes that predominated in human cultures for the past 100,000 years. The fact that so much of modern post-industrial life revolves around these forms of technology should give us pause, and we should be working hard to think of ways to understand post-industrial brains with the new tools of cognitive science. That having been said, the origins of written culture in the Western world goes back to the ancient near East, to southwestern Iran, where we find an intrinsic connection between writing and accounting.

We find evidence for a ratcheting effect<sup>8</sup> in the early story of writing from about 8000 to 3000 BCE as told by Denise Schmandt-Basseret (1992).<sup>9</sup> In the proto-stage, human beings sculpted figurines representing various gods and animals for ritual purpose. In the next stage tokens of basic geometric shapes representing simple food staples were made out of baked clay. Next, more complex tokens emerged that represent complex staples. These tokens would be sealed in clay envelopes for accounting purposes in the context of the rise of agricultural surpluses and cities. Since there is no way to tell what was in the envelope, in the next stage someone came up with the idea to embed tokens on the outside of the clay to tell what was inside, and thus a system of marks was developed for the same purpose. This facilitated a transition from three-dimensional objects to two-dimensional scratches.

Up to this point there was a one to one correspondence between an object and token, so for example, three jars of grain were represented by three tokens in or on the envelope. A sign represented the token inside the envelope, which in turn represented a commodity/staple. In the next stage clay tablets replaced clay envelopes and a sign mark on the tablet

8. For the term “ratcheting” as applied here, see Tomasello 1999, 37–40 and Levinson 2005, 10.

9. It is interesting to note that this is the time period for the emergence of *ASPM* (abnormal spindle-like microcephaly), a gene thought to regulate human brain growth. Martin (forthcoming, 16–17) points out that the evolutionary argument that ties brain size with cultural abilities is extremely speculative. In other words it has not been shown that the emergence of *ASPM* corresponds to any real phenotypic changes. However, this is an open question; these genes may indeed express themselves as variation in certain types of cognitive abilities (see Nitzan and Lahn 2007).



was used to represent a token, marked either with a stylus or the corresponding token. The first recordings of numerals occur with these tablets. In other words, there is no longer a one to one correspondence. Here the sign represents a concept, not the particular object in question, and we move to greater degrees of abstraction. In the next stage, which Schmandt-Basseret does not discuss, signs go from representing objects or concepts (pictures) to representing the sound of first syllable of the word for the concept (acrophonic principle) and eventually signs represent sounds.

In line with the current revival of Evo-Devo, a field of biology that examines ontogenetic development to find insight into evolution, I find it extremely interesting that this “evolutionary” trajectory is similar to the developmental progression of literacy in young children. Homer and Olson studied pre-literate children’s developing conception of writing (Homer and Olson 1999). There are striking parallels between this form of the development and the one noted in the case of writing. The basic gist of their finding was that as children age most move from a “token” based representational schema to a “type” based one. When preliterate children were asked to write “one dog, two dogs, no dog, red dog, blue dog” many used the individual word dog as a token one-to-one representation. Thus “two dogs” was written as “DOG DOG” and “no dog” many claimed could not be written. This points to the fact that many preliterate children believe there is some intrinsic non-arbitrary relation between the written word and the concept/thing to which it refers. As children progressed they learned that the sign “dog” could be annotated and modified with other signs, namely numerical ones.

The fact that both cognitive systems develop from an iconic stage to an indexical one has precedents in many other fields. More complex informational systems must, by definition, be built up out of simpler systems, for it would be impossible for the symbolic relation to emerge without a more basic layer of one to one relations. The iconic perspective would seem to be the default cognitive position that must be modified with training. Furthermore, we know that the relation between token and type is a key property of any informational or programming system, from MS-DOS to DNA (see Deacon 2004 and Clark 2006). In contrast to much of what has been written about the predominant effect of writing on the mind, perhaps the most revolutionary innovation for human development was the robust recognition of the type-token distinction, which simply put is an “ontological one between a general sort of thing and its particular concrete instances.” For example, the sentence “a rose is a rose is a rose is a rose” has three word types and ten word tokens (Wetzel 2006). Training in literacy is training in higher-order characterization and organization, especially with regard to words and numerosity; for this reason the earliest forms of writing rarely distinguished between letters and numbers.

### Jewish Niche Construction: The Emergence of Writing and Cities

So types are higher order labels that apply to a configuration of tokens. Similarly, in discussing the emergence of what he calls the “Age 4 transition,” the theoretical philosopher Mark Bickhard points out that

knowing is an interactive, functional, relational property between systems and their environments, and ... such interactive systems ... themselves instantiate properties that could not be known (interacted with) by the systems themselves, but could be interactively known by systems at the next higher level.... The hierarchy of potential knowing levels is

generated by iteration of the basic relationship of representational “aboutness”—each level’s interactive representations are about properties of the lower level. (Bickhard, 2)

Bickhard points out that the hierarchy of interacting systems can be climbed only in a particular sequence because, to paraphrase, lower order arrangements provide the content for higher order systems. Though this example is meant to make sense of the important step in human development around the age of 4 when full-blown intersubjectivity becomes apparent in most human beings, we can equally well apply it to the “emergence” of writing. It is not unrelated to this transition at all: recent research in the psychology of literacy has shown that literacy tends to enhance or change precisely theory-of-mind/cognitive-embedding abilities that make their robust appearance in children around the age of 4 (Olson 2001).

David Olson, the foremost researcher in the psychology of literacy, is the first to point out that claims about the enormous effects of literacy during the 70s and 80s were somewhat exaggerated. Since then, literacy has been shown to “play less a causal role than an ancillary or instrumental one in psychological and social change.” Thus “literacy played more of a role in the elaboration and adjustment of pre-existing structures and practices than in the actual creation of novel ones” (Olson 2001, 240). However, Olson does leave room for one extremely important locus of change that literate composition brings to this equation, and this concerns precisely the theory of mind mechanisms that are so central to culture and religion.<sup>10</sup> Literacy is in principle meta-linguistic because complex forms of written correspondence are forms of quoting oneself—one must disembed her own utterances from their normative environment of present speech in order to communicate in writing (Olson 2001, 243–244). So to put it more concretely, the idea is that literacy not only helps organize lower order representations like words and numbers, but robust literacy also helps to organize “higher-order” cognitive activities and propositions (see Levy 2008, forthcoming).

Writing did not begin this way. As Jared Diamond has pointed out: “anyone hoping to discover how Sumerians of 3000 BC thought and felt is in for a disappointment” (1999, 234). The first forms, as noted, were extremely cumbersome; they were what Diamond calls “telegraphic” in an analogy to another somewhat cumbersome communicative technology that has since been modified. Diamond reiterates Levi-Strauss’s point that the main function of ancient writing was “to facilitate the enslavement of other human beings” (235). The shift to expressive forms of resistance and poetry would come much later.

The points made above concerning perceptions about writing in young children must also be understood in light of a developmental progression. It is not that children who use the token method for accounting for writing are wrong, it is rather that at a certain stage

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10. Dunbar (2006, 176–177) also makes the connection between “cultural evolution” and theory of mind. The evidence indicates that the neo-cortex grew in correlation (perhaps causally) to the size of human groups. The inference to take here is that the neocortical, non-modular, brain grew to keep track of *social relations*. A social relation is not a physical object; it is invisible. From keeping track of invisible social relations, it is a quantum step to keeping track of relations in general. Cognitive disembedding is simply a higher order form of this ability. It takes the outputs of lower order relation tracking as the inputs to higher orders of relation tracking. Thus the marked outcome of this cognitive process in most adult humans is the ability to retain comprehension while imbedding up to 5 or 6 propositions within a sentence. “I believe that you think that I want you to suppose that I believe that the world is flat” (173). Dunbar finds this embedding essential to teaching and learning, and thus to cultural transmission in general.



when robust literacy emerges children are able to take higher order inputs, such as theory of mind concepts, into processes of communication and thought. The emergence of writing as a historical phenomenon must have gone through a similar developmental process.

But the development of various “knowing levels,” in Bickhard’s terminology, are not one-dimensional, linear events. Knowing levels are processes where higher levels are made up of a variety of lower order processes, which themselves do not reduce to one another. This is so because the organization itself of each micro-system is a key property for higher order processing (Bickhard and Campbell 2000, 342–343). Bickhard’s model gives an extremely compelling framework for making sense of the Age 4 transition in neurological terms. There appears to be a consensus from a variety of angles, including Baron-Cohen, that the theory of mind takes as its input simulations of interactions between social agents—thus the organization of the interaction, similarly, will be key (see Baron-Cohen 1995, 38–40).

In the limited uses of early forms of writing, Diamond finds a clue for the reason why writing appears so late in the human narrative: it was for management and control of complex institutions. He notes that all forms of writing seem to have evolved in the context of “socially stratified societies with complex and centralized political institutions” (Diamond 1997, 236). Similarly Whitehouse, Goody, and Boyer also connect writing to complex polities, though they disagree concerning causes and consequences. While Whitehouse tends to favor the idea of writing emerging in the context of other technological and demographic changes, Goody and Boyer seem to indicate writing was the cause of the changes (see Boyer 2001, 313–315 and Goody 2004). I think a more fruitful line of approach to this subject is to see in literate societies the emergence of a novel ecological niche.

For our purposes it is sufficient simply to point out that higher-order phenomena, such as literacy (which is only of high-order from a certain perspective) is composed of a causal lattice among various interacting levels (Lemke 2000). A crucial element in this causal lattice is the social environment in which literacy develops. Indeed, in his 1997 book Diamond goes further to say that the change in food production technology was a necessary condition for the emergence of writing. This is not a trivial condition, for we saw that Schment-Basserat has shown the empirical connection between surplus storage, accounting techniques, and the emergence of writing. The store of surplus, in turn, allowed for the emergence of cities: “early writing served the needs of [complex and centralized] political institutions (such as record keeping and royal propaganda), and the users were full time bureaucrats nourished by stored food surpluses grown by food-producing peasants” (Diamond 1997, 236). Thus we find the movement and development of a “naturally” occurring ecological-social niche. Literate guilds slowly molded the social environment to be conducive to their own particular skills. Goody pointed to these connections long ago, between domesticating the savage mind and writing (Goody 1977).

But can we be more precise about the mechanisms by which biological and cultural ecology interact? Indeed we can. Levinson notes a number of relevant mechanisms of “twin track evolution with feedback” from culture (Levinson 2005, 4). The first is natural selection in an environment that “can be partly constructed by the organism itself.” For example, the invention of fire “lies behind the progressive reduction of dentition” in *Homo sapiens*, due to the fact that fire softens food. The second is the Baldwin effect where “behavioral changes can feed back into the genome by exposing the organism to new environmental pressures.” The example he gives is clothing, which encouraged humans to move into colder climates, which in turn lead to physiological adaptations. These first two probably fit under the rubric of niche construction illustrated by Odling-Smee *et al.* (2003). The

third is group selection, which occurs where a group can act in concert to affect the fitness of other groups; this process is a likely scenario for the extinction of the Neanderthals in northern Europe (Levinson 2005, 6). Related to group selection, the fourth is “kin selection in culture-bearing kindreds,” where the well-known mechanism of altruistic behavior toward others of sufficient biological relatedness is regulated and modified by the perception of common culture. The fifth is sexual selection, or the “choice by females of their mates.” Indeed much of culture and language has recently been understood in this line of thinking (see Martin 2008, forthcoming and Deacon 1997, 379–381, 384–389). For example, Levinson notes that if a culture erects boundary conditions for reproduction, like the payment of a bride price, “it translates the biological foundation for those skills into reproductive success, thus ultimately fixing those skills in the genome.” The last form of feedback Levinson terms “auto-domestication,” by which Levinson means selective breeding in human populations, though there are “distinct limits to the extent to which humans have applied breeding techniques to their own kind” (2005, 7).<sup>11</sup>

Thus literate religions like Judaism do not evolve in a technical sense, but they do make lasting changes to human ecology, which in turn have their own selection pressures. Indeed there is a case to be made in terms of sexual selection that much of the human decoupling ability, which would be so important to religion, evolved so that men could convince women and their fathers to give themselves over into a sexual relationship (marriage). In women, a pronounced cheater-detector *and* false-belief detector would be crucially important for sifting the respectable men out from sexual cheaters and smooth-talkers, respectively. These cognitive systems develop faster in girls and are more closely associated with estrogen; indeed “in the brain centers for language... women have 11% more neurons than men” (in contrast, men have “two and a half times the brain space devoted to sexual drive,” see Brizendine 2007: 5).

However, knowing the mental states of potential suitors is crucial for all parties involved, not just the women. Wildgen makes a similar point concerning the origin of language. Citing Dunbar and Deacon, he adds that it is not just women who need to detect sexual cheaters, for while “females needed more and richer information on the males to select in order to be able to predict their future behavior in the caring for females and children,” males had to be able to trust women sexually “when they were on long hunting excursions” because they “do not want to invest in the children of other males” (Wildgen 2004, 19). With these points we are reminded again of the story of Laban and Jacob, where language is again tied back to food and sex. To put it simply, with literacy—especially literacy of both sexes—a new biological phenomenon emerges: the love letter (*Shir ha-Shirim*) and its more modern incarnation in email and online matchmaking.

Apart from sexual selection, the classic example of cultural feedback and niche construction concerns diet: the phenomenon of lactose tolerance in human dairy farming populations (Levinson and Jaisson 2005, 7). In human groups where dairying has been practiced consistently, the enzyme lactase does not shut down after weaning, thus allowing people to continue drinking milk. Thus Durham has shown that “distinct food-preparation techniques have resulted in microevolutionary adaptations in human groups” (Durham 1991). Levinson finds that a thousand years, or about 40 generations, is sufficient for the kind of feedback discussed above to take place. Other interesting examples of “cultural adaptation

11. For a fuller picture of these mechanisms they should perhaps be juxtaposed with Tomasello’s points about the way in which uniquely human forms of culture modifies previous (animal) forms of social cognition; see Tomasello (1999, 210).

on the genotype” are the cases of type II diabetes and hypertension, which are found predominantly in agricultural populations; Diamond explains this fact as due to the “unconscious domestication of humans by agriculture” (Diamond 2001, 707; Levinson, 8).

With these mechanisms in mind, let us return to the case of Judaism for a moment. The question as to whether Judaism is a sufficiently unitary category to warrant examination will be left for the reader to decide. From my perspective Judaism would seem to fit quite well into Levinson’s notion of “culture-bearing kindreds.” In other words, we are dealing here with a cultural unit with borders policed by individuals and groups, from both the inside and outside. The individual may identify as a Jew, but the institutions of the group may reject that identity. Outside institutions, like states (the Third Reich or the State of Israel), may also police Judaism’s borders, defining who and who is not a member. The idea that Judaism could be a distinct biological category is an illusion that emerges out of this dynamic model of border crossing and policing. These practices are not unique to Judaism, though it is perhaps the paradigmatic case, for Judaism must be understood as a cultural constellation that arose in relation and reaction to Christianity. Early Christianity largely colonized the pathways and networks already set in place by early “Judaism.”

All of Levinson’s mechanisms of cultural feedback into evolutionary processes thus appear to be present quite acutely in the case of Judaism. The niche that Judaism helps to set up is the urban environment and its accompanying technologies. This new environment of course leads to different environmental pressures on its inhabitants.<sup>12</sup> Perhaps one Talmudic passage will suffice as evidence: “A man should sell all he possesses in order to marry the daughter of a scholar, as well as to marry his daughter to a scholar” (Talmud, Tractate *Pesahim* 49a). A more operative question here must be to what extent the cultural imperative to educate sons—notably to teach them to read a second language, which was in most cases a foreign alphabet, starting at a very young age (before puberty)—has a persistent biological effect.

Botticini and Eckstein have recently proposed an intriguing model which argues that Judaism as an identity selected itself (i.e. Jews selected themselves) to urban skilled occupations that most often required literacy or the manipulation of symbol systems (mathematical, monetary, or legal). They argue that the implementation after the second century of the common era of the

religious norm requiring Jewish fathers to educate their sons determined three major patterns in Jewish history: (i) a slow process of conversions from Judaism among illiterate Jewish farmers who lived in subsistence economies; (ii) a comparative advantage in urban skilled occupations in which the literate Jews selected themselves when urbanization and the development of a commercial economy provided them with the returns to their investment in education; and (iii) the voluntary diaspora of the Jews in search of worldwide opportunities in crafts, trade, and moneylending. (Botticini and Eckstein 2007, 886)

Similarly, Murray also ties selection to urbanization in his attempt to explain the facts that American Jews perform significantly better at verbal and reasoning skill portions of IQ tests and that Jews have won about 32% of the Noble Prizes awarded in the twenty-first

12. It is important to be clear on the point that religion in general is not an evolutionary adaptation, and is neutral or detrimental often with respect to fitness. Harris (2006) gives the example of Catholic priests discouraging the use of condoms in Africa, despite the HIV and AIDS epidemic. For more on the strange logic of adaptation see Maolem 2007. For the most recent critique of the use of functionalism in the study of religion, see Penner (2003, 390–392).

century. He summarizes Cochran *et. al* (2005, 659–693) to say that economic success in these occupations

is far more highly selected for intelligence than success in the chief occupation of non-Jews: namely, farming. Economic success is in turn related to reproductive success, because higher income means lower infant mortality, better nutrition, and, more generally, reproductive “fitness.” Over time, increased fitness among the successful leads to a strong selection for the cognitive and psychological traits that produce that fitness, intensified when there is low inward gene flow from other populations. (Murray 2007, 5)<sup>13</sup>

In this sense, Judaism throughout history was probably the first highly distributed network of people bonded in core beliefs of biological descent and common language. The technology of writing allowed for the network to expand intact. Interestingly, Greif (1994) has presented a game-theoretical model that tries to explain the success of Jewish (Maghribi) traders in the Middle ages. The Maghribi traders had a “collectivist” mentality as opposed to the “individualist” one of their Christian neighbors. As such they “invested in the sharing of information and the Genoese [Christians] did not. Each Maghribi corresponded with many other Maghribi traders by sending informative letters to them with the latest available commercial information and ‘gossip,’ including whatever transpired in agency relations among other Maghribis.” In contrast, the Genoese Christian merchants “seem to have held an opposite attitude regarding information sharing” (Greif 1994, 923–924).

Botticini and Eckstein (2007) contend that “the network externality among Jewish traders highlighted by Greif could not exist without a common written language (Hebrew), high literacy levels, and a common law (Talmud)” (890). It is sufficient to note in conclusion that this particular case suggests an important amendment to the recent trend, exemplified in the excellent work of Bulbulia (2004/2005), that would take into consideration the role of technology in general and religious technology in particular as offering a new class of constraints or resources in the game-theoretical machinery and evolutionary modeling.

Judaism provides an important test case to understand the relation between cognition and past minds. I think bottom-up psychological processes tend to be overemphasized in cognitive accounts of culture and religion. Thus, the main purpose of this essay has been to give the rudiments of a plausible account of downward forms of causation that also does justice to biology and cognition. It is for this reason that I have focused on mechanisms of niche construction and gene-culture co-evolution. These concepts are powerful tools for explaining institutions like writing and religion, the primary cases of downward causation. I think these concepts also encourage us to leave behind a static picture of human cognition where modern day humans are simply Pleistocene creatures wearing Versace.

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13. An important qualification is that where Murray says “intelligence,” he means “verbal and reasoning skills” and significantly *not* “visuo-spatial skills” (nor other kinds of intelligences such as emotional and social intelligence).

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