J. P. Rushton's Theory of Ethnic Nepotism

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Keywords: Genetic Similarity Theory; ethnic nepotism; altruism; evolution; genomics

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HIGHLIGHTS

Manuscript title: **J. P. Rushton's Theory of Ethnic Nepotism**

GST helps explain core features of ethnicity.

Sociological research confirms GST applied to ethnicity.

Genomics confirms the theory for ethnically mixed societies.

Rushton's important discoveries concerning genetic ethnic similarity are yet to be fully mined.

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J. P. Rushton's Theory of Ethnic Nepotism

Abstract

Unreciprocated aid among co-ethnics and the emotional intensity of ethnic conflict have long been explanatory challenges to evolutionary science. J. P. Rushton's theory of assortative ethnic affiliation–altruism, mating and friendship directed towards fellow ethnics–derives from his more general theory of genetic similarity (GST). GST proposes that humans give preferential treatment to others in whom they detect genetic resemblance and that such behaviour enhances genetic fitness. The theory coincides with W. D. Hamilton's theory of inclusive fitness as applied to relations between populations. GST helps explain core features of ethnicity, including its basis in putative kinship and correlation with gene frequencies. Ethnic nepotism due to similarity is a weak social force compared to social identity. However its pervasiveness makes it a potential driver of evolutionary and social change, a potential borne out by sociological studies of the impact of ethnic diversity on social cohesion and public altruism. Genomics confirms the theory for interactions within populations with sufficient genetic diversity, such as ethnically mixed societies. GST applied to ethnicity is promising for further research in evolutionary social science because it unifies evolutionary and behavioral mechanisms in a single theory.

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1. *Theoretical background*

The evolutionary approach to ethnicity has given priority to understanding affiliation outside the family and clan. Why is it that people so often prefer to marry and befriend fellow ethnics and defend their ethnic groups? These tendencies are present in all populations, indicating an evolutionary origin. But it has not been clear how such altruism could be evolutionarily stable. For ethnic solidarity to have evolved there must have been a substantial fitness payoff for sacrificing individual fitness for groups or populations that had ethnic characteristics.

An ethnic group is a named population whose members share a belief in common descent, have a shared history, a distinctive shared culture, a shared attachment to a homeland, and some degree of solidarity (Smith, 1986, pp.22-30). The core elements of this definition, including putative kinship, derive from the sociologist Max Weber (1946/1922, p.173). Genetic assay data show that ethnic kinship is real (e.g. Cavalli-Sforza, Menozzi & Piazza, 1994, p.75, Table; Harpending, 2002).

An early evolution theory of ethnic solidarity was provided by Eibl-Eibesfeldt (1972/1970; 1982), who argued that ethnic ties are based on family bonds. Behavioral adaptations for bonding with close kin came to be applied to whole populations, first bands, then tribes and nations. Affiliation to the hunter-gatherer band was subjected to group selection. The first part of this argument was reinterpreted sociobiologically by van den Berghe (1981), using Hamilton's theory of inclusive fitness. In his classic 1964 paper, Hamilton showed that genes coding for altruism would spread if altruism was directed towards genealogical kin, and if the

resulting boost to their fitness exceeded the fitness cost to the altruist. This condition for the evolution of altruism, known as Hamilton's Rule, was widely accepted by zoologists by 1980.

Like Eibl-Eibesfeldt, van den Berghe argued that because ethnicity is putative kinship, shared ethnic identity should release some of the same altruistic motivation found within families. He adopted Hamilton's concept of kin-recognition markers, which included language, territory, religion, and phenotypic similarity based on shared culture (language, clothing or scarification) and physical appearance. These recognition markers, which overlap those proposed by Weber, had evolved as releasers of nepotism because in the evolutionary environment they signaled kinship, though with different degrees of reliability (see also Shaw and Wong, 1989). Van den Berghe's theory appeared when sociobiological studies of animal altruism and kinship were appearing. This was the background against which Rushton and colleagues proposed their own theory.

2. *Rushton's contribution*

In 1984 Rushton and co-authors R. J. H. Russell and H. G. Wells proposed an evolutionary theory of ethnic altruism based on Genetic Similarity Theory (GST). GST seeks to explain a number of prosocial behaviors including ethnic affiliation, by generalizing Hamilton's theory such that genetic similarity alone elicits affiliative behavior without knowledge of genealogical kinship.

> [W]e propose genetic similarity detection as a mechanism by which organisms are attracted and repelled by each other. We hypothesize that genetically similar others ("strangers," as well as "kin") have a tendency to seek each other out and provide mutually supportive environments, while genetically dissimilar others have a tendency

> to form natural antipathies and provide mutually hostile environments (Rushton et al., 1984, pp.179-80).

The theory included evolutionary causality by asserting that responding differentially to genetic similarity increases an organism's fitness, defined as increased genetic representation in the population. It allowed for altruism among kin as well as among similar strangers. The theory held that assortment is stronger for the more heritable characteristics because they are more reliable indicators of genetic similarity, based on sociometrical data as well as a quantitative model by W. D. Hamilton (1996/1971).

The resulting theory of ethnic affiliation was more behaviorally detailed than Eibl-Eibesfeldt's and more general than van den Berghe's. Whereas social science research into ethnicity had been published in journals of sociology and anthropology, the new approach shifted the locus to psychology, ethology, and behavior genetics. Attention began to shift to genetics and selection theory.

Rushton continued to develop GST over the following years. In 1985 the team of Rushton, Russell and Wells again presented GST and argued that assortative mating for personality influenced the evolution of variation in human personality types. They combined GST with reciprocal altruism theory to predict that genetic similarity facilitates reciprocity by reducing the condition of complete reciprocity (Rushton et al., 1985, p.80).

The major statement of the relation between ethnic nepotism and genetic similarity was a paper by Rushton in *Behavioral and Brain Sciences* (Rushton, 1989a). One addition was data indicating that similarity among spouses and friends is strongest in the most heritable characteristics within a trait category. For example, married pairs are more alike in general

intelligence *g* than they are in particular cognitive abilities such as vocabulary or arithmetic, and *g* is generally the more heritable cognitive ability. The same difference applies to the overall assemblage of traits on which spouses are similar, including anthropometrics (Rushton, 1989a, p.534; Russell & Rushton, 1985).

In the *BBS* article Rushton speculated about how similarity could give rise to ethnocentric ideology. He reviewed the literature on extended phenotypic effects of genes, focusing on the idea that epigenetic developmental rules can incline people towards constructing and learning ideologies that increase their fitness (pp.515-16). This led to a review of models and empirical findings supporting the theory that group selection in humans has been led by cultural strategies. Socialization pressure could have included mutual monitoring and moralistic aggression (p.517). "In the evolutionary past . . . those groups that adopted an optimum degree of ethnocentric ideology may have replicated their genes more successfully than those that did not" (p.518).

Limitation of space precludes reviewing all evidence for and against GST as it was applied to ethnicity. Instead we limit discussion to four major objections that are of special relevance to ethnicity and whose failure has left the theory more firmly grounded.

The first criticism is that inclusive fitness processes can only operate between genealogical kin because their genes are identical by common descent (Mealey 1985; Tooby & Cosmides 1989). Hamilton's 1964 paper is cited in support of this objection which, if true, causes the genetic similarity theory of ethnic nepotism to fail. However, Hamilton dropped the identical-by-descent criterion in the early 1970s (e.g. Hamilton, 1996/1971, p.221; discussed by Pepper, 2000, pp.355-6). Genetic similarity is a sufficient basis for inclusive fitness to operate, regardless of how the similarity arises.

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A second criticism has been that ethnic kinship is too slight ever to justify diverting effort from genealogical kin. A related criticism is that a gift or other benefit always yields a larger genetic payoff when directed to close kin than to co-ethnics. However, Hamilton himself showed that the aggregate kinship in populations can be sufficient to allow investment in it to be adaptive (Hamilton, 1996/1971, p.221). Harpending derived the same result (Harpending, 1979). And it is feasible for individuals to contribute to the welfare of multitudes via collective goods, such as big game hunting, group defense, and punishment of free-riders (Goetze, 2007).

The third criticism of GST was made by Grafen (1990, p.51) who argued that for altruism to pay off, shared genes must occur frequently in the genome, which he thought was not the case beyond genealogical kin. Leek and Smith (1989, p.534) cite Grafen to conclude: "[I]t seems important for Rushton to provide a more convincing rationale for the existence of sufficient degrees of overall genetic similarity amongst non-relatives . . ." Grafen's criticism may hold for selection within outbred populations. However, ethnic kinship is considerable within ethnically partitioned populations. Ethnic kinship was estimated in 2002 by Harpending to average 15% between unrelated populations (Harpending, 2002). The example given in section 3.2 below finds a kinship of 6%, equivalent to that with a great grandparent, more than sufficient to meet Grafen's criterion.

A fourth criticism proceeded from the reformation in Anthropology that followed World War II and was established in the 1970s consequent to the Vietnam War. According to the dogma people were really gentle, peaceful, and nice except for disruptions caused by colonialism. Even more pervasive was the new "pots not peoples" view of human mobility. In this understanding the earth before agriculture was a carpet of sessile foragers interacting with

neighboring groups only over short distances. Given this, people rarely if ever encountered others unlike themselves so there was never any selection in favor of ethnic or racial recognition and discrimination. A familiar saying was that we were foragers "for 99% of our existence". The criticism is dubious for two reasons. First, it discounts the possibility that humans can detect slight phenotypic resemblances. Secondly, the claim of low mobility has difficulties. Agriculture is about 10,000 years old while fully modern humans are only 45,000 or so years old, and we have no reason to think that bursts of innovation and population growth and decline have been limited to agricultural peoples. If, as is likely, human history has always been characterized by eruptions, invasions, and extinctions, then the criticism disappears.

3. *Subsequent Genetic Similarity Research on Ethnic Nepotism*

3.1 Social behavior

In a follow-up exchange on his 1989 paper, Rushton (1991) hypothesized and discussed methods for detecting ethnic nepotism in science. He recommended studying journal citations to search for assortment of authors. His hypothesis was confirmed using the citation method in a large-scale study of European journals conducted by Greenwald and Schuh (1994).

In 1997 Rushton discussed the stability of states experiencing changing ethnic proportions. He observed that the Soviet empire had fragmented into its constituent nations and argued that ethnic conflict due to genetic dissimilarity was a rising centripetal force within the United States and Canada due to increasing diversity. Welfare was a likely divisive factor (p.375). He examined a proposal for the partial ethnic partition of the US as guided by individual choice as a means for reducing conflict. In a 2005 paper Rushton argued that GST was compatible with the theory of ethno-symbolism, according to which nations form around pre-existing ethnic groups and are perpetuated by the founding ethny's myth-symbol complex.

The theory that ethnic groups are pools of genetic similarity has helped inspire sociological research. GST presaged the study of ethnic altruism as a social force. It conceptualized ethnic groups as extended kinship, with greater genetic similarity within than between. It connected to van den Berghe's concept of ethnic nepotism, which predicts more generous charity within than between ethnic groups (Rushton, 1984, p.78).

Thus from its initial formulation, GST set many parameters of the study of ethnic nepotism. It is consistent with the mainstream definition of ethnicity given earlier, which includes population-level belief in descent from common ancestors. Solidarity is also a characteristic

of ethnic groups, again consistent with Weber, and the study of charity and other forms of altruism has successfully tested Rushton's prediction.

Sociological research confirms GST applied to ethnicity (Salter, 2007). Trust and the risky joint enterprises it facilitates are more common within than among ethnic groups (Salter, 2002), giving an ethnic dimension to middleman trading groups, organized crime, dissidents from totalitarian regimes, and nationalist freedom fighters. Rushton's prediction that ethnic diversity lowers trust and cooperation has been confirmed in the United States and Australia (Putnam, 2007; Leigh, 2010).

Ethnic similarity also affects charitable donations to strangers in need, as predicted by GST. Field studies of street beggars in Eastern Europe find that passersby give more generously to beggars of the same ethnicity (Butovskaya, Salter, Diakonov & Smirnov, 2000). Global comparisons of government expenditure show that ethno-linguistic diversity explains over 30% of the variance in support for welfare ($r = -0.56$) (Sanderson & Vanhanen, 2004, Table 6.4, p.120). Diversity explains 80% of the variance in foreign aid expenditure after controlling for national income and overall budget ($r \approx -0.9$). It also correlates negatively with economic growth for all except the wealthiest 10% of economies (Masters & McMillan, 2004). A likely explanation is that diversity decreases national cohesion and the ability of governments to make rational economic decisions (Alesina, Baqir & Easterly 1999; Alesina & Spolaore 2003; Easterly & Levine 1997). An Australian study has confirmed the similarity-cohesion link (Healy, 2007).

3.2 Genomics and Kin Recognition

With the arrival of inexpensive technology to genotype individuals at large numbers of single nucleotide polymorphisms we can rather precisely assess genetic similarity (simply "kinship"

in the terminology of genetics) between individuals within and between groups. For example worldwide samples of individuals from human populations assessed hundreds of thousands of polymorphic markers are easily available on the internet (http://www.hgdp.org). Here we explore such patterns in several populations. What we present here is essentially an elaboration of previous work that confirmed Rushton's arguments concerning ethnic kinship and the extra parental kinship resulting from endogamous marriage (Harpending, 1979; 2002; Salter, 2002).

While much of inclusive theory has been developed in terms of the coefficient of relationship, everything is easier when it is written in terms of the coefficient of kinship. For example the coefficient of relationship, the "fraction of shared genes" is unity with oneself. But what if a person is highly inbred? Then we need something to recognize that such a person is "more related" to himself than the offspring of a random mating or an outbred mating.

Kinship with oneself in an infinite random mating population is ½ rather than 1, derived like this. Pick an allele from a locus from a person, then pick another from the same locus in the same individual and ask if it is the same. The probability it is the same is just ½, but if the individual is inbred it is greater than ½ and if the individual is outbred it is less. Similar reasoning applies to any pair of individuals. In this formalism, the coefficient of relationship of person *a* to person *b* is the ratio of *a*'s kinship with *b* to *a*'s kinship with himself. This has the strange property that the relationship of *a* to *b* is not necessarily the same as the relationship of *b* to *a* (for details see Harpending, 1979; 2002).

Given the databases published by the Human Genome Diversity project it is relatively straightforward to compute pairwise kinship in their samples. In Figure 1, for example, are results from nearly a million single nucleotide polymorphisms in the 29 individuals of the HGDP French sample. The top panel shows all pairwise kinships while the bottom panel shows, for each individual, how close a kinsman he can find in this sample.

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Figure 1

Notice in the top panel of Figure 1 the cluster of mass around ½: these comparisons are people with themselves showing the variation around the theoretical value of ½ in this large real population. Some are more inbred than others. The bottom panel shows that if these 29 people were, say, adult males in a small community there is little or no opportunity to exploit genetic similarity to form nepotistic cooperative arrangements. The best one can do is around 1%, meaning that helping your closest (stranger) kin is worth about 2% of helping oneself by the same amount, 4% as much as helping one's own child, etc. Doing so would depend on the ability to discern 1% genetic kinship, which is implausible. Rushton's extensive data showing similarity among friends and spouses is unlikely to be due to such a low degree of genetic resemblance. Altruism via incomplete reciprocity fails for the same reasons. Investing in aggregates is not feasible because strangers are not grouped by family or clan or ethnicity. These genetic data therefore disconfirm Genetic Similarity Theory within outbred populations.

Figure 2 shows the result of the same computation for 29 Japanese:

Figure 2

The pattern for the Japanese is hardly different from that of the French. Now let us suppose that these two communities, one of 29 French male adults and one of 29 Japanese adults, were

brought together in the one community. In this new community we can repeat the calculations to yield Figure 3:

Figure 3

This new diverse community looks like nature red in tooth and claw in the making. Imagine for example that conditions are Malthusian and that one can share a transient surplus with a neighbor, thereby increasing the latter's individual fitness. If a person can recognize ethnic kin using cultural or heritable markers, he can pick a neighbor with kinship of 0.06 almost every time, corresponding to kinship with a great-grandchild. If at marginal cost he confers some fitness benefit on this neighbor, this is equivalent to increasing his own fitness by 12% (0.06/0.50) of that benefit. On the other hand if he confers the same benefit to a neighbor with kinship -0.06, that decreases his own fitness by the same 12%. Discrimination can therefore cause an action or relationship to yield a 24% difference in fitness. This is an extraordinarily strong selective force, and any quantitative trait that favored ethnic kin discrimination would be rapidly selected with consequences easily visible within a few hundreds to thousands of years. The effect would be stronger when the benefit was conferred on aggregated ethnic kinship via a collective good; so strong as to select for the extreme altruism associated with violent ethnic conflict. Thus GST is confirmed for interactions between populations, such as adjacent or mixed ethnic groups. More generally, GST is confirmed for situations in which population subdivision creates significant genetic diversity. Another example is endogamous classes, the extreme case being castes. GST would also apply to small isolates, inbred populations where ancestry links are short due to cousin-cousin and uncle-niece marriages. In these populations kinship outside nuclear families is extremely varied, making it possible for altruism between strangers to increase fitness.

4. Amendments and future research

Rushton's theory of ethnic nepotism explains broad trends in ethnic affiliation and has been productive in generating empirical research. One shortcoming in the original formulation is that GST does not account for the way ethnic solidarity varies from culture to culture and within cultures over time. Although solidarity is inherent to ethnicity, it is usually of moderate or low intensity. However, it strengthens in response to attacks perceived to be aimed at group identity, especially invasion of the homeland and physical harm done to co-ethnics. The latter are far more efficient releasers of ethnic sentiment than are perceptions of similarity alone (Salter, 2008a). Even a symbolic threat to group status, such as an ethnic slur, can produce an intense emotional response.

GST needs to be modified if it is to explain both the quiescence and passion of ethnicity. Ethnic nepotism's sensitivity to culture and situation sets it apart from the more constant familial bonds. Sustaining high levels of solidarity requires sustained cultural stimulation. Minorities that have retained ethnic solidarity over long periods have religious rituals that keep alive historical memories of victories and defeats across generations (Spicer, 1971).

An example of the sensitivity of ethnic nepotism to culture and situation is provided by Kurzban, Tooby & Cosmides (2001), who found that participants in an experiment were less prone to categorize others by race when the others' race did not correlate with coalition membership. The same was not true of categorization by sex, which remained robust even when coalitions contained men and women. This paper might be taken as a challenge to Rushton's theory because the authors concluded that race is a proxy for coalition, a formulation incompatible with ethnic categorization being "automatic and mandatory" and invariably strong. However, this does not apply to GST, which is based largely on intra-ethnic

relations and describes weak ties. It should also be noted that Kurzban et al.'s hypothesis might be difficult to generalize because it is based on erroneous evolutionary assumptions. They describe race as a construct that corresponds to inconsequential genetic difference, based on an argument by Lewontin (1972) (p. 15387). Though influential, this argument is fallacious because genetic and phenotypic variation among populations is substantial (Edwards, 2003). Kurzban et al. also assert that in the environment in which humans evolved individuals would not have met members of other races. As noted earlier, this ignores both the human capacity to detect small intra-racial group differences and the high likelihood that regular contact of very different peoples occurred over most of human history.

Amendments have been proposed to both the evolutionary and behavioral components of GST's account of ethnic nepotism, though none that contradict the core insight. As already noted in Section 2, the evolutionary part of the theory, especially involving group selection, becomes more plausible when combined with the concepts of aggregate kinship and collective goods. In competitions between primordial ethnic populations, especially in defending territory, tribal fighters defended aggregate kinships comparable in scale to aggregate family kinship (Salter, 2007/2003, pp.63-7). In the case of hunter-gatherer bands and tribal units it was possible to invest in aggregate kinship by contributing to collective goods, such as defense and big game hunting (Goetze, 2007).

The behavioral component of GST is also being improved by findings from social psychology and sociology, aided by the heuristic advantages of theories that combine evolutionary and behavioural mechanisms. In doing so GST is helping unite the known causes of ethnic behaviour within a single evolutionary theory.

It will be useful to explore interactions between innate categorization of human kinds, social identification, and attraction to similar others. By age three infants categorize themselves and others into descent groups and apply this to distinguishing races (Hirschfeld, 1996). The attraction of phenotypic similarity is weaker than the ties of ethnic identity. However, similarity cues an implicit state that can position individuals for a transition to explicit ethnic identity (MacDonald, 1998, pp.1-15; 2008). Evolutionary theories that conceptualize organized religion as group strategies point to links between religiously inspired altruism and group reproductive interests (MacDonald, 1994; Wilson, 2002). Brain scan technology is helping illuminate the mental structures that distinguish implicit and explicit ethnicity (Lieberman, Hariri, Jarcho, Eisenberger & Bookheimer, 2005; Norton, Mason, Vandello & Biga, 2012). Further work is needed to identify the factors that modulate group-identity and which ethnic markers release greatest affiliative motivation. It should also be useful to distinguish the kinds of affiliation involved, and how they interact with moral sentiments (Salter, 2008b). Rushton's important discoveries concerning genetic ethnic similarity are yet to be fully mined.

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Figure for manuscript: J. P. Rushton's Theory of Ethnic Nepotism

Figure 1

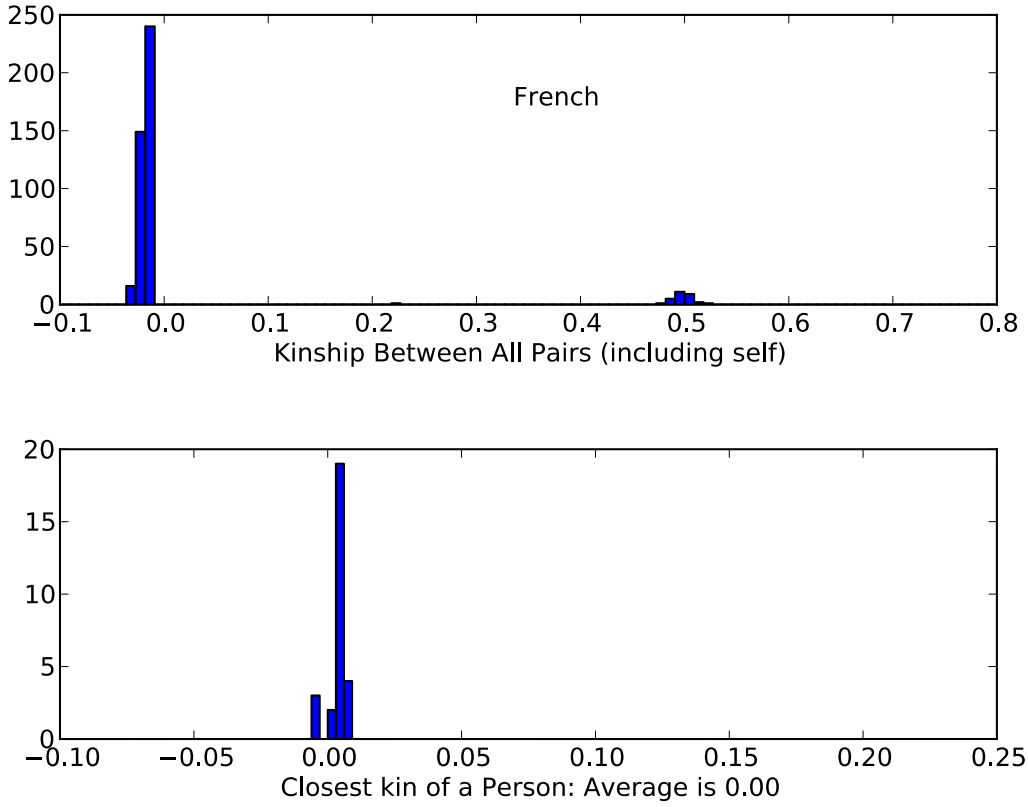


Figure for manuscript: J. P. Rushton's Theory of Ethnic Nepotism

Figure 2

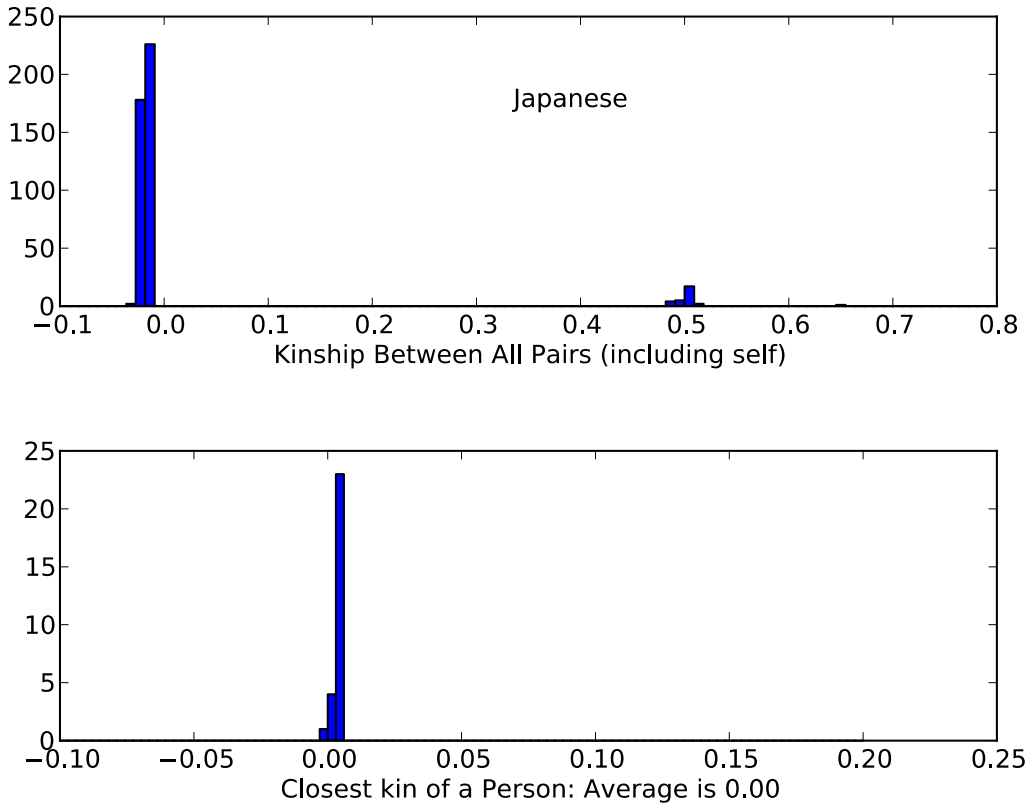
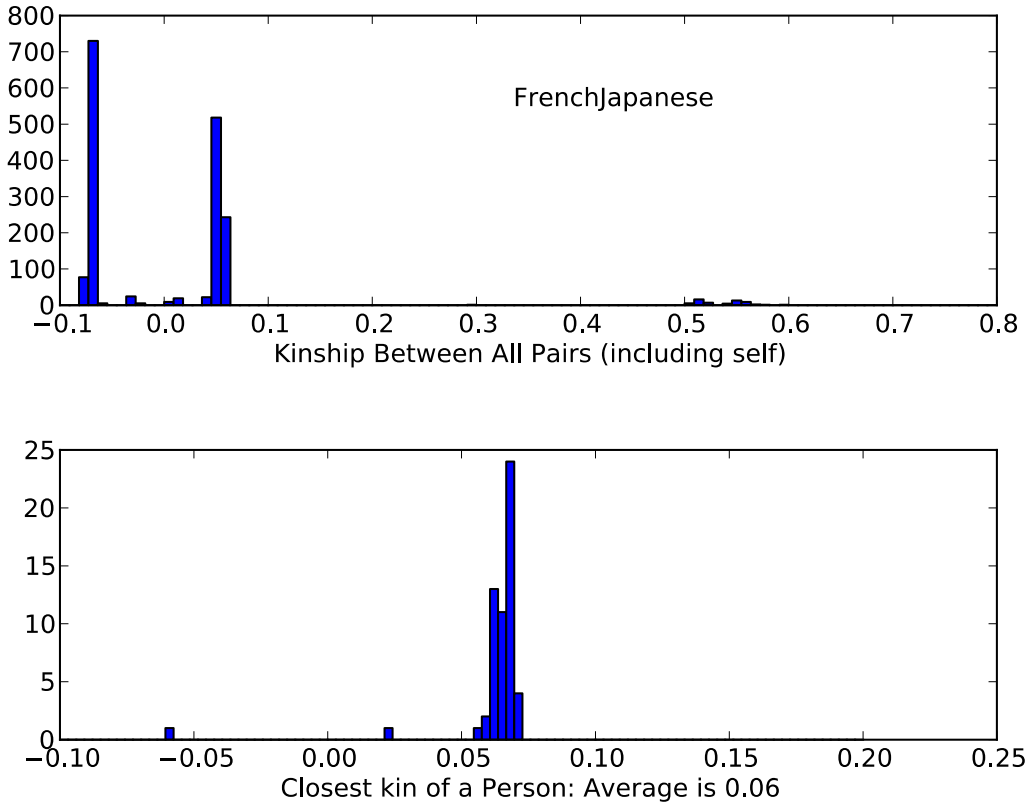


Figure for manuscript: J. P. Rushton's Theory of Ethnic Nepotism

Figure 3



For manuscript: J. P. Rushton's Theory of Ethnic Nepotism

Figure captions are contained in the figures.

The figures need only be numbered, e.g.:

Figure 1.

Figure 2.

Figure 3.