

Human Sociobiology: Pair-Bonding and Resource Predictability (Effects of Social Class and Race)

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Summary. 1. Social class and racial differences in human pair-bonding and heterosexual behavior patterns are considered in an evolutionary perspective. The expected unpredictability of one's future income stream should be an important parameter influencing these variables, according to theoretical considerations.

2. The literature is reviewed relevant to the prediction that those facing more predictable income streams should have a stronger marital pair bond and premarital sexual activities more likely to lead to a strong pair bond, all other things being equal.

3. It is shown that those with high education or high occupational status do have more predictable income streams, and that their pair-bonding activities exhibit the predicted consequences of that fact. A much smaller number of studies comparing different races' sexual patterns are also consistent with the theory. In the extremely few cases that permit it, it is found that a correlate of income predictability is more important in determining the dependent variables than either race or class, as expected.

4. Alternative explanations of the data are briefly examined and found wanting, especially with respect to explaining the patterns of individuals whose parental class differs from their own. Further research is suggested.

Introduction

As statistical ensembles, working-class people and middle-class people act differently from each other, as do whites and blacks. Many theories have been proposed to account for this variation, ranging from inborn genetic differences with no adaptive significance to purely environmental effects with no adaptive significance.

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An evolutionary biologist should suspect that such theories are unrealistically narrow. Significant behavior differences strongly affecting one's reproductive success must have been subjected to strong selection, leading to behaviors best understood as adaptive for the environments individuals find themselves in. If different reproductive strategies or different sex ratios (say) occur with different frequencies in different environments, adaptive explanations should first be sought for these phenomena (see Steffan, 1973, 1975; and Trivers and Willard, 1973 for some recent attempts). Even in organisms that learn, it can be easier to learn some things than others, and one can investigate the degree to which the learning pattern is adaptive (Garcia et al., 1968).

In the past thirty years, it has become clear that social classes and races differ in several parameters relating to the marital pair bond and heterosexual behavior patterns. These variables are closely tied to the process of getting one's genes into the next generation; they are thus especially amenable to an evolutionary analysis. To make this analysis, one must produce a theoretical argument relating a causal, independent variable to dependent variables; demonstrate that data from the real world are consistent with the model's predictions; and then test the model's adequacy in relation to competing theories of the phenomena in question.

The independent variable I have chosen is the future *predictability* of those resources most needed for reproduction. In many species, this is food; in humans, family income. I will argue that humans are adapted to sense the degree of income unpredictability expected in their future, and to adjust their reproductive strategy accordingly. I will present data that show it is unlikely that these behavioral differences are due to simple genetic differences, and probably involve mechanisms more subtle than simple socialization, modeling, or learning. Thus I adopt the position that the patterns seen now reflect relationships that were adaptive in the recent, hunter-gatherer past, and could still be adaptive today; and that although the proximal cause of a given response may be environmental, the more ultimate causes need not involve totally conscious responses devoid of adaptive significance.

Predictability and the Pair Bond: Theory

Certain features of a species' breeding system should be influenced by the predictability of the male's food supply. Trivers (1972) noted that when a male's investment in offspring is less than a female's investment, the male must choose how to allocate energy between investment in offspring (defined as food, energy, or actions that help some offspring's survival at a cost to other current or future offspring) and male-male competition (which helps no offspring). There is sometimes a cost of maintaining a pair bond that was not noted by Trivers—the cost to the male of maintaining the female at times when the reproductive return is low. A male facing an unpredictable food supply should be more likely to follow an opportunistic pattern of reproduction and be less likely to be willing to pay the spouse-maintenance cost, being more likely to reproduce when food is abundant, and to break the pair bond when food is scarce to

avoid wasting the investment on young that have little chance of surviving. A male facing a more predictable food supply is more likely to make the initial investment in a female that a pair bond requires.

There are, of course, a great many other factors that influence the strength of a species' pair bond. E.O. Wilson (1975, pp. 327–329) noted the 'Orians-Verner effect' (Orians, 1969; Verner, 1965), which attributes the evolution of polygyny to high variability in the males' attractiveness, making it advantageous for the females to abandon a high-investing male with a poor territory and join a low-investing male with a better one. While high unpredictability can often cause high variability and thus promote polygyny under the Orians-Verner model, I am proposing an additional route. If a female is likely to desert a male when the food supply is low—to join another male or to give up on reproduction for the season—then a male facing a relatively unpredictable food supply would be more likely to devote a larger fraction of his resources to male-male competition, forming a pair bond only when resources seem to be plentiful enough to assure breeding success.

Pitelka et al. (1974) described the breeding systems of several closely related Arctic sandpipers that are consistent with this interpretation. Reporting on 24 species of the subfamily Calidridinae, they separated species into two groups: 'conservative' species exploiting relatively predictable resources, and 'opportunistic' ones taking advantage of food varying "in amplitude and in predictability over both space and time". They found that the conservative species were monogamous, while the opportunistic ones were polygamous or promiscuous. Pitelka et al. did not specifically relate this to a higher probability of desertion by the female, although they noted one mostly monogamous species where there was a tendency for the female to leave the male to raise the brood to fledging after hatching, citing this as the first step in the evolution of serial polygamy.

Other possible examples of the proposed mechanism in the animal world have been hard to come by. Much of the effort in this field has been directed toward theories of r and K selection, and the proposed relationship between unpredictability or variability and an r strategy. Although r and K phenotypes may well be of importance within (and especially between) human cultures, I consider in this paper situations where the classical r and K theory does not apply: situations where the group in the more unpredictable and variable environment is *not* exploiting an abundant resource.

Predictability: Its Relation to Human Social Class and Race

Adequate quantifications of environmental predictability are lacking. Instead, I will rely on comparisons between groups differing in two correlates of predictability: social class and race. In this section I will show that, all other things being equal, a human member of the working class faces a more unpredictable future than a member of the middle or upper class; similarly, a member of a racial group (American blacks) facing significant racial prejudice faces a more unpredictable future than a person of a more privileged race (American whites). By 'future' I mean that collection of opportunities and resources required for

raising children successfully. In western cultures, this is the family's income stream, as subjected to the risks of unemployment, death, or disability of the family's wage earners.

A recent study (Levison, 1974) has stressed the importance of such unpredictabilities for working-class American men. Regarding disability, American workers face much higher levels of job-related injuries and death than middle-class individuals (Levison, 1974, p. 78). Regarding unemployment, the 1970 percentages of those unemployed at some time during the year ranged from 14% to 31% of various working-class job categories, while middle-class categories ranged from 5% to 12% (Young and Michelotti, 1971; Levison, 1974, p. 82). These same sources showed that when unemployment came it was more likely to be of long duration for working-class men, and moreover, working-class men were more likely to have two or more spells of unemployment during the year. The 1973 figures (Young, 1974; US Department of Labor, 1975) show a similar pattern.

These statistics show that working-class jobs produce income streams that are characteristically less predictable than those from middle-class jobs. There is a second reason why working-class families face a more unpredictable future—the simple fact that working-class jobs pay less money, which provides a much smaller cushion for riding out short-term environmental fluctuations.

According to the Bureau of Labor Statistics (reported in Levison, 1974, p. 32), in 1970 about 30% of American working-class families (with employed heads) had total incomes putting them in the 'poor' budgetary category; another 30% were above poverty but below Levison's so-called 'shabby intermediate' category. Even this intermediate budget only allows extremely sparse expenditures. (For example, neither the poor nor the intermediate budgets allocate anything whatsoever for savings.) It is not surprising, then, that "for most workers, a single economic crisis can wipe out the work of a lifetime" (Levison, 1974, p. 103).

Work-experience data also bear out the hypothesis that certain blacks face more unpredictable incomes streams than whites. In 1973, for example, a larger percentage of the white male population had work experience than the black male population, black men were more likely to face longer periods of unemployment, and black men were more likely to face more spells of unemployment if they worked at all (all regardless of age: US Department of Labor, 1973, Table C-1). There is only one table permitting a separation of the effects of race and class (Table 1); here an interesting pattern emerges. Black men in most middle-class jobs were more likely to work part time than white men in similar jobs, and blacks with some full-time middle-class employment were more likely to have that employment last less than 50 weeks. In contrast, for working-class jobs, black and white men with some full-time work during the year did not differ in any consistent way in the length of that employment, although whites were somewhat more likely to have had part-time jobs during the year.

Thus, being black does seem to exert an independent effect on income predictability for middle-class jobs, but not for working-class ones. Accordingly, aggregate racial differences may partially reflect covarying class differences.

But interracial comparisons with class controlled may reflect income predictability differences solely a result of race, depending on the particular class compared.

Predictability and the Pair Bond: A Preliminary Test

Rainwater made the first precise study of American marital relationships as a function of class and race (Rainwater, 1960, 1965). His picture has not been significantly challenged since then, and others have confirmed various portions of it (see LeMasters, 1975, especially pp. 41, 84, 89, and other references therein; also Hammond and Ladner, 1969). Rainwater found that one of the most important parameters characterizing American marriages was the 'Conjugal Role Relationship' (hereinafter CRR) of the partners. (This concept was originated by Bott, 1957.) A joint CRR is characterized by

"... activities carried out by husband and wife together (shared) or the same activity carried out by either partner at different times (interchangeable)... [E]ven where there is a division of labor in task performance ... each is expected to be interested in and sympathetic to the other in his assigned duty" (Rainwater, 1965, p. 30).

The other extreme, a segregated CRR, is characterized by

"... activities of husband and wife that are separate and different but fitted together to form a functioning unit or that are carried out separately by husband and wife with a minimum of day-to-day articulation of the activity of each to the other ... Such couples tend to emphasize a formal division of labor in the family rather than a solidarity based on interchangeability of role activities, or the identification and empathy of each with the other's activities and concerns" (Rainwater, 1965, pp. 30-31).

There is also an 'intermediate' CRR, between these two extremes.

These sociologic definitions hinge on the degree of sexual dimorphism in child-rearing tasks. But sexual dimorphism is a parameter known to be of biological significance. The study of nonhuman species has produced a consensus regarding one connection between environmental factors and the degree of dimorphism (E.O. Wilson, 1975, p. 334): when there is strong selective pressure for quick reproduction, sexual dimorphism increases. Sometimes this is accompanied by polygyny, but polygyny is not a necessary consequence, and Wilson's exposition can be carefully transposed to humans as follows.

In a species showing significant investment in offspring by both parents, mated pairs about to undertake reproduction can pursue any of several strategies for dividing the work. These strategies form a continuum. At one polar extreme, there is a species-wide, culture-wide, or subculture-wide standard of what a mother is supposed to do and what a father is supposed to do. Each individual fits itself into the pattern required of its own sex, regardless of its own predispositions and abilities. In this case, the attractiveness of a potential mate is determined mostly by how closely it fits the standard.

At the other extreme, an individual can seek a mate complementary to its own particular strengths and weaknesses. While the first extreme strategy is well suited for frequent partner changes (whether voluntary or involuntary),

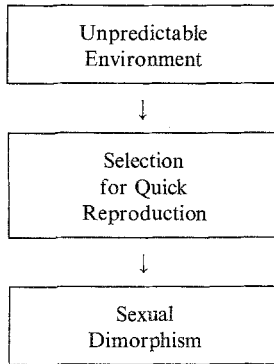


Fig. 1. The central hypothesis. — The theory asserts that unpredictability in the resources most important for reproduction selects for an opportunistic reproductive strategy (*first arrow*). Previously established theory predicts in turn that this leads to sexual dimorphism (*second arrow*) and division of labor. The data for humans operationalize these two consequences as a segregated conjugal role relationship (CRR); see text

Table 1. Association between social class and CRR

Class	CRRs			(n)
	Joint (%)	Intermediate (%)	Segregated (%)	
Upper-middle	88	12	0	(32)
Lower-middle	42	58	0	(31)
Upper-lower whites	19	58	23	(26)
blacks	12	52	36	(25)
Lower-lower whites	4	24	72	(25)
blacks	0	28	72	(29)

From Rainwater (1965), Table 2-1. Chi-square $P < 0.005$, with races combined for test

this second one is better for maximizing reproductive efficiency, since it minimizes the loss when an individual not fitting the standard mates with another deficient in the same respect. This efficiency is achieved at a cost in reproductive speed: it takes time to find one's perfect complement, given significant variations in the population.

This trade-off between reproductive speed and reproductive efficiency is diagrammed by the bottom arrow in Figure 1. Above (under 'Predictability and the Pair Bond: Theory'), I proposed that an unpredictable resource supply should select for the ability to switch into and out of reproductive modes quickly; this is diagrammed by the top arrow of Figure 1. Putting these two mechanisms together, and applying them to the sociologic definitions above, one predicts that the degree of CRR jointness should be strongly correlated with our correlates of income predictability.

This is indeed the case. Table 1 shows the distribution of CRRs by social class in Rainwater's sample. Note especially the absence of segregated CRRs in the middle classes, and the virtual absence of joint CRRs in the lower-lower class. Note also that the trend persists when race is controlled and that blacks

Table 2. Social class and family problems of husbands interviewed: proportion citing problems in the marriage, and proportion of these citing money and job instability

	Whites				Blacks	
	Upper-middle (%)	Lower-middle (%)	Upper-lower (%)	Lower-lower (%)	Upper-lower (%)	Lower-lower (%)
Money and job instability	26	46	63	76	59	83
Other problems	74	54	37	24	41	17
Those with problems as percent of total	77	87	92	87	92	71

Calculated from Rainwater (1965), Table A-8. No chi-square reported

also tend to have more segregated CRRs than whites when class is controlled, although this last is only a weak trend (consistent with the weak or absent independent effect of race on income predictability in the lower class).

Rainwater also gathered some data with direct bearing on the links I hypothesize between income unpredictability and social class. Table 2 shows that the lower the class, the more likely it is that 'money and job instability' would be mentioned by the husband as the main problem in the marriage, among those who felt there was any significant problem in their marriage. Again, this trend persists across classes when race is controlled, but is almost nonexistent across race when class is controlled.

A method for more stringent testing of these ideas will now be described.

Methods: Predictability and Heterosexual Behavior

Although Rainwater's data are generally recognized as valid, a series of tests of the theory can be made with data on sexual behavior within, outside of, and before marriage. There are now dozens of studies of such sexual behaviors from many different countries, although most are restricted to western cultures. This section describes the selection of these studies and the tests used to assess the significance of their findings.

Selection of the Studies

A search was made of the sociologic, psychologic, and sex research literatures in order to find studies anywhere on earth that have relevance to social class or racial differences in sexual behavior. Studies selected had to:

- (1) Give statistics on sexual behavior (not attitudes or norms alone)
- (2) Include a breakdown of the results by social class (or its close correlate, education) or race (to avoid comparisons between studies conducted with different methodologies)
- (3) Use standard survey-research interviewing techniques (not participant observation or subjective impressions, unless supported by numerical data)
- (4) Have been gathered since the Kinsey studies (about 1945)
- (5) Use subjects drawn from 'normal' populations, not psychiatric, prison, or venereal-disease clinics, and
- (6) Show an absence of gross statistical problems.

Roughly thirty of these studies were found (Weinrich, 1976a, Table 5); those listing behaviors to be considered in this paper are described in Table 3. Studies examining attitudes rather than behavior were eliminated because behavior is more closely tied to biological consequences. Even with nonrandom samples it is common to find attitudes differing more strikingly than behavior (e.g., Athanasiou, 1972), and the two are certainly not always identical (Kinsey et al., 1948, p. 385; Christensen and Carpenter, 1962; W.C. Wilson, 1975, p. 50). The pre-Kinsey restriction was made since the Kinsey group's statistics are generally acknowledged to be the most accurate up to that time. Extremely few studies were done before 1940.

Restrictions 1-5 above can be carried out blind to the results of the studies being evaluated. Restriction 6 is difficult to do blindly, but resulted in only 1 disqualification (due to comparison of incomparable groups and mistranslation of survey questions, Weinrich, 1976a, p. 39).

Papers in preparation may examine sexual patterns before 1900 in western nations, and pattern among so-called primitive peoples. It is suspected that the class differences reported below extend "back to colonial times in this country and to a time several centuries ago in Europe" (Pomeroy, 1972, p. 470); the extent of truly cross-cultural validity remains unknown.

At least regarding studies with *ns* over 1000, it is suspected that the list in Table 3 is very close to complete, subject to the foregoing criteria. The search was thorough, not being limited to English-language sources (see acknowledgements). It turned up one major study (Deggeller et al., 1969) that was completely overlooked in other reviews (Weinrich, 1976b), and the final version of another (Olsen, 1974) that was only once described (as 'in progress') in a Danish medical journal. Regarding smaller-scale studies, the list may not be complete (e.g., Edwards and Booth, 1976 was discovered after Weinrich, 1976a was finished), but certainly the great majority of such studies have been found, if they were mentioned in the English-language literature.

The Statistical Tests

Given the results of the various studies, what constitutes a statistically significant confirmation of the predictions? Theoretically, any result in the proper direction that is statistically significant within the confines of the study itself would do so, but what if there are other studies with different results? And what can be made of studies without reports of statistical significance? To overcome these difficulties, the following very conservative tests were decided upon.

A '*collapsed sign test*' is applied to the composite result of all studies reporting on a certain parameter. All differences, no matter how small, are divided according to whether the difference is in a direction confirming or disconfirming the hypothesis. If an exact binomial tail sign test indicates a significant deviation from the expected 50-50 division, then the null hypothesis (of no class or racial difference) is considered rejected. Some studies report a class difference for more than one age group or other demographic subgroup; here independence of differences for each subgroup must be considered. If all these differences are in the same direction, it is counted as a single instance in that direction. If the differences are in different directions, the figures for the demographic subgroups are averaged, the direction of the overall correlation is assessed, and the study entered as an instance in that direction. Clearly, this might result in highly debatable assignments. In these studies, however, such problematic cases did not occur (with one important exception); even the cases where there are two demographic subgroups with one exception to the average overall trend, the nonexceptional subgroup's difference clearly overwhelmed the exceptional one. The important exception occurred several times in Table 5c, where such difficulties were expected since the theory predicted confirmation of the null hypothesis.

To provide a check on such cases, however, a second test was also applied. An '*expanded sign test*' was applied to the composite result of all the demographic subgroups of the studies reporting on a given parameter. In the tables, each independent division of the overall sample into demographic subgroups is listed, with the total number of subdivisions bearing on a given overall correlation listed and the number of subdivisions showing exceptions to this overall trend. From each study, the division is chosen that divides the overall sample into the largest number of subgroups. The total number of these demographic subdivisions across all studies is tallied, as is the number of exceptions to the overall trend. The null hypothesis states that half of the total number of divisions should show exceptions, and an exact binomial tail probability is calculated from the observed totals. This expanded test is slightly more conservative than the collapsed test

Table 3. Studies consulted. — A list of the characteristics of the studies of sexual behavior consulted for this paper

Source	Country	Year data gathered	Number		Remarks
			M	F	
{ Kinsey et al. (1948) Kinsey et al. (1953) Gebhard et al. (1958) Bell (1968)	USA	1938–1946	5300	0	I Whites; all ages
	USA	1938–1949	0	5900	I Whites; all ages
	USA	1939–1956	0	9585	I Blacks and whites; all ages
	USA	1942–1949	496	498	I Blacks; all ages
Udry and Morris (1968)	USA	ca. 1967	0	88	Q Black and white married women
Kantner and Zelnik (1972)	USA	1971	0	4611	I National random sample of black and white teenage girls
Hunt (1974)	USA	1972	982	1044	Q Blacks and whites; all adult ages
W.C. Wilson (1975)	USA	1970	911	1370	Q Blacks and whites; national random sample of adults
Levin (1975)	USA	1974	0	18349	Q National magazine questionnaire
Edwards and Booth (1976)	Canada	1973–1974	213	294	I Random sample of white Toronto households
Schofield (1965)	England	ca. 1963	934	939	I Random sample of adolescents
Friedeburg (1953)	Germany	1949	493	517	I Quota sample of Germans over 20 years
Schmidt and Sigusch (1971)	Germany	1966–1969	545	362	Q, I University students and young workers
Simon et al. (1972)	France	1970	1250	1375	Q Representative national quota sample of those 20 years and above
Jonsson (1951)	Sweden	1942–1943	968	728	Q M: 20- and 40-year-olds at compuls. mil. serv. F: Lecture attendees and various
Zetterberg (1969)	Sweden	1967	1011	989	Q, I Stratified probability sample of 18- to 60-year-olds
{ Israel et al. (1970) Eliasson (1971)	Sweden	1966	663	634	I Probability sample of Stockholm teens
	Denmark	1944–1947	0	315	I Nonchronic hospital patients
Auken (1953)	Denmark	1963–1965	2532	0	Q, I Random sample of 18- to 19-year-olds at compulsory military exam
Hertoft (1968, 1969)	Denmark	1963–1965	2532	0	Q, I Random sample of 15- to 19-year-old Eskimos from south
Olsen (1974)	Greenland	1967–1968	244	255	I Random sample of 15- to 19-year-old Eskimos from south
Sievers et al. (1974)	Finland	1971	912	1490	Q National random sample
Deggeller et al. (1969)	Holland	1968	585	699	Q Stratified probability sample of 21- to 64-year-olds
Hart (1975)	Australia	1970	670	0	Q Random sample of Vietnam soldiers and those at V.D. clinic
Asayama (1975)	Japan	1950–1956	248	≈900	Q, I Adults and students; summary of earlier studies
Hall (1972)	Chile	1968	240	0	I Stratified random sample of Santiago 18- to 54-year-olds
Armijo and Monreal (1965)	Chile	1961–1962	0	1890	I Random sample of Santiago 20- to 44-year-olds

Only those studies needed for Tables 4–8 are listed here; more are given in Weinrich (1976a, Table 5). The untitled column gives the data-gathering method: I=interview, Q=questionnaire. Bracketed studies refer to essentially the same data base

in that it does not rely on averaging in the individual exceptions to the overall trend. It is slightly less conservative in that it assumes within one study that results from one demographic subgroup are independent of another (nonoverlapping) demographic subgroup.

Selection of Hypotheses

Every hypothesis reported in Weinrich (1976 a) that was testable by five or more studies [permitting a $P \leq (1/2)^5 < 0.05$ on the collapsed test] is considered in this paper.

Statistical Independence of Different Studies

In Table 3, every attempt has been made to identify and link studies that referred back to the same data base, to avoid considering as independent studies that are not so. Confronted with a specified set of significant differences, however, one could claim that the result might be caused by a systematic bias in all the studies, unbeknownst to the separate investigators. Given the highly conservative nature of the two statistical tests used, and the reputations of the professional survey research organizations conducting many of the studies, this is unlikely. Of course, no statistical test can prove that findings are indeed the result of a given theory; they can only show that the differences really exist.

Unpredictability and Heterosexual Behavior: Theory

This section sets out the predictions of an evolutionary theory of marital, extra-marital, and premarital heterosexual behaviors, developed from the theory of the previous sections. Many further predictions are possible (see Weinrich, 1976 a), but only those testable according to the tests of the previous section are developed below.

Sexuality within Marriage

Coitus is the one sexual act (short of artificial insemination) than can result in conception. On the other hand, there are many sexual acts that can help to maintain a pair bond over long periods of time. Thus, the relative importance of simple coitus versus other social sexual acts, and the probability of conception from a given sex act, should be indicators of the strength of the marital pair bond. Couples facing relatively unpredictable income streams should favor uncomplicated coitus over other more 'advanced' techniques, in comparison to those with more predictable incomes, all other things being equal. Likewise, they should choose coital acts more likely to result in conception. A female would usually be expected to favor a stronger pair bond to the extent that it makes her husband more likely to be around to invest in her offspring (Trivers, 1972). But this bias is in the same direction in all social classes. Since husbands continue to be the primary breadwinners in the great majority of US families, the husband's job status level and its correlates (education of husband and wife) should be acceptable independent variables when more sophisticated socioeconomic indices are unavailable.

It remains to divide marital acts into those that are more reproductive and those that are less so. Clearly, coitus is more likely to be reproductive

than are fellatio, cunnilingus, masturbation to orgasm, other petting, anal intercourse, or affection after an orgasm. But some coital situations are more likely to be reproductive than others. Although fertilization can occur at any time in the menstrual cycle, it is most likely to occur at ovulation (mid-cycle) among couples who are regularly engaging in intercourse. One of the least likely times for fertilization in such couples is during menstruation. Likewise, a position creating a seminal pool in the vagina (Masters and Johnson, 1966, p. 81) that contacts the cervix after orgasm, facilitates entry of the sperm into the uterus. Coitus with the female above is quite counterproductive in this regard.

The function of the female's orgasm in this process is controversial; some say orgasm sucks the seminal fluid up into the uterus while others deny that uterine contractions play such a role (Masters and Johnson, 1966, pp. 122–124). In any case, the anatomical relationships change with the human's use of the ventral-ventral position (as opposed to the mounting position used by other primates for the most part), and no attempt will be made here to classify coitus with female orgasm as more or less reproductive.

In summary, noncoital acts are least reproductive, followed by coitus during menstruation and in the female-above position; coitus in the familiar, 'missionary' position is more likely to result in conception. Those more interested in pair bonding should be more likely to employ the first two; those more motivated by reproductive ends should be more likely to engage in the last.

Extramarital Experience and Divorce

Here there is an important distinction to be made: between extramarital coitus early and late in marriage. Extramarital involvement early in marriage is more likely to be an extension of the behavior occurring just before marriage. Late in marriage it is more likely to involve affairs with investment. (This is especially important in the Kinsey group's studies, where a couple was not required to have a formal marriage license to be considered married.) Moreover, there is a statistical weeding-out process whereby unstable marriages break up; those that survive the longest are likely to be disproportionately weighted with couples with predictable incomes. Thus intercourse with companions should decrease with age among husbands with unpredictable income streams, but it should increase with age among husbands with predictable incomes. No prediction can be made regarding the incidence of extramarital experience averaged over the course of the marriage, since the two trends go in opposite directions with age.

Since a woman's reproductive success is not increased by divorce and remarriage except in exceptional circumstances having little to do with income predictability, no predictions are made regarding female extramarital behavior. Some weak ad hoc hypotheses can be made (Weinrich, 1976a, pp. 45–46), but empirical data are sparse.

A corresponding pattern should exist with divorce and remarriage after reproduction. Early in marriage, this is more expected with unpredictable-income strata; late in marriage, with more predictable-income strata. Length of marriage should thus also be higher for upper levels.

Premarital Experience

A first-order analysis would make the same prediction as in the marital case: more reproductive techniques (like coitus) for those expecting unpredictable incomes, more pair-bond-directed techniques (like petting) for predictable incomes. But premarital experience carries with it the possibility that the couple will not end up making a reproductive commitment to each other. A deeper analysis is thus required—one that turns out to make use of the correlation between income predictability and social status.

Theoretical considerations of parental investment and sexual selection (Trivers, 1972) imply that when one sex (usually male) invests less in offspring than the other does, those investing less compete with each other for access to those investing more. In humans, however, both sexes often invest large amounts in offspring. The individuals capable of the highest investment in offspring are usually high-status males, followed by females; low-status males are least able to invest. There is thus a complex competition for mates, biased by sex and class. Females are expected to compete with each other for access to high-status males; low-status males are expected to compete with each other for access to females.

Complicating this picture is the fact that high-status males, although capable of investing at high rates in a single female's offspring, need not do so, and may sometimes maximize their reproductive success through simultaneous or serial polygyny. Simultaneous polygyny is illegal for the cultures under study; no statistics exist for it and no predictions will be made. Serial polygyny is legal, but actions leading up to it—such as extramarital coitus—were covered in the previous section.

One can make sense of this theoretical mishmash by realizing that premarital sexual behavior can be directed at two biological ends: *preparation for marriage* and *coercion of investment*. Petting is useful for the first, but useless for the second (unless the culture in question has unusually strong norms requiring marriage when *any* sexual activity is discovered). Coitus is useful for both, but carries with it the possibility of premarital pregnancy and abandonment of the female by the male.

A high-status female is relatively more likely to be able to win the female-female competition and pair with a high-status, high-income-predictability male. But it is just about equally disadvantageous for her to be impregnated and abandoned by a high-status male as by a low-status one. We thus expect her premarital sexual behavior to be pair-bond-directed but noncoital. What coitus occurs should be directed toward preparation for marriage.

A low-status female is relatively more likely to be forced to try the coercion-of-investment strategy. Coitus should thus occur earlier, at the expense of petting. But when this strategy succeeds and marriage results, one might not find much difference (compared to high-status females) in the length of time between coitus and marriage. (A slightly shorter interval might remain for high-status females, however.)

For males, similar logic leads to predicting relatively early coitus and little petting among low-status men; they, too, are more likely to follow a coercion-of-

investment strategy. But in this case success of the coercion-of-investment strategy consists not in getting married, but in staying single. Accordingly, we expect no significant diminution in the class difference in age at first coitus when age at marriage is controlled for.

In summary, low-status women and men should show an early age at first coitus compared to high-status individuals. This difference should be sharply reduced with a control for age at marriage among women, but not among men. Petting should be more likely among high-status individuals right into marriage.

Finally, a note about correlations with *parental* socioeconomic class. Sexual behaviors considered in this paper should reflect an individual's expected future income predictability. This is strongly correlated with one's *adult* social class. It should not be expected to correlate well – if at all – with parental occupational class. This caveat was exceptionally well illustrated in the correlation between religious devoutness and virginity in a study by Schofield (1965, pp. 148–149). In this case, the usual strong ($P < 0.001$) positive correlation was found between the two when it concerned the boy's or the girl's own church attendance. However, “there was no association between parental church-going and the levels of [the children's] sex activity”. The relationship between parental socioeconomic status and children's sexual behavior is indeed inconsistent (Weinrich, 1976a, pp. 48–50) and will not be further discussed here.

Relations with Prostitutes

Coitus with a prostitute rarely results in children. But prostitutes are fertile and do have babies, and even though they may often try to have their children fathered by a steady boyfriend, it seems inconceivable that babies are not sometimes fathered by customers. Accordingly, a man's coitus with a prostitute can be seen as an extremely non-pair-bond-oriented sexual act. The theory predicts that such intercourse should be more common among men with unpredictable income streams. There are no data for women's intercourse with male prostitutes, and accordingly no predictions for women will be made.

Social Class and Heterosexual Behavior: Results

Sexuality within Marriage

The null hypothesis is that there is no variation by class in the relative incidence of reproductive sexual acts versus nonreproductive ones. Evidence concerning this hypothesis is summarized in Table 4. All eight independent studies, in 19 different tabulations, agree that there are no significant exceptions to the predictions of the theory. These results are not changed if Zetterberg (1969) and Simon et al. (1972) are eliminated (they did not distinguish between marital and premarital experience), nor if the intermediately reproductive acts (coitus during menstruation and coitus with the female above) are eliminated—the

Table 4. Sexual behavior within marriage.—Null hypothesis: There is no variation by class in the relative amount of reproductive sexual acts versus nonreproductive ones in marriage

Sex	Act	Higher in	No. of comparisons	No. of exceptions	Source
M	Coitus with ♀ above, frequent	UE	5	0	Table 95 } Kinsey et al. (1948)
M	Fellatio and cunnilingus, ever	UE	10	0	Table 93 } Kinsey et al. (1948)
F	Fellatio and cunnilingus	UE	14 ^b	3	Table 100, Kinsey et al. (1953)
F	Midcycle/menses coital ratio	LE	1 ^b	0	Figures 1 and 2, Udry and Morris (1968)
M, F	Fellatio and cunnilingus	UE	4 ^b	0	Table 32, Hunt (1974)
M, F	Coitus with ♀ below	LE	12 ^b	3	Table 6: 27, Sievers et al. (1974)
M	Fellatio	UE	1 ^b	0	Page 223, Hart (1975)
M, F	Coitus with ♀ below, always	LS	1 ^b	0	Page 105 } Asayama (1975)
M, F	Frequency of foreplay	US	1	0	Page 104 }
In last month, there was:					
M+F	Coitus only	LJ, LE	1, 2	0, 0	Zetterberg (1969) ^a , Table IV:3
M+F	Coitus+masturb'n or petting	UJ, UE	3, 6 ^b	1, 0	
M, F	Coitus with ♀ above	UE	4	0	Page 241 } Simon et al. (1972) ^a
M, F	Orgasm by mutual masturbation	UE	4	0	Page 243 }
M, F	Ever mutual oral-genital rel'n	UE	4	0	Page 246 }
M, F	Ever coitus during menses	UE	2	0	Page 248 }
M, F	Ever anal intercourse	UE	4 ^b	1	Page 250 }
M, F	Often affection after orgasm	UE	3	0	Pages 760-2 }

M = Males, F = Females, M + F = Sexes not separated in this study, U = Upper, L = Lower, E = Educational level, J = Job status level, S = Socioeconomic level

Expanded sign test: 43 comparisons, 7 exceptions, $P \leq 0.001$

Collapsed sign test: 8 studies, 0 exceptions, $P < 0.005$

^a Marital experiences not separated from premarital experiences

^b This breakdown used for expanded sign test

level of significance can rise as far as about 0.03 but no further. The null hypothesis is rejected.

Extramarital Experience and Divorce

The null hypotheses state that there is no variation by class in the relative incidence of extramarital relations early, late, and over the course of the marriage. Evidence is summarized in Tables 5a, 5b, and 5c. No reason has been given to suspect rejection of the hypothesis for women; interestingly, it approaches rejection in two cases. According to Tables 5b and 5c, better-educated women may be more likely to have extramarital affairs than more poorly educated ones late in marriage and over the course of the marriage (the second would follow from the first if there is really no class difference early in marriage). Although this result is consistent with the logic of Weinrich (1976a, pp. 45-46), no confirmation will be claimed due to the ad hoc nature of that reasoning.

Table 5a. Extramarital experience early in marriage.—Null hypothesis: There is no variation by class in extramarital coitus early in marriage

Sex and Age	Extramarital act	Higher in	No. of comparisons	No. of exceptions	Source
M \leq 30	last 5 years, companions	LE	6	2	Table 86, Kinsey et al. (1968) ^a
F \leq 30	last 5 years, companions	UE	5	2	Table 116, Kinsey et al. (1953)
M < 35	ever	LE	1	0	Page 259, Hunt (1974)
F < 40	ever	LE	1	0	Text, Levin (1975)
M + F \leq 30	in last year	LE	1	0	Table II:11, Zetterberg (1969)
M < 50	ever	LE	1	0	Page 694 } Simon et al. (1972)
F < 50	ever	(LE)	1	0	
M < 30	ever	UE	2	1	Table 6:39, Sievers et al. (1974)
F < 30	ever	LE	1	0	

() highest and lowest figures differ by 2 percentage points or less. All other symbols as in Table 4
 Expanded sign test, women only: 8–9 comparisons, 3 exceptions, $P > 0.15$ LE trend overall
 Collapsed sign test, women only: 4–5 studies, 1 exception, $P > 0.15$ LE trend overall
 Expanded sign test, men only: 10–11 comparisons, 3 exceptions, $0.1 < P < 0.2$ LE trend overall
 Collapsed sign test, men only: 4–5 studies, 1 exception, $P > 0.15$ LE trend overall
 Variability due to uncertainty about including Zetterberg (1969) in male or female category

^a High level of cover-ups reported (p. 587)

Table 5b. Extramarital experience late in marriage.—Null hypothesis: There is no variation by class in extramarital coitus late in marriage

Sex and Age	Extramarital act	Higher in	No. of comparisons	No. of exceptions	Source
M > 30	last 5 years, companions	UE ^b	5	2	Table 86, Kinsey et al. (1948) ^a
F > 30	last 5 years, companions	UE	10	3	Table 116, Kinsey et al. (1953)
M \geq 35	ever	LE	1	0	Page 259, Hunt (1974)
F \geq 40	ever	UE	1	0	Text, Levin (1975)
M + F > 30	in last year	UE	1	0	Table II:11, Zetterberg (1969)
M \geq 50	ever	UE	1	0	Page 694 } Simon et al. (1972)
F \geq 50	ever	(UE)	1	0	
M \geq 30	ever	LE	2	1	Table 6:39, Sievers et al. (1974)
F \geq 30	ever	UE	2	1	

() highest and lowest figures differ by 2 percentage points or less. All other symbols as in Table 4
 Expanded sign test, women only: 14–15 comparisons, 4 exceptions, $0.05 < P < 0.10$ UE trend clear
 Collapsed sign test, women only: 4–5 studies, 0 exceptions, $0.03 < P < 0.06$ UE trend clear
 Expanded sign test, men only: 9–10 comparisons, 4 exceptions, $P \approx 0.5$ UE trend possible
 Collapsed sign test, men only: 4–5 studies, 2 exceptions, $P \approx 0.5$ UE trend possible
 Variability due to uncertainty about including Zetterberg (1969) in male or female category

^a High level of cover-ups reported (p. 587)

^b Most often in intermediate educational group

Table 5c. Extramarital experience overall. — Null hypothesis: There is no variation by class in extramarital coitus over the course of the marriage

Sex	Extramarital act	Higher in	No. of comparisons	No. of exceptions	Source
M	ever with companions	LE	1	0	Table 86, Kinsey et al. (1948) ^a
F	ever with companions	UE	2	1	Table 115, Kinsey et al. (1953)
M	ever	LE	1	0	Page 259, Hunt (1974)
M	ever	(LE)	1	0	Table 2, Edwards and Booth (1976)
F	ever	(UE)	1	0	
M, F	ever	(UE)	1, 1	0, 0	Table 41, Friedeburg (1953)
M	ever	(LE)	1	0	Table 6:39, Sievers et al. (1974)
F	ever	(UE)	1	0	
M	ever	UE	3	0	Page 194, Deggeller et al. (1969)
F	ever	UE	3	1	
M	last 3 months	UE	2	0	Table 7, Hall (1972)

() highest and lowest figures differ by 2 percentage points or less, or are reported by authors as nonsignificant. All other symbols as in Table 4

Expanded sign test, women only: 8 comparisons, 2 exceptions, $P \approx 0.14$ LE trend clear

Collapsed sign test, women only: 5 studies, 0 exceptions, $P < 0.04$ LE trend clear

Expanded sign test, men only: 10 comparisons, 6 exceptions, $P \approx 0.5$ LE trend possible

Collapsed sign test, men only: 7 studies, 3 exceptions, $P = 0.5$ LE trend possible

^a High level of cover-ups reported (p. 587)

Likewise, no reason was given to reject the hypothesis for men over the course of the marriage, and here the null hypothesis is just as likely as its negation; indeed, many of the 'differences' are exceedingly small. For the extramarital relations of young men (presumably synonymous with early in marriage), the null hypothesis remains viable (with a P between 0.1 and 0.2), but would probably be rejected in the presence of more or better data. Only 5 studies exist for men (one confounded by the addition of data for women), only 1 study showed an exception overall, and that exception is itself equivocal. The sizes of the class differences are large enough that had statistical significances been reported for each study, the overall probability of the rejection of the null hypothesis would almost certainly have been very high. For men late in marriage, the null hypothesis also remains in the running. As I will now explain, this is consistent with the theory but not a confirmation of it.

These nonsignificant findings are probably due to two factors. First, the prediction is that lower-class men will have extramarital relations decreasing with age, while upper-level men's affairs will increase with age although they begin at a lower level. Strictly speaking, this can be settled only with active incidences, and only two studies reported data in this way. The others reported ever/never incidences at the time of reporting, broken down by age at reporting; if upper-class levels increase to the point where they exceed lower-class levels the predicted shift can be detected, but the maintenance of the lower-class

lead is also possible. This shift occurred with Zetterberg (1969), Simon et al. (1972), and Hunt (1974, p. 259), but the opposite shift (with exceptions) occurred in Sievers et al.'s study. Second, extramarital liaisons are notoriously subject to cover-ups (Kinsey et al., 1948, p. 585), and all the studies listed except the Kinsey group's relied on questionnaires, where cover-up and omission of answers is especially difficult to combat. Thus, although the predicted relationship for males is probably true (see especially the conclusion of Kinsey et al., 1948, p. 587), the entire corpus of data on extramarital affairs could at present be denied by someone willing to adopt a sufficiently extreme position.

Studies of divorce were not systematically collected for this paper. The best study I ran across in the course of this research, however (Bumpass and Sweet, 1972), showed the predicted trend: education inversely related to the proportion of first marriages ending in separation or divorce. I did not run across any studies with contrary conclusions.

Premarital Experience

The null hypotheses state that there is no variation by class in the age of first coitus or in the amount of 'advanced' petting short of coitus before marriage. Evidence is summarized in Tables 6a and 6b. Regarding the age at first coitus, there is overwhelming agreement with the theory, with no important exceptions. There are only five studies bearing on the question of petting (Zetterberg, 1969 and Simon et al., 1972 were instead included in the marital table), but even so all five agree ($P < 0.04$), with no important exceptions. The null hypotheses are rejected.

Relations with Prostitutes

The null hypothesis states that there is no variation by class in the incidence of men's relations with prostitutes. Evidence is summarized in Table 7. Due to the small number of studies, conclusions are tentative, but the evidence is, in my opinion, sufficient to reject the null hypothesis. The only exceptions are for Deggeller et al. (1969) who themselves express uncertainty about their results, and Simon et al. (1972), where confirmation or disconfirmation depends on which statistic is chosen. Evidence from the other studies is clear-cut; indeed, when the less conservative 'expanded' test of significance is used, the null hypothesis is rejected at the 0.01 level or better, depending on whether one accepts an ever/never incidence when other measures are available.

Summary

Where there is a large amount of evidence, it is clear-cut in favor of the theory's predictions and in rejecting the null hypothesis (Tables 4 and 6a). Where there is barely enough evidence to allow the feasibility of a statistically significant

Table 6a. Premarital sexual experience, first coitus.—Null hypothesis: There is no variation by class in the age at first coitus

Sex	Age at first coitus	Lower among	No. of comparisons	No. of exceptions	Source
M	≤ 20	LE	2	0	Figure 146, Kinsey et al. (1948)
F	≤ 20	LE	3	0	Figure 47, Kinsey et al. (1953)
F	≤ 20	LE	2	0	Table 17, Gebhard et al. (1958)
M	≤ 17	LE	1	0	Page 149, Hunt (1974)
M	≤ 17	LE	2	1 ^a	Table 3, W.C. Wilson (1975)
F	≤ 17	LE	2	0	
M, F	≤ 18	LE	1, 1	0, 0	Table 3, Schmidt and Sigusch (1971)
M, F	≤ 17-19 ^c	LE	3, 3	0, 0	Table 9.2, Schofield (1965)
M	< 18	LE	2	0	Page 202, Simon et al. (1972)
F	< 18	LE	2	1	
F	unspecified	LE	1	0	Pages 390-391, Auker (1953)
M	< 17	LE, LJ	2, 3	0, 0	Table 2/VIII, Hertoft (1968, 1969) ^b
M	≤ 20	LE	1	0	Table 1, Jonsson (1951)
M+F	≤ 18-30 ^c	LE (LJ)	1, 1	0, 0	Table 3:1, Zetterberg (1969)
M	≤ 20	LE	2	0	Table 7 } Israel et al. (1970)
M, F	≤ 16-25 ^c	LE	3, 3	0, 0	
M, F	≤ 18	LE	1, 1	0, 0	Page 8, Eliasson (1971)
M	≤ 17	LE	6	2	Table 5:9, Sievers et al. (1974)
F	≤ 17	LE	5	0	
M, F	≤ 14	LS, LE	2, 2	0, 0	Table 65, Olsen (1974)
F	≤ 18	LS	1	0	Page 103, Asayama (1975)
M	< 15	LS	2	0	Table 2, Hall (1972)
F	< 20	LS	3	0	Table 8, Armijo and Monreal (1965)

() highest and lowest figures differ by 2 percentage points or less. All other symbols as in Table 4

Expanded sign test: 55 comparisons, 4 exceptions, $P \leq 0.001$

Collapsed sign test: 17 studies, 0 exceptions, $P \leq 0.001$

Expanded sign test, men only: 28 comparisons, 3 exceptions, $P \leq 0.001$

Collapsed sign test, men only: 12 studies, 0 exceptions, $P < 0.001$

Expanded sign test, women only: 26 comparisons, 1 exception, $P \leq 0.001$

Collapsed sign test, women only: 11 studies, 0 exceptions, $P < 0.001$

^a Wilson believes this may be an artifact (p. 61)

^b Farm category eliminated (see Weinrich, 1976a, p. 27)

^c Age at interview

result (5 studies), the evidence clearly confirms the theory and rejects the null hypothesis in 1 case (Table 6b), tends toward confirmation of the theory in 2 cases (Tables 5b and 5c), and does not reject the null hypothesis as allowed by the theory in 2 cases (Tables 5b and 5c). The theory is quite consistent with the facts.

Table 6b. Premarital sexual experience, petting only.—Null hypothesis: There is no variation by class in the amount of 'advanced' petting before marriage

Sex	Act	More among	No. of comparisons	No. of exceptions	Source
M	petting to orgasm	UE	8	1	Table 84, Kinsey et al. (1948)
F	petting to orgasm	UE ^a	12	5	Table 58, Kinsey et al. (1953)
M	fellatio and cunnilingus	UE	2	0	Table 5 and p. 97, Schmidt and Sigusch (1971)
F	fellatio and cunnilingus	UE	2	0	
M	{ petting only on first heterosexual contact	US	1	0	Page 192, Deggeller et al. (1969)
F		US	1	0	
M	has had petting, not coitus	UE	3	0	Table 9.2, Schofield (1965)
F	has had petting, not coitus	UE	3	1	
M	petting to orgasm	UE, UJ	2, 3	1, 1	Table 5/VIII, Hertoft (1968, 1969) ^b

All symbols as in Table 4

Expanded sign test: 35 comparisons, 7 exceptions, $P < 0.005$

Collapsed sign test: 5 studies, 0 exceptions, $P < 0.04$

The relationship is clearer for men than for women

^a Relationship often confusing, but least educated always least experienced; uncertainties arise for those with postgraduate education

^b Farm category eliminated (see Weinrich, 1976a, p. 27)

Table 7. Relations with prostitutes.—Null hypothesis: There is no variation by class regarding the incidence of men's relations with prostitutes

Act	Higher in	No. of comparisons	No. of exceptions	Source
When single, active incidence	LE	8	0	Table 87, Kinsey et al. (1948)
When married, active incidence	LE	12 ^b	5	
Active median freq., single	LE	7	0	
Active median freq., married	LE	8	2	
Coitus when single, ever	LE	2	0	Table 21, Hunt (1974)
Coitus when married, ever	US ^a	2	1	Page 123, Deggeller et al. (1969)
Coitus when single, ever	LE, LJ	2, 1	0, 0	Table 1/XIV, Hertoft (1968, 1969)
Coitus, ever	UE	2	1	Page 686, Simon et al. (1972)
Median freq. of experienced	LE	2	0	

All symbols as in Table 4

Expanded sign test, median frequencies: 23 comparisons, 3 exceptions, $P < 0.001$

Collapsed sign test, median frequencies: 5 studies, 1 exception, $P > 0.15$

Expanded sign test, incidences: 28 comparisons, 7 exceptions, $P < 0.01$

Collapsed sign test, incidences: 5 studies, 2 exceptions, $P = 0.5$

^a Authors express skepticism due to higher nonresponse rate in LS group

^b Usually most often in intermediate education group

Other Races and Heterosexual Behavior: Results

Nonwhites were not included in Tables 4-7 because there are fewer than 5 studies that compare their sexual behavior to white groups. The results of these studies, however, are summarized in Table 8 for those parameters listed in Tables 4-7. (Note that Udry and Morris (1968) appears again, since they studied a college-educated white group and a high-school-educated black group.)

Recalling that working-class blacks and whites do not differ measurably in the predictability of their income streams, samples drawn from these strata should show small or nonexistent racial differences. The only study fulfilling this criterion is Rainwater's (1965), who considered parameters not covered in depth in this paper. Nevertheless (as mentioned above), for those parameters racial differences do seem to be much less important than class differences (Rainwater, 1965, Tables 2-1 and A-8). The *ns* for this study are small, however.

Middle-class blacks and whites do differ in income unpredictability. Hunt's study (1974) drew mostly on urban, well-educated persons of both races (Hunt, personal communication), and thus can be used as a control for this parameter. Other studies did not permit comparisons within socioeconomic groups, and thus the 'racial' differences found can be confounded with class differences.

These cases are all consistent with the theory presented in this paper. (The finding for age at first intercourse, however, should be interpreted with particular caution; see the next section.) Ignoring the Rainwater findings (where no differences were expected), there are 7 confirming instances (in 4 independent studies) and no disconfirmations. This finding is best construed as suggestive, given the small number of studies and the fact that markedly different behaviors were combined in these totals.

Table 8. Racial differences in sexual behavior

Sex	Act	More among	No. of cases	No. of exceptions	Source
F	low age first coitus	B	6	0	Tables 17 and 63, Gebhard et al. (1958)
M, F	low age first coitus	B	2	0	Page 11, Bell (1968)
F	high midcycle/menses coital ratio	B	1	0	Figures 1 and 2, Udry and Morris (1968)
F	first coitus by late teens	B	11	0	Table 5, Kantner and Zelnik (1972)
M, F	fellatio and cunnilingus	W	4	0	Page 198
F	low age first coitus (in teens)	B	1	0	Page 149
M	coitus with prostitutes	B	1	0	Page 145

W = Whites, B = Blacks

All other symbols as in Table 4

Number of studies too small for statistical test

Differences between Western Cultures: Results

Tables 4–7 show that most class differences between American and western European populations lie in the same direction. They were not designed to show that the baseline figures are quite different, nor other differences between the groups. A complete tabulation would show what Sigusch and Schmidt (1971) found for a smaller sample: that the European populations resemble one another quite closely and show relatively small class differences. (Although some portion of these and other differences should be due to differences in income predictability, much could be due to other factors as well. This seems especially clear for age at first coitus, since age at first reproduction in other animals is known to be influenced by many factors.) Sigusch and Schmidt explained these differences in a way that confirms the logic of this paper. Their primary sources for American patterns were the Kinsey group's volumes (also main sources for this paper) and Rainwater's works (1960, 1965). The German authors noted both a similarity and a difference between the Rainwater subjects and their own. The workers in both cases came from the bottom sixth of their societies, socioeconomically speaking, but the German workers had much more reliable, less intermittent jobs than the Americans. Thus, the American workers had low, highly unstable incomes; the German workers had low, predictable ones. Sigusch and Schmidt concluded:

“Therefore, the differences in sexual behavior and in sexual attitudes between the American and the West German as well as the Scandinavian lower-lower class can be imputed to their differing socioeconomic situation. What we have described as the Scandinavian pattern of lower-class sexuality is actually the pattern of the ‘stable working class’ or affluent workers; what we have described as the American pattern is the pattern of the ‘unstable working class’ or nonaffluent workers” (Sigusch and Schmidt, 1971, pp. 42–43, incorporating corrections included by the authors with a reprint).

The West German situation thus constitutes a control for the effects of low income versus low income predictability. Indeed, while unemployment is common in the US, in most western European countries there was the reverse—more job vacancies than there were people willing to fill them. The theory presented in this paper predicts that the foreign migrant workers now causing social upheaval in Europe should show sexual and marital patterns quite similar to those Rainwater found in the lower-lower class here. (A profile of one such migrant-worker family, published after the preceding passage was prepared, confirmed this—(Kramer, 1976, pp. 70, 74–76, 78, 83). Clearly, an *n* of more than 1 should be sought.)

Rainwater (1965) did include some controls by the degree of jointness of the CRR (conjugal role relationship). To the extent that this is a proxy for income predictability, class and racial differences should disappear (or at least be drastically reduced, to allow for inexact proxying) when the CRR jointness is controlled. For the data he gathered on marital sexuality it is indeed true that the middle-class patterns (which are all joint and intermediate CRRs) are very close to the lower-class intermediate patterns, with the segregated lower-class patterns standing out as sharply different (Rainwater, 1965, Tables 3-

1, 3-2, 3-5, 3-6, and 3-13). Likewise, racial differences disappeared almost completely. Somewhat more weakly, but along the same lines, Eliasson (1971, p. 3) found that "among those who state that their parents are happy together, the occurrence of expressions of affection is unrelated to socioeconomic group" (misspelling corrected) although without this control there is a clear class difference. In this respect, the class and racial differences in sexual behavior might more accurately be referred to as pair-bond strength differences. In future studies, a more direct measure of income predictability could decide whether they are still more aptly called income predictability differences.

Discussion

Up to this point, this paper has considered two questions. First, what are the facts regarding class and racial differences in reproductive strategy? Second, can this particular evolutionary theory explain those facts satisfactorily?

The third step in the evaluation of any scientific theory is to see what other theories might explain the same facts, and to show that only the proposed theory is adequate. This will be only partially accomplished in this section, for reasons explained below.

The most widely accepted theories in opposition to an evolutionary one are, of course, the environmentalistic ones, which propose that education, socialization, early childhood events, or other processes devoid of evolutionary significance account for the observed behavior patterns. Many of these theories are severely challenged by existing data, but a few can be adjusted so as to be consistent with the facts explained by the evolutionary theory. It is conceivable that an impasse will be reached, with the entire set of data explainable by both theories. In this case, it should be noted that the evolutionary explanation ties together a whole series of phenomena previously considered unrelated (including many phenomena regarding fertility; see Weinrich, 1976a, pp. 24-36). The environmentalistic theories, in contrast, view the phenomena for the most part as unconnected.

For example, nonreproductive heterosexual activity has for centuries in the west been strenuously discouraged in many groups; it is still discouraged in some groups today. Many of these same groups consider the only permissible coital position to be the one with the female supine and the male prone above her. The correlation between these two customs is widely acknowledged, but the explanations for them have been different; nonreproductive heterosexual activity was regarded as 'unnatural' and coitus with the female above was regarded as upsetting the power balance between husband and wife. (To be sure, this power balance was sometimes in turn regarded as 'natural'.) Given the earlier discussion showing that the female-above position is one very likely (perhaps even most likely) to avoid conception, an evolutionary view sees a more ultimate causation behind the two correlated customs. Given a desire to have sexuality serve solely the ends of reproduction, limitation of coitus to this missionary position is (subconsciously) rational—and so logical that I am surprised that this connection has not, to the best of my knowledge,

been proposed previously. Another striking example of a closely related phenomenon—the convergence in attitudes toward the loss of semen outside of marriage in Victorian England and modern India—is described by Malhotra and Wig (1975). The low probability of cultural transmission of this belief system makes the evolutionary explanation especially worthy of consideration.

That subset of environmentalistic theories that propose that early childhood socialization experiences are *the* key to understanding adult behavior patterns has the most difficulty with the facts. A close second are those theories that state that formal or informal education alone often significantly alters behavior patterns. Exceptionally few studies have put these theories to the test by looking at data; those that have, have produced mostly negative results.

The most extensive test of these ideas was reported recently by Spanier (1976), results of a nationwide probability sample of college students in the US. A wide variety of childhood, high-school, and current influences were collected. For our purposes, the most important result is the very general finding that “Reports of current influences and pressures explain more variance in premarital sexual behavior than reports of past informal sexualization influences, which, in turn, explain more variance than reported formal sex-educating experiences” (p. 40).

Other studies show that this finding is not restricted to college students, although here the data were not analyzed in as elaborate a fashion. A significant finding of the Kinsey group’s early studies was that those individuals moving from one class to another (between childhood and early adulthood) show the sexual pattern of their *acquired* class, not the class they were socialized in by their parents (Kinsey et al., 1948, Chap. 11; 1953, p. 297). According to Zetterberg (1969, Table V:1), even knowledge of simple facts about sex is better predicted by either social class or educational attainment than it is by attendance at a sex education course—and this in a country (Sweden) famous for sex education in its schools! Finally, at least two US studies of lower-class youth (Hammond and Ladner, 1969; Rosenberg and Bensman, 1968) found that sex education in the use of contraceptives was virtually useless in motivating the use of contraception; the latter study, for example, found that those well versed knew much better “just what it is they habitually decline to use”.

In short, we can discard those environmentalistic theories that depend heavily on environmental influences too far removed from current conditions faced by the individual. Once this is done, there remain environmentalistic theories that fit the facts fairly well, agreeing (with the evolutionary explanation) that one’s current behavior should reflect one’s current circumstances. Perhaps the main differing feature of the evolutionary explanation lies in the assertion of a connection between those current responses and maximization of reproductive success that is biologically rational.

I know of no data now that can decisively eliminate all but one of these theories. I do know of some data that are highly suggestive and worthy of further investigation.

It has been shown that individuals who end up in a social class different from that of their parents show the sexual pattern of their acquired class. The Kinsey group (1948, Chap. 11; 1953, p. 297) also found that most such

individuals begin showing the pattern of their acquired class *before* they actually make the change! One of Kinsey's collaborators (Pomeroy, 1972, p. 469) believed as recently as 1972 that this is a phenomenon that deserves to be reinvestigated today. More recently, Pomeroy felt (personal communication) that recent decreases in social class differences make the point "much less clear-cut". In any case, the earlier data remain to be explained.

Any explanation must accept the fact of the premonition of one's future class status. But some explanations are better able than others to deal with the consequences of that premonition. I can conceive of four ways to understand these results.

First, one might hypothesize that people differ innately (whether genetically or through irreversible childhood socialization) in their sexual habits, and the class one ends up in is causally related to those habits. That is, those sexually unsuited for a certain class are excluded from it by life events. Certainly the genetic half of this hypothesis seems unlikely; there is so much interclass migration in the US (Blau and Duncan, 1967; Kinsey et al., 1948, p. 328) that genetic differences should be few. The socialization version of this hypothesis seems similarly unlikely in the light of Spanier's (1976) result, which included childhood socialization parameters.

Second, it may be argued that "Families that train their children for eventual mobility, ... through a process of anticipatory socialization, also teach them the mores, including the sexual codes, thought to be appropriate for 'higher' social positions" (Lindenfeld, 1960). While this may indeed be the case in certain individuals (Kinsey et al., 1948, pp. 440-441), the Kinsey group rejected this as a general explanation. The very fact that people are surprised to learn of class differences in sexual behavior indicates that such behavior patterns are not well known—and are even greatly distorted—outside the class they occur in. (Some of these distortions are still current and are listed by Stycos in Rainwater, 1960, pp. ix-x.) I know of no empirical study that indicates that such sexual anticipatory socialization actually occurs in many cases.

The third theory is the one advocated throughout this paper. It proposes that the predictability of the resource stream of *Homo sapiens* has varied over the short term for evolutionarily significant periods of time. It then proposes a built-in mechanism that gives the developing organism a sensitivity to the predictability it can expect to find itself in as an adult, and produces the necessary fine tuning of reproductive strategy according to the premonition or expectation the individual's sensors have about the future. It predicts correlations with class and racial status not because of any inherent differences in those groups, but because of the empirical correlation of income predictability with them. Note that although this mechanism involves genes, it is quite different from the one proposed as part of the first theory above. What is 'built in' is not a single, invariable strategy, but a tree giving the appropriate strategy for different environments.

The fourth theory is not completely incompatible with the third, but it is also the strongest competitor. It proposes that precisely those differences in behavior that seem to predict the group one will move into are the behaviors

that cause the movement into the group, but that one is not socialized into those behaviors (else the first explanation would apply). For example, a girl who is highly promiscuous in the absence of contraceptive use will probably have an early pregnancy, resulting in an early age at marriage and little chance for a college education. Likewise, the boy who resists coitus and pets a lot is, as a direct result, less likely to have to get married early and more likely to be able to go to school longer and get a better job. As a proximate mechanism for the more ultimate evolutionary cause, this theory has much to recommend it. However, it has at least three difficulties as the sole, causative mechanism. First, it cannot explain racial differences in sexual behavior, except in terms of earlier, unexplained differences in blacks' and whites' behavior. Second, it does not explain why a whole group of activities vary together – why a working-class couple is least likely to have coitus with the wife above, why the husband is more likely to go to prostitutes, why the woman finds sex distasteful while her better-off sister enjoys it more (Rainwater, 1965, Table 3-7) but has somewhat less of it (Kinsey et al., 1953, Table 6). It is conceivable that a set of ad hoc explanations could be the cause of these united consequences, but it seems unlikely. Third, this theory is motivationally (and evolutionarily) naive. If early marriage, say, is a cause of entry into the lower-class groups, then accumulated experience (or natural selection) begins to select against those who are susceptible to the cause of the 'mistake'. (The assumption that a human's high learning and socialization capabilities make him or her powerless in the face of such environmental events, while often made, is certainly unproven and probably not true. See Alcock, 1975.) Although mistakes can be made in any system, it is motivationally (and evolutionarily) much more believable to reason that mistakes made by millions of people are not mistakes. (It is also more palatable to some to conclude that working-class behavior has a dignity and validity of its own, being more than a puppet's reaction to conditions imposed from the outside.) These actions may be better understood as positive adaptations to the conditions people have been placed in.

Suggestions for Future Research

Prospective studies of sexual and reproductive behavior are exceedingly rare. Clearly, such studies are needed to confirm or refute the data on 'premonition' of one's future social class, if only to rule out the possibility of retrospective distortion. As an intermediate goal, data should be gathered to correlate one's current reproductive strategy with one's current feelings about the predictability of one's future, so that correlations with the intermediate variables of class and race will not have to be relied upon. When this was done in the study of the relationship between family size and income, highly significant correlations explaining large portions of the variance were obtained (Groat and Neal, 1967; Bauman and Udry, 1972). Also worth investigating is the predicted correlation between the size of the sexual-behavior and income-predictability differences over time.

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