

## Race Differences in Sexual Behavior: Testing an Evolutionary Hypothesis

J. PHILIPPE RUSHTON AND ANTHONY F. BOGAERT

*University of Western Ontario, Canada*

Population differences exist in personality and sexual behavior such that, in terms of restraint, Orientals > whites > blacks. This ordering is predicted from an evolutionary theory of r/K reproductive strategies in which a tradeoff occurs between gamete production and parental care. Literature is reviewed on differences between the three groups in rate of ovulation, intercourse frequencies, sexual attitudes, developmental precocity, size of genitalia, secondary sexual characteristics, and biologic control of behavior that accord with this formulation. Novel analyses of data from the Institute for Sex Research are also carried out, indicating that American blacks, compared to American whites, are more precocious and less restrained. Their parents were younger when they were born, had more children, and had an earlier mortality. Blacks left home earlier, experienced a variety of premarital, marital, and extramarital sexual events earlier, had a greater number of premarital and extramarital partners, had a greater frequency of marital intercourse, used fewer contraceptives, and had a greater incidence of pregnancy, at a faster rate. The men had larger penises, at a different angle of erection, and maintained intromission longer, while the women had shorter menstrual cycles, more periodicity of sexual response, and a greater number of orgasms per act of coitus. Whites varied their sexual activity more, both with spouses and with prostitutes, although blacks consorted with prostitutes more frequently. Finally, blacks had a shorter duration of marriage and more permissive sexual attitudes.

© 1987 Academic Press, Inc.

Differences in sexual behavior have long been observed and related to personality. Freud (1930) noted a positive correlation between inhibited sexuality and the production of culture. Eysenck (1976) and Barnes, Malamuth, and Check (1984) showed that, compared to introverts, extraverts manifest a stronger sex drive, tend toward liberalism and moral permissiveness, and have intercourse earlier, more frequently, and with more different partners. Snyder, Simpson, and Gangestad (1986) found that high self-monitors (who are more responsive to situational cues),

This research was supported by a grant from The Pioneer Fund. Requests for reprints should be sent to J. P. Rushton, Department of Psychology, University of Western Ontario, London, Ontario N6A 5C2, Canada.

compared to low self-monitors (who are more responsive to internal cues), adopt an "unrestricted" orientation to sexuality and report both a greater enjoyment of and a greater frequency of casual sex. Several studies have reported that those high in sex guilt are more limited in their sexual behavior (Abramson & Mosher, 1975; Mosher & Cross, 1971), recall less birth control information (Schwartz, 1973), and spend less time reading erotica (Schill & Chapin, 1972). Similarly, erotophobia-erotophilia, the inclination to like or dislike sexuality, was found to predict the number of sexual partners, the use of birth control, the enjoyment of erotica, and the ease of fantasizing or talking about sex (Fisher, Byrne, White, & Kelley, in press). Finally, Malamuth (1986) observed that sexually experienced, aggressive and dominant men, with permissive attitudes toward violence, were more likely to engage in sexual aggression on dates, while Mosher and Anderson (1986) found that those willing to use aggression in sexual relationships were also more generally aggressive and demonstrated a lack of distaste, fear, or guilt while imagining committing a rape.

Common to these findings is the notion of sexual restraint, with some individuals (introverts, erotophobes, low self-monitors, low aggressors) acting in the more reticent manner across a variety of attitudinal and behavioral phenomena. As to etiology, Freud explained restraint in terms of the psychodynamics of repression and sublimation. Most researchers have proposed models based on socialization and the conditioning of negative affect to sexually linked stimuli, showing, for example, that a disdain for sexuality occurs more often in family backgrounds that emphasize conservative values and frequent church attendance (Fisher et al., in press). Both Eysenck (1976) and Snyder et al. (1986; see also Snyder, 1987) reported twin studies showing that genetic factors also underlie the observed individual differences, and conjectured whether the sexual strategies they had observed existed across a diversity of cultures and were related to evolutionary processes.

### THE r/K CONTINUUM

Sexual restraint was a major feature of a theory of individual differences proposed from an evolutionary perspective by Rushton (1985a). In this account, described under the rubric "Differential K Theory," the degree to which an individual had acquired a K rather than an r reproductive strategy was predicted to underlie multifarious characteristics concerning life histories and personality. The symbols r and K originate in the mathematics of population biology and refer to two ends of a continuum of reproductive behavior organisms can adopt ranging from extreme r, involving maximum egg output and no parental care, to extreme K, emphasizing elaborate parental care in which the birthrate is reduced to

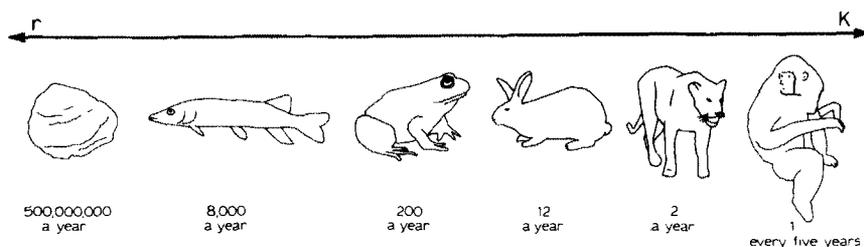


FIG. 1. The r/K continuum of reproductive strategies balancing egg output with parental care (after Johanson & Edey, 1981).

a minimum (E. O. Wilson, 1975). As can be seen in Fig. 1, oysters, producing 500 million eggs a year, exemplify the r-strategy, while the great apes, producing only one infant every 5 or 6 years, exemplify the K-strategy.

Evidence from both comparative studies and selective breeding experiments on species ranging from dandelions to fish to mice to men, indicates that these reproductive strategies are correlated with other features of the organism's life history. Following Pianka (1970), Wilson (1975), Eisenberg (1981), Barash (1982), and Daly and Wilson (1983), these are summarized in Table 1. While each of the life cycle traits might independently contribute to fitness, the important point is that they are expected to covary along a single axis both between and within species.

From Table 1, it can be seen that, in terms of *family characteristics*, r and K strategists differ in terms of litter size (number of offspring produced at one time), birth spacing, total number of offspring, rate of infant mortality, and degree of parental care. In regard to *individual characteristics*, r and K strategists differ in rate of physical maturation, sexual precocity, life span, reproductive effort, energy use, and intelligence. Finally, in terms of *population and social system characteristics*, they differ in their treatment of the environment, the stability of their population size, their ability to compete under scarce resources, their degree of social organization, and their altruism.

Individuals and species are, of course, only relatively r and K. Thus rabbits are K-strategists compared to fish but r-strategists compared to humans. Primates are all relatively K-strategists, and humans are the most K of all. Indeed, as depicted in Fig. 2, the order primates display a natural scale going from lemur to macaque to gibbon to chimp to humans, in which there is a consistent trend toward K with progressive prolongation of gestation period and life phases (Lovejoy, 1981). Note the proportionality of the four indicated phases. The postreproductive phase is restricted to humans. With each step in the natural scale, populations devote a greater proportion of their reproductive energy to subadult care, with increased investment in the survival of offspring. As a species,

TABLE 1  
SOME LIFE HISTORY, SOCIAL BEHAVIOR, AND PHYSIOLOGICAL DIFFERENCES BETWEEN r- AND K- STRATEGISTS (FOLLOWING PIANKA, 1970)

r-Strategist	K-Strategist
Family characteristics	
Large litter size	Small litter size
Short spacing between births	Long spacing between births
Many offspring	Few offspring
High rate of infant mortality	Low rate of infant mortality
Low degree of parental care	High degree of parental care
Individual characteristics	
Rapid rate of maturation	Slow rate of maturation
Early sexual reproduction	Delayed sexual reproduction
Short life	Long life
High reproductive effort	Low reproductive effort
High energy utilization	Efficient energy utilization
Low intelligence	High intelligence
Population characteristics	
Opportunistic exploiters of environment	Consistent exploiters of environment
Dispersing colonizers	Stable occupiers of habitat
Variable population size	Stable population size
Competition variable, often lax	Competition keen
Social system characteristics	
Low degree of social organization	High degree of social organization
Low amounts of altruism	High amounts of altruism

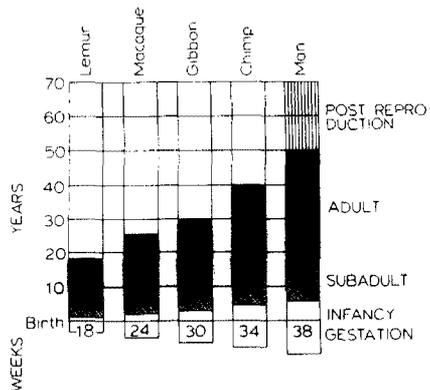


FIG. 2. Progressive prolongation of life phases and gestation in primates. Source: From C. O. Lovejoy "The Origin of Man," *Science*, 1981, 211, 341-350. Copyright 1981 by the American Association for the Advancement of Science. Reprinted by permission.

humans are at the K end of the continuum, although it is postulated that some are genetically more so than others (Rushton, 1985a).

Several falsifiable predictions derive from this analysis. The more K the family, the greater should be the spacing between births, the fewer the number of offspring, the lower the rate of infant mortality, the more stable the family system, and the better developed the parental care. The more K the person, the longer the gestation period, the higher the birthweight, the more delayed the onset of sexual activity, the older the age at first reproduction, the lower the sex drive, the longer the life, the more efficient the energy system (as in absence of obesity), the higher the intelligence, the more social-rule-following the behavior, and the greater the altruism. Thus, diverse organismic characteristics, not otherwise relatable, are presumed to covary along a single dimension.

Consideration of the evidence provides support for the K perspective. As a necessary preliminary, many components of K have been found to be heritable, including rate of multiple birthing, family size, and structure (Bulmer, 1970); the rate of maturation from 3 months to 15 years (R. S. Wilson, 1983); the age of onset of puberty and menopause (Bouchard, 1984); obesity (Stunkard et al., 1986); longevity (Hrubec, Floderus-Myrhed, de Faire, & Sarna, 1984); the strength of the sex drive and its relation to age of first intercourse, frequency of intercourse, and total number of partners (Eysenck, 1976; Martin, Eaves, & Eysenck, 1977); and personality traits such as extraversion (Buss & Plomin, 1984), intelligence (Bouchard & McGue, 1981), social-rule-following (Mednick, Gabrielli, & Hutchings, 1984), and altruism and aggression (Rushton, Fulker, Neale, Nias, & Eysenck, 1986).

Studies have also found the predicted covariation among the K attributes. Rushton (in press-a) contrasted the characteristics of the mothers of dizygotic twins who, because they produce more than one egg at a time can be considered to represent the r-strategy, with the mothers of singletons representing the K-strategy. As expected, the former were found to have a lower age of menarche, a shorter menstrual cycle, a higher number of marriages, a higher rate of coitus, a greater fecundity, more wasted pregnancies, an earlier menopause, and an earlier mortality. In another domain, Ellis (1987) contrasted the characteristics of those low in social-rule-following (criminals) with controls and found the former to have shorter gestation periods (more premature births), a more rapid development to sexual functioning, a greater copulatory rate outside of bonded relationships (or at least a preference for such), less stable bonding, lower parental investment in offspring (as evidenced by higher rates of child abandonment, neglect and abuse), and a shorter life expectancy.

### POPULATION DIFFERENCES IN K

Additional predictions from K theory can be derived from the comparison of human populations known to differ in egg production, namely: lower socioeconomic > higher socioeconomic, and Negroids > Caucasoids > Mongoloids. While the monozygotic twinning rate is nearly constant at about  $3\frac{1}{2}$  per 1000 in all groups, dizygotic twinning (the r-strategy) is greater among lower than among upper social class women in both European and African samples (Golding, 1986; Nylander, 1981). Also, the rate per 1000 births among Mongoloids is < 4; among Caucasoids, 8; and among Negroids, > 16, with some African populations having rates as high as 57 per 1000 (Bulmer, 1970). The incidence of nonmonozygotic triplets and quadruplets shows comparable rank orders. Moreover, data from racially mixed matings suggest that the dizygotic twinning rate is largely determined by the race of the mother independently of the race of the father, as shown for Mongoloid-Caucasoid crossings in Hawaii, and Caucasoid-Negroid crosses in Brazil (Bulmer, 1970).

The pattern of population differences in rate of multiple birthing, in which whites fall *between* Orientals and blacks, has numerous parallels, including on measures made of intelligence, health, law-abidingness, rate of maturation, and temperament (Jensen, 1985; Rushton, 1985a, 1985b, 1987, in press-b; Vernon, 1982; J. Q. Wilson, & Herrnstein, 1985). Consider, for example, the pattern with temperament. Across ages (24-h-old infants, children, high school students, university students, and adults), across traits (activity level, aggressiveness, cautiousness, dominance, excitability, and impulsiveness), and across methods (archival statistics, naturalistic observation, ratings, and self-reports), the data support the hypothesis that, in terms of restraint, Orientals > whites > blacks (Freedman, 1979; Lynn, 1971; Rushton, 1984; Vernon, 1982). Thus, Rushton (1985b) indexed behavioral restraint by low extraversion and high neuroticism (anxiety) scores from the Eysenck Personality Questionnaire and, aggregating data from 25 countries, found that 8 Mongoloid samples ( $N = 4044$ ) were less extraverted and more neurotic than 38 Caucasoid samples ( $N = 19,807$ ), who were less extraverted and more neurotic than 4 Negroid ones ( $N = 1906$ ). As discussed, extraversion and neuroticism have been found to predict sexual restraint *within* populations.

### RACIAL DIFFERENCES IN SEXUAL BEHAVIOR

In order to test the hypothesis that in sexual restraint, Orientals > whites > blacks, we (a) carry out a literature review, and (b) provide novel analyses of archival data. Restraint is indexed in numerous ways having in common a lowered allocation of bodily energy to sexual functioning. We begin by examining Hofmann's (1984) analysis of the extent

TABLE 2  
PROPORTION OF POPULATION AGED 11-21  
EXPERIENCING PREMARITAL COITUS

Population	% Sexually experienced		
	Males	Females	Combined
Asians	12	5	9
Europeans	46	35	40
Africans	74	53	64

*Note.* Adapted from Hofmann (1984).

of premarital coitus among young people around the world, categorizing the 27 countries by primary racial composition and averaging the figures. As can be seen in Table 2, the results showed that African adolescents are more sexually active than Europeans, who are more sexually active than Asians. While some variation occurred from country to country, consistency was found within groups. Thus Koreans and Japanese were similar to each other and different from Israelis, Swedes, and white Americans, who, in turn, were similar to each other but different from Kenyans, Nigerians, and black Americans. As is typical of such surveys, young men report a greater degree of sexual experience than young women (Symons, 1979). It is clear from Table 2, however, that the population differences are replicable across sex, with the men of the more restrained group having less experience than the women of the less restrained.

The rate of premarital intercourse is matched by that following marriage. We inspected a section on cross-cultural intercourse frequency in a review by Ford and Beach (1951) and categorized the tribal peoples listed into three main groups. The Oceanic and Amerindian peoples tended to a lower per week average (1-4), than U.S. whites (2-4), than Africans (3-10). Recent surveys support the same conclusion. For married couples in their 20s, the average frequency per week of intercourse for the Japanese approximates 2 (Asayama, 1975), for American whites 4, and for American blacks, 5 (Fisher, 1980).

Concomitant differences are found in sexual attitudes. In Ford and Beach's (1951) survey, the Asian groups were the most likely to endorse beliefs concerning the weakening effects of intercourse. A review by Vernon (1982) led him to conclude that both the Chinese and the Japanese were not only less experienced in premarital sex, but also less permissive, and less concerned with sexual display than Caucasians. For example, Connor (1975, 1976) found three generations of Japanese-Americans, as well as Japanese students in Japan, reported less interest in sex than

Caucasian samples. Abramson and Imari-Marquez (1982) observed that each of three generations of Japanese-Americans showed more sex guilt than matched Caucasian Americans. In studies carried out in Britain and Japan using a sex fantasy questionnaire, Iwawaki and Wilson (1983) found that British men reported twice as many fantasies as Japanese men, and British women admitted to four times as much sex fantasy as Japanese women.

In contrast, African-descended people are more permissive than Caucasians. Reiss (1967) observed this with several hundred black and white university students in the United States on scales measuring premarital sexual attitudes (e.g., approving of or feeling guilt about petting and intercourse in casual and romantic relationships), results replicated with other samples and measuring instruments (Heltsley & Broderick, 1969; Sutker & Gilliard, 1970). Johnson (1978) also compared black and white premarital sexual attitudes and behavior and included a Swedish sample who were expected to be (and were) more permissive than American whites. The black sample (particularly males) were found to have had intercourse earlier and with a greater number of casual partners, and with less feelings of guilt or distaste, than either white sample. In a study of sex fantasies, Price and Miller (1984) found that black men and women had higher mean frequencies than white men and women, and that whites more than blacks were prone to feel guilt for having them.

The ethnographic record [e.g., A French Army Surgeon (1898/1972), a 30-year specialist in genitourinary diseases] makes reference to numerous anatomical distinctions which show a similar pattern of whites being *between* blacks and Orientals. These include the placement of female genitals (Orientals front and high; blacks back and low); angle and texture of erection (Orientals parallel to body and stiff, blacks at right angles to body and flexible); salient buttocks, breasts, and muscularity (Orientals least, blacks most); and size of genitalia (Orientals smallest, blacks largest). We averaged the ethnographic data on erect penis and found the means to approximate: Orientals, 4 to 5.5 in. in length and 1.25 in. in diameter; Caucasians, 5.5 to 6 in. in length and 1.5 in. in diameter; blacks, 6.25 to 8 in. in length and 2 in. in diameter. Women were proportionate to men, with Orientals having smaller vaginas and blacks larger ones, relative to Caucasians. Clitoral size differed in length: in European women, 1.2 in.; in African women, 2 in. variations were noted: in the French West Indies, the size of the penis and vagina covaried with amount of black admixture; Arab men, who were often mixed with black, had larger penises than Europeans.

Recent data show similar patterns. Measurements taken from living subjects as well as those at autopsy, show the size of testes is twofold lower in Asian men than Europeans (9 g vs 21 g), a difference too large

to be accounted for entirely in terms of body size (Diamond, 1986; Short, 1984). Concomitantly, as mentioned, Asian women have lower ovulation rates than Caucasian women, as indexed by dizygotic twin frequency, with the frequency per 1000 across several Asian populations being < 4, while for Caucasians it is 8, and for blacks 16 per 1000 (Bulmer, 1970; Diamond, 1986). Contrary to the general trend, Freeman (1934) observed that, at autopsy, American blacks had less heavy testes than American whites (13 g vs 15 g). Freeman (1934), however, did find that black women had heavier ovaries than white women. Subsequently Daniel, Feinstein, Howard-Peebles, and Baxley (1982) found no black-white difference in testicular volume among American adolescents, while Ajmani, Jain, and Saxena (1985) found larger scrotal circumferences in Nigerians than Europeans (212.6 mm vs 195.1 mm or 8.37 in. vs 7.68 in.).

A French Army Surgeon (1898/1972) also provided early observations that, in speed of sexual maturation, Orientals < whites < blacks. Several subsequent studies are confirmatory. In the United States, blacks are more precocious than whites as indexed by age at menarche, first sexual experience, and first pregnancy (Malina, 1979). A national probability sample of American youth found that by age 12, 19% of black girls had reached the highest stages of breast and pubic hair development, compared to 5% of white girls (Harlan, Harlan, & Grillo, 1980), although the same survey found white and black boys to be similar (Harlan, Grillo, Coroni-Huntley, & Leaverton, 1979). Subsequently, Westney, Jenkins, Butts, and Williams (1984) found that 60% of 11-year-old black boys had reached the stage of accelerated penis growth in contrast to the white norm of 50% of 12½-year-olds. This genital stage significantly predicted onset of sexual interest, with 2.2% of the black boys experiencing intercourse by age 11. While some surveys found that Oriental girls enter puberty as early as whites (Eveleth & Tanner, 1976), others suggest that in both physical development and onset of interest in sex, the Japanese, on the average, lag 1.5 to 2 years behind white Americans (Asayama, 1975).

There is evidence that biologic changes differentially control behavior across the races, the direction being Orientals < whites < blacks. Inspection of Figs. 1 vs 2 and 3 in Udry and Morris (1968), for example, shows a higher periodicity, or midcycle/menses coital ratio, for blacks than for whites. Westney et al. (1984) found that biologic maturation predicted sexual interest in black 11-year-old boys, although not girls. Previous authors have reported the relationship for black girls. Thus Presser (1978) noted that for blacks, but not for whites, age at menarche predicted the onset of dating, and in blacks and whites age at first date predicted age at first intercourse. Goodman, Grove, and Gilbert (1980) found age at menarche predicted age at first pregnancy in several groups in Hawaii, with the prediction being significantly less in Orientals than in Caucasians.

Weinrich (1977) scaled acts of sexuality in terms of how directly they led to conception versus their likelihood of maintaining the pair bond. In this scaling, noncoital acts such as fellatio, cunnilingus, petting, and affection were seen as least obviously reproductive, followed by coitus during menstruation and in the female-above position, followed by coitus in the familiar "missionary" position, followed by an early onset of extramarital affairs and coitus with prostitutes. Weinrich (1977) concluded that, compared to whites, blacks engaged in less variation with their wives and more coitus with prostitutes.

In summary, racial differences exist in sexuality, with Orientals manifesting less precocity and more restraint, both morphologically and behaviorally than Caucasians, who in turn, manifest less precocity and more restraint than blacks. As such, the evidence supports the contention that, in terms of K, Orientals > whites > blacks. We now provide an additional test of the hypothesis, reporting novel analyses of published data on the sexuality of whites and blacks in the United States.

#### METHOD

The basis for our analyses is the Kinsey data. As is generally known, Kinsey, Pomeroy, Martin, and Gebhard created the Institute for Sex Research at Indiana University in 1947. In 1948 they published *Sexual Behavior in the Human Male* and in 1953 *Sexual Behavior in the Human Female*. In these books they did not address the issue of group differences but did leave a promissory note:

The present volume is confined to a record on American and Canadian whites, but we have begun accumulating material which will make it possible to include the American and Canadian Negro groups in later publications. Several hundred histories from still other race cultural groups begin to show the fundamental differences which exist between American and other patterns of sexual behavior, but the material is not yet sufficient for publication. (1948, p. 76)

Early impressions based on some of these data suggested that if blacks were found to be sexually precocious compared to whites on some measures (Gebhard, Pomeroy, Martin, & Christenson, 1958), the differences would probably be small and overstated (Bell, 1978). Only recently has it become possible to provide tests of significance on a full range of variables. In 1979 Gebhard and Johnson published a supplementary volume containing novel information, as well as a "cleaning" of the original data (eliminating individuals derived from sources with a known sexual bias such as prostitutes). This volume presented nearly 600 tables of percentages for a range of sexual practices and morphological data by race, socioeconomic status, sexual orientation, etc. Here we report data on race differences in some of these variables and provide tests of significance. To the best of our knowledge these are the first analyses published on these differences, with one exception to be described immediately.

Differences in penis size between blacks and whites was a topic addressed by Noble (1982) who published a table from Gebhard and Johnson (1979) from which statistically significant different averages were computed. The length of the erect penis for the white sample was 6.15 in. and for the black sample, 6.44 in.—a difference of 0.29 in.; the circumference of the erect penis was 4.83 in. for whites and 4.96 for blacks—a difference

of 0.13 in. Larger differences occurred in the flaccid state, with the length in the average white man being 3.86 in., as compared to 4.34 in. in the average black—a difference of 0.48 in. The averages for flaccid circumference are 3.16 in whites and 3.78 in blacks—a difference of 0.62 in.

In addition to Nobile's (1982) article, we examined each of the 26 citations (in both the *Science Citation Index* and *Social Sciences Citation Index*) to Gebhard and Johnson (1979) for 1979–1986 and found that only one referred to black-white differences. Money, Lehne, and Pierre-Jerome (1984) reported that eight adults with "some black ancestry" were not different from 57 white adults on a measure of "stretched length" of the penis. Money et al. (1984) used the Gebhard and Johnson (1979) data for normative purposes, as indeed did most other citing articles, many of which were concerned with homosexuality (e.g., frequency of anal intercourse). The studies on nonhomosexuals also used the tables for normative purposes (e.g., frequency of intercourse, orgasm, impotence, etc.). Thus we feel confident in reporting our analyses as novel.

### *Sampling*

The Kinsey interview method along with some of its strengths and weaknesses has been described by Gebhard and Johnson (1979). Personal interviews were conducted from 1938 to 1963 assessing some 300 items of demographic, physical, and sexual information on over 10,000 white and 400 black respondents. It is not a random sample, as most respondents were college educated and between 20 and 25 years of age when interviewed. They are most representative of the middle classes and the Midwest of the United States at the time (Indiana and Illinois, including Chicago). With respect to the representativeness of the black sample, consisting of university students from 1938 to 1963, this is atypical in the religiously devout and high SES direction (see Gebhard & Johnson, 1979, Tables 3–6, 9, 295). As such this provides a conservative test of the hypotheses, for if more normative samples of blacks were used, it is possible that the differences would be greater.

### *Statistical Analysis*

We independently examined the 600 tables in Gebhard and Johnson (1979) and pooled our judgments to choose those that seemed to provide the most direct test of the r/K theory (Rushton, 1985a). We also included the occasional other item that, as a result of the literature review, seemed of interest. As often as possible, we chose as a cutoff point the place where 50% of the black respondents, who were all college educated, had fallen and then examined the percentage of white college educated respondents falling above this point. Where feasible, we collapsed across males and females, thus providing the maximum number of data points from which to test the theory. We turned the percentages into proportions based on the number who had answered the question and calculated a  $z$  test for the significance of differences between proportions (McClave & Dietrich, 1985, pp. 370–374).

## RESULTS

The items from Gebhard and Johnson (1979), along with their table numbers and our computations, are presented in Table 3. Almost all of the items show statistically significant mean differences such that blacks are more precocious and less sexually restrained than whites. Their parents were younger when they were born (19,20), had more children (31), and died earlier (28,29). Compared to whites the black respondents in this sample entered puberty at a *later* age (53), but *did* tend to leave

TABLE 3  
RACE DIFFERENCES IN SEXUAL BEHAVIOR

Table number and item	Sample size and proportion		Significance	
	Black	White	z	p
19 Genetic father's age at respondent's birth: 26-30 and under	$\frac{189}{313} = .60$	$\frac{3385}{7872} = .43$	5.67	.001
20 Genetic mother's age at respondent's birth: 26-30 and under	$\frac{275}{348} = .79$	$\frac{5415}{8082} = .67$	4.00	.001
28 Respondent's age at genetic father's death: 18 and under	$\frac{65}{123} = .53$	$\frac{966}{2300} = .42$	2.75	.01
29 Respondent's age at genetic mother's death: 19 and under	$\frac{49}{93} = .53$	$\frac{663}{1441} = .46$	1.40	.10
30 Age respondent left parental home: 21 years or under	$\frac{104}{186} = .56$	$\frac{1767}{3606} = .49$	1.75	.05
31 Number of siblings: 2 and under	$\frac{215}{399} = .54$	$\frac{6423}{9047} = .71$	5.67	.001
53 Age at puberty (aggregate measure): 13 years and under	$\frac{292}{400} = .73$	$\frac{6970}{9052} = .77$	1.86	.05
69 Estimated length of erect penis: Less than or equal to 6.50 in.	$\frac{105}{161} = .65$	$\frac{3059}{3777} = .81$	5.33	.001
70 Measured length of erect penis: Less than or equal to 6.25 in.	$\frac{30}{59} = .51$	$\frac{1497}{2376} = .63$	1.71	.05
71 Measured length of flaccid penis: Less than or equal to 4.50 in.	$\frac{40}{59} = .68$	$\frac{2117}{2379} = .89$	5.25	.001
72 Measured circumference of flaccid penis: Less than or equal to 4.00 in.	$\frac{41}{59} = .70$	$\frac{1825}{2310} = .79$	1.80	.05
74 Angle of penile erection: Penis almost vertical or down from vertical as much as 85°	$\frac{102}{164} = .62$	$\frac{3473}{4396} = .79$	5.67	.001
90 Average length of menstrual cycle: 28 days or less	$\frac{129}{155} = .83$	$\frac{1983}{2916} = .68$	3.75	.001
91 Average length of menstrual flow: 4 days or under	$\frac{80}{148} = .54$	$\frac{1044}{2983} = .35$	4.75	.001

TABLE 3—Continued

Table number and item	Sample size and proportion		Significance	
	Black	White	<i>z</i>	<i>p</i>
99 Periodicity of female sexual response: No periodicity	$\frac{36}{173} = .21$	$\frac{710}{2839} = .25$	1.33	.10
100 Age hymen broken: 18 years or under	$\frac{67}{126} = .53$	$\frac{414}{1594} = .26$	6.75	.001
135 Incidence of prepubertal heterosexual techniques: Coitus	$\frac{116}{400} = .29$	$\frac{814}{9045} = .09$	10.00	.001
183 Reason for worry about masturbation: Moral (guilt, shame)	$\frac{13}{41} = .32$	$\frac{390}{1027} = .38$	0.75	ns
199 Age of first premarital petting: 15 years and under	$\frac{241}{388} = .62$	$\frac{3929}{8731} = .45$	5.70	.001
218 Age first postpubertal coitus: 17 years and under	$\frac{171}{335} = .51$	$\frac{1186}{5651} = .21$	15.00	.001
227 Intention to have premarital coitus: No intention	$\frac{81}{368} = .22$	$\frac{3509}{7311} = .48$	8.67	.001
228 Moral restraint on premarital coitus: Much	$\frac{195}{397} = .49$	$\frac{5926}{8845} = .67$	9.00	.001
239 Number of premarital coital companions: 5 partners or fewer	$\frac{169}{307} = .55$	$\frac{3068}{4202} = .73$	6.00	.001
268 Incidence and type of nonmarital pregnancy: Never	$\frac{102}{310} = .68$	$\frac{3938}{4633} = .85$	5.67	.001
291 Duration of first marriage: Under 5 years	$\frac{93}{176} = .53$	$\frac{1446}{3443} = .42$	3.67	.001
297 Time elapsed between marriage and first marital coitus in first marriage: One day or less	$\frac{53}{67} = .79$	$\frac{1108}{1705} = .65$	2.33	.01
301 Time before first birth in first marriage: 9–11 months	$\frac{14}{62} = .23$	$\frac{218}{1815} = .12$	2.75	.01
308 Clarity of contraceptive data for first marriage: Clearly none used	$\frac{25}{176} = .14$	$\frac{172}{3432} = .05$	4.50	.001

TABLE 3—Continued

Table number and item	Sample size and proportion		Significance	
	Black	White	<i>z</i>	<i>p</i>
322 Frequency of cunnilingus in foreplay in first marriage: None	$\frac{139}{174} = .80$	$\frac{1576}{3426} = .46$	8.50	.001
323 Frequency of fellation in foreplay in first marriage: None	$\frac{146}{174} = .84$	$\frac{1710}{3420} = .50$	8.50	.001
324 Time between intromission and ejaculation in coitus in first marriage: <6 min.	$\frac{89}{158} = .56$	$\frac{2057}{3164} = .65$	2.25	.05
326 Frequency (mean) per week of marital coitus in first marriage: Age 21–25	3.83	3.11		
327 Maximum frequency of marital coitus in first marriage: 7 per week or less	$\frac{110}{167} = .66$	$\frac{2043}{3349} = .61$	1.25	ns
329 Frequency of positions in coitus in first marriage: female above, male supine: Much	$\frac{16}{172} = .09$	$\frac{546}{3415} = .16$	2.33	.01
340 Average number of wife's orgasms per act of coitus in first marriage: >1	$\frac{23}{173} = .13$	$\frac{304}{3376} = .09$	2.00	.05
342 Incidence of extramarital sexual activity in first marriage: None	$\frac{31}{175} = .17$	$\frac{1047}{3439} = .30$	3.25	.001
348 Year of first marriage in which first extramarital coitus occurred: Within first 2 years	$\frac{40}{78} = .51$	$\frac{199}{867} = .23$	5.60	.001
351 Number of extramarital companions during first marriage: Zero	$\frac{93}{173} = .54$	$\frac{2573}{3431} = .75$	7.00	.001
355 Expectation of future extramarital coitus: Will not have	$\frac{50}{131} = .38$	$\frac{1751}{2779} = .63$	6.25	.001
367 Incidence of sexual contact with prostitutes: Never	$\frac{96}{177} = .54$	$\frac{3285}{4693} = .70$	4.00	.001
374 Incidence of fellation with prostitutes: Never	$\frac{44}{70} = .63$	$\frac{605}{1164} = .52$	1.83	.05

home earlier (30). They experienced a variety of premarital, marital, and extramarital sexual events earlier (100,135,199,218,297,348), had a greater number of premarital and extramarital sexual partners (239,342,351), a greater frequency of intercourse (326, but see 327), used fewer contraceptives (308), and had a greater incidence of pregnancy (268), at a faster rate (301). The black men had larger penises than the white men (69,70,71,72), at a different angle of erection (74), and maintained intromission longer (324). Black women had shorter menstrual cycles than white women (90,91), showed a nonsignificant tendency to more periodicity of sexual response (99), and to a greater number of orgasms per act of coitus (340). Whites varied their sexual activity more than blacks, both with their spouses (322,323,329) and with prostitutes (374), although blacks consorted with prostitutes more frequently (367). Compared to whites, blacks also had a shorter duration of marriage (291) and had more permissive sexual attitudes (183,227,228,355).

#### DISCUSSION

Deriving predictions from modern evolutionary theory for population differences in sexual behavior, we found, from a review of the literature and novel analyses of existing data, that on a variety of K attributes, Orientals > whites > blacks. These are summarized in Table 4. Some of the observations can be explained in purely environmental terms. Chinese and Japanese, for example, typically come from traditional backgrounds where there are strong socializing pressures to conform, and restraint is generally valued (Vernon, 1982). Black males apparently learn early that assertive sexuality and sexual prowess are means of gaining status as well as gratification (Johnson, 1978; Staples, 1978). Other findings suggest the presence of genetic and evolutionary influences. The smaller testes of the Asians and larger penises and shorter menstrual cycles of Africans, for example, are likely a result of evolutionary selection pressures (Smith, 1984). Even permissive attitudes are found to have a genetic component (Martin et al., 1986). When tied to other data such as dizygotic twinning rate (>16 per thousand in blacks; 8 per thousand in whites, and < 4 per thousand in Orientals), the differential K theory approach to human sexuality appears to be supported.

Issues that reflect on the validity of our findings, and those we reviewed, concern the self-report methods of measurement, the biases of the observers, and the representativeness of the samples. While numerous sources of error may be involved in any single item or study, as we have seen, diverse observations have provided multiple replications. Moreover, within the archival data set we used, there is evidence of both internal reliability and external validity. In Nobile's (1982) scrutiny of these data, examining black-white differences in penis size, the samples were shown

TABLE 4

SUMMARY OF GROUP DIFFERENCES IN SEXUAL BEHAVIOR CODED IN THE DIRECTION OF RESTRAINT AND/OR THE "K" REPRODUCTIVE STRATEGY, BASED ON A REVIEW OF THE LITERATURE AND NOVEL EMPIRICAL ANALYSES

	Orientals	Whites	Blacks
Literature review			
Ovulation rate and multiple birthing	1	2	3
Frequency of premarital coitus	1	2	3
Frequency of marital coitus	1	2	3
Frequency of sexual fantasies	1	2	3
Permissive attitudes and sex guilt	1	2	3
Primary sexual characteristics	1	2	3
(Size of penis, testis, vulva, vagina, clitoris, ovaries)	1	2	3
Secondary sexual characteristics			
(Salient breasts, buttocks, muscles, voice)	1	2	3
Rate of sexual maturation	1	2	3
Biologic/periodic control of behavior	1	2	3
Empirical analyses			
Maturational precocity			
(Earlier sex, earlier reproduction, earlier death)		1	2
Number of premarital partners		1	2
Number of extramarital partners		1	2
Frequency of intercourse		1	2
Length of menstrual cycle		1	2
Incidence and speed of pregnancy		1	2
Penis size		1	2
Duration of marriage		1	2
Permissive attitudes		1	2

to have high internal consistencies, with the white mean approximating closely to that in other studies. In our analyses we also observed the size difference (Items 69, 70, 71, 72), as well as that the angle of erection in black Americans (Item 74) agreed with observations made on Africans 90 years ago by A French Army Surgeon (1898/1972). Similarly, we replicate Weinrich's (1977) analysis of black-white differences in the use of sexual variation and prostitutes (Items 322, 323, 329, 367, 374), as also the established findings on permissive attitudes (Items 183, 227, 228, 355). We believe, therefore, that the data we have reported reflect real differences. As mentioned earlier, the black sample, consisting of university students from 1938 to 1963, is unrepresentative in the religiously devout and high SES direction. If more normative samples of blacks were used, it is possible that the differences might increase.

Many of the observations of black-white differences we made, including

rate of sexual maturation, genital size, permissive attitudes, intercourse frequency, and fertility are not counterintuitive, despite suggestions that such beliefs reflect only prejudice and faulty stereotyping. Other findings may be less obvious, including apparent racial differences in preference for oral sex, intercourse position, and consortment with prostitutes. Some observations, such as black testes size and periodicity of sexual response, are tentative and require additional research. Other differences found between blacks and whites such as shorter menstrual cycles (Items 90, 91), duration of intromission (Item 324), and number of female orgasms per act of coitus (Item 340), are of unknown relation in Oriental populations. Some of the findings, such as the greater use of sexual variety in whites than in blacks noted by both Weinrich (1977), and by us, and in Asians rather than Africans by A French Army Surgeon (1898/1972), are of uncertain status to differential K theory. Most of the findings, however, were elegantly predicted by K theory, and constitute persuasive evidence of its general merit. Irrespective of particular explanations, however, we believe we have identified behavioral phenomena worthy of additional research.

The pattern of population differences in sexual restraint is paralleled by others (Rushton, in press-b). Inter- and intranational comparisons, from a variety of time periods, show the same ordering for measures made of intelligence (cranial capacity, brain weight, test scores), maturation rate (age to hold head erect, age to walk alone, age of death), social organization (marital stability, mental health, law abidingness), and temperament (activity level, anxiety, sociability). That across populations brain size negatively correlates with gamete production, and both covary with a suite of other attributes, provides compelling support for the r/K perspective.

From a differential K theory perspective, a single dimension—K—underlies a variegated complex of human life history characteristics resulting from a tradeoff between egg production and other adaptive behavior such as parental care and social organization (Rushton, 1985a). Essentially, genotypes reproductively compete by allocating energy either to sexual behavior directly and increasing the number of offspring produced, or by diverting some energy to traits such as altruism, and the capacity for family and social organization, thereby increasing the chances of offspring maturing to adulthood. Freud (1930) had also predicted a positive correlation between restrained sexuality and the production of culture, based on the psychodynamics of repression and sublimation. Differential K theory predicts the relationship in terms of correlated traits.

Purely cultural and purely genetic perspectives on inheritance may be giving way to those based on reciprocal gene-culture coevolution (Lumsden & Wilson, 1981, 1985; Rushton, Littlefield, & Lumsden, 1986). Such analyses explain why attitudes and behavior covary with morphology.

In this account, epigenetic rules guide development over the life span, biasing individuals to learn or produce patterns of culture maximally compatible with their genotypes. Thus epigenetic rules modulate the sequencing and intensity of an individual's sexual responses, sensitize feature detectors in the brain to attend to some environmental stimuli over others, and prime associative networks to incline the individual toward some cultural products over others. In China and Japan, for example, clothing styles have often been chosen to flatten the breasts and buttocks in an explicit attempt "to deanimalize" (Freedman, 1979, p. 107). In Africa, dances have been invented which emphasize undulating rhythms and mock copulation (A French Army Surgeon 1898/1972; Freedman, 1979). Cultural innovations in turn influence the genetic composition of future generations. Restrained individuals may be out of place in uninhibited cultures and less able to attract partners, with an opposite pattern occurring for uninhibited people in restrained cultures. As we have implied, personality, sexuality, and culture are likely to interact in profound ways.

Conjecturing as to physiological mechanisms, one hypothesis implicates testosterone and other sex hormones. Freeman (1934) found differences in the weight of the hypophysis (pituitary) with blacks having the heaviest (800 mg), whites being intermediate (700 mg), and Orientals the lightest (600 mg). The pituitary is directly involved with the release of gonadotropins which stimulate the testicles and ovaries in their functions (the release of testosterone, estradiol, and progesterone on the one hand, and sperm and eggs on the other). This would order the population differences in rate of multiple birthing, for gonadotropin levels differentiate the races in the predicted directions (Nylander, 1973; Soma, Takayama, Kiyokawa, Akaeda & Tokoro, 1975), as well as distinguishing mothers of dizygotic twins from mothers with no dizygotic twins (Martin et al., 1984). Temperament differences may also be so ordered, for gonadal hormones have been thought to underlie aggression and altruism (Baucom, Besch, & Callahan, 1985; Rushton, et al., 1986a), as well as age and sex differences therein (Ellis, 1986; Hines, 1982). They are also involved in the development of secondary sexual characteristics such as muscularity and depth of voice (Haeberle, 1978; Hudson & Holbrook, 1982), as well as in the organization and structure of the brain (Kimura, 1987). With respect to the brain, Gray (1982) has described the cytoarchitecture and functioning of the behavioral inhibition system postulated to underlie such relevant components of temperament as anxiety and extraversion, which also differentiate the races (Rushton, 1985b).

Finally, a word about the propriety of our investigation. The juxtaposition of gene-based evolutionary theory with racial differences in sexual behavior is controversial, as it is with intelligence (Jensen, 1985), law-abidingness

(Wilson & Herrnstein, 1985), and other attributes (Rushton, in press-b). For humanitarian reasons many scientists believe such treatments are inappropriate given our current state of knowledge. We do not agree with this. In our view, knowledge is not as advanced as it should be *because* so few behavioral scientists are researching group differences. We simply do not know what the evolutionary origins of the races are, nor the extent of their similarities and differences. We do know that considerable variability exists within each major group, as well as within numerous subdivisions.

Explaining racial differences in behavior may provide a catalyst for understanding individual differences, for the former constitute an aggregate of the latter. As such, any true score variance attributable to category membership will cumulate, whereas unique and idiosyncratic variance will not (Rushton, Brainerd, & Pressley, 1983). Ultimately, the study of racial differences may help us to appreciate more fully the nature of human diversity as well as the binding commonalities we share with other species (E. O. Wilson, 1984). That, too, would be one of the legacies of the Darwinian perspective.

## REFERENCES

- Abramson, P. R., & Imari-Marquez, J. (1982). The Japanese-American: A cross-cultural, cross-sectional study of sex guilt. *Journal of Research in Personality*, *16*, 227-237.
- Abramson, P. R., & Mosher, D. L. (1975). Development of a measure of negative attitudes toward masturbation. *Journal of Consulting and Clinical Psychology*, *43*, 485-490.
- A French Army Surgeon (1898/1972). *Untrodden fields of anthropology* (2 vols.). Paris, France: Carrington. (Reprinted Huntington, New York: Krieger.)
- Ajmani, M. L., Jain, S. P., & Saxena, S. K. (1985). Anthropometric study of male external genitalia of 320 healthy Nigerian adults. *Anthropologischer Anzeiger*, *43*, 179-186.
- Asayama, S. (1975). Adolescent sex development and adult sex behavior in Japan. *Journal of Sex Research*, *11*, 91-112.
- Barnes, G. E., Malamuth, N. M., & Check, J. V. P. (1984). Personality and sexuality. *Personality and Individual Differences*, *5*, 159-172.
- Barash, D. P. (1982). *Sociobiology and behavior* (2nd ed.). New York: Elsevier.
- Baucom, D. H., Besch, P. K., & Callahan, S. (1985). Relation between testosterone concentration, sex role identity, and personality among females. *Journal of Personality and Social Psychology*, *48*, 1218-1226.
- Bell, A. P. (1978). Black sexuality: Fact and fancy. In R. Staples (Ed.), *The black family: Essays and studies* (2nd ed.). Belmont, CA: Wadsworth.
- Bouchard, T. J., Jr. (1984). Twins reared together and apart: What they tell us about human diversity. In S. W. Fox (Ed.), *Individuality and determinism*. New York: Plenum.
- Bouchard, T. J., Jr., & McGue, M. (1981). Familial studies of intelligence: A Review. *Science*, *212*, 1055-1059.
- Bulmer, M. G. (1970). *The biology of twinning in man*. Oxford: Oxford Univ. Press (Clarendon).
- Buss, A. H., & Plomin, R. (1984). *Temperament: Early developing personality traits*. Hillsdale, NJ: Erlbaum.

- Connor, J. W. (1975). Value changes in third generation Japanese Americans. *Journal of Personality Assessment*, **39**, 597-600.
- Connor, J. W. (1976). Family bonds, maternal closeness and suppression of sexuality in three generations of Japanese Americans. *Ethos*, **4**, 189-221.
- Daly, M., & Wilson, M. (1983). *Sex, evolution and behavior* (2nd ed.). Boston, MA: Willard Grant.
- Daniel, W. A., Feinstein, R. A., Howard-Peebles, P., & Baxley, W. D. (1982). Testicular volumes of adolescents. *Journal of Pediatrics*, **101**, 1010-1012.
- Diamond, J. M. (1986). Variation in human testis size. *Nature (London)*, **320**, 488-489.
- Eisenberg, J. F. (1981). *The mammalian radiations: An Analysis of trends in evolution, adaptation, and behavior*. Chicago, IL: Univ. of Chicago Press.
- Ellis, L. (1986). Evidence of neuroandrogenic etiology of sex roles from a combined analysis of human, nonhuman primate and nonprimate mammalian studies. *Personality and Individual Differences*, **7**, 519-552.
- Ellis, L. (1987). Criminal behavior and r- vs. K-selection: An extension of gene-based evolutionary theory. *Deviant Behavior*, **8**, 149-176.
- Eveleth, P. B., & Tanner, J. M. (1976). *Worldwide variation in human growth*. Cambridge: Cambridge Univ. Press.
- Eysenck, H. J. (1976). *Sex and personality*. London: Open Books.
- Fisher, S. (1980). Personality correlates of sexual behavior in black women. *Archives of Sexual Behavior*, **9**, 27-35.
- Fisher, W. A., Byrne, D., White, L. A., & Kelley, K. (in press). Erotophobia-erotophilia as a dimension of personality. *Journal of Sex Research*.
- Ford, C. S., & Beach, F. A. (1951). *Patterns of sexual behavior*. New York: Harper & Row.
- Freedman, D. G. (1979). *Human sociobiology: A holistic approach*. New York: Free Press.
- Freeman, W. (1934). The weight of the endocrine glands: Biometrical studies in psychiatry, No. 8. *Human Biology*, **6**, 489-523.
- Freud, S. (1962). *Civilization and its discontents*. (Ed. and Trans. by J. Strachey). New York: Norton. (Originally published, 1930)
- Gebhard, P. H., & Johnson, A. B. (1979). *The Kinsey data: Marginal tabulations of the 1938-1963 interviews conducted by the Institute for Sex Research*. Philadelphia, PA: Saunders.
- Gebhard, P. H., Pomeroy, W. B., Martin, C. E., & Christenson, C. V. (1958). *Pregnancy, birth, and abortion*. New York: Harper-Hoeber.
- Golding, J. (1986). Social class and twinning. *Acta Geneticae Medicae et Gemellologiae*, **35**, 207 (Abstracts, p. 29).
- Goodman, M. J., Grove, J. S., & Gilbert, F. (1980). Age at first pregnancy in relation to age at menarche and year of birth in Caucasian, Japanese, Chinese and part-Hawaiian women living in Hawaii. *Annals of Human Biology*, **7**, 29-33.
- Gray, J. A. (1982). *The neuropsychology of anxiety: An enquiry into the functions of the septo-hippocampal system*. Oxford: Oxford Univ. Press.
- Haeberle, E. S. (1978). *The sex atlas*. New York: Seabury.
- Harlan, W. R., Grillo, G. P., Coroni-Huntley, J., & Leaverton, P. E. (1979). Secondary sex characteristics of boys 12 to 17 years of age: The U.S. Health Examination Survey. *Adolescent Medicine*, **95**, 293-297.
- Harlan, W. R., Harlan, E. A., & Grillo, G. P. (1980). Secondary sex characteristics of girls 12 to 17 years of age: The U.S. Health Examination Survey. *Adolescent Medicine*, **96**, 1074-1078.
- Heltsley, M. E., & Broderick, C. B. (1969). Religiosity and premarital sexual permissiveness:

- Reexamination of Reiss's traditionalism proposition. *Journal of Marriage and the Family*, **21**, 441-443.
- Hines, M. (1982). Prenatal gonadal hormones and sex differences in human behavior. *Psychological Bulletin*, **92**, 56-80.
- Hofmann, A. (1984). Contraception in adolescence: A review. I. Psychosocial aspects. *Bulletin of the World Health Organization*, **63**, 151-162.
- Hrubec, Z., Floderus-Myrhed, B., de Faire, U., & Sarna, S. (1984). Familial factors in mortality with control of epidemiological covariables. Swedish twins born 1886-1925. *Acta Geneticae Medicae et Gemellologiae*, **33**, 403-412.
- Hudson, A. I., & Holbrook, A. (1982). Fundamental frequency characteristics of young black adults: Spontaneous speaking and oral reading. *Journal of Speech and Hearing Research*, **25**, 25-28.
- Iwawaki, S., & Wilson, G. D. (1983). Sex fantasies in Japan. *Personality and Individual Differences*, **4**, 543-545.
- Jensen, A. R. (1985). The nature of the black-white difference on various psychometric tests: Spearman's hypothesis. *Behavioral and Brain Sciences*, **8**, 193-263.
- Johanson, D. C., & Edey, M. A. (1981). *Lucy: The beginnings of humankind*. New York: Simon & Schuster.
- Johnson, L. B. (1978). Sexual behavior of southern blacks. In R. Staples (Ed.), *The black family: Essays and studies* (2nd ed.). Belmont, CA: Wadsworth.
- Kimura, D. (1987). Are men's and women's brains really different? *Canadian Psychology*, **28**, 133-147.
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. Philadelphia, PA: Saunders.
- Kinsey, A. C., Pomeroy, W. B., Martin, C. E., & Gebhard, P. H. (1953). *Sexual behavior in the human female*. Philadelphia, PA: Saunders.
- Lovejoy, C. O. (1981). The origin of man. *Science*, **211**, 341-350.
- Lumsden, C. J., & Wilson, E. O. (1981). *Genes, mind and culture: The coevolutionary process*. Cambridge, MA: Harvard Univ. Press.
- Lumsden, C. J., & Wilson, E. O. (1985). The relation between biological and cultural evolution. *Journal of Social and Biological Structures*, **8**, 343-359.
- Lynn, R. (1971). *Personality and national character*. Oxford: Pergamon.
- Malina, R. M. (1979). Secular changes in size and maturity: Causes and effects. *Monographs of the Society for Research in Child Development*, **44**, Serial No. 179, Nos. 3-4.
- Malamuth, N. M. (1986). Predictors of naturalistic sexual aggression. *Journal of Personality and Social Psychology*, **50**, 953-962.
- Martin, N. G., Eaves, L. J., & Eysenck, H. J. (1977). Genetical, environmental and personality factors influencing the age of first sexual intercourse in twins. *Journal of Biosocial Science*, **9**, 91-97.
- Martin, N. G., Eaves, L. J., Heath, A. C., Jardine, R., Feingold, L. M., & Eysenck, H. J. (1986). The transmission of social attitudes. *Proceedings of the National Academy of Sciences of the United States of America*, **83**, 4365-4368.
- Martin, N. G., Olsen, M. E., Thiele, H., Beaini, J. L. E., Handelsman, D., & Bhatnager, A. S. (1984). Pituitary-ovarian function in mothers who have had two sets of dizygotic twins. *Fertility and Sterility*, **41**, 878-880.
- McClave, J. T., & Dietrich, F. H. II. (1985). *Statistics* (3rd edition). San Francisco, CA: Dellen.
- Mednick, S. A., Gabrielli, W. F., & Hutchings, B. (1984). Genetic influences in criminal convictions: Evidence from an adoption cohort. *Science*, **224**, 891-894.
- Money, J., Lehne, G. K., & Pierre-Jerome, F. (1984). Micropenis: Adult follow-up and

- comparison of size against new norms. *Journal of Sex and Marital Therapy*, **10**, 105–114.
- Mosher, D. L., & Anderson, R. D. (1986). Macho personality, sexual aggression, and reactions to guided imagery of realistic rape. *Journal of Research in Personality*, **20**, 77–94.
- Mosher, D. L., & Cross, H. (1971). Sex guilt and premarital sexual experiences of college students. *Journal of Consulting and Clinical Psychology*, **36**, 27–32.
- Nobile, P. (1982). Penis size: The difference between blacks and whites. *Forum: International Journal of Human Relations*, **11**, 21–28.
- Nylander, P. P. S. (1973). Serum levels of gonadotropins in relation to multiple pregnancy in Nigeria. *Journal of Obstetrics and Gynaecology of the British Commonwealth*, **80**, 651–653.
- Nylander, P. P. S. (1981). The factors that influence twinning rates. *Acta Geneticae Medicae et Gemellologiae*, **30**, 189–202.
- Pianka, E. R. (1970). On r- and K- selection. *American Naturalist*, **104**, 592–597.
- Presser, H. B. (1978). Age at menarche, socio-sexual behaviour, and fertility. *Social Biology*, **25**, 94–101.
- Price, J. H., & Miller, P. A. (1984). Sexual fantasies of black and of white college students. *Psychological Reports*, **54**, 1007–1014.
- Reiss, I. L. (1967). *The social context of premarital sexual permissiveness*. New York: Holt, Rinehart & Winston.
- Rushton, J. P. (1984). Sociobiology: Toward a theory of individual and group differences in personality and social behavior (with commentaries and response). In J. R. Royce & L. P. Mos (Eds.), *Annals of Theoretical Psychology* (Vol. 2, pp. 1–81). New York: Plenum.
- Rushton, J. P. (1985a). Differential K theory: The sociobiology of individual and group differences. *Personality and Individual Differences*, **6**, 441–452.
- Rushton, J. P. (1985b). Differential K theory and race differences in E and N. *Personality and Individual Differences*, **6**, 769–770.
- Rushton, J. P. (1987). An evolutionary theory of health, longevity, and personality: Sociobiology and r/K reproductive strategies. *Psychological Reports*, **60**, 539–549.
- Rushton, J. P. (in press-a). An evolutionary theory of human multiple birthing: Sociobiology and r/K reproductive strategies. *Acta Geneticae Medicae et Gemellologiae*.
- Rushton, J. P. (in press-b). Race differences in behaviour: A review and evolutionary analysis. *Personality and Individual Differences*.
- Rushton, J. P., Brainerd, C. J., & Pressley, M. (1983). Behavioral development and construct validity: The principle of aggregation. *Psychological Bulletin*, **94**, 18–38.
- Rushton, J. P., Fulker, D. W., Neale, M. C., Nias, D. K. B., & Eysenck, H. J. (1986a). Altruism and aggression: The heritability of individual differences. *Journal of Personality and Social Psychology*, **50**, 1192–1198.
- Rushton, J. P., Littlefield, C. H., & Lumsden, C. J. (1986). Gene-culture coevolution of complex social behavior: Human altruism and mate choice. *Proceedings of the National Academy of Sciences of the United States of America*, **83**, 7340–7343.
- Schill, T. K., & Chapin, J. (1972). Sex guilt and male's preferences for reading magazines. *Journal of Consulting and Clinical Psychology*, **39**, 516.
- Schwartz, S. (1973). Effects of sex guilt and sexual arousal on the retention of birth control information. *Journal of Consulting and Clinical Psychology*, **41**, 61–64.
- Science Citation Index*. Philadelphia, PA.: Institute for Scientific Information, 1980–1985.
- Short, R. V. (1984). Testis size, ovulation rate, and breast cancer. In O. A. Ryder & M. L. Byrd (Eds.), *One Medicine*. Berlin: Springer-Verlag.
- Smith, R. L. (1984). Human sperm competition. In R. L. Smith (Ed.), *Sperm competition and the evolution of animal mating systems*. Orlando, FL: Academic Press.

- Snyder, M. (1987). *Public appearances/private realities: The psychology of self-monitoring*. New York: Freeman.
- Snyder, M., Simpson, J. A., & Gangestad, S. (1986). Personality and sexual relations. *Journal of Personality and Social Psychology*, *51*, 181-190.
- Social Sciences Citation Index*. Philadelphia, PA: Institute for Scientific Information, 1980-1985.
- Soma, H., Takayama, M., Kiyokawa, T., Akaeda, T., & Tokoro, K. (1975). Serum gonadotropin levels in Japanese women. *Obstetrics and Gynecology*, *46*, 311-312.
- Staples, R. (1978). The black dating game. In R. Staples (Ed.), *The black family: Essays and studies* (2nd ed.). Belmont, CA: Wadsworth.
- Stunkard, A. J., Sorensen, T. I. A., Hanis, C., Teasdale, T. W., Chakraborty, R., Schull, W. J., & Schulsinger, F. (1986). An adoption study of human obesity. *New England Journal of Medicine*, *314*, 193-198.
- Sutker, P. B., & Gilliard, R. S. (1970). Personal sexual attitudes and behavior in blacks and whites. *Psychological Reports*, *27*, 753-754.
- Symons, D. (1979). *The evolution of human sexuality*. New York: Oxford Univ. Press.
- Udry, J. R., & Morris, N. M. (1968). Distribution of coitus in the menstrual cycle. *Nature (London)*, *220*, 593-596.
- Vernon, P. E. (1982). *The abilities and achievements of Orientals in North America*. New York: Academic Press.
- Weinrich, J. D. (1977). Human sociobiology: Pair bonding and resource predictability (effects of social class and race). *Behavioral Ecology and Sociobiology*, *2*, 91-118.
- Westney, O. E., Jenkins, R. R., Butts, J. D., & Williams, I. (1984). Sexual development and behavior in black preadolescents. *Adolescence*, *19*, 557-568.
- Wilson, E. O. (1975). *Sociobiology: The new synthesis*. Cambridge, MA: Harvard Univ. Press.
- Wilson, E. O. (1984). *Biophilia*. Cambridge, MA: Harvard Univ. Press.
- Wilson, J. Q., & Herrnstein, R. J. (1985). *Crime and human nature*. New York: Simon & Schuster.
- Wilson, R. S. (1983). The Louisville twin study: Developmental synchronies in behavior. *Child Development*, *54*, 298-316.