

Rushton, J. P. (1999). Ethnic differences in temperament.

In Y-T Lee, C. R. McCauley, & J. Draguns (Eds.), Personality and person perception across cultures (pp. 45-63). Mahwah, NJ: Erlbaum.

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Ethnic Differences in Temperament

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Over a century ago, Sir Francis Galton began modern questionnaire research into temperament with his study of "Good and Bad Temper in English Families" (Galton, 1865). He was also the first to advocate the study of human twins and of selective breeding studies of animals to disentangle the effects of heredity and environment. And it was Galton who first contrasted the taciturn reserve of American Indians, and the complacency of the Chinese, with the talkative impulsivity of Africans. He further noted that these temperamental differences persisted irrespective of climate (from the frozen north through the equator), and religion, language, or political system (whether self-ruled or governed by the Spanish, Portuguese, English, or French). Anticipating later studies of transracial adoptions, Galton observed that the majority of individuals adhered to racial type even after being raised by White settlers. Modern evidence shows that Galton's views were largely correct.

Temperament refers to an individual's characteristic or habitual modes of behavioral and emotional responding that are present at an early age and often believed to have some basis in biological processes partly determined by heredity. It is typically discernible at birth. That infants differ systematically is shown by research observations starting in the first few days or weeks of life and extending, in some cases, for over a decade. In their book, *Temperament and Behavior Disorders in Children*, Thomas, Chess, and Birch (1968) were able to classify babies shortly after their birth into three types—"easy children" (adaptable, cheerful, regular in habits), "difficult children" (irritable, crying, withdrawn, irregular in habits), and "slow-to-warm-up children" (inactive, slow to adapt, gentle). About 70% of the difficult babies later developed behavioral problems calling for psychiatric attention; only 18% of the easy ones had such problems (Thomas & Chess, 1984).

GENETICS AND TEMPERAMENT

One of the best known analyses of genetics and temperament was published in 1974 by Daniel G. Freedman. He observed 20 pairs of newborn twins of the same gender, some identical (monozygotic, sharing 100% of their genes), and others fraternal (dizygotic, sharing at least 50% of their genes). Until their observations were complete, the investigators did not know which type of twin they were studying (and neither, at the time, did the parents). The investigators rated the infants for behavioral tendencies such as being responsive to others, displaying fear of a new situation, and having a long attention span. Overwhelmingly, the identical twins were more similar in behavior than the fraternal twins, especially with regard to fearfulness, social awareness, and the tendency to smile and vocalize.

Other twin studies confirm the heritability of temperament. Several investigators have videotaped toddlers to determine how shy they were in dealing with new situations (such as a stranger arriving at the home or a stranger offering toys). A study of activity level in 3- to 12-year-olds counted the number of times children "got up and down" while "watching television" and "during meals." In all these studies, identical twins were found to be much more similar than fraternal twins, with the genetic contribution typically ranging from 27% to 56% (Rowe, 1994).

Several studies have been carried out on temperament traits in adults. In one, my colleagues and I gave questionnaires to 573 pairs of 19- to 60-year-old twins measuring nurturant and aggressive tendencies. The questionnaires included a 20-item altruism scale, a 33-item empathy scale, a 16-item nurturance scale, and many items assessing aggression. As shown in Table 3.1, 50% of the variance on each scale was associated with genetic effects, virtually 0% with the twin's common environment, and the remaining 50% with each twin's specific environment. When the estimates were corrected for unreliability of measurement, the genetic contribution increased to 60% (Rushton, Fulker, Neale, Nias, & Eysenck, 1986).

High heritabilities were also found in an examination of violent reactions such as the destruction of property, fighting, carrying and using a weapon, and struggling with a police officer (Rushton, 1996). At least the heritabilities were high for men. In this study, however, environmental factors were predominant for women. More generally, women averaged a significantly gentler temperament than men; they were typically more empathetic, less prone to anger, less prone to aggression, and less prone to acts of violence. Women also had a smaller variance of scores on measures of violence.

TABLE 3.1
Genetic and Environmental Contributions to Altruism and Aggression Questionnaires
in 573 Adult Twin Pairs

Trait	Additive Genitive Variance		Common Environmental Variance		Specific Environmental Variance	
	Altruism	51%	(60%)	2%	(2%)	47%
Empathy	51%	(65%)	0%	(0%)	49%	(35%)
Nurturance	43%	(60%)	1%	(1%)	56%	(39%)
Aggressiveness	39%	(54%)	0%	(0%)	61%	(46%)
Assertiveness	53%	(69%)	0%	(0%)	47%	(31%)

Note. From Rushton, Fulker, Neale, Nias, & Eysenck (1986). Altruism and aggression: The heritability of individual differences. *Journal of Personality and Social Psychology*, 50, 1194. Copyright © 1986 by the American Psychological Association. Adapted by permission. Estimates in parentheses are corrected for measurement unreliability.

Corroborating the twin work on antisocial behavior are several American, Danish, and Swedish adoption studies. Children who were adopted in infancy were at greater risk for criminal convictions if their biological parents had been convicted of a crime than if their adoptive parents had been. For example, in a Danish study of some 14,000 adoptees, if boys had neither adoptive parents nor biological parents who were criminals, their rate of criminal conviction was 14%. If the adoptive, but not the biological parents were criminals, boys still had a conviction rate of only 15%. But if the biological, but not the adoptive parents were criminal, the rate increased to 20%. And, if both biological and adoptive parents were criminals, the rate increased to 25%. Moreover, whereas siblings raised apart showed 20% concordance for criminality, half-siblings showed only 13% concordance, and pairs of unrelated children reared together only 9% concordance (Mednick, Gabrielli, & Hutchings, 1984).

ETHNIC DIFFERENCES IN TEMPERAMENT

I cannot emphasize enough that the profiles I am about to describe reflect *average* differences. Not all Africans or East Asians (and their descendants) are the same as each other and different from Europeans (and their descendants). There is much overlap and the full range of temperament and behavior is found in every ethnic group. Moreover, I obviously engage in much oversimplification by dividing all the world's people into just three categories: East Asian, European, and African (although I do provide a wide

sampling from the home continents as well as the United States). Also, although the data suggest that genetic factors contribute to differences between human groups, it is clear that environmental factors do so too (Rushton, 1995).

Temperamental differences are not randomly distributed in the population. Again Daniel Freedman (1974, 1979) was one of the first to provide evidence in support of Galton's insights. Freedman examined 24 newborn Chinese-American babies and 24 newborn White babies who were similar in weight, physical vitality, mother's age, length of labor, and use of drugs during labor. Though there was a substantial overlap between the two groups: The Chinese-American babies, within (on the average) 33 hours of being born, were less perturbable, more placid, and more easily consoled than the White babies. The Euro-American infants had a greater tendency to be changeable, move back and forth between states of contentment and upset, and reach the peak of excitement sooner, whereas the Chinese-American infants were calmer and more consolable when upset.

Similar findings have been reported by Jerome Kagan and his coworkers (Kagan, Arcus, Snidman, Feng, Hendler, & Greene, 1994) at Harvard University. In a comparison of 106 Irish 4-month-olds born in Dublin and 80 Chinese infants who were born in Beijing, Kagan et al. recorded motor activity, vocalization, fretting, crying, and smiling. A total motor score was calculated based on the frequency of movements of both arms, both legs, bursts of movement of either arms or legs, or arches of the back. Vocalization, smiling, and fretting were coded in terms of the seconds the child cried. Analysis of the videotapes of the infants' behavior revealed a dramatic difference between the White and the Chinese infants. The Chinese infants were significantly lower in motor activity, irritability, and vocalization compared with either the Irish infants or the White American infants.

Interestingly, Amerindian infants tend to be temperamentally and motorically similar to Chinese babies. In a study of Amerindian infants, Brazelton, Robey and Collier (1969) reported that Amerindian neonates exhibited almost none of the normally occurring spasmodic movements common in White newborns, and maintained smoother gross motor movements throughout the first year. DNA analysis suggests that Amerindians and Chinese are two branches of the Mongoloid race, thought to have become differentiated from Whites about 41,000 years ago and from each other about 30,000 years ago (Stringer & Andrews, 1988; see more later). The common Mongoloid-Caucasoid split from African Negroids is believed to have occurred about 110,000 years ago.

By 2 years of age, Caucasoid children show greater behavioral inhibition than do Mongoloid children. One cross-cultural laboratory study comparing 118 Chinese toddlers from the People's Republic of China with 82 White Canadian children, found the Chinese children spent more time in physical contact with their mothers during free play and had a longer latency to approaching a stranger or an exciting toy than did the White children (Chen et al., in press). By 3 and 4 years of age, White children readily engage in approach and interaction behavior whereas East Asian children spend more time on individual projects and generally demonstrate low noise levels, quiet serenity, and few aggressive or disruptive behaviors (Freedman, 1974, 1979). African-descended (or Negroid) children are even more uninhibited than Whites.

A study carried out in Quebec, Canada, with preschoolers, showed how generalizable the racial pattern in temperament is. A sample of 825 4- to 6-year-old children from 66 different countries speaking 30 different languages were assessed by 50 teachers. All the children were in preschool French language immersion classes for immigrant children in Montreal used to facilitate integration into the school system. Only 20% of the children were born in Canada, with the Black children typically coming from French-language countries like Haiti, the White children from Spanish-speaking countries like Chile, and the Oriental children from what was once French Indo-China (now Vietnam and Kampuchea). Teachers reported better social adjustment and less hostility-aggression from Mongoloid children than from Caucasoid children, who in turn were better adjusted and less hostile than Negroid children (Tremblay & Baillargeon, 1984).

Comparing three groups of Chinese 5-year-olds in Beijing with three groups of White Canadians in Ottawa, using continuous observation on four separate occasions, Orlick, Zhou, and Partington (1990) also found significant differences in prosocial and antisocial behavior. Whereas 85% of peer interactions documented in China were cooperative in nature, 78% of those in Canada involved conflict. Similar results emerged from a study of 10-year-olds in the People's Republic of China compared with children from Sweden on the Olweus' Aggression Inventory. Ekblad and Olweus (1986) found that the Chinese were less aggressive and higher in prosocial behavior than were the Swedes.

These results do not vary, regardless of the age of the subjects, the trait studied, or the method of measurement. Typically, studies of infants and young children use observer ratings, whereas studies of adults use paper-and-pencil tests. Researchers have investigated the personality of the Chi-

nese and Japanese, both in their homelands and in North America, giving university students standardized tests such as Cattell's Sixteen Personality Factor Questionnaire, the Eysenck Personality Questionnaire, the Edwards Personal Preference Schedule, and the Minnesota Multiphasic Personality Inventory (Vernon, 1982). The evidence showed that, on average, East Asians were more introverted and more anxious, though less dominant and less aggressive than White Americans. Studies carried out on Africans and Black Americans show greater aggressiveness, dominance, impulsivity, and displays of masculinity compared to Whites (Wilson & Herrnstein, 1985).

In one study, I indexed behavioral restraint by low Extraversion (sociability) and high Neuroticism (anxiety) scores from the Eysenck Personality Questionnaire for a worldwide database of thousands of subjects from 25 different countries (Rushton, 1985). Asian samples averaged less extraversion and more anxiety than did the European samples, who averaged less extraversion and more anxiety than did the African samples. Of course studies of subjects who are not neonates, even studies of children as young as 6 months of age, may be assessing heredity-environment interaction rather than only inherited differences in temperament. But when studies of neonates and older subjects converge on the same pattern of results—Europeans consistently between Africans and East Asians—we are entitled to suggest that heredity makes some contribution to this pattern.

Self-Esteem. Self-esteem may be one aspect of temperament. Surprisingly, African-American youth have higher general self-esteem than Whites or Asians (Levin, 1997). In one of the larger studies, 11- to 16-year-olds were examined in two small southern towns (Tashakkori, 1993). Respondents read along on each question while the teacher read it aloud. Items measuring self-esteem were from the Rosenberg Self-Esteem Scale and included "I take a positive attitude toward myself," "I feel I am a person of worth, on an equal basis with others," "At times I think I am no good at all," "On the whole, I am satisfied with myself," and "I am able to do things as well as most people." Assessments were also made concerning beliefs about general competence with items such as "I am intelligent" and "I can learn almost anything if I set my mind on it," as well as more specific beliefs about attractive appearance, physical ability, and academic self-perceptions like reading and mathematics and personal control over events.

Tashakkori (1993) found the general self-esteem scores on the Rosenberg Scale as well as other indices of self-attitudes showed African Americans scored from one half to two thirds of a standard deviation higher than White

Americans. This finding is confirmed by a study of older adolescents in national studies (see Tashakkori, 1993). African-American groups consistently showed more positive scores on the majority of specific self-belief indices, particularly regarding appearance and attractiveness, but also regarding competence in reading, science, and social studies (but not mathematics), despite their lower self-reported (and actual) academic achievement. The only beliefs in which the African Americans scored lower than the Whites were those that reflected self-efficacy and control of events that happened to self.

Crime. Crime is partly based on temperament. In *Crime and Human Nature*, Wilson and Herrnstein (1985) noted that the East Asian underrepresentation in U.S. crime statistics posed a theoretical problem. The solution proposed by criminologists as early as the 1920s was that the Asian "ghetto" protected members from the disruptive tendencies of the outside society. For African Americans, however, the ghetto is said to foster crime. Even though they make up less than one eighth of the population, African Americans account for half of all arrests for assault and murder and two thirds of all arrests for robbery in the United States. Because about the same proportion of African-American and White crime victims report that their assailant was African American (Levin, 1997), the arrest statistics cannot be attributed only to racist police.

Female-perpetrated homicides tell a similar story. In one study (Mann, 1996), 75% of arrests were of African-American women, 13% were White women, whereas no Asian women at all were arrested. Contrary to some popular sociocultural explanations, African Americans also make up a disproportionate share of those arrested for white-collar offenses. For example, about one third of those arrested for fraud, forgery, counterfeiting, and receiving stolen property, and about one fourth of those arrested for embezzlement are African American. African Americans are underrepresented only for crime in the executive suites—those white-collar offenses (tax fraud, securities violations) that by definition are restricted to individuals in high-status occupations.

A similar racial pattern is found in other industrialized Western countries. In London, England, for example, African-descended people make up 13% of the population, but account for 50% of the crime. A government commission in Canada reported that Blacks were 5 times more likely to be in jail than were Whites, and 10 times more likely than Asians (Ministry of the Solicitor-General and Correctional Services, 1996).

I have carried out several analyses of INTERPOL Yearbooks including for the years 1983–1984, 1985–1986, and 1989–1990. The results are consistent. The rate of violent crime (murder, rape, and serious assault) was three times lower in Asian or Pacific Rim countries than in African or Caribbean countries, with European countries intermediate. Aggregating the data for Asian, European, and African countries from the 1990 INTERPOL Yearbook yielded the following crime rates per 100,000 population: Asian = 32, European = 75, and African = 240. Of course, these data, by themselves, do not (and cannot) address the issue of whether the behaviors are genetic or cultural in origin.

STEREOTYPES OR ACCURATE PERCEPTIONS?

Daniel Freedman (1979), Ottati and Lee (1995), and Lee, Jussim, and McCauley (1995), among others, have examined the question of whether so-called “stereotypes” may sometimes be accurate perceptions of real group differences. For example, Eskimos, Amerindians, and Asians alike (all of whom are of Mongoloid origin) are perceived by Europeans as placid and behaviorally restrained whereas Eskimos and Asians sometimes characterize Whites as “emotionally volatile” (LeVine, 1975).

In my book, *Race, Evolution, and Behavior* (Rushton, 1995), I described three distinct racial profiles that apply to over 60 anatomical and social variables, including temperament and personality, in which East Asians are at one end of the continuum, Africans are at the other, and Europeans regularly fall between the two. These results show that Galton’s original assessments of race differences extend beyond temperament (Table 3.2). Temperament is best seen as one element in a suite of behaviors that make up what is known in evolutionary biology as a “life-history.”

While conducting my research on mean race differences on the various traits listed in Table 3.2, I carried out a survey (Rushton, 1992) of the opinions of 73 Asian and 211 non-Asian (mainly White) students at the University of Western Ontario concerning the ranking of the races on that list of traits. There was substantial agreement of the rankings by the Asian and non-Asian students. Asians (and Whites) viewed Asians as having more intelligence, industry, anxiety, and rule-following behavior than either Whites or Blacks, while being significantly lower in activity level, sociability, aggressiveness, strength of the sex drive, and genital size. Whites were ranked intermediate to Asians and Blacks. This gradient parallels that

TABLE 3.2
Relative Ranking on Diverse Variables

<i>Variable</i>	<i>Asians</i>	<i>Whites</i>	<i>Blacks</i>
Temperament			
Activity	Lower	Intermediate	Higher
Aggressiveness	Lower	Intermediate	Higher
Cautiousness	Higher	Intermediate	Lower
Dominance	Lower	Intermediate	Higher
Impulsivity	Lower	Intermediate	Higher
Self-concept	Lower	Intermediate	Higher
Sociability	Lower	Intermediate	Higher
Maturation rate			
Gestation time	Later	Later	Earlier
Skeletal development	Later	Intermediate	Earlier
Motor development	Later	Intermediate	Earlier
Dental development	Later	Intermediate	Earlier
Age of first intercourse	Later	Intermediate	Earlier
Age of first pregnancy	Later	Intermediate	Earlier
Life-span	Longer	Intermediate	Shorter
Social organization			
Marital stability	Higher	Intermediate	Lower
Law abidingness	Higher	Intermediate	Lower
Mental health	Higher	Intermediate	Lower
Administrative capacity	Higher	Higher	Lower
Reproductive effort			
Two-egg twinning (per 1000 births)	4	8	16
Hormone levels	Lower	Intermediate	Higher
Secondary sex characteristics	Smaller	Intermediate	Larger
Intercourse frequencies	Lower	Intermediate	Higher
Permissive attitudes	Lower	Intermediate	Higher
Sexually transmitted diseases	Lower	Intermediate	Higher
Intelligence			
IQ test scores	106	100	85
Decision times	Faster	Intermediate	Slower
Brain size			
Autopsy data (cm ³ equivalents)	1.351	1.356	1.223
Endocranial volume (cm ³)	1.415	1.362	1.268
External head measures (cm ³)	1.356	1.329	1.294
Cortical neurons (billions)	13.767	13.665	13.185

Note. Adapted from J. P. Rushton (1995). *Race, evolution, and behavior* (p. 5). New Brunswick, NJ: Transaction Publishers. Copyright © 1995 by Transaction Publishers. All rights reserved. Reprinted by permission.

found for the objective measures. (The only exception to the general tendency is that Asians, but not Whites, viewed Whites as more aggressive than Blacks.)

RELATED RACIAL TRAITS

It is important to examine at least briefly some of the other differences listed in Table 3.2. The relationship between these differences and the levels of various hormones (especially testosterone) may help to order the biological basis of behavior. If temperament differences are rooted in the genes, they must also be mediated by neurophysiological mechanisms. Even more, they must be rooted in evolutionary processes where, of course, genes originate.

Physical Maturation. In the United States, Asian and White babies have a longer gestation period than African-American babies. By week 39, 51% of African-American children have been born, but only 33% of Asian or White babies. Similar differences are found in Europe where women of European ancestry have been compared with women of (often middle-class) African ancestry (Papiernik, Cohen, Richard, de Oca, & Feingold, 1986). Although Black babies are born earlier than White babies, they are physiologically more mature at birth (as measured by pulmonary function and amniotic fluid).

The relative Asian delay in physical maturation continues through life. Asian children typically do not walk until 13 months, compared with 12 months for White children, and 11 months for Black children (Freedman, 1974, 1979). Well-standardized tests such as Bayley's Scales of Mental and Motor Development and the Cambridge Neonatal Scales show that Black babies from Africa, the Caribbean, and the United States mature faster on measures taken from birth to 12 months (coordination and head lifting, muscular strength and turning over, and locomotion) and 15 to 20 months (putting on clothing).

Asian children begin the first phase of permanent tooth eruption at 6.1 years and finish at 7.8 years; Europeans begin at 6.1 years and finish at 7.7 years; and Africans begin at 5.8 years and finish at 7.6 years (Eveleth & Tanner, 1990; Tompkins, 1996). East Asians also reach sexual maturity (measured by age at first menstruation, first sexual experience, and first pregnancy) later than do Europeans, who in turn sexually mature slower

than do Africans. One large U.S. survey showed that by age 12, 19% of African-American girls had reached the highest stages of breast and pubic hair development, compared to 5% of White girls (Herman-Giddens, Slora, Wasserman, Bourdony, Bhapkar, Koch, & Hasemeier, 1997). By age 11, 2% of African-American boys had experienced coitus, figures not reached by White boys for another 1.5 years. Asians, in turn, lag 1 to 2 years behind their (White) American counterparts in sexual development and onset of sexual interest.

Sexuality. World Health Organization as well as national surveys show that Asians are sexually less active and precocious than Europeans, who are sexually less active and precocious than Africans (Centers for Disease Control and Prevention, 1992). One typical U.S. study carried out in Los Angeles found the average age at first intercourse was 16.4 years for East Asians and 14.4 years for African Americans, with Whites intermediate (Moore & Erickson, 1985). The percentage of students who were sexually active was 32% for East Asians and 81% for African Americans, with Whites again intermediate. A self-report study recently carried out in Canada, found that Asians were significantly more sexually "restrained," even on items measuring fantasy and masturbation that do not require the presence of a sexual partner (Meston, Trapnell, & Gorzalka, 1996). Further, Asian students born in Canada were as restrained as those who had only recently immigrated.

Sexual activity after marriage reveals a similar pattern. A meta-analysis of a number of surveys showed that for married couples in their 20s, the average frequency of intercourse per week is 2.5 for the Japanese and Chinese in Asia; 4 for American Whites, and 5 for African Americans (Rushton, 1995). Similar differences are found on measures of sexual permissiveness, amount of thinking about sex, and sex guilt. One study observed that each of three generations of Japanese Americans, as well as Japanese students in Japan, reported less interest in sex than did European samples. In studies carried out in Britain and Japan, using a sex-fantasy questionnaire, British men reported twice as many such fantasies as Japanese men. British women admitted to four times as much sex fantasy as did Japanese women (Iwawaki & Wilson, 1983). Asians were the most likely to believe sex has a weakening effect. By contrast, Blacks reported not only having had intercourse with more casual partners but also fewer second thoughts than did Whites.

The hypothesis that the racial differences in sexual behavior go deeper than culture is supported by their linkage to reproductive physiology.

Whereas the average woman produces one egg every 28 days, in the middle of the menstrual cycle, some women have shorter cycles than others, and some produce two eggs in a cycle. Either behavior produces greater opportunities for conception and therefore can lead to greater population growth. Occasionally, each egg in a double ovulation is fertilized by a separate sperm, producing dizygotic (two-egg) twins. The races differ in their rates of double ovulation. The frequency of dizygotic twins is less than 4 per 1,000 births for Mongoloids, 8 for Caucasoids, and 16 or greater for Negroids (Bulmer, 1970). Studies of Mongoloid-Caucasoid crosses in Hawaii and Caucasoid-Negroid crosses in Brazil have established that the rate of multiple birthing is determined by the race of the mother, not the father.

Family Functioning. Marital stability can be measured by rates of divorce, out-of-wedlock birthing, child abuse, and delinquency. On each of these measures, Asians are more stable than Whites or Blacks. The 2 million East Asians in the United States are rarely perceived as a "social problem." They have significantly fewer divorces, out-of-wedlock births, or incidences of child abuse than do Whites. Perhaps this is why they are very seldom studied. African-American family structure, on the other hand, has been studied intensively. About 75% of births to African-American teenagers are out of wedlock compared with 25% of births to White teenagers. Overall, over 50% of new mothers are teenagers (Jaynes & Williams, 1989).

However, the female-headed family structure is not unique to the United States, the legacy of slavery, or the result of inner-city decay. It is also found in many areas of Black Africa (Draper, 1989). The female-headed family is part of an overall life-history pattern that consists of: (a) early onset of sexual activity, (b) loose emotional ties between spouses, (c) expectation of sexual union with many partners, and children by them, (d) lowered maternal nurturing with long-term "fostering" of children, sometimes for several years, with the stated reason sometimes being to remain sexually attractive, (e) greater competition by males for females, (f) less paternal involvement in child rearing, and (g) higher fertility, despite education and urbanization (which in other regions and among other groups produce a decline in fertility).

Even when compared to others in the developing world, African women stop caring intensively for their children relatively early in the child's life (Draper, 1989). Once breast feeding is stopped, ovulation resumes and the mother can conceive again. This allows a relatively high number of births per woman at relatively short birth intervals. Once a child is a year or so

old, other children and grandparents do much of the caretaking. Children learn to look to older children for basic needs during the day. Groups of preteens and teenagers are left relatively free of adult supervision.

Intelligence Test Scores. Although this chapter is concerned with temperament, intelligence is certainly an important facet of character. As Galton recognized early on, intelligence interacts with differences in temperament to produce socially desirable outcomes such as educational achievement and the avoidance of crime. East Asian populations both in the United States and in Pacific Rim countries average IQs in the range of 101 to 111; White populations in the United States, Europe, and India average from 85 to 117, with an overall mean of 100; and African populations in the United States, Britain, the Caribbean, and sub-Saharan Africa average from 70 to 90 (Herrnstein & Murray, 1994; Jensen, 1998; Levin, 1997).

Voice Dominance. Asians have lighter voices than do Whites and Whites lighter than do Blacks. In one study, Hudson and Holbrook (1982) gave a reading task to 100 Black men and 100 Black women volunteers ranging in age from 18 to 29 years. The fundamental vocal frequencies were measured and compared to White norms. The frequency for Black men was 110 Hz, lower than the 117 Hz for White men; the frequency for Black women was 193 Hz, lower than the frequency of 217 Hz for White women.

HOW ARE THE TEMPERAMENT DIFFERENCES MEDIATED?

Testosterone. Is there then some neurohormonal “master switch” that sets each person’s and the racial average position on the overall suite of characters? One possible trigger is testosterone level. Testosterone level correlates with temperament, self-concept, aggression, altruism, crime, and sexuality, in women as well as in men (Harris, Rushton, Hampson, & Jackson, 1996). Testosterone is also involved in secondary sexual characteristics such as muscularity and deepening of the voice, and even the organization and structure of the brain.

Race differences in testosterone (male hormone) level may explain other behavior differences. The testosterone rate was found to be 19% higher in a sample of Black U.S. college students than in their White counterparts. In an older group of U.S. military veterans, Blacks had a testosterone level

3% higher than Whites (Ellis & Nyborg, 1992). A study of testosterone metabolites showed a 10% to 15% higher incidence in African Americans than in White Americans and a still lower incidence among the Japanese (in Japan).

Hormones and other biological factors may influence sexual behavior more among Blacks than they do among Whites or Asians. For example, there is a greater frequency of intercourse at mid-cycle (the time most likely to result in pregnancy) among Black women than among White women. When East Asian and White students at a Canadian university were compared, the Asian women reported less periodicity of sexual response than did White women (Rushton, 1992). Biological factors similarly predict the onset of sexual interest, dating, first intercourse, and first pregnancy better for Blacks than they do for Whites or for Asians. Conversely, social factors such as religious beliefs and gender-role attitudes predict the sexual behavior of White women better than they do for Black women.

Neurobehavioral Activation and Inhibition Systems. For several decades British psychologist Jeffrey Gray (1987) has been investigating the areas of the brain responsible for the control of emotional behavior. These include a behavioral inhibition system (BIS) and a behavioral activation system (BAS). In Gray's theory antisocial behavior is especially linked to underactivation of the BIS and the failure to learn a conscience or the conditioned emotional response of anxiety to antisocial thoughts. Behavioral inhibition is especially linked to the prefrontal cortex, and damage here often results in antisocial responding.

The racial gradient in decreasing mean brain size, going from East Asians to Europeans to Africans, has been independently established using three different procedures: wet brain weight at autopsy, volume of empty skulls using filler, and volume estimated from external head sizes. Recently, more sophisticated techniques including magnetic resonance imaging (MRI) have confirmed the findings by in vivo three-dimensional images of the brain. The results from all these studies converge on the conclusion that the brains of East Asians and their descendants average about 17 cm³ (1 in³) larger than those of Europeans and their descendants whose brains average about 80 cm³ (5 in³) larger than those of Africans and their descendants (Rushton & Ankney, 1996).

Kagan et al. (1993) suggested that the differences in motor activity and crying between the two groups lie in the excitability of the amygdala and its circuits to the corpus striatum, cingulate, central gray, and hypothala-

mus. The differences in ease of motor activity and crying suggest a muting or modulation of these circuits in the Chinese infants. It is relevant that Asian-American patients with symptoms of anxiety require lower concentrations of psychotropic medication than do White American adults with the same symptoms (Levy, 1993).

TRANSRACIAL ADOPTIONS

In the early part of this chapter behavior genetic evidence was presented showing substantial heritability for temperament traits. The question arises as to whether findings based on studies carried out within populations (mostly White, but also including Asian and African American; Lynn & Hattori, 1990; Osborne, 1980), generalize to differences between populations. One crucial type of evidence are multiracial adoption studies. Most of these have assessed IQ, but some have examined temperament.

Studies of Korean and Vietnamese children adopted into White American and White Belgian homes have been conducted (e.g., Clark & Hanisee, 1982). As babies, many adoptees had been hospitalized for malnutrition. Nonetheless they went on to develop IQs 10 or more points higher than their adoptive national norms. By contrast, Black and mixed-race (Black-White) children adopted into White middle-class families typically perform at a lower level than similarly adopted White children. For example, in the well-known Minnesota Transracial Adoption Study, by age 17, adopted children with two White biological parents had an average IQ of 106, adopted children with one White and one Black biological parent had an average IQ of 99, and adopted children with two Black biological parents had an average IQ of 89 (Weinberg, Scarr, & Waldman, 1992). These results, showing that Black and Asian babies register neither gains (for Blacks) nor losses (for Asians) in IQ by being adopted by Whites, provide direct evidence for a genetic basis for the ethnic differences.

Less well known (and much less established) are the transracial adoption results on temperament. Two unpublished doctoral theses have been carried out. Under the direction of Dan Freedman at the University of Chicago, Brooks (1989) assessed activity level and temperament in Korean children raised by White American families. She found that the adopted children scored partway between the other two groups. In collaboration with Sandra Scarr at the University of Virginia, DeBerry (1991) analyzed the Minnesota Transracial Adoption Study. She found that fully two thirds of the interracial

(Black and mixed-race) adoptees, who took the Minnesota Multiphasic Personality Inventory, had higher than average scores, thereby indicating impulsivity, outgoingness, aggressiveness, rebelliousness, and hedonism. Individuals with this profile typically report difficulty in marital or family relationships and have trouble with the law or authority in general.

EVOLUTIONARY SELECTION

In 1758, Caroleus Linneus classified four subspecies of *Homo sapiens*: American Indians, Asians, Europeans, and Africans. Most subsequent classifications recognize at least the three major subdivisions considered in this chapter: Mongoloid, Caucasoid, and Negroid. This classification does not rule out making finer distinctions within these major races. I have provided an evolutionary hypothesis that explains why so many variables correlate so consistently and why East Asians average the most quiescent temperament, Africans average the least quiescent, and Europeans average intermediately (Rushton, 1995).

The currently most accepted view of human origins posits a beginning in Africa some 200,000 years ago, an African/non-African split about 100,000 years ago, and a Caucasian/East Asian split about 40,000 years ago (Cavalli-Sforza, Menozzi, & Piazza, 1993; Stringer & McKie, 1996). Evolutionary selection pressures were different in the hot savanna where Africans evolved than in the cold Arctic where East Asians evolved. I hypothesize that the farther north the populations migrated, out of Africa, the more they encountered the cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children successfully during prolonged winters. Similarly, the winters were socially demanding, putting a premium on cooperation and impulse control. As the original African populations evolved into present-day Europeans and East Asians, they did so in the direction of larger brains, slower rates of maturation, and lower levels of sex hormone with concomitant reductions in sexual potency and aggression and increases in family stability and longevity.

CONCLUSION

The scientific study of ethnic differences in temperament began with Galton's contrast between the Chinese, the Amerindians, and the Africans. Since then, most of the research has been carried in Europe or the United

States, where various groups have been viewed through a Eurocentric lens. Increasingly, however, scientists of non-European ancestry have been adding to our store of knowledge and thereby broadening our perspective. By doing so, research on ethnic differences in temperament and behavior may help to promote mutual understanding and cooperation.

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