Available online at www.sciencedirect.com

SCIENCE DIRECT®

Intelligence 32 (2004) 227–243

INTELLIGENCE

Why beautiful people are more intelligent

Satoshi Kanazawa[a,*], Jody L. Kovar[b]

[a] *Interdisciplinary Institute of Management, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, UK*

[b] *Department of Sociology, Indiana University of Pennsylvania, USA*

Received 22 September 2003; received in revised form 20 March 2004; accepted 26 March 2004
Available online 1 June 2004

Abstract

Empirical studies demonstrate that individuals perceive physically attractive others to be more intelligent than physically unattractive others. While most researchers dismiss this perception as a "bias" or "stereotype," we contend that individuals have this perception because beautiful people indeed *are* more intelligent. The conclusion that beautiful people are more intelligent follows from four assumptions. (1) Men who are more intelligent are more likely to attain higher status than men who are less intelligent. (2) Higher-status men are more likely to mate with more beautiful women than lower-status men. (3) Intelligence is heritable. (4) Beauty is heritable. If all four assumptions are empirically true, then the conclusion that beautiful people are more intelligent is *logically* true, making it a proven theorem. We present empirical evidence for each of the four assumptions. While we concentrate on the relationship between beauty and intelligence in this paper, our evolutionary psychological explanation can account for a correlation between physical attractiveness and *any other* heritable trait that helps men attain higher status (such as aggression and social skills).

Keywords: Intelligence; Physical attractiveness; Stereotypes; Correlation

If females generally prefer intelligent males because they typically have higher incomes and status, and if most males prefer physically attractive females, then over time these two characteristic will tend to covary.

David M. Buss (1985, p. 49).

* Corresponding author. Tel.: +44-207-955-7297.
E-mail address: S.Kanazawa@lse.ac.uk (S. Kanazawa).

0160-2896/$ - see front matter © 2004 Elsevier Inc. All rights reserved.
doi:10.1016/j.intell.2004.03.003

1. Introduction

In their 1983 article "Beauty as Status," Webster and Driskell argue that physical attractiveness is a diffuse status characteristic, which affects others' perceptions of competence. Their experiment demonstrates that subjects perceive attractive others to be not only more intelligent and competent in general, but also more competent in such a seemingly unrelated and specific task as piloting a plane. While Webster and Driskell's study leaves little doubt that physical attractiveness is a diffuse status characteristic which produces expectations of competence among perceivers, one important question remains unanswered: Why is beauty status? Why is physical attractiveness a diffused status characteristic and why does it produce the general and specific expectations of competence?

There are other studies which demonstrate that people expect physically attractive others to be more intelligent than physically less attractive others (Jackson, Hunter, & Hodge, 1995; Zebrowitz, Hall, Murphy, & Rhodes, 2002). Studies also show that people perceive beautiful others to possess a host of other desirable qualities (Eagly, Ashmore, Makhijani, & Longo, 1991; Feingold, 1992; Langlois et al., 2000). This common perception is captured by the phrase "What is beautiful is good" (Dion, Berscheid, & Walster, 1972).[1] What is important to note, however, is that, for most of these studies, as it is for Webster and Driskell (1983), neither the sex of the target nor the sex of the perceiver has a significant effect on people's perception that beautiful people are intelligent or otherwise good: both men and women perceive physically attractive men and women to be intelligent and good. In addition, children as young as first and second graders hold the perception that better looking teachers are more intelligent (Goebel & Cashen, 1979; Zebrowitz et al., 2002). Thus, romantic or sexual attraction does not seem to underlie people's perception that beautiful others are intelligent and good (Mulford, Orbell, Shatto, & Stockard, 1998).

While most researchers dismiss this perception as a "bias," "stereotype," or "halo effect" (with the implicit assumption that the perception is not accurate and has no factual basis) or else the outcome of self-fulfilling prophecy (Snyder, Tanke, & Berscheid, 1977), we instead contend in this paper that people have this perception because more beautiful people indeed are more intelligent than less beautiful people. The conclusion that beautiful people are more intelligent follows from four assumptions.

Assumption 1. More intelligent men are more likely to occupy higher status than less intelligent men.

Assumption 2. Higher-status men are more likely to mate with more beautiful women than lower-status men.

Assumption 3. Intelligence is heritable, such that sons and daughters of more intelligent men are more intelligent than sons and daughters of less intelligent men.

[1] Critics have noted that people have the opposite stereotype that extremely attractive women are unintelligent. We do not believe such a stereotype exists, however. We instead believe that the stereotype is that blonde women and women with large breasts are unintelligent, both of which, just like the stereotype that beautiful people are intelligent, may statistically be true. In the ancestral environment without any artificial means of altering appearance (such as hair dyes and plastic surgery), both light blonde hair (Ridley 1993, pp. 293–295) and large firm breasts (Marlowe 1998) were honest indicators of youth, and thus naïveté and inexperience, which can sometimes be interpreted as a lack of intelligence.

Assumption 4. Beauty is heritable, such that sons and daughters of more beautiful women are more beautiful than sons and daughters of less beautiful women.

The conclusion that more beautiful people are more intelligent than less beautiful people logically follows from these four assumptions, making it a theorem. In other words, if all four assumptions are empirically true, then the conclusion must logically be true and there must be a correlation between beauty and intelligence. Such a correlation, however, is *extrinsic*, rather than intrinsic (Jensen, 1998, pp. 139–143) or causal.

Our contentions in this paper are therefore twofold: (1) There exists an empirical correlation between beauty and intelligence across individuals and (2) this correlation is extrinsic and results from assortative mating of intelligent, high-status men and beautiful women. Whereas Zebrowitz et al. (2002) consider and rule out one evolutionary psychological explanation for the covariance of beauty and intelligence (whereby "good genes" produce both beauty and intelligence), we offer an alternative evolutionary psychological explanation whereby such covariance is extrinsic (not causal) and occurs as a result of assortative mating. This possibility was originally suggested very briefly by Vandenberg (1972), and again by Buss (1985) in the passage quoted above. Our paper formalizes their insight and presents a deductive theory of this process with supportive empirical evidence for each of the assumptions necessary to derive the theorem. Before we turn to the evidence, however, we will briefly discuss the key concept of physical attractiveness.

2. Physical attractiveness (beauty)

While theory and research in evolutionary psychology usually confirm, and elucidate the mechanisms behind, most stereotypes, common perceptions and aphorisms, such as "Men like young and attractive women, and women like rich and powerful men" (Buss, 1994), they have disconfirmed two aphorisms about beauty: "Beauty is in the eye of the beholder" and "Beauty is skin deep." Evolutionary psychology has shown neither to be entirely true (Langlois et al., 2000).

2.1. Beauty is not entirely in the eye of the beholder

Samuels and Ewy (1985) and Langlois et al. (1987) were the first to demonstrate that the standards of beauty might be at least partly innate. In their experiments, infants as young as 2 and 3 months gaze longer at a face that adults have judged to be more attractive than at a face that adults have judged to be unattractive, indicating the infants' preference for attractive faces. Langlois, Roggman, and Reiser-Danner (1990) show that 12-month-old infants exhibit more observable pleasure, more play involvement, less distress, and less withdrawal when interacting with strangers wearing attractive masks than when interacting with strangers wearing unattractive masks. They also play significantly longer with facially attractive dolls than with unattractive dolls. Because 2–12 months is not nearly enough time for infants to have learned and internalized the cultural standards of beauty through socialization and media exposure, the evidence by Langlois et al. seems to suggest that the standards of beauty might be innate, not learned.

Because the standards of beauty are innate, they are also culturally universal and invariant, contrary to popular belief (Cunningham, Druen, & Barbee, 1997). Within the United States, Asians and whites

(Wagatsuma & Kleinke, 1979), and whites and blacks (Bernstein, Lin, & McClellan, 1982; Cross & Cross, 1971) agree on which faces are more or less attractive. Cross-culturally, there is considerable agreement in the judgment of beauty among Asians, Hispanics, and Americans (Cunningham, Roberts, Barbee, Druen, & Wu, 1995), Brazilians, Americans, Russians, the Ache of Paraguay, and the Hiwi of Venezuela (Jones & Hill, 1993; Jones, 1996), Cruzans and Americans in St. Croix (Maret & Harling, 1985), white South Africans and Americans (Morse & Gruzen, 1976), and the Chinese, Indians, and English (Thakerar & Iwawaki, 1979). In none of these studies does the degree of exposure to the Western media have any influence on people's perception of beauty.

Rather than arbitrary, culturally specific, learned, and idiosyncratic (implicit in the phrase ''beauty is in the eye of the beholder''), the standards of beauty appear to be innate, culturally universal, and part of evolved psychological mechanisms or adaptations (hence the new aphorism ''beauty is in the *adaptations* of the beholder''; Symons, 1995). The standards of beauty appear to be part of universal human nature. But why should this be so? Why should all humans consider some facial features more attractive than others? And what facial features do we consider attractive?

2.2. Beauty is not entirely skin deep

Evolutionary psychological research suggests that the standards of beauty might be species-typical because attractive people are genuinely different from less attractive people. Specifically, beauty is an indicator of genetic and developmental health. There is some evidence that physically attractive people are healthier than physically less attractive people (Langlois et al., 2000; Shackelford & Larsen, 1999; but see Kalick, Zebrowitz, Langlois, & Johnson, 1998 for counterevidence).

There appear to be a few features that characterize physically attractive faces: bilateral symmetry, averageness, and secondary sexual characteristics (Little, Penton-Voak, Burt, & Perrett, 2002). Attractive faces are more symmetrical than unattractive faces (Gangestad, Thornhill, & Yeo, 1994; Mealey, Bridgstock, & Townsend, 1999; Perrett et al., 1999). Fluctuating asymmetry (FA) increases with exposure to parasites, pathogens, and toxins during development (Bailit, Workman, Niswander, & Maclean, 1970; Møller, 1990, 1992; Parsons, 1992). FA also increases with genetic disruptions, such as mutations and inbreeding (Parsons, 1990). Developmentally and genetically healthy individuals have less FA, more symmetry in their facial and bodily features, and are more attractive. For this reason, across societies, there is a positive correlation between parasite and pathogen prevalence in the environment and the importance placed on physical attractiveness in mate selection (Gangestad & Buss, 1993); people place more importance on physical attractiveness when there are more pathogens and parasites in their local ecology. This is because, in societies where there are a lot of pathogens and parasites in the environment, it is especially important to avoid individuals who have been afflicted with them when they select mates.

Facial averageness is another feature that increases physical attractiveness; faces with features closer to the population average are more attractive than those with extreme features (Langlois & Roggman, 1990; Rubenstein, Langlois, & Roggman 2002). Evolutionary reasons for why average faces in the population are more attractive than extreme faces are not as clear as the reasons for why facial symmetry is attractive. Current speculation is that facial averageness results from the heterogeneity rather than homogeneity of genes, and thus individuals with average faces are more resistant to a larger number of parasites and are less likely to be homozygous on deleterious alleles (Thornhill & Gangestad, 1993). Thus, just like FA, facial averageness may be an indicator of genetic health and parasite resistance.

Far from merely skin deep, beauty appears to be an indicator of genetic and developmental health, and therefore of mate quality; beauty is a "health certification" (Thornhill & Møller, 1997, pp. 528–533). FA measures beauty so accurately that there is now a computer program which can calculate someone's level of FA from a scanned photograph of a face (by measuring the sizes of, and distances between, various facial parts) and assign a single score for physical attractiveness, which correlates highly with scores assigned by human judges (Grammer & Thornhill, 1994). A computer program can also digitally average human faces (Langlois, Roggman, & Musselman, 1994). Beauty therefore appears to be an *objective* and *quantitative* attribute of individuals like height and weight.

3. Using the current architecture of the brain to make inferences about the ancestral environment

Evolutionary psychologists contend that the human brain (like the rest of the body) is adapted, not necessarily to the current environment, but to the ancestral environment in which we evolved. The way our mind functions, the way we perceive or "see" things, often reflects how things were in the ancestral environment. Stereotypes or common perceptions, to the extent that they are universally shared, seem to be no exceptions.

For instance, one of the stereotypes that people have is that high-status people are taller. In one experiment (Dannenmaier & Thumin, 1964), 46 freshmen in a nursing school estimated the height of four people they knew well who differed in their status (assistant director of the school, instructor at the school, their class president, and one specific fellow student). The students consistently overestimated the height of two high-status people (assistant director and instructor), and underestimated the height of two low-status people (class president and fellow student). In another experiment (Wilson, 1968), the same man was introduced to five different groups of students. In each group, he was introduced as someone with a different academic status (student, demonstrator, lecturer, senior lecturer, and professor). After the man left the room, the students were asked to estimate his height. The status of the stimulus person had a positive and monotonic effect on his estimated height. Participants who thought he was a student estimated him to be less than 5 ft 10 in.; those who thought he was a professor estimated him to be more than 6 ft.

Why is this? Why do people perceive higher-status persons to be taller than lower-status persons? It may be because higher-status persons tended to be taller than lower-status people throughout the evolutionary history. In the ancestral environment, many (if not most) competitions for status were physical, although alliances and coalitions were also important (de Waal, 1982). Our ancestors physically fought each other, and those who won the physical battle came out on top to occupy high status. In the ancestral environment, taller and bigger people therefore had an advantage over shorter, smaller competitors, and they often occupied high status.

In fact, a positive correlation between height and status still exists today to a lesser extent. Across all species, there is a significant positive correlation between height or body size and status dominance (Ellis, 1994); taller or larger males in these species are more likely to be dominant in social hierarchies than smaller males. In human villages throughout the world, the chief is known as "the Big Man," and they are usually tall. The average height of men in the United States today is 5 ft 9 in. Yet more than half of the CEOs of the Fortune 500 companies are 6 ft or taller; only 3% are 5 ft 7 in. or less (Etcoff, 1999, p. 173). Since 1776, only two U.S. Presidents (James Madison and Benjamin Harrison) have been below average in height, and the taller candidate almost always wins the presidential election (McGinniss, 1988).

Our stereotype that higher-status people are taller thus accurately reflects how things tended to be in the ancestral environment and, to a lesser extent, how things still tend to be in the current environment. We contend that our perception that beautiful people are more intelligent has a similar origin. Individuals believe that more attractive people are more intelligent today, because such a correlation existed in the ancestral environment, and may have survived to the current environment (like the correlation between height and status).

4. A note on parsimony

Our theory posits four assumptions (Assumption 1: More intelligent men are more likely to occupy higher status than less intelligent men; Assumption 2: Higher-status men are more likely to mate with more beautiful women than lower-status men; Assumption 3: Intelligence is heritable; and Assumption 4: Beauty is heritable) in order to deduce a theorem (Theorem 1: More beautiful people are more intelligent). We posit these four assumptions, and none other, because these constitute the minimal set of assumptions necessary and sufficient to derive the theorem. We leave out a large number of related observations from our theory because they are not necessary.

In particular, our theory does *not* state: (a) beauty increases men's status; (b) intelligence increases women's status; (c) children inherit their beauty from their father; or (d) children inherit their intelligence from their mother. We do not posit these assumptions, not because we believe they are not true, but because they are not necessary for the logical derivation of the theorem. In fact, we do believe all four of these observations are true, and there is empirical evidence to support each of them. However, to the extent that they are true, these unstated assumptions *strengthen*, rather than weaken, the extrinsic correlation between beauty and intelligence.

For instance, once there is a correlation between beauty and intelligence (as a result of the assortative mating that our theory posits), then more intelligent men are more likely to be beautiful than less intelligent men, and more beautiful women are more likely to be intelligent than less beautiful women. Then, if intelligence is heritable from the mother to her children (in addition to the father), and if beauty is heritable from the father to his children (in addition to the mother), the extrinsic correlation between beauty and intelligence among the children will be even stronger than if intelligence is heritable only through the father and beauty is heritable only through the mother (as our theory states).

Deductive theory like ours is not a comprehensive description of the complex reality and therefore by necessity leaves out much that is true (Kanazawa, 1998). However, scientific theory should not be evaluated by how much it does not say or whether what it does not say is true, but rather by whether what it does say is true.

5. Empirical evidence for the assumptions and the theorem

5.1. Assumption 1. More intelligent men are more likely to occupy higher status than less intelligent men

By intelligence, we mean what psychometricians call general intelligence or the *g* factor (Spearman, 1904). General intelligence is an important determinant of success in a wide range of endeavors

(Gottfredson, 1997). "The *g* factor... predicts performance to some degree in every kind of behavior that calls for learning, decision, and judgment...because *g* is intrinsic to learning novel material, grasping concepts, distinctions, and meanings" (Jensen, 1998, p. 270).

There is evidence that men who occupy higher-status positions are more intelligent. Across different occupations, the correlation between occupational prestige (a measure of status) and the *mean* IQ of individuals in the occupation is between .90 and .95, although the correlation between occupational prestige and *individual* IQ across individuals is only about .50 to .75 due to the large variance in intelligence among individuals in any given occupation (Jensen, 1980, pp. 340–341).

There is a significant positive correlation between the mean IQ and the occupational prestige among both the draftees of World War I (Fryer, 1922) and those of World War II (Harrell & Harrell, 1945). The 1970 data from the U.S. Department of Labor show the following mean IQs for selected occupations: engineer (130), accountant (118), teacher (114), bookkeeper (110), photographer (108), stenographer (106), machinist (104), carpenter (99), laborer (92), and stock clerk (84). Men who scored above the 80th percentile on the Armed Forces Qualification Test after the Korean War had incomes 34% above the national mean, and those who scored below the 20th percentile had incomes 34% below the mean (Jencks, 1972, pp. 220–221). The former group of men earned twice as much as the latter. Reynolds, Chastain, Kaufman, and McLean's (1987) more comprehensive study ($N = 1880$) also demonstrates a monotonic positive relationship between occupational prestige and mean IQ: professional and technical (111.00), managerial, clerical and sales (104.13), skilled workers (99.49), semiskilled workers (93.06), and unskilled workers (89.07). IQ also has a significant ($P < .001$) main effect on educational attainment.

Longitudinal data demonstrate that the direction of causation is from intelligence to occupational prestige, not the other way around. Ball (1938) shows that childhood IQs of 219 men correlate significantly with their adult occupational prestige—at .47, fourteen years later and at .71, nineteen years later. Thorndike and Hagen (1959) study 10,000 World War II Airforce cadets, all of whom were high-school graduates and had IQs above 105. Their IQs were measured at age 21, and their occupational prestige at age 33. Those who were .53 standard deviations *above* the mean IQ of 105 had occupations, such as accountants, architects, college professors, engineers, lawyers, physicians, scientists, treasurers and comptrollers, and writers. Those who were .54 standard deviations *below* the mean became bus and truck drivers, guards, miners, production assemblers, tractor and crane operators, railroad trainmen, and welders. Despite the limited variance in IQ (35% of the total variance in the general population), there is a positive correlation between IQ and occupational prestige among the men studied by Thorndike and Hagen.

Terman and Oden's (1959) study of 1500 gifted children, all with IQs above 140 ($M = 152$) reaches the same conclusion. Over 85% of the men in their study were in the following 10 occupations as adults: lawyers, engineers, college professors, major business managers, financial executives, scientists, physicians, educational administrators, top business executives, and accountants. Only 3% of these men were farmers or semiskilled laborers, and virtually none were unskilled laborers. In their longitudinal study of 13,248 10th graders, Austin and Hanisch (1990) conclude that general mental ability is the strongest predictor of their occupational attainment 13 years later. Hunter and Hunter's (1984) meta-analysis reaches a similar conclusion that mental ability is the strongest predictor of job performance for entry-level jobs.

The effect of intelligence on status is also evident in the study of intergenerational mobility. In Minnesota, Waller (1971) discovers that sons whose IQs were higher than their fathers' tended to be

upwardly mobile, while those whose IQs were lower than their fathers' tended to be downwardly mobile. Furthermore, the more discrepant the son's IQ was from his father's in either direction, the more likely the son was to be upwardly or downwardly mobile. In England, Mascie-Taylor and Gibson (1978) find that the IQs of upwardly mobile sons averaged seven points higher than those of their fathers, whereas those of downwardly mobile sons averaged eight points lower. Intelligence also predicts job performance. Within a single occupation, workers with higher intelligence scores are better workers, on the basis of both supervisors' evaluations and objective measures of productivity (Ghiselli, 1973; Hunter, 1986). The cognitive ability is highly correlated (r=.75) with job performance in civilian jobs (Hunter, 1986). Men with higher IQs are therefore more upwardly mobile both within and across generations. There appears to be little doubt that more intelligent men are more likely to occupy higher status than less intelligent men.

5.2. Assumption 2. Higher-status men are more likely to mate with more beautiful women than lower-status men

From the evolutionary psychological perspective, there are theoretical reasons to expect that higher-status men and beautiful women marry each other. Buss' (1994) extensive cross-cultural data on criteria of mate selection indicate that men in all cultures prefer physically attractive women as their mates, and women in all cultures prefer wealthy men of high status as their mates. There have also been experimental demonstrations that men prefer to mate with physically attractive women and women prefer to mate with socially dominant men (Graziano, Jensen-Campbell, Todd, & Finch, 1997; Gutierres, Kenrick, & Partch, 1999; Kenrick, Neuberg, Zierk, & Krones, 1994). Because not every man can marry a beautiful woman, and not every woman can marry a wealthy man of high status (even in polygynous societies), it is natural to assume that more desirable (i.e., higher-status) men will marry more desirable (i.e., beautiful) women. The process of assortative mating should unite higher-status men and physically attractive women in mateships.

Available empirical studies demonstrate that this may be the case. In his study of intermarriage in India, Davis (1941) notes that, while strict caste endogamy is the rule, certain types of hypergamy (where women from lower castes marry men from higher castes) are culturally sanctioned. When this happens, the women are always physically attractive. In a longitudinal study of youths from Oakland, CA (Elder, 1969), women's physical attractiveness has a very strong (.348) effect on their husband's occupational status in the path analysis. The bivariate correlation between women's physical attractiveness with their husband's occupational status is stronger among working-class women (.46) than among middle-class women (.35). Among the working-class women, their physical attractiveness is the strongest determinant of their husband's occupational status. In their analysis of large, nationally representative data (1972 CPS-SRC American Election Study), Taylor and Glenn (1976) find that the correlation between women's physical attractiveness and their husband's occupational status is significantly positive (.265, $P < .05$), and does not vary by the woman's age. Consistent with Elder (1969), Taylor and Glenn (1976) find that the effect of physical attractiveness on the husband's occupational status is strongest among women from working-class families.

In his replication of Elder (1969) and Taylor and Glenn (1976), Udry (1977) demonstrates that, among both blacks and whites, upwardly mobile women are more physically attractive than others. Women's physical attractiveness has a significant effect on both their husband's occupational status, and

their upward mobility (the difference between their father's and husband's occupational statuses). In their analysis of longitudinal data on a national sample of high-school sophomores originally surveyed in 1955, Udry and Eckland (1984) find that women's physical attractiveness has a significantly positive effect on their household income, although it has no effect on their own income (among those who were employed in 1970). Udry and Eckland interpret this "as evidence that females' attractiveness affects adult status through marriage to husbands of high income" (p. 51). More attractive women in their sample marry men with more education as well. Finally, Hamermesh and Biddle's (1994) analysis of the 1977 Quality of Employment survey finds that, relative to average-looking women, below-average-looking women are married to men with significantly less education, concurring with Udry and Eckland's findings. Available evidence thus indicates that there is assortative mating between high-status men and physically attractive women.

5.3. Assumption 3. Intelligence is heritable

There is insurmountable evidence that general intelligence (g) is substantially genetically heritable. Behavior geneticists currently estimate the genetic heritability (h^2) of g to be somewhere between .4 and .8 (Bouchard, Lykken, McGue, Segal, & Tellegen, 1990; Bouchard & McGue, 1981; Pedersen, Plomin, Nesselroade, & McClearn, 1992; Plomin & DeFries, 1980). Genetic heritability between .4 and .8, however, means that 20–60% of the variance in general intelligence is environmental. The current research in behavior genetics indicates that most of these environmental influences largely occur outside of the family, in what behavior geneticists call nonshared environment (E_1; Harris, 1998; Rowe, 1994). Because most of the environmental effects on general intelligence take place outside of the family, through processes that do not involve the parents, these environmental factors tend to *attenuate* the correlation in g between parents and children. The current estimate of the bivariate correlation (r) between parents' and children's general intelligence, derived from 32 studies involving 8433 pairs of parents and children, is .42 ($P < .001$; Fig. 1 cited in Bouchard & McGue, 1981).

Consistent with the earlier evidence in behavior genetics, a study of preschoolers in China (Wang & Oakland, 1995) confirms that general intelligence is largely heritable. Children aged 4–6 years whose parents are either intelligentsia (e.g., teachers or doctors) or officers (e.g. managers) have significantly ($P < .05$) higher IQs than their agemates whose parents are either clerks or workers. The parents' education also has a monotonic positive effect on their children's IQs. Those whose parents have a college or university education have significantly ($P < .05$) higher IQs than those whose parents have a senior high-school education, who in turn have significantly ($P < .05$) higher IQs than those whose parents only have junior high-school education. Available empirical evidence in behavior genetics and elsewhere therefore indicates that general intelligence is heritable.

5.4. Assumption 4. Beauty is heritable

Perhaps the idea that offspring physically resemble their parents, and thus beautiful parents beget beautiful children, is too obvious and taken for granted to be subjected to empirical verification in scientific research. We have not been able to locate any empirical study whose *principal* goal is to establish the heritability of physical attractiveness. However, a few studies on other topics have computed correlations in physical attractiveness between monozygotic (MZ) twins and dizygotic

(DZ) twins. We are able to estimate the heritability coefficient (h^2) of physical attractiveness from these correlations.

McGovern, Neale, and Kendler (1996) show that the correlation in physical attractiveness between female MZ twins ($n = 334$ pairs) is .65, and for female DZ twins ($n = 216$ pairs), it is .33. Because $h^2 = 2(r_{MZ} - r_{DZ})$, their data show that the heritability coefficient for physical attractiveness is .64. Rowe, Clapp, and Wallis (1989) measure the physical attractiveness of 25 MZ twins (14 male and 11 female pairs). Because their final sample does not contain DZ twins, they are not able to estimate heritability (h^2) of physical attractiveness from their data as do McGovern et al. However, the uncorrected correlation in physical attractiveness among the 25 MZ twin pairs is r=.54, and Rowe et al. estimate the "true" correlation, corrected for measurement errors, to be r=.94, which seems to suggest a very high h^2. These available estimates therefore show that physical attractiveness is probably as highly heritable as intelligence is (see Section 5.3).

There is also some indirect evidence that beauty is heritable. As we note above, beautiful faces are symmetrical faces that indicate underlying genetic and developmental health; FA and other measures of developmental stability underlie beauty (Thornhill & Møller, 1997, pp. 528–533). Livshits and Kobylianski's (1989) study of two samples of nuclear families in Israel (ns = 216 and 60) indicates that the heritability of mean FA (calculated from eight different bilateral traits) is .317. Møller and Thornhill's (1997) meta-analysis shows that the overall mean effect size of heritabilities of individual FA, computed from 34 studies of 17 species, is .19 ($P < .0001$). These studies indicate that there is a significant genetic component to developmental stability and FA, and hence to beauty. FA is heritable, hormone markers in the face are heritable, and facial structure in general is heritable. It is therefore reasonable to assume that physical attractiveness is also heritable, as available evidence indicates.

5.5. Theorem 1. More beautiful people are more intelligent

If Assumptions 1–4 are *empirically* true, then Theorem 1 is *logically* true. However, there is also empirical evidence to support the claim that beautiful people are more intelligent. Elder (1969) notes that middle-class girls in his longitudinal sample simultaneously have higher IQs ($P < .05$) and are physically more attractive ($P < .05$ or $P < .01$) than working-class girls. His data therefore indicate that intelligence and beauty might be positively correlated among his female respondents. Zebrowitz et al.'s (2002) analysis of longitudinal data from the Intergenerational Studies of Development and Aging demonstrates that facial attractiveness significantly ($P < .05$, $P < .01$, or $P < .001$) correlates with IQ among both men and women throughout the life course (childhood, puberty, adolescence, and middle adulthood), except late adulthood.

Furlow, Armijo-Prewitt, Gangestad, and Thornhill (1997) find that body FA is significantly negatively correlated with psychometric intelligence (IQ) among two separate samples of undergraduates. Physical attractiveness (inversely measured by FA) is therefore positively correlated with intelligence in their samples. Jackson et al.'s (1995) and Langlois et al.'s (2000) comprehensive meta-analyses demonstrate that more beautiful children and adults of both sexes have greater intelligence. Langlois et al. thus conclude that the maxim "beauty is skin deep" is a "myth." At the same time, however, their meta-analysis also shows that the relationship between beauty and intelligence, while statistically significant ($P < .05$), is nonetheless very weak (weighed d=.07), compared to the relationship between beauty and popularity (d=.65) or perception of occupational

competence (d=.96). Thus, their meta-analysis also seems to demonstrate that beauty is at least partially skin deep while at the same time, partially more than skin deep.[2]

There are other studies that indirectly demonstrate that beautiful people are more intelligent. These studies typically use some measures of attainment (like income or education) as indicators of intelligence. Of course, to use these studies to support Theorem 1, we must assume that Assumption 1 (intelligence leads to high status) holds true for both men and women. Mazur, Mazur, and Keating (1984) show that, among West Point cadets, physical attractiveness (measured by facial dominance) has a significant positive effect on their cadet rank while at West Point. Umberson and Hughes (1987) show that, controlling for demographic variables, physical attractiveness has a significant positive effect on family income ($P<.001$), personal income ($P<.05$), Duncan SEI ($P<.01$), and education ($P<.001$) in a large ($n=3692$) representative sample in the United States. In their study, the effect of physical attractiveness interacts with neither race nor sex of the respondent; beauty is positively correlated with intelligence among both men and women of all races.

In their analysis of a sample of Canadians employed full-time ($n=1062$), Roszell, Kennedy and Grabb (1989) find that physical attractiveness has a significant ($P<.01$) positive effect on income. In a separate analysis, however, the significant effect only holds for men, not for women. Using three separate representative samples from the United States and Canada, Hamermesh and Biddle (1994) find that physical attractiveness has a strong effect on hourly earnings, and the effect is much stronger for men ($P<.0001$) than for women ($P<.05$).

The significant effect of physical attractiveness on income has been documented in longitudinal studies of two professions. In their study of MBA graduates, Frieze, Olson, and Russell (1991) show that more attractive men have a significantly ($P<.05$) higher starting salaries and their advantage increases over time. For women, attractiveness has no effect on starting salaries, but more beautiful women earn significantly ($P<.05$) more later in their careers. In their sample, men earn US$2600 more on average for each unit of attractiveness (on a five-point scale), and women earn US$2150 more. In their longitudinal study of lawyers, Biddle and Hamermesh (1998) show that better-looking attorneys earn more than others 5 years after graduation from law school, and their advantage increases over time. Once again, the effect of physical attractiveness on income is stronger for men than for women; the regression coefficient for the effect of standardized beauty on log(earnings) is .0257 ($P<.01$) for men and .0138 (ns) for women. Biddle and Hamermesh specifically rule out employer discrimination as the cause of the beauty premium among lawyers because those in the private sector (who are self-employed) benefit from their physical attractiveness as much as (if not more than) those in the public sector. Biddle and Hamermesh cannot rule out the effect of client discrimination, however.

6. Discussion

Table 1 summarizes all the empirical studies in support of the assumptions and the theorem. There appears to be some evidence for each of the four assumptions (Assumptions 1 – 4). Given the available empirical evidence, we feel confident to conclude that people have the perception that beautiful people are more intelligent because they indeed are more intelligent. There is also evidence to support this conclusion (Theorem 1).

[2] We thank Douglas T. Kenrick for making this point.

Table 1
Evidence for the assumptions and the theorem

A1. More intelligent men are more likely to attain higher status than less intelligent men
(Austin & Hanisch, 1990; Ball, 1938; Fryer, 1922; Ghiselli, 1973; Harrell & Harrell, 1945; Hunter, 1986; Hunter & Hunter, 1984; Jencks, 1972; Jensen, 1980; Mascie-Taylor & Gibson, 1978; Reynolds et al., 1987; Terman & Oden, 1959; Thorndike & Hagen, 1959; U.S. Department of Labor, 1970; Waller, 1971)

A2. Higher-status men are more likely to mate with more beautiful women than lower-status men
(Davis, 1941; Elder, 1969; Hamermesh & Biddle, 1994; Taylor & Glen, 1976; Udry, 1977; Udry & Eckland, 1984)

A3. Competence is heritable
Bouchard & McGue, 1981 (review); Bouchard et al. 1990 (review); Pedersen et al., 1992 (review); Plomin & DeFries, 1980 (review); Wang & Oakland, 1995

A4. Beauty is heritable
Livshits & Kobyliansky, 1989; McGovern, Neale, and Kendler, 1996; Møller & Thornhill, 1997 (meta-analysis); Rowe, Clapp, & Wallis, 1989

T1. More beautiful people are more intelligent than less beautiful people
Biddle & Hamermesh, 1998; Elder, 1969; Frieze et al., 1991; Furlow et al., 1997; Hamermesh & Biddle, 1994; Jackson et al., 1995 (meta-analysis); Langlois et al., 2000 (meta-analysis); Roszell et al., 1989; Zebrowitz et al., 2002

It goes without saying that our contention that beautiful people are more intelligent is purely scientific (logical and empirical); it is not a prescription for how to treat or judge others. To derive a behavioral prescription (what one ought to do) from a scientific conclusion (what is) would be an example of what Hume (1964/1739) calls the ‘‘naturalistic fallacy.’’ At the same time, our theory is probabilistic, not deterministic, and the available evidence suggests that the empirical correlation between physical attractiveness and intelligence, far from being 1.0, is modest at best. Thus, any attempt to infer people’s intelligence and competence from their physical appearance, in lieu of a standardized IQ test, would be highly inefficient.

Our theory identifies but one mechanism which produces the extrinsic correlation between beauty and intelligence. It is important to emphasize that we do *not* claim that the mechanism we identify is the only possible one. In fact, our theory is compatible with other potential mechanisms that create the correlation (extrinsic or intrinsic) between beauty and intelligence, such as self-fulfilling prophecy (Snyder et al., 1977) and the ecological theory of social perception (Zebrowitz et al., 2002). For instance, the weak empirical correlation between beauty and intelligence produced by assortative mating can be strengthened further by self-fulfilling prophecy. That is why we have made no effort to rule out alternative explanations; *the truth of our theory does not depend on their falseness*. However, our theory, and the evidence we present in its support, does mean that the empirical correlation between beauty and intelligence can occur through assortative mating alone, even in the absence of all other mechanisms.

We can also derive other novel hypotheses from our theory. To the best of our knowledge, there currently exist no empirical data available to test these hypotheses. First, *the perception that beautiful people are more intelligent should be culturally universal.* We contend that this perception is part of a species-typical evolved psychological mechanism. Thus, our evolutionary psychological theory leads us to conclude that the perception that beautiful people are more intelligent, far from a mere ‘‘bias’’ in the contemporary western societies, should exist in every human society.

Second, *the empirical correlation between beauty and intelligence should be culturally universal*. To the extent that men's preference for beautiful women, and women's preference for high-status men are culturally universal (Buss, 1994), then the assortative mating of beautiful women and intelligent, high-status men, the mechanism we posit behind the extrinsic correlation, should also be culturally universal. The actual extent of empirical correlation may vary from society to society, however.

Third, *the actual extent of empirical correlation between beauty and intelligence should be stronger in polygynous societies than in monogamous societies.* Monogamy, by limiting even the highest-status man to one legal wife at a time, weakens the extent to which Assumption 2 holds. In polygynous societies, the most intelligent men of highest status can mate and reproduce with several of the most beautiful women (Betzig, 1986), thereby increasing the correlation between beauty and intelligence among their offspring. In monogamous societies, all but one of the most beautiful women would have to mate with less intelligent men, and the correlation between beauty and intelligence among their offspring will therefore weaken.

We suspect that this might be why Jackson et al.'s (1995) and Langlois et al.'s (2000) meta-analyses find a weak effect size for the correlation between physical attractiveness and intelligence among adults. All of the studies were conducted in monogamous societies, most of them in the United States. We expect the effect size to be larger if the meta-analysis includes (hitherto nonexistent) studies conducted in polygynous societies (or at least less monogamous societies or societies with shorter histories of monogamy).

Finally, while we have concentrated on the relationship between beauty and intelligence in this paper, our evolutionary psychological theory can explain people's perception, and the extrinsic correlation, between beauty and *any other heritable trait that helps men attain higher status*. Take aggression, for instance. To the extent that aggression helps men attain higher status (or it did so in the ancestral environment), and to the extent that aggression is genetically heritable, we expect a positive correlation between beauty and aggression.[3] To explain such a correlation, all we have to do is substitute intelligence with aggression in Assumptions 1 and 3.

Assumption 1. More aggressive men are more likely to occupy higher status than less aggressive men.

Assumption 2. Higher-status men are more likely to mate with more beautiful women than lower-status men.

Assumption 3. Aggression is heritable, such that sons and daughters of more aggressive men are more aggressive than sons and daughters of less aggressive men.

[3] One logical requirement for our theory is that traits that help men attain higher status (such as intelligence or aggressiveness) not diminish beauty when they occur among women. To the extent that they do, the correlation between such traits and beauty among daughters will be diminished. Higher levels of testosterone might be an example of such a trait, which simultaneously increases men's status and decreases women's beauty. We thank Jeremy Freese for making this point.

In this context, however, it is important to distinguish between a woman's *beauty* and her *desirability* as a mate. The two are very closely related, but not the same. Height is a case in point. As we note above, men's height is positively correlated with their status. To the extent that height is heritable, then the daughters of high-status men (with their beautiful wives) will be tall as well as beautiful. However, there is some evidence that height might decrease women's desirability as mates. In one study, the husband is taller than the wife in 99.9986% of all married couples ($n = 720$) (Gillis & Avis, 1980); thus, taller women generally have a smaller pool of potential mates than shorter women. This is probably why half the women surveyed in another study want to be shorter than they are, while virtually all men want to be taller than they are (Calden, Lundy, & Schlafer, 1959). However, there is no reason to believe that height diminishes women's beauty, measured by the symmetry and averageness of their facial and bodily features.

Assumption 4. Beauty is heritable, such that sons and daughters of more beautiful women are more beautiful than sons and daughters of less beautiful women.

Theorem 1. More beautiful people are more aggressive.

If both Assumptions 1 and 3 (in addition to Assumptions 2 and 4) are empirically true, as we suspect they might be, then the conclusion that beautiful people are more aggressive is logically true. The same logic can explain the observed correlations between beauty and social skills, or beauty and dominance (Feingold 1992), among others. We suggest that good-looking people might be exactly what we think.

Acknowledgements

We thank Mary C. Still for the original inspiration, Nancy L. Segal and Randy Thornhill for providing us with key references, and Jeremy Freese, Christine Horne, John Orbell, Craig T. Palmer, and Paul J. Quirk for their comments on earlier drafts.

References

Austin, J. T., & Hanisch, K. A. (1990). Occupational attainment as a function of abilities and interests: A longitudinal analysis using project TALENT data. *Journal of Applied Psychology*, *75*, 77–86.

Bailit, H. L., Workman, P. L., Niswander, J. D., & Maclean, J. C. (1970). Dental asymmetry as an indicator of genetic and environmental conditions in human populations. *Human Biology*, *42*, 626–638.

Ball, R. S. (1938). The predictability of occupational level from intelligence. *Journal of Consulting Psychology*, *2*, 184–186.

Bernstein, I. H., Lin, T. -D., & McClellan, P. (1982). Cross- vs. within-racial judgments of attractiveness. *Perception and Psychophysics*, *32*, 495–503.

Betzig, L. L. (1986). *Despotism and differential reproduction: A Darwinian view of history*. New York: Aldine.

Biddle, J. E., & Hamermesh, D. S. (1998). Beauty, productivity, and discrimination: Lawyers' looks and lucre. *Journal of Labor Economics*, *16*, 172–201.

Bouchard Jr., T. J., Lykken, D. T., McGue, M., Segal, N. L., & Tellegen, A. (1990). Sources of human psychological differences: The Minnesota study of twins reared apart. *Science*, *250*, 223–228.

Bouchard Jr., T. J., & McGue, M. (1981). Familial studies of intelligence: A review. *Science*, *212*, 1055–1059.

Buss, D. M. (1985). Human mate selection. *American Scientist*, *73*, 47–51.

Buss, D. M. (1994). *The evolution of desire: Strategies of human mating*. New York: BasicBooks.

Calden, G., Lundy, R. M., & Schlafer, R. J. (1959). Sex differences in body concepts. *Journal of Consulting Psychology*, *23*, 378.

Cross, J. F., & Cross, J. (1971). Age, sex, race, and the perception of facial beauty. *Developmental Psychology*, *5*, 433–439.

Cunningham, M. R., Druen, B. B., & Barbee, A. P. (1997). Angels, mentors, and friends: Trade-offs among evolutionary, social, and individual variables in physical appearance. In J. A. Simpson, & D. T. Kenrick (Eds.), *Evolutionary social psychology* (pp. 109–140). Mahwah: Lawrence Erlbaum.

Cunningham, M. R., Roberts, A. R., Barbee, A. P., Druen, P. B., & Wu, C. -H. (1995). Their ideas of beauty are, on the whole, the same as ours: Consistency and variability in the cross-cultural perception of female physical attractiveness. *Journal of Personality and Social Psychology*, *68*, 261–279.

Dannenmaier, W. D., & Thumin, F. J. (1964). Authority status as a factor in perceptual distortion of size. *Journal of Social Psychology*, *63*, 361–365.

Davis, K. (1941). Intermarriage in caste societies. *American Anthropologist*, *43*, 376–395.

de Waal, F. (1982). *Chimpanzee politics: Power and sex among apes*. London: Jonathan Cape.

Dion, K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology*, *24*, 285–290.

Eagly, A. H., Ashmore, R. D., Makhijani, M. G., & Longo, L. C. (1991). What is beautiful is good, but...: A meta-analytic review of research on the physical attractiveness stereotype. *Psychological Bulletin*, *110*, 109–128.

Elder Jr., G. H. (1969). Appearance and education in marriage mobility. *American Sociological Review*, *34*, 519–533.

Ellis, L. (1994). The high and the mighty among men and beast: How universal is the relationship between height (or body size) and social status. In L. Ellis (Ed.), *Social stratification and socioeconomic inequality. Reproductive and Interpersonal Aspects of Dominance and Status, vol. 2* (pp. 93–111). Westport: Praeger.

Etcoff, N. (1999). *Survival of the prettiest: The science of beauty.* New York: Doubleday.

Feingold, A. (1992). Good-looking people are not what we think. *Psychological Bulletin*, *111*, 304–341.

Frieze, I. H., Olson, J. E., & Russell, J. (1991). Attractiveness and income for men and women in management. *Journal of Applied Social Psychology*, *21*, 1039–1057.

Fryer, D. (1922). Occupational-intelligence standards. *School and Society*, *16*, 273–277.

Furlow, F. B., Armijo-Prewitt, T., Gangestad, S. W., & Thornhill, R. (1997). Fluctuating asymmetry and psychometric intelligence. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, *264*, 823–829.

Gangestad, S. W., & Buss, D. M. (1993). Pathogen prevalence and human mate preferences. *Ethology and Sociobiology*, *14*, 89–96.

Gangestad, S. W., Thornhill, R., & Yeo, R. A. (1994). Facial attractiveness, developmental stability, and fluctuating asymmetry. *Ethology and Sociobiology*, *15*, 73–85.

Ghiselli, E. E. (1973). The validity of aptitude tests in personnel selection. *Personnel Psychology*, *26*, 461–477.

Gillis, J. S., & Avis, W. E. (1980). The male-taller norm in mate selection. *Personality and Social Psychology Bulletin*, *6*, 396–401.

Goebel, B. L., & Cashen, V. M. (1979). Age, sex, and attractiveness as factors in student ratings of teachers: A developmental study. *Journal of Educational Psychology*, *71*, 646–653.

Gottfredson, L. S. (1997). Why *g* matters: The complexity of everyday life. *Intelligence*, *24*, 79–132.

Grammer, K., & Thornhill, R. (1994). Human (*Homo sapiens*) facial attractiveness and sexual selection: The role of symmetry and averageness. *Journal of Comparative Psychology*, *108*, 233–242.

Graziano, W. G., Jensen-Campbell, L. A., Todd, M., & Finch, J. F. (1997). Interpersonal attraction from an evolutionary psychology perspective: Women's reactions to dominant and prosocial men. In J. A. Simpson, & D. T. Kenrick (Eds.), *Evolutionary Social Psychology* (pp. 141–167). Mahwah: Lawrence Erlbaum.

Gutierres, S. E., Kenrick, D. T., & Partch, J. J. (1999). Beauty, dominance, and the mating game: Contrast effects in self-assessment reflect gender differences in mate selection. *Personality and Social Psychology Bulletin*, *25*, 1126–1134.

Hamermesh, D. S., & Biddle, J. E. (1994). Beauty and labor market. *American Economic Review*, *84*, 1174–1194.

Harrell, T. W., & Harrell, M. S. (1945). Army general classification test scores for civilian occupations. *Educational and Psychological Measurement*, *5*, 229–239.

Harris, J. R. (1998). *The nurture assumption: Why children turn out the way they do*. New York: Free Press.

Hume, D. (1964/1739). *A treatise of human nature*. In L. A. Selby-Bigge (Ed.). Oxford: Clarendon Press.

Hunter, J. E. (1986). Cognitive ability, cognitive aptitudes, job knowledge, and job performance. *Journal of Vocational Behavior*, *29*, 340–362.

Hunter, J. E., & Hunter, R. F. (1984). Validity and utility of alternative predictors of job performance. *Psychological Bulletin*, *96*, 72–98.

Jackson, L. A., Hunter, J. E., & Hodge, C. N. (1995). Physical attractiveness and intellectual competence. A meta-analytic review. *Social Psychology Quarterly*, *58*, 108–122.

Jencks, C. (1972). *Inequality: A reassessment of the effect of family and schooling in America*. New York: Basic.

Jensen, A. R. (1980). *Bias in mental testing*. New York: Free Press.

Jensen, A. R. (1998). *The g factor: The science of mental ability.* Westport: Praeger.

Jones, D. (1996). *Physical attractiveness and the theory of sexual selection*. Ann Arbor: University of Michigan Museum of Anthropology.

Jones, D., & Hill, K. (1993). Criteria of physical attractiveness in five populations. *Human Nature*, *4*, 271–296.

Kalick, S. M., Zebrowitz, L. A., Langlois, J. H., & Johnson, R. M. (1998). Does human facial attractiveness honestly advertise health?: Longitudinal data on an evolutionary question. *Psychological Science*, *9*, 8–13.

Kanazawa, S. (1998). In defense of unrealistic assumptions. *Sociological Theory*, *16*, 193–204.

Kenrick, D. T., Neuberg, S. L., Zierk, K. L., & Krones, J. M. (1994). Evolution and social cognition: Contrast effects as a function of sex, dominance, and physical attractiveness. *Personality and Social Psychology Bulletin*, *20*, 210–217.

Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallam, M., & Smoot, M. (2000). Maxims or myths of beauty?: A meta-analytic and theoretical review. *Psychological Bulletin*, *126*, 390–423.

Langlois, J. H., Roggman, L. A., & Musselman, L. (1994). What is average and what is not average about attractive faces? *Psychological Science*, *5*, 214–220.

Langlois, J. H., & Roggman, L. A. (1990). Attractive faces are only average. *Psychological Science*, *1*, 115–121.

Langlois, J. H., Roggman, L. A., Casey, R. J., Ritter, J. M., Rieser-Danner, L. A., & Jenkins, V. Y. (1987). Infant preferences for attractive faces: Rudiments of a stereotype? *Developmental Psychology*, *23*, 363–369.

Langlois, J. H., Roggman, L. A., & Rieser-Danner, L. A. (1990). Infants' differential social responses to attractive and unattractive faces. *Developmental Psychology*, *26*, 153–159.

Little, A. C., Penton-Voak, I. S., Burt, D. M., & Perrett, D. I. (2002). Evolution and individual differences in the perception of attra tiveness: How cyclic hormonal changes and self-perceived attractiveness influence female preferences for male faces. In G. Rhodes, & L. A. Zebrowitz (Eds.), *Facial attractiveness: Evolutionary, cognitive, and social perspectives* (pp. 59–90). Westport: Ablex.

Livshits, G., & Kobyliansky, E. (1989). Study of genetic variance in the fluctuating asymmetry of anthropometrical traits. *Annals of Human Biology*, *16*, 121–129.

Maret, S. M., & Harling, C. A. (1985). Cross-cultural perceptions of physical attractiveness: Ratings of photographs of whites by Cruzans and Americans. *Perceptual and Motor Skills*, *60*, 163–166.

Marlowe, F. (1998). The nubility hypothesis: The human breast as an honest signal of residual reproductive value. *Human Nature*, *9*, 263–271.

Mascie-Taylor, C. G. N., & Gibson, J. B. (1978). Social mobility and IQ components. *Journal of Biosocial Science*, *10*, 263–276.

Mazur, A., Mazur, J., & Keating, C. (1984). Military rank attainment of a West Point class: Effects of cadets' physical features. *American Journal of Sociology*, *90*, 125–150.

McGinniss, J. (1988). *Selling of the President*. New York: Penguin.

McGovern, R. J., Neale, M. C., & Kendler, K. S. (1996). The independence of physical attractiveness and symptoms of depression in a female twin population. *Journal of Psychology*, *130*, 209–219.

Mealey, L., Bridgstock, R., & Townsend, G. C. (1999). Symmetry and perceived facial attractiveness: A monozygotic co-twin comparison. *Journal of Personality and Social Psychology*, *76*, 151–158.

Møller, A. P. (1990). Fluctuating asymmetry in male sexual ornaments may reliably reveal male quality. *Animal Behaviour*, *40*, 1185–1187.

Møller, A. P. (1992). Parasites differentially increase the degree of fluctuating asymmetry in secondary sexual characters. *Journal of Evolutionary Biology*, *5*, 691–700.

Møller, A. P., & Thornhill, R. (1997). A meta-analysis of the heritability of developmental stability. *Journal of Evolutionary Biology*, *10*, 1–16.

Morse, S. J., & Gruzen, J. (1976). The eye of the beholder: A neglected variable in the study of physical attractiveness? *Journal of Personality*, *44*, 209–225.

Mueller, Ulrich, & Mazur, A. (2001). Evidence of unconstrained directional selection for male tallness. *Behavioral Ecology and Sociobiology*, *50*, 302–311.

Mulford, M., Orbell, J., Shatto, C., & Stockard, J. (1998). Physical attractiveness, opportunity, and success in everyday exchange. *American Journal of Sociology*, *103*, 1565–1592.

Parsons, P. A. (1990). Fluctuating asymmetry: An epigenetic measure of stress. *Biological Review*, *65*, 131–145.

Parsons, P. A. (1992). Fluctuating asymmetry: A biological monitor of environmental and genomic stress. *Heredity*, *68*, 361–364.

Pederson, N. L., Plomin, R., Nesselroade, J. R., & McClearn, G. E. (1992). A quantitative genetic analysis of cognitive abilities during the second half of the life span. *Psychological Science*, *3*, 346–353.

Perrett, D. I., Burt, M., Penton-Voak, I. S., Lee, K. J., Rowland, D. A., & Edwards, R. (1999). Symmetry and human facial attractiveness. *Evolution and Human Behavior*, *20*, 295–307.

Plomin, R., & DeFries, J. C. (1980). Genetics and intelligence: Recent data. *Intelligence*, *4*, 15–24.

Reynolds, C. R., Chastain, R. L., Kaufman, A. S., & McLean, J. E. (1987). Demographic characteristics and IQ among adults: Analysis of the WAIS-R standardization sample as a function of the stratification variables. *Journal of School Psychology*, *25*, 323–342.

Ridley, M. (1993). *The red queen: Sex and the evolution of human nature*. New York: Penguin.
Roszell, P., Kennedy, D., & Grabb, E. (1989). Physical attractiveness and income attainment among Canadians. *Journal of Psychology*, *123*, 547–559.
Rowe, D. C. (1994). *The limits of family influence: Genes, experience, and behavior*. New York: Guilford.
Rowe, D. C., Clapp, M., & Wallis, J. (1989). Physical attractiveness and the personality resemblance of identical twins. *Behavior Genetics*, *17*, 191–201.
Rubenstein, A. J., Langlois, J. H., & Roggman, L. A. (2002). What makes a face attractive and why: The role of averageness in defining facial beauty. In G. Rhodes, & L. A. Zebrowitz (Eds.), *Facial attractiveness: Evolutionary, cognitive, and social perspectives* (pp. 1–33). Westport: Ablex.
Samuels, C. A., & Ewy, R. (1985). Aesthetic perception of faces during infancy. *British Journal of Developmental Psychology*, *3*, 221–228.
Shackelford, T. K., & Larsen, R. J. (1999). Facial attractiveness and physical health. *Evolution and Human Behavior*, *20*, 71–76.
Snyder, M., Tanke, E. D., & Berscheid, E. (1977). Social perception and interpersonal behavior: On the self-fulfilling nature of social stereotypes. *Journal of Personality and Social Psychology*, *35*, 656–666.
Spearman, C. (1904). General intelligence, objectively determined and measured. *American Journal of Psychology*, *15*, 201–293.
Symons, D. (1995). Beauty is in the adaptations of the beholder: The evolutionary psychology of human female sexual attractiveness. In P. R. Abramson, & S. D. Pinkerton (Eds.), *Sexual nature, sexual culture* (pp. 80–118). Chicago: University of Chicago Press.
Taylor, P. A., & Glenn, N. D. (1976). The utility of education and attractiveness for female status attainment through marriage. *American Sociological Review*, *41*, 484–498.
Terman, L. M., & Oden, M. H. (1959). *The gifted group at mid-life: Thirty-five years' follow-up of the superior child*. Stanford: Stanford Univ. Press.
Thakerar, J. N., & Iwawaki, S. (1979). Cross-cultural comparisons in interpersonal attraction of females toward males. *Journal of Social Psychology*, *108*, 121–122.
Thorndike, R. L., & Hagen, E. (1959). *Ten thousand careers*. New York: Wiley.
Thornhill, R., & Gangestad, S. W. (1993). Human facial beauty: Averageness, symmetry, and parasite resistance. *Human nature*, *4*, 237–269.
Thornhill, R., & Møller, A. P. (1997). Developmental stability, disease and medicine. *Biological Review*, *72*, 497–548.
Udry, J. R. (1977). The importance of being beautiful. *American Journal of Sociology*, *83*, 154–160.
Udry, J. R., & Eckland, B. K. (1984). Benefits of being attractive: Differential payoffs for men and women. *Psychological Reports*, *54*, 47–56.
Umberson, D., & Hughes, M. (1987). The impact of physical attractiveness on achievement and psychological well-being. *Social Psychology Quarterly*, *50*, 227–236.
U.S. Department of Labor. (1970). *Manual for the USES general aptitude test battery: Section III. Development*. Washington, DC: Government Printing Office.
Vandenberg, S. G. (1972). Assortative mating, or who marries whom? *Behavior Genetics*, *2*, 127–158.
Wagatsuma, E., & Kleinke, C. L. (1979). Ratings of facial beauty by Asian-American and Caucasian females. *Journal of Social Psychology*, *109*, 299–300.
Waller, J. H. (1971). Achievement and social mobility: Relationships among IQ score, education, and occupation in two generations. *Social Biology*, *18*, 252–259.
Wang, F. -F., & Oakland, T. (1995). Qualities related to intelligence among Chinese children between ages 4 to 6. *School Psychology International*, *16*, 59–65.
Webster Jr., M., & Driskell Jr., J. E. (1983). Beauty as status. *American Journal of Sociology*, *89*, 140–165.
Wilson, P. R. (1968). Perceptual distortion of height as a function of ascribed status. *Journal of Social Psychology*, *74*, 97–102.
Zebrowitz, L. A., Hall, J. A., Murphy, N. A., & Rhodes, G. (2002). Looking smart and looking good: Facial cues to intelligence and their origins. *Personality and Social Psychology Bulletin*, *28*, 238–249.