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RESEARCH ARTICLE

Toupee or Not Toupee?: Cranial Hair and Perceptions of Men's Attractiveness, Personality, and Other Evolutionary Relevant Traits

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Abstract

The question of whether or not cranial hair affects perceptions of attractiveness, personality, career success, and other traits related to fitness for men in two populations was investigated in two experiments. Experiment 1 used a 2 (race) × 2 (cranial hair of man) design, and examined attractiveness, fitness, and socially desirable personality measures. Experiment 2 used a 2 (race) × 2 (cranial hair) design to determine perceived attractiveness, fitness-related traits, and the Big-5 dimensions of personality. Amount of cranial hair did not affect personality ratings on the dimensions of the Big-5 but did affect perceived socially desired aspects of personality (such as warmth, sophistication, kindness, etc.). In Experiment 1, the White man with hair received higher perceived attractiveness, personality, and fitness ratings than the bald White man, while no differences occurred for the Black men. For Experiment 2, when differences for amount of cranial hair occurred, the White man with hair and the Black man without hair received higher perceived fitness and career success ratings. These results are discussed in terms of prior research on male cranial hair.

Keywords Hair · Attractiveness · Halo effects · Personality evaluations · Social desirability

Evolutionary-based studies on men's hair have focused almost exclusively on facial hair, such as beards (e.g., Craig et al., 2019; Dixson et al., 2017a, 2017b; Jach & Moroń, 2020). The argument is that beards represent a sexually dimorphic trait that underwent sexual selection over human's evolutionary history (e.g., Craig et al., 2019). Specifically, phylogenetic evidence indicates human beardedness (and by extension, patterned baldness) are sexually selected secondary sexual traits. Men rank similarly in visually conspicuous secondary trait development, including beards and patterned baldness, to male nonhuman primates with polygynous mating systems (Dixson et al., 2005) and large social group sizes with multilevel social organizations (Grueter et al., 2015). These conditions favour sexually selected ornaments that signal age, social status, and dominance involved primarily in male-male competition and secondarily in attractiveness to females.

Beards, then, are regarded to be intrasexually selected. Craig et al., (2019; see also Dixson et al. 2021) provide evidence that beards enhance the speed and accuracy of detecting angry facial expressions as compared to clean shaven faces. Further, cross-cultural findings indicate beards augment explicit aggressiveness ratings of angry facial expressions (Dixson & Vasey, 2012). A final line of support is that beards enhance judgments of male facial masculinity, dominance, and aggressiveness compared to clean-shaven faces, irrespective of the degree of underlying facial masculinity (Dixson et al., 2017a, 2017b; Mefodeva et al., 2020; Sherlock et al., 2017).

In addition to beards, another sexually dimorphic trait is androgenic alopecia (AGA; also called male pattern baldness, common baldness, and male pattern hair loss), which is characterized by progressive hair loss from the scalp (Lee & Lee, 2012). Unlike beards, AGA has remained highly overlooked as a potential research area within evolutionary psychology.

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The Stigma of AGA

This lack of research is surprising as the loss of hair carries considerable stigma in both men and women, with baldness cures dating back to 4000 BC (Henss, 2001). Men are highly aware of cranial hair loss and how important it is with respect to how they are viewed by themselves and others. For example, the fear of going bald has led to a nearly $4 billion industry in the USA alone, with consumers, primarily men, purchasing goods and services for hair-loss prevention and restoration products that include shampoos, medications, toupees, and surgical procedures (Friedman, 2019). Men with hair loss tend to become increasingly preoccupied, self-conscious, moderately stressed and distressed, dissatisfied with their physical appearance, and undertake coping efforts (Budd et al., 2000; Cash, 1992). These negative feelings are possibly because "hair is perhaps our most powerful symbol of individual and group identity" (Synnott, 1987, p. 381).

However, under evolutionary analysis, if hair loss leads to decreased mate value (especially without simultaneous increases in social standing or similar to make up the deficit in mate value), the results could lead to lowered reproductive success. The link between reduced mate value and cranial hair loss has been documented in a variety of ways. Research using both schematic and photographic stimuli clearly indicates that men with hair are usually viewed more positively. Studies over decades have shown that bald or balding men are perceived as less physically attractive (Blaker et al., 2020; Cash, 1990; Hellström & Telke, 1994; Mannes, 2013; Moerman, 1988; Muscarella & Cunningham, 1996; Roll & Vernis, 1971). Men with a full head of hair are also rated higher in personal likability (Cash, 1990), confidence (Lee et al., 2002), self-assertiveness (Henss, 2001), masculinity (Butler et al., 1998; Hellström & Telke, 1994), aggressiveness (Muscarella & Cunningham, 1996), intelligence (Blaker et al., 2020), health (Blaker et al., 2020), sexual attractiveness (Henss, 2001), and potency (Lee et al., 2002; Roll & Vernis, 1971).

Not surprisingly given the descriptors above, amount of hair relates to career success (e.g., career and occupational prestige; Cash, 1990; Henss, 2001) which has important implications from an evolutionary standpoint of women's mate preferences. That is, copious amounts of research has indicated that women place high importance on a potential mate's ability to accrue resources (e.g., Buss, 1989), and career prestige and status are presumably connected to ownership of resources. In addition, men who hold public office exhibit less hair loss than men of the same age in the general population (Sigelman et al., 1990; see also Kuntzman, 2000) and men with hair are more likely to be invited for a job interview and to be hired than bald men (Tischer, 1999, reported in Henss, 2001).

Interestingly, recent findings show that leaders who have shaved heads (i.e., mimicking but not actual baldness) are more preferred during times of conflict and when coordination of group peace keeping is not needed (Blaker et al., 2020). This outcome may be due to head shaving increasing perceived dominance, but not age, compared to baldness (Blaker et al., 2020).

Other researchers find that bald men are perceived more positively on some dimensions. Bald men are rated higher in conscientiousness, emotional stability, intellect, occupational prestige, and cheerfulness (Hellström & Telke, 1994; Henss, 2001; Moerman, 1988; Wogalter & Hosie, 1991) than men with hair. Additionally, Muscarella and Cunningham (1996) report that men with less hair receive higher social maturity and appeasement ratings (i.e., timidity, femininity, baby-facedness, naivety, and gentleness) than men with a full head of hair. While baldness may lead to some positive attributions, based on the aforementioned research, one can see that there are more positive effects associated with a full head of hair than baldness. Basically, halo effects (thinking more positively of attractive people) occur such that full heads of hair receive better evaluations.

AGA as an Indicator of Health

Why does cranial hair have this effect on the perception of men? Perhaps it is because of the biological significance of cranial hair for men. If AGA causes such distress and carries such stigma, one evolutionary hypothesis is that AGA is an indicator of poor health, stress response, or other issues that would lower mate value. Henss (2001) made it clear that AGA is an indicator of hormonal status. Synnott (1987) reports that increased levels of hormones during puberty lead to the development of thicker scalp hair, which leads to inferences of strength, dominance, status, and competency. Since hormonal status is used to make inferences regarding character and biological fitness (Singh, 1995; Wade, 2000, 2003), social perceivers may execute an evolutionary adaptation where they use the amount of men's cranial hair to make inferences regarding behaviour, personality, and so on.

While Kranz et al. (2019) argued that "male pattern baldness is not a medical problem in the proper sense; it has no impact on the individual's state of physical health." (p. 331), there is considerable evidence that certain types of AGA may be strong indicators of health. AGA is heritable and polygenic (Yap et al., 2018), with several identified patterns and progressions (Lee & Lee, 2012), and is considered a disease with a genetic predisposition. Importantly, some researchers suggest that the early onset of alopecia (before the age of 36 years) is genetically different from the late onset of alopecia (Dawber et al., 1998). Further, there have

been studies regarding diseases associated with AGA. Jang et al. (2013) observed associated diseases in 72.7% of males and 71.7% of females with AGA. Seborrheic dermatitis was the most common disease, found in over half of males and almost half of females. Hypertension, hyperlipidemia, diabetes mellitus, and gastrointestinal diseases (in rank order) were also found to be associated with AGA.

It is critical to note that many of these health issues may be associated with one type of AGA and not others. It is specifically the subtype of *early* onset AGA that may indicate these risks. Jang et al. (2013) reported an over representation of early onset AGA in their sample. Early onset AGA was also a risk factor for an early onset of severe coronary heart disease (Matilainen et al., 2001). Men between ages 19 and approximately 50 years and who have early AGA (occurring before 35 years of age) have an increased incidence of hyperinsulinemia and disorders associated with insulin resistance, such as obesity, hypertension, and Dyslipidemia.

Some researchers argue that cultural differences like lifestyle choices and diet play a role (Lee & Lee, 2012), particularly as those choices impact on insulin and diabetes. González-González et al. (2009) reported that insulin resistance was significantly higher in AGA patients, but this insulin resistance was associated with eating habits. However, the diet implicated in these issues is the 'Western' diet, which conflates this factor with early onset AGA which is far more common in European men (Jang et al., 2013; Lee & Lee, 2012).

AGA may also be an indicator of how well an individual reacts to stress. Researchers have argued that the age of onset of AGA may be influenced by the stress of competition, specifically because of the endocrine, metabolic, and immunological nature of AGA (Jang et al, 2013). However, these researchers again also point to the "increases in weight and body mass index due to the Western style of eating habits" (Jang et al., 2013, p. 186). While diet may play some role, it is important to remember that AGA has a strong documented genetic basis and as we shall see, clear racial differences.

Racial Differences

Pattern baldness typically starts in men during their 20 s or 30 s (Odom et al., 2000) and affects at least half of all men (Henss, 2001) but up to 80% of 'European' men (Hamilton, 1951). White men are four times more likely to develop male pattern baldness than Black men (Setty, 1970). Overall, the incidence of AGA in a Korean sample (14.1% of men, 5.6% of women, Paik et al., 2001) and a Chinese sample (21.3% of men, 3.7% of women, Wang, et al., 2010) was much lower than European samples, such as Turkey (67.1% of men, 23.9% of women; Salman et al., 2017). However, a Thai sample showed higher numbers than the Chinese sample (38.5% in men, Pathomvanich et al., 2002). Khumalo et al. (2007) found that the prevalence of AGA was much lower in their African sample (14.6% of men, 3.5% of women) and developed much later (4.4% of the sample under the age of 50, and 16.1% over the age of 50).

This pattern re-emerges in when hair loss occurs. In Asian men, hair loss is minimal before the age of 40 and then the incidence increases with age (Kakizo, 1969). A study of Japanese men found that they developed hair loss roughly one decade later than European men (Takashima et al., 1981). By their forties, 53% of European men had developed male pattern baldness (Rhodes et al., 1998); for Korean men, only 47% develop it by their seventies (Paik et al., 2001). The previous research shows that early pattern baldness is a stronger indicator of health, and this particular onset and progression of AGA is far more common in European men than men from other racial groups.

All of this literature implies that both the incidence of particular types of male pattern baldness and what they may indicate (e.g., age or health status) may differ across race. Moreover, investigation into this topic is lacking and the overwhelming majority of studies rely on White stimuli. For example, Kranz et al. (2019) examined the effect of AGA on ratings of attractiveness using exclusively White men in the stimulus materials. Blaker's (2020) study on hair and leadership used a Dutch sample for stimulus materials, and Alfonso et al. (2005) and Budd et al. (2000) only studied European men. Marcinska et al. (2015) conducted a large-scale study of DNA variants in AGA, but only in European men. Matilainen et al. (2001), who found the link between early AGA and early onset of severe coronary heart disease, used a sample of Finnish men but did not comment on the racial composition of the sample. Overall, researchers on perceptions of cranial hair in men maybe overlooking the role that race plays in both the development and perceptions of AGA.

The Present Study

Cranial hair halo effects may also occur because hair signals age, sex, ethnicity, health, and social and private identity (Henss, 2001; Synnott, 1987). However, while the research on baldness and social perception is informative, only Cash (1990) and Mannes (2013) have included Black male stimuli in their research. Further, the research that has included Black men as stimuli has not incorporated major measures of personality such as the Big-5, is not framed using an evolutionary theory perspective, and the full range of evolutionary-related fitness traits (e.g., those underpinning being a good parent, good mate, or being enthusiastic; Mogilski et al., 2014; Wade, 2000, 2003) was not encompassed by that research. Additionally, one of those studies is quite dated (Cash, 1990, which is 31 years old) and social perceptions may have changed in the interim. This topic is particularly important, as hair loss

is a concern for men across the world, but shows distinctive patterns in incidence and onset across groups. These patterns appear to have a genetic basis and are associated with health outcomes. If AGA is an indicator of health or stress, it is of note that these indicators map on to the specific pattern of hair loss seen far more in White men (early onset AGA) and may not apply to Black men.

One must also consider cultural context in which adaptations evolve; evolutionary adaptations can be modified by culture (Crawford & Anderson, 1989; Wade, 2003). For example, Blacks do not judge themselves using the entirety of the same evolutionary criteria as Whites (Wade, 2000, 2003). For the current study, it is interesting that baldness appears to not affect Black and White men in the same manner. Henss (2001) suggests, for instance, that a bald head may be viewed as a sex symbol for Black men. Popular culture has been commenting on the attractiveness of bald Black men for decades (Jet, "Why bald heads have become so popular," 1997; Ebony, "The sex appeal of bald men", 1994).

While findings suggest White men with hair should be perceived more positively than White men without hair, the amount of cranial hair may not matter for Black men, or Black men with less hair may be perceived more positively than Black men with hair. The goal of the present research is to investigate this issue in two experiments. Experiment 1 examines socially desirable personality measures, while Experiment 2 includes Big-5 measures of personality to determine if amount of cranial hair only affects desired aspects of Black and White men's personalities.

Hypotheses

An interaction of men's race by amount of men's cranial hair was hypothesized. It was predicted that a White man with more hair should receive higher ratings on various measures of attractiveness and status than a White man with male pattern baldness. The interaction expected for Black men was less clear, as a Black man with less hair may receive higher ratings than a Black man with hair, or the amount of hair may not matter for ratings of Black men. If the interaction does not occur, then an amount of hair main effect should occur such that men with hair receive higher ratings than men without hair (i.e., male pattern baldness).

Experiment 1

Method

Participants

Participants were 70 students, 37 men and 33 women, ranging in age from 18 to 22 years ($M = 19.23$, $SD = 0.920$) from a private university in the northeastern USA. Seven participants were not White. Their participation was in partial fulfilment of the requirements of an introductory psychology course.

Procedure

The same cover story used in previous research examining halo effects (Dion et al., 1972; Wade & DiMaria, 2003; Wade et al., 2003) was used in the present research. Participants were told that the experiment was a study of person perception accuracy. They were informed that the purpose of the study was to compare the accuracy of untrained college students with the accuracy of graduate students in clinical psychology and clinical psychologists. Participants received one of two possible descriptions of a man (Black or White) with one of two photographs (with hair or bald) attached to a questionnaire. The same White and the same Black man were used in the bald and non-bald photographs. At the conclusion of the experiment, the participants were debriefed, fully informing them of the purpose of the research and the fictitious nature of the cover story we used.

Each description contained information pertaining to where the individual lived, what sport they played, what they did in their spare time, and what their favourite colour was to reinforce the cover story. Participants were asked to rate the individual on the 27 different point scalar bipolar personality trait characteristics from prior research on halo effects (Dion et al., 1972; Wade & DiMaria, 2003; Wade et al., 2003). Thus, participants evaluated their assigned stimulus person on how much they were altruistic, conventional, self-assertive, exciting, stable, emotional, dependent, safe, interesting, genuine, sensitive, outgoing, sexually permissive, sincere, warm, sociable, competitive, obvious, kind, modest, strong, serious, sexually warm, simple, poised, bold, and sophisticated. Participants were also asked to rate the individual on eight 7-point scale items (1 = negative to 7 = positive) included in prior research examining attractiveness halo effects (Dion et al., 1972; Wade & DiMaria, 2003) and perceptions of traits that signal fitness (Mogilski et al., 2014; Wade, 2000, 2003). The eight items were attractiveness, intelligence, friendliness, enthusiasm, trustworthiness, career success (i.e., lucrative career), and whether the person would be a good parent, and a good mate.

Hair and race of stimulus person manipulation checks were also included. Participants were asked the following: how much hair the individual has (1 = bald to 7 = full head of hair) and to indicate the individual's race. Additional questions focusing on the extraneous information in the description were also included in order to reinforce the cover story. The manipulation checks were presented last in the

questionnaire. To minimize any possible psychological tension associated with evaluating a Black man, and in keeping with the proportion of psychology students being female-biased, the experimenter was a White female (see Davis & Silver, 2003; Wijenayake et al, 2020; Wilson et al, 2002).

Results

Manipulation Checks

The manipulation of amount of hair was effective. The bald stimulus man was rated as having less hair than the non-bald man, $F(1,69) = 191.57$, $p < 0.001$, $\eta 2 = 0.74$ ($M = 5.89$, $SD = 1.41$ vs. $M = 2.40$, $SD = 0.60$ for non-bald and bald men, respectively). Additionally, individuals correctly recalled the race of the stimulus man.

Personality, Attractiveness, Fitness, and Perceived Career Success

Prior research examining beauty and personality halo effects (Dion, et al., 1972; Eagly et al., 1991) and prior research examining perceptions of men's cranial hair (Cash, 1990; Hellström & Telke, 1994; Henss, 2001; Moerman, 1988; Muscarella & Cunningham, 1996; Roll & Vernis, 1971; Sigelman et al., 1990; Tischer, 1999, as reported in Henss, 2001) did not find sex of perceiver differences. Also, a 2 (sex of participant) × 2 (race; Black or White) × 2 (hair condition; bald or full head of hair) ANOVA was computed for the average of the 27 traits. This average score of the traits was created by summing the ratings for the traits and then computing an average for each participant. Prior to summing the items, items were reversed scored, consistent with Dion et al. (1972), so that higher numbers reflected a positive evaluation. The summed trait average score showed moderate internal consistency, Cronbach's $\alpha = 0.66$ (Cronbach, 1951). The ANOVA revealed no significant effects for sex of participant. Similarly, a 2 (sex of participant) × 2 (race) × 2 (hair condition) MANOVA for the attractiveness and fitness items was computed and revealed no significant effects for sex of participant. Therefore, data for men and women were analysed together.

A 2 × 2 race (White or Black) by hair condition (bald or full head of hair) ANOVA was computed on the 27 personality traits average score, and the attractiveness question. The ANOVA revealed a significant interaction of race and amount of hair, $F(1, 69) = 5.70$, $p < 0.02$, $\eta 2 = 0.08$; see Table 1. Table 1 shows that the White man with hair is rated higher than the White man without hair ($t(33) = 3.05$, $p < 0.004$), while the amount of hair does not matter for Black men ($t(33) = -0.065$, ns).

The ANOVA also revealed a significant effect for amount of cranial hair, $F(1, 69) = 5.31$, $p < 0.024$, $\eta 2 = 0.07$. In general, the bald men were rated lower in socially desirable personality traits than the non-bald men (non-bald men $M = 4.71$, $SD = 0.33$, *vs* bald men $M = 4.56$, $SD = 0.35$). A significant effect for race also occurred, $F(1, 69) = 19.04$, $p < 0.0001$, $\eta 2 = 0.22$. In general, Black men received higher socially desirable personality ratings than White men (Black men $M = 4.79$, $SD = 0.26$ *vs* White men $M = 4.48$, $SD = 0.40$).

Table 1 Experiment 1 Mean personality rating as a function of race and cranial hair

Race	Hair	
	Non-bald	Bald
White	4.64a** (.38)	4.31a** (.25)
Black	4.78b (.27)	4.79b (.27)

Higher numbers mean more positive personality; means with the same superscript were compared; **$p < .005$; standard deviations are in parentheses

A 2 (race of man) × 2 (amount of hair) MANOVA was conducted on the attractiveness and fitness items. The MANOVA revealed a marginally significant multivariate interaction effect for race and the amount of hair $F(8, 59) = 1.92$, $p < 0.074$, $\eta 2 = 0.21$. This effect was accompanied by significant univariate interaction effects for race and amount of hair on attractiveness, $F(1, 69) = 5.01$, $p < 0.04$, $\eta 2 = 0.07$, and enthusiasm $F(1, 69) = 4.05$, $p < 0.048$, $\eta 2 = 0.06$, see Tables 2 and 3. Tables 2 and 3 show that the White man with hair was perceived as more attractive and enthusiastic than the White man without hair ($t(33) = 4.51$, $p < 0.0001$ and ($t(33) = 4.50$, $p < 0.0001$ for attractiveness and enthusiasm, respectively) while amount of cranial hair did not matter for ratings of Black men's attractiveness and enthusiasm ($t(33) = 1.94$, ns and $t(33) = 1.44$, ns for attractiveness and enthusiasm, respectively).

The MANOVA also revealed a significant multivariate main effect for the amount of hair, $F(8, 59) = 4.72$, $p < 0.0001$, $\eta 2 = 0.39$. This effect was accompanied by a significant univariate effect for amount of hair on attractiveness, $F(1, 69) = 21.61$, $p < 0.0001$, $\eta 2 = 0.25$; friendliness, $F(1, 69) = 4.59$, $p < 0.036$, $\eta 2 = 0.07$; and enthusiasm

Table 2 Experiment 1 Mean attractiveness as a function of race and cranial hair

Race	Hair	
	Non-bald	Bald
White	4.39a*** (.78)	2.82a*** (1.24)
Black	4.41b (.87)	3.83b (.92)

Higher numbers mean more attractive; means with the same superscript were compared; ***$p < .0001$; standard deviations are in parentheses

Table 3 Experiment 1 Mean enthusiasm rating as a function of race and cranial hair

Race	Hair	
	Non-bald	Bald
White	5.22[a***] (.55)	4.18[a***] (.81)
Black	5.47[b] (.72)	5.11[b] (.76)

Higher numbers mean more enthusiastic; means with the same superscript were compared; ***$p < .0001$; standard deviations are in parentheses

$F(1,69) = 16.96$, $p < 0.0001$, $\eta 2 = 0.20$. A marginally significant univariate effect for amount of hair occurred for the item lucrative career, $F(1, 69) = 3.50$, $p < 0.066$, $\eta 2 = 0.05$; see Table 4. In general, the men with hair were perceived as more attractive, friendlier, and more successful than the bald men.

The MANOVA also revealed a significant multivariate main effect for race, $F(8, 59) = 4.77$, $p < 0.0001$, $\eta 2 = 0.39$. This effect was accompanied by a significant univariate effect for race on attractiveness, $F(1, 69) = 5.01$, $p < 0.029$, $\eta 2 = 0.07$; friendliness, $F(1, 69) = 15.71$, $p < 0.0001$, $\eta 2 = 0.19$; enthusiasm $F(1,69) = 12.02$, p < 0.001, $\eta 2 = 0.15$; trustworthiness, $F(1, 69) = 12.04$, $p < 0.001$, $\eta 2 = 0.15$; parenting potential, $F(1, 69) = 4.63$, $p < 0.035$, $\eta 2 = 0.07$; and mate potential $F(1, 69) = 14.95$, $p < 0.0001$, $\eta 2 = 0.19$; see Table 5. In general, the Black men were perceived as more attractive, friendly, enthusiastic, trustworthy, and as better parents and mates than the White men.

Experiment 2

The goal of this experiment was to replicate and extend the results of Experiment 1. Here, we sought to determine whether the amount of hair and race influenced women's evaluations of men's attractiveness, perceived personality (as measured using the Big-5), and perceived career success.

Table 4 Experiment 1 Mean attractiveness, friendliness, enthusiasm, and success as a function of cranial hair

	Hair	
	Non-bald	Bald
Attractiveness	4.40 (.81)	3.34 (1.19)
Friendliness	5.09 (.82)	4.71 (.86)
Enthusiasm	5.34 (.64)	4.66 (.91)
Success	5.51 (.78)	5.14 (.85)

Higher numbers mean more attractive, friendly, enthusiastic, and successful career; standard deviations are in parentheses

Table 5 Experiment 1 Mean attractiveness, friendliness, enthusiasm, trustworthiness, parenting skill, and mate potential ratings as a function of race

	Race	
	White	Black
Attractiveness	3.63 (1.29)	4.11 (.93)
Friendliness	4.54 (.89)	5.26 (.66)
Enthusiasm	4.71 (.86)	5.29 (.75)
Trustworthiness	4.11 (.90)	4.77 (.65)
Parenting skill	4.51 (.85)	4.91 (.70)
Mate potential	4.23 (.94)	5.03 (.79)

Higher numbers mean more attractive, friendly, trustworthy, and better: parenting skill, and mate potential; standard deviations are in parentheses

Method

Participants

Participants were 50 women between the ages 19–21 from a private university in the northeastern USA. Three of these women were not White, but note that past research shows Black and White women evaluate Black men in similar ways (Gergen, 1968; Lincoln, 1968; Wade et al., 2004a, 2004b).

Procedure

The same procedure from experiment 1 was utilized. The dependent measure was the Interpersonal Adjectives Scale (Trapnell & Wiggins, 1990). The Interpersonal Adjectives Scale includes the Big-5 personality dimensions of surgency/extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience, and it has been utilized in prior research investigating personality halo effects (Wade et al., 2003). Once again, to minimize any possible psychological tension associated with evaluating a Black American, the experimenter was a White female.

Results

Manipulation Checks

The manipulation of the amount of hair was effective. The bald stimulus man was rated as having less hair than the non-bald man, $F(1,46) = 94.58$, $p < 0.0001$, $\eta 2 = 0.69$ ($M = 6.05$, $SD = 0.95$ vs. $M = 3.44$, $SD = 1.29$ for non-bald and bald men, respectively). Additionally, individuals correctly recalled the race of the men in the stimuli.

Table 6 Experiment 2 Mean attractiveness rating as a function of race and cranial hair

Race	Hair	
	Non-bald	Bald
White	4.50a*** (1.00)	2.55a*** (1.04)
Black	3.80b (1.40)	4.29b (1.07)

Higher numbers mean more attractive; means with the same superscript were compared; ***$p < .0001$; standard deviations are in parentheses

Table 8 Experiment 2 Mean career success rating as a function of race and cranial

Race	Hair	
	Non-bald	Bald
White	5.08a (1.17)	4.55a (1.21)
Black	4.80b* (.92)	5.64b* (.93)

Higher numbers mean more lucrative career; means with the same superscript were compared; *$p < .05$; standard deviations are in parentheses

Personality, Attractiveness, Evolutionary Fitness, and Perceived Career Success

Separate 2 (amount of hair) × 2 (race of man) MANOVAs were computed on the Big-5 dimensions, and attractiveness, and career success items. The MANOVA for the Big-5 personality dimensions revealed no significant effects. However, the MANOVA for the attractiveness and career success items revealed a significant multivariate interaction effect for race and the amount of hair $F(8, 36) = 3.10$, $p < 0.009$, $\eta 2 = 0.41$. This effect was accompanied by significant univariate interaction effects for race and the amount of hair on attractiveness, $F(1, 46) = 13.67$, $p < 0.001$, $\eta 2 = 0.25$; trustworthiness, $F(1, 46) = 4.86$, $p < 0.03$, $\eta 2 = 0.10$; and perceived career success, $F(1, 46) = 4.89$, $p < 0.03$, $\eta 2 = 0.10$; see Tables 6, 7, and 8. Table 6 shows that the White man with hair was perceived as more attractive than the White man without hair ($t(21) = 4.60$, $p < 0.0001$). Additionally, Table 6 shows that the amount of hair did not affect ratings of Black men's attractiveness ($t(22) = 0.97$, ns). Table 7 shows that the amount of hair did not affect ratings of trustworthiness for White men ($t(21) = 1.66$, ns). Table 7 also show that the amount of hair did not affect ratings of Black men's trustworthiness ($t(22) = 1.45$, ns). However, Table 8 shows that the Black man without hair was perceived as more successful than the Black man with hair ($t(22) = 0.2.20$, $p < 0.039$), while amount of hair did not affect ratings of White men's career success ($t(21) = 1.09$, ns).

The MANOVA also revealed a significant multivariate main effect for race, $F(8\ 36) = 2.66$, $p < 0.02$, $\eta 2 = 0.24$. This effect was accompanied by a significant univariate effect for race on friendliness, $F(1, 46) = 14.53$, $p < 0.0001$, $\eta 2 = .25$; enthusiasm, $F(1, 46) = 20.77$, $p < 0.0001$, $\eta 2 = 0.33$; trustworthiness, $F(1,46) = 5.13$, $p < 0.029$, $\eta 2 = 0.11$; parenting skill $F(1, 46) = 6.73$, $p < 0.01$, $\eta 2 = 0.14$; and mate potential, $F(1, 46) = 8.53$, $p < 0.006$, $\eta 2 = 0.17$, see Table 9. In general, the Black man was perceived as friendlier, more enthusiastic, more trustworthy, a better parent, and a better potential mate. No other significant effects occurred.

Table 7 Experiment 2 Mean trustworthiness rating as a function of race and cranial hair

Race	Hair	
	Non-bald	Bald
White	4.58a (.97)	3.91a (.94)
Black	4.60b (.84)	5.14b (.95)

Higher numbers mean more trustworthy; means with the same superscript were compared; standard deviations are in parentheses

Discussion

As predicted, the personality of the White man with hair was evaluated more positively than the personality of the bald White man. Similarly, as predicted, the amount of cranial hair did not matter for ratings of the Black man's personality. Additionally, consistent with prior research investigating personality halo effects (Eagly et al., 1991; Feingold, 1992; Wade et al., 2003), effects only occurred for socially desirable aspects of personality such as altruistic, conventional, self-assertive, exciting, stable, emotional, dependent, safe, interesting, genuine, sensitive, outgoing, sexually permissive, sincere, warm, sociable, competitive, obvious, kind, modest, strong, serious, sexually warm, simple, poised, bold, and sophisticated, not major aspects of personality such as the Big-5 dimensions. Race and the amount of

Table 9 Experiment 2 Mean friendliness, enthusiasm, trustworthiness, parenting skill, and mate potential ratings as a function of race

	Race	
	White	Black
Friendliness	4.52 (.89)	5.54 (.98)
Enthusiasm	4.30 (1.02)	5.58 (1.02)
Trustworthiness	4.26 (1.01)	4.92 (.93)
Parenting skill	4.43 (1.20)	5.33 (1.09)
Mate potential	4.26 (1.25)	5.17 (.82)

Higher numbers mean more friendly, enthusiastic, trustworthy, and better parenting skill and mate potential; standard deviations are in parentheses

hair differentially affected social perceivers' evaluations of socially desirable aspects of men's personalities, their attractiveness, and career success.

The results for the White man are consistent with prior research showing that White men with hair are perceived more positively (Cash, 1990; Hellström & Telke, 1994; Henss, 2001; Moerman, 1988; Muscarella & Cunningham, 1996; Roll & Vernis, 1971). However, as predicted, our findings for the Black man suggest that amount of cranial hair does not matter for evaluations of Black men's attractiveness and personality. This difference may be because other factors carry more weight than cranial hair in these judgements of Black men. This possibility cannot be directly ascertained from the present research and falls to future work.

Another possibility, as discussed in the introduction, is that hair loss does not indicate the same features or potential faults in Black men than it does in White men. Black men do not experience hair loss at the same time, with the same progression, or in similar numbers to White men, and therefore, men and women do not view hair loss the same way with this population. As prior research indicates, early hair loss is a significant issue in European men, but not in Black or Asian men. Our data map onto the patterns seen in the type of hair loss associated with several health issues. The current work is very preliminary but indicates that these differences in indicators may result in very different perceptions of hair loss in different populations. A great deal of future research is needed to determine if hair loss in these populations is viewed the same way, or indicates other health, attractiveness, or personality features. This research should include different features of health, mate value, and parenting value, as well as other populations represented in stimulus materials (such as Asian populations).

The findings for Black men suggest that baldness is not a sex symbol for Black men contrary to Henss' (2001) suggestion. The Black man without hair may be viewed as more successful due to his similarity to the large proportion of Black male athletes and entertainers who appear publicly with their heads shaved (Henss, 2001). Since Black male athletes and entertainers have very large incomes, participants may believe a Black male with either male pattern baldness or a shaved head has a large income. This provocative explanation warrants further investigation. Alternatively, one may argue that since the participants are primarily White, they may have some apprehension about judging the characteristics of men of another race. That is, in attempt to appear non-racist, they may have rated the Black man more highly than they actually perceive him to be, in terms of personality and career success, for example. However, if participants in the present research were truly attempting to appear non-racist, they would most likely have rated the bald and non-bald Black men higher than the White men on all items, which did not occur in the present research. Nevertheless, additional research incorporating non-reactive measures of racism is necessary to fully rule out participants' apprehension over appearing racist.

Limitations

There are four limitations of this study, in part stemming from the lack of prior research on the topic. First, the use of only two races in the stimulus materials limits our ability to make more general interpretations about men in general. The literature on AGA and its implications for perceptions of health clearly shows the need to re-examine these findings with Asian models in particular, if not a range of other ethnicities. Second, the number of models used for each race needs to be expanded in the future, such that participants would be presented with several men with and without cranial hair. Third, we have yet to learn about patterns of AGA and what perceptions regarding health they may trigger. This will also be an important avenue for future research. Lastly, we did not explore age in relation to cranial hair. The literature review outlines that age interacts with AGA in very important ways, such as the age of onset of AGA being influenced by stress from competition (Jang et al, 2013). In some men, baldness may reliably signal age (e.g., among Asian men, hair loss is minimal before the age of 40 and increases with age; Kakizo, 1969), but social factors such as competitive stress and diet (Jang et al., 2013; Lee & Lee, 2012) may play a role. Perception of age in relation to baldness warrants more attention; researchers could present models who vary in age and determine whether evaluations are affected accordingly.

There is also a limitation with our dependent variables in Study 1. Our dependent measure in Study 1 had relatively low reliability ($\alpha = 0.66$). So, future research on cranial hair loss in men across race using those same DVs should compute an EFA to see if the personality social desirability items involve multiple dimensions with higher reliability.

Future Research

In addition to the limitations listed above, future research should examine these health and personality perceptions in various contexts. If there are health implications to AGA in particular populations, how would that affect preferences in short- and long-term mating contexts? Other forms of hair, particularly facial hair, have been shown to affect female judgements of male mate value in specific social roles. For example, Dixson and Brooks (2013) report women found beards more attractive when considering fathering abilities than when considering sexual attractiveness. Others have documented that preferences for beards are strongest for long-term relationships and when assessing fathering potential (Clarkson et al., 2020; Stower et al., 2020). This

preference is particularly strong among women with young infants and women with higher parity who specifically evaluated men's fathering abilities, masculinity, dominance, and age (but not attractiveness; Dixson et al., 2019a, 2019b). Given the research on facial hair, the effect of cranial hair on these judgments should be investigated.

Another area that needs to be explored is the influence of variation of preferences for beards due to sex-biased ratios or economic inequality, for example. Researchers have found beards are more frequent among men living in countries with male-biased sex ratios (Dixson et al., 2019a, 2019b), as well in countries with higher levels of pathogens, larger urban centers, and greater economic disparity (Dixson & Lee, 2020; Dixson et al., 2017b; Pazhoohi & Kingstone, 2020). Indeed, women's preferences for beards appear to be stronger in countries where income inequality is high versus more equitable (Dixson et al., 2017b). Perhaps the same trend carries over to preferences for cranial hair. That is, both beards and cranial hair may be linked such that women will prefer these secondary sexual traits given they reliably signal age, social status, and dominance that may be used to win in male-male competition for resources.

Along a different vein, it may be informative to examine whether the presence or absence of cranial hair is related to assessments stemming from perceived symmetry. Alopecia may lead to a decrease in the visual level of face or head symmetry, and symmetry of appearance is one of the criteria of attractiveness, closely related to the physical quality of the organism (i.e., the decrease in symmetry may result from hormonal disorders, medical history, having parasites, or risky behaviour; see Etcoff, 2011; Thornhill & Moeller, 1997, Wade, 2010). Therefore, future experimental designs could include symmetry as a variable in order to tease apart the role it has on assessments as compared to cranial hair.

Future researchers could also study whether hair length affects personality evaluations of men (and women). Hair length is often part of people's evaluations of women's attractiveness (Buss & Schmitt, 1993) and yet there seems to be no attention toward how hair length influences perceptions of personality. Perhaps these links between hair length and personality assessment exist for both men and women. It is also important to note that there are different patterns of hair loss: four basic types and two specific types categorized by where the hair is lost on the head and in what progression (Lee & Lee, 2012). Research has not yet determined whether the pattern of hair loss has an effect on perceptions (for example, a receding hairline vs. a bald spot in the centre of the crown).

There is a lack of research on evolutionary views of men's hair (or baldness), including mate preferences, halo effects, and how it connects to male intrasexual competition for status. There is also a lack of research on how baldness has evolved, to the point where it is prevalent among White men (Henss, 2001; Setty, 1970) but not others. Male pattern baldness is accompanied by several health concerns, including increased risk of heart disease (e.g., Sasmaz et al., 1999; Yamada et al., 2013). Further, bald men have slightly but significantly fewer children than men without baldness despite also hitting puberty younger (Yap et al., 2018). Therefore, the question becomes one about the advantages of being bald that offset these costs. Evolutionary psychology is well situated to begin to address this issue.

Overall, perceptions of men with hair loss are not universal, and may point to several cultural or biological factors. While there is a great deal of research in both realms, very little research has attempted to parse out these factors. In addition, little work has determined differing perceptions according to race, hair length, pattern of hair loss, or other variables. Evolution and human behavior is well suited to this research scope, and future evolutionary work on this topic should determine the roles of health, status, and hormonal factors in perception of balding men.

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Availability of Data and Material Not applicable

Code Availability Not applicable

Declarations

Ethics Approval Approval was obtained from the Institutional Review Board of Bucknell University. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Consent for Publication Not applicable

Conflict of Interest The authors declare no competing interests.

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