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Ethnic group differences in the general factor of personality (GFP) are opposite to that which would be predicted by differential-K theory

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Abstract

The general factor of personality (GFP) has been construed as a life history trait and as representing social effectiveness. In either case, differential-K theory would predict that levels of the GFP are highest in Asians, intermediate in Caucasians, and lowest in Blacks. In studies 1–5, I present evidence for the opposite ranking such that Blacks are highest, Caucasians intermediate, and Asians lowest. In study 5, I also show that this finding is not fully explained by differences in self-esteem. In study 6 I show that the disconnect between the GFP and life history strategies when analyzed at the level of ethnic groups cannot be unambiguously resolved by observing patterns of covariation among lower-order personality traits. I argue that—similar to the relationship between the general factor of intelligence and life history strategies—within-group individual differences in the GFP do not necessarily result from the same processes as between-group differences.

1. Introduction

1.1. Life history theory

Life History (LH) theory is a mid-level evolutionary theory that seeks to explain the resource trade-offs made by individuals and populations within species as well as differences in resource trade-offs between species. LH strategies can be thought of as existing on a continuum from fast to slow. Fast LH strategists evolve or develop in environments characterized by high rates of extrinsic mortality and instability (Brumbach, Figueredo, & Ellis, 2009; Ellis, Figueredo, Brumbach, & Schlomer, 2009). Because they do not tend to reach the carrying capacity of their environment, fast LH species and populations tend to take on a strategy by which they maximize the quantity of offspring rather than the quality. However, the role of carrying capacity has been downplayed more recently in favor of mortality regimes. Populations with high levels of adult extrinsic mortality (i.e., mortality that is not able to be controlled by the organism) tend to have faster LH strategies (Figueredo, Woodley, & Jacobs, 2015; Hertler, Figueredo, Peñaherrera-Aguirre, Fernandes, & Woodley, 2018). Fast LH strategists do not invest as much in their offspring, tending to devote more time and resources to obtaining novel mates (Figueredo et al., 2005). Among humans, fast LH strategists tend to be characterized by a dominant and expressive personality, an opportunistic interpersonal style, unrestricted sociosexuality (i.e., willingness to engage in casual sex), and low conscientiousness (Figueredo et al., 2005; Sherman, Figueredo, & Funder, 2013).

Slow LH strategists evolve or develop in highly stable environments characterized by high rates of intrinsic mortality and low rates of extrinsic mortality. Inter and intraspecies competition may be intense for slow LH strategists, so spending time and resources on developing the skills needed to compete is a worthwhile strategy (Figueredo et al., 2015). Slow LH strategists tend to have fewer offspring, investing more resources per offspring than fast LH strategists (Figueredo et al., 2005). Slow LH strategists tend to live longer, and populations of slow LH strategists are more likely to approach the carrying capacity of their environment (Hertler et al., 2018). Among humans, slow LH strategists tend to be prosocial, conscientious, and restricted in their sociosexuality (Figueredo et al., 2005; Hertler et al., 2018; Sherman et al., 2013). Furthermore, people with slow LH strategies tend to have highly differentiated cognitive ability and personality profiles (i.e., their lower order cognitive abilities and personality traits don't covary as much), likely reflecting the need for cognitive and behavioral specialization in order to compete in highly stable ecologies with populations at or near the carrying capacity of the environment (Figueredo et al., 2015; Figueredo, Woodley, Brown, & Ross, 2013; Hertler et al., 2018; Woodley, 2011).

Individual differences in LH strategy have been shown to have a strong heritable component (Figueredo & Rushton, 2009; Figueredo, Vásquez, Brumbach, & Schneider, 2004) and to be affected by

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environmental factors like the presence of both parents or a stable home life (Del Giudice, Gangestad, & Kaplan, 2015; Ellis et al., 2009). Figueredo et al. (2004, 2005, 2006); Figueredo, Vásquez, Brumbach, and Schneider (2007) have revealed a large number of LH traits that covary among humans, making up what they call the K factor. The K factor covaries with the general factor of personality (discussed below) and covitality (i.e., physical and mental health) to form a higher order factor called Super-K (Figueredo et al., 2007; Figueredo et al., 2015).

1.2. The general factor of personality

The general factor of personality (GFP) arises from the fact that lower order personality traits tend to correlate with each other to form a single factor. Usually, these are the Big Five personality traits (Musek, 2007). Some researchers have argued that the GFP is an artifact or merely represents socially desirable responses (Bäckström, Björklund, & Larsson, 2009; Revelle & Wilt, 2013). However, the GFP is correlated with delinquency (negatively), job performance (as rated by peers or supervisors), and with being liked by one's peers, suggesting that it has a substantive component (van der Linden, Dunkel, Beaver, & Louwen, 2015; van der Linden, Scholte, Cillessen, te Nijenhuis, & Segers, 2010; van der Linden, te Nijenhuis, & Bakker, 2010). Furthermore, when controlling for socially desirable responses, the GFP remains (Erdle & Rushton, 2011). Rather than being a measure of LH strategy, some have argued that the GFP represents social effectiveness (these need not be mutually exclusive positions; van der Linden, Dunkel, & Petrides, 2016). In support of the view that the GFP represents social effectiveness, there is substantial overlap between the GFP and trait emotional intelligence (EI), to the point where they might be considered measures of the same construct (Pérez-González & Sanchez-Ruiz, 2014; Rushton et al., 2009; Van der Linden, Tsaousis, & Petrides, 2012; Veselka et al., 2009). For example, the short form of the Trait Emotional Intelligence Questionnaire (TEIQue-SF) consists of four factors, all of which have been shown to load heavily onto the GFP. Rushton et al. (2009) split their dataset into two randomly chosen halves and extracted the GFP from the Big Five, four humor styles, and the TEIQue-SF in two samples, the results of which were nearly identical. In the first sample, the GFP accounted for 33% of the variance and loaded strongly onto the four trait EI factors: Well-being (0.84), Self-Control (0.70), Emotionality (0.77), and Sociability (0.63). Results were similar in the second sample — the GFP accounted for 31% of the variance and loaded on to Well-being (0.84), Self-control (0.62), Emotionality (0.73), and Sociability (0.69). The substantial overlap between the GFP and trait EI provides strong evidence that the GFP reflects social effectiveness because trait EI is associated with academic performance, positive peer relations, lack of personality disorders, and leadership ability (Petrides & Mavroveli, 2018).

1.3. Differential-K theory

Differential-K theory applies the principles of LH theory to human individual and group differences (Rushton, 1985, 2000). In this view, LH strategies are reflected in both physiological and psychological traits and these traits consistently covary among individuals and groups. Rushton (1985) also posited the existence of three major races (mongoloid, caucasoid, & negroid; hereafter referred to as Asians, Caucasians/Whites, & Blacks), which he arrayed on a continuum of LH traits, such that Asians tend to have slower LH strategies, while Blacks tend to have faster LH strategies, with Caucasians intermediate. Differential-K theory posits that these differences in LH speed result from divergent evolution. According to this view, the Eurasian continent, having predictably cold winters, hard-to-extract resources, and relatively low rates of infectious disease, would have selected for slower LH strategists (Hertler et al., 2018). Sub-Saharan Africa, with relatively easier to obtain food resources but higher rates of infectious disease (i.e., extrinsic mortality), would have selected for faster LH strategists (Rushton, 2000). The application of differential-K theory to racial group differences and the tripartite differentiation of racial groups has been criticized on psychometric grounds and on the failure of the theory to account for some differences between groups (e.g., high rates of gambling among the ethnic Chinese; Flynn, 2019).

As Dunkel, Cabeza de Baca, Woodley, and Fernandes (2014) argue, differential-K theory suggests that we should expect Asians to have the highest levels of the GFP and Blacks the lowest if the GFP is a LH trait. However, that is not what Dunkel, Cabeza de Baca, et al. (2014) found. In a sample drawn from Project Talent (Prescott et al., 2013) consisting of 999 Asians, 6533 Blacks, and 147,355 Whites, they found that Whites had the highest GFP and Asians the lowest, with Blacks intermediate. There are a couple reasons why their results may be inconsistent with the results presented herein:

1) Their data was collected in 1960 while the present samples' data was collected after the year 2000. It's possible that global and national cultural changes have differentially shifted levels of the GFP among racial groups. In particular, the pernicious discrimination against Blacks in America at that time may have suppressed the Black GFP.
2) Their GFP was constructed from a personality scale called the Student Activities Inventory while the studies herein use the Big Five or a related model of personality to construct a GFP. It's possible that these GFPs differ from each other in such a way that the ordering of scores by racial groups is shifted.

1.4. The present studies

I report, in studies 1–5, group differences on the GFP such that Blacks have the highest GFP, Asians the lowest, and Whites/Arabs (i.e., Caucasians) intermediate. The objective of these studies is to show that this finding is replicable in a variety of datasets using different measures of the Big Five and drawn from different kinds of populations. In the fifth study I also hypothesize that self-esteem will partially mediate the relationship between ethnicity and the GFP. A meta-analysis has shown that self-esteem is highest in Blacks, intermediate in Whites, and lowest in Asians (Twenge & Crocker, 2002). Since this is the same pattern of results seen with the GFP, and since the GFP has substantial overlap with self-esteem (Erdle, Irwing, Rushton, & Park, 2010), self-esteem is a plausible mediator of ethnic differences in the GFP. The results of study 5 show that differences between Asians and Caucasians are not mediated by self-esteem, but that self-esteem partially mediates differences between Asians/Caucasians and Blacks. In the sixth and final study I hypothesize that the disconnect between the GFP and the purported LH strategies of different ethnic groups might be accounted for by covariation among lower-order personality traits (as was previously discussed, slower LH strategists should have more differentiated personality profiles; Figueredo et al., 2013, 2015). By reanalyzing the data from studies 1–4, I find that Blacks had more covariation of personality traits than Whites or Asians, consistent with predictions from differential-K theory. However, there was little difference in covariation between Asians and Caucasians. Study 6 shows that differences in covariation among the lower-order personality traits (re-analyzing the data from studies 1–4) do not unambiguously resolve the disconnect between the GFP and the purported LH traits of different ethnic groups.

2. Studies 1–3

2.1. Methods

Participants for studies 1–3 were people who completed self-report questionnaires using an interactive website from which data is publicly available (see Gosling, Vazire, Srivastava, & John, 2004 for a discussion of the viability of internet data). In all 3 studies the sample was global, with participants from multiple countries.

In study 1, 84 responses were removed from analysis because the

age inputted was > 99 (there was no limit on age that could be inputted, and some people inputted ages upwards of 1 million; N = 19,634, 60.8% female, M age = 26, SD = 11.6).

In study 2, the data originally consisted of 145,828 respondents. Due to a coding error, the categories of White, Native American, and Australian Native were combined into a single category. Therefore, I drop anyone coded as White/Native American/Australian Native from data analysis (doing so did not appreciably change the results). Furthermore, another 97 respondents were excluded from analysis because they provided an age > 99. The final sample were 66,166 respondents (65.5% female; M age = 23.37; SD = 9.7).

In study 3, 22 participants were dropped from analysis for inputting an age > 99. The final sample were 73,467 respondents (44.7% female, M age = 29.24, SD = 12.9).

The International Personality Item Pool (IPIP) Big-Five Predictor Markers (Goldberg, 1992) were used in study 1. The test consists of fifty items rated on a 5-point scale (1: "Disagree", 5: "Agree"), and asks the participant to determine how true or false each item is about their personality (e.g., "I am the life of the party").

The Ten Item Personality Inventory (TIPI) was used in studies 2–3 (Gosling, Rentfrow, & Swann Jr., 2003). While necessarily lacking internal consistency because of the small number of items, the TIPI shows adequate levels of convergence with traditional Big Five assessments in terms of correlations with external measures and observer ratings (Gosling et al., 2003). Each item contains two related adjectives (e.g., "extraverted, enthusiastic"; "reserved, quiet") and respondents are asked to rate how much the adjectives apply to them on a scale of 1: "Disagree strongly" to 7: "Agree strongly".

In all three studies, participants were asked to self-identify their race or ethnicity. The meaning of "race" and "ethnicity" continues to change over time, and different studies have used different terminologies. In this paper I will generally refer to these groups as "ethnic groups" rather than races to avoid the conceptual baggage that accompanies the term "race" (e.g., Maceachern, 2012; Wagner et al., 2017). The racial or ethnic categories were different in each study, presumably because the surveys were created at different times by different researchers. In study 1, the options were: Mixed Race, Arctic (Siberian, Eskimo), Caucasian (European), Caucasian (Indian), Caucasian (Middle East), Caucasian (North African, Other), Indigenous Australian, Native American, North East Asian (Mongol, Tibetan, Korean, Japanese, etc.), Pacific (Polynesian, Micronesian, etc.), South East Asian (Chinese, Thai, Malay, Filipino, etc.), West African/Bushmen/Ethiopian, Other. For our purposes, North East Asian and South East Asian were combined to form an 'Asian' group. While Rushton's original conception of differential-K theory included Native Americans and Pacific Islanders with what he called 'Mongoloids' (Rushton, 2000), more recent papers specifically refer to 'East Asia', and so only the East Asian categories are included in this group (see e.g., Rushton & Jensen, 2005, 2010). European, Indian, Middle East, and North African were combined to form a 'Caucasian' group, and the West African/Bushmen/Ethiopian category represented Blacks. These groupings were chosen because they represent East Asians, Caucasians, and Sub-Saharan Africans, respectively, and these are the groups for which differential-K theory makes explicit predictions. Mean levels of the GFP are reported for both the separate ethnic groups and the combined groups.

In study 2, the options were Asian, Arab, Black, Indigenous Australian / Native American / White, Other (There was a coding error in the survey, and three different options were given the same value). I analyze the results for Asians, Arabs (i.e., Caucasians), and Blacks. The Indigenous Australian/Native American/White option is uninterpretable due to the combining of the data.

In study 3, the options were Asian, Arab, Black, Indigenous Australian, Native American, White, Other. I analyze the results for Asians, Arabs, Whites, and Blacks. I report descriptive statistics for all ethnic groups in studies 1–3, but as the purpose of this paper is to compare results to what would be expected based on differential-K theory, I restrict analysis to those groups for which differential-K theory provides explicit predictions (i.e., Asians, Caucasians, and Blacks).

2.2. Results

All analyses were carried out using the Statistical Package for the Social Sciences (SPSS) version 25 (IBM Corp., 2017). To extract the GFP, an Exploratory Factor Analysis using Principal Axis Factoring was performed and the first unrotated factor was saved. This method has been used in multiple previous studies to extract a GFP (Dunkel, Cabeza de Baca, et al., 2014; Dunkel, Summerville, et al., 2014; van der Linden et al., 2018; van der Linden, Scholte, et al., 2010; Veselka et al., 2009). In study 1, this factor had an Eigenvalue of 1.7 and accounted for 34.2% of the variance among the Big Five traits. Factor loadings were: Openness (0.26), Conscientiousness (0.34), Agreeableness (0.47), Extraversion (0.56), and Neuroticism (−0.43).

In study 2, the GFP had an Eigenvalue of 1.7 and accounted for 34.7% of the variance among the five traits. The factor loadings were: Openness (0.51), Conscientiousness (0.58), Extraversion (0.35), Agreeableness (0.39), and Neuroticism (−0.31).

In study 3, the GFP had an Eigenvalue of 1.51 and accounted for 30.2% of the variance among the five traits. The factor loadings were: Openness (0.48), Conscientiousness (0.34), Extraversion (0.41), Agreeableness (0.32), and Neuroticism (−0.22).

2.2.1. Study 1

Descriptive statistics for each ethnic group are presented in Table 1. A one-way analysis of variance (ANOVA) revealed that there were significant differences between the three groups on the GFP, $F(2, 15{,}214) = 58.6$, $p < .001$. The effect size, as indexed by η^2, was 0.008. Tukey post-hoc tests revealed that Black > Caucasian > Asian, all ps < .01.

2.2.2. Study 2

Descriptive statistics for each ethnic group are presented in Table 2. A one-way ANOVA revealed that there were significant differences between the three groups on the GFP, $F(2, 46{,}706) = 1946$, $p < .001$. The effect size, as indexed by η^2, was 0.08. Tukey post-hoc tests revealed that Black > Arab > Asian, all ps < .01.

2.2.3. Study 3

Descriptive statistics for each ethnic group are presented in Table 3. A one-way ANOVA revealed that there were significant differences between the four groups on the GFP, $F(3, 64{,}140) = 90.3$, $p < .001$. The effect size, as indexed by η^2, was 0.004. Tukey post-hoc tests

Table 1
GFP and combined trait scores by ethnicity, study 1.

Race/region	*N*	GFP(*SD*)	O	C	E	A	N
Asian	2022	−0.16(69)	37.1	33.5	28.8	37.5	32.0
NE Asia	187	−0.16(69)	37.5	32.7	29.6	36.9	32.0
SE Asia	1835	−0.16(69)	37.1	33.6	28.7	37.5	32.0
Caucasian	12,936	0.02(0.74)	39.8	33.3	30.2	38.5	30.9
European	10,529	0.03(0.75)	40.3	33.3	30.2	38.5	30.7
Indian	1505	−0.07(0.69)	37.2	33.2	30.2	38.5	32.1
Middle East	506	−0.01(0.73)	38.0	33.7	30.8	38.4	31.8
North African	396	−0.01(0.77)	38.6	33.3	30.1	38.4	30.7
Black	259	0.19(0.77)	39.6	34.7	30.9	39.6	28.1
Arctic	13	0.24(0.64)	39.8	31.5	34.4	37.4	26.4
Indigenous-Australian	24	−0.12(0.74)	39.0	30.3	31.5	35.1	30.2
Native-American	201	0.02(0.83)	37.0	34.7	30.2	38.2	29.7
Pacific	65	0.03(0.66)	37.9	33.0	30.7	38.2	29.3
Mixed race	1430	−0.019(0.77)	39.6	33.0	30.0	38.0	30.9
Other	2532	0.03(0.75)	37.2	34.3	30.7	39.0	30.9

Note: O = openness, C = conscientiousness, E = extraversion, A = agreeableness, N = neuroticism.

Table 2
GFP and combined trait scores by ethnicity, study 2.

Race/region	*N*	GFP(*SD*)	O	C	E	A	N
Asian	32,045	−0.19(0.68)	10.3	9.6	8.1	9.5	7.4
Arab	1693	−0.07(0.73)	10.7	10.3	8.4	9.2	7.3
Black	12,971	0.27(0.75)	11.3	11.4	8.4	10.1	6.0
Other	17,313	0.01(0.71)	10.9	10.4	8.2	9.6	7.0

Note: O = openness, C = conscientiousness, E = extraversion, A = agreeableness, N = neuroticism.

Table 3
GFP and combined trait scores by ethnicity, study 3.

Race/region	*N*	GFP(*SD*)	O	C	E	A	N
Asian	10,809	−0.08(0.67)	10.6	9.2	7.2	8.6	7.5
Arab	1054	−0.01(0.66)	11.1	9.4	7.6	7.9	7.5
White	48,695	0.01(0.66)	10.9	9.7	7.4	8.4	7.2
Black	3586	0.10(0.71)	11.3	9.9	7.3	8.7	6.6
Native American	815	−0.02(0.67)	10.9	9.7	7.1	8.4	7.3
Indigenous Australian	76	0.04(0.85)	10.8	9.3	7.9	9.0	7.2
Other	7323	0.00(0.66)	11.1	9.4	7.3	8.4	7.3

Note: O = openness, C = conscientiousness, E = extraversion, A = agreeableness, N = neuroticism.

revealed that Black > Arab/White > Asian, ps < .01, and that there was no difference between Arab and White respondents, p = .67.

2.3. Discussion

Studies 1–3 show a consistent pattern—that Blacks are higher than Caucasians who are higher than Asians on the GFP. The primary limitation of these studies is that the data was collected from the same online interactive website. The sample for study 1 is from a different time period (study 1's data was last updated in 2014 while study 2 & 3's data were last updated in 2018 & 2019) indicating that the sample from study 1 does not overlap with the samples from studies 2–3. However, it's possible that there is some overlap in respondents for all of the samples. Furthermore, the samples are not likely to be representative. There is some concern that the people who choose to take online personality tests are different from the average person in the population (see Gosling et al., 2004 for a discussion of the utility of web-based surveys). Study 4 alleviates this concern by using a more representative sample that was determined in part via random sampling rather than self-selection.

3. Study 4

3.1. Methods

Data for study 4 was obtained from the third wave (2013–2014) of the Survey of Midlife Development in the United States (MIDUS; Ryff et al., 2015), N = 3294, 55% female, M age = 64. Respondents in this sample are older than in studies 1–3 because the third wave of the MIDUS study was only administered to those who had participated in the first two waves, and respondents were therefore older than the general population. However, participants for the MIDUS surveys were selected in part via random digit dialing (i.e., calling random phone numbers), making the MIDUS sample more representative of the general population than self-selected internet samples (Ryff et al., 2015). Respondents were asked to rate themselves on 31 self-descriptive adjectives (e.g., “Helpful”, “Organized”) measuring six personality traits. These were the usual Big Five traits plus one more called “agency” (self-confidence, assertiveness, etc.). Participants rated how much each adjective described them on a 4-point scale ranging from 1: “A lot” to 4: “Not at all”.

The options for ethnicity were White, Black and/or African American, Native American or Alaska Native, Aleutian Islander/Eskimo, Asian, Native Hawaiian or Pacific Islander, and Other. Because the Asian sample size was too small to provide meaningful results (N = 9), I report and analyze results for the White and Black/African American groups only.

Table 4
GFP and average trait scores by ethnicity, study 4.

Race/region	*N*	GFP(*SD*)	O	C	E	A	N	Ag
White	2424	−0.01(0.89)	2.9	3.4	3.1	3.4	2.1	2.6
Black	90	0.45(0.93)	3.1	3.4	3.3	3.5	2.0	2.9

Note: O = openness, C = conscientiousness, E = extraversion, A = agreeableness, N = neuroticism, Ag = agency.

3.2. Results

The GFP was extracted using the same method as studies 1–3 (N = 2715). The Eigenvalue was 2.53 and the GFP accounted for 42.13% of the variance among the six traits. The factor loadings were: Agency (0.56), Agreeableness (0.49), Extraversion (0.81), Neuroticism (−0.22), Conscientiousness (0.40), and Openness (0.73).

Descriptive statistics for Black and White respondents are presented in Table 4. GFP levels for other groups aren't reported because sample sizes were very small. An independent samples *t*-test revealed that Blacks were significantly higher than Whites on the GFP, t (2512) = −4.8, p < .001.

3.3. Discussion

Study 4 replicates the result from studies 1–3 (albeit without an ‘Asian’ group) using a more representative sample and with a different age group. In four studies so far, we have seen that Blacks > Caucasians > Asians on the GFP. These four studies, along with study 5, show that these differences are reliably found in different populations using different measures of the Big Five.

4. Study 5

4.1. Introduction

In study 5 I test the hypothesis that the relationship between ethnicity and the GFP is mediated by differences in self-esteem. A meta-analysis has shown that within the United States, Blacks have higher self-esteem than Whites who have higher self-esteem than Asians (Twenge & Crocker, 2002). Furthermore, there is substantial overlap between self-esteem and the GFP, with one study (using the same dataset I am about to use in study 5) indicating that the GFP accounted for 67% of the variance in self-esteem (Erdle et al., 2010). It was therefore predicted that differences in self-esteem would partially mediate the relationship between ethnicity and the GFP. This prediction was preregistered on aspredicted.org.

4.2. Method

Data for this study came from the Gosling-Potter internet project (see Srivastava, John, Gosling, & Potter, 2003, for details). Participants completed the surveys for study 5 via an online interactive website (N = 688,844; 56% female; M age = 24; SD age = 9.6). Big Five traits were measured with the Big Five Inventory (BFI; John & Srivastava, 1999). The BFI is a 44-item self-report measure assessing the Big Five personality traits.

Self-esteem was measured using the Single-Item Self-Esteem scale (SISE; Robins, Fraley, Roberts, & Trzesniewski, 2001). Participants rated the item (“I see myself as someone who has high self-esteem”) on

Table 5
GFP and average trait scores by ethnicity, study 5.

Ethnicity	*N*	GFP(*SD*)	O	C	E	A	N	SE
Asian	43,430	−0.12(0.76)	3.9	3.3	3.1	3.6	3.0	3.35
Caucasian	499,075	0.01(0.76)	4.0	3.4	3.2	3.6	3.0	3.31
Black	12,133	0.12(0.80)	4.0	3.5	3.3	3.7	2.8	3.53
Latino	21,065	0.01(0.76)	4.0	3.4	3.3	3.6	2.9	3.41
Native American	2020	0.07(0.78)	4.0	3.5	3.2	3.6	2.8	3.37
Multi-ethnic	2008	−0.06(0.77)	4.1	3.3	3.1	3.5	3.0	3.39

Note: O = openness, C = conscientiousness, E = extraversion, A = agreeableness, N = neuroticism, SE = self-Esteem.

a 5-point Likert scale ranging from 1 (disagree strongly) to 5 (agree strongly). The SISE has high test-retest reliability and a similar pattern of construct validity coefficients as the Rosenberg Self-Esteem Scale (Robins et al., 2001). Using longitudinal data, Robins et al. (2001) estimated the reliability of the SISE to be 0.75.

The options provided for ethnicity were multi-ethnic, Asian, Black, White/Caucasian, Latino, and Native American. I report descriptive statistics for all groups but restrict analysis to Asians, Whites/Caucasians, and Blacks because these are the only groups for which differential-K theory has explicit predictions.

4.3. Results

The GFP was extracted using the same method as studies 1–4. The GFP had an Eigenvalue of 1.70 and accounted for 33.9% of the variance among the Big Five traits. Factor loadings were: Openness (0.19), Conscientiousness (0.40), Extraversion (0.36), Agreeableness (0.45), and Neuroticism (−0.66).

Descriptive statistics for each ethnic group are presented in Table 5. A one-way ANOVA revealed that there were significant differences between the three groups being analyzed, $F(2, 554{,}635) = 687.9$, $p < .001$. The effect size, as indexed by η^2, was 0.002. Tukey post-hoc tests revealed that Black > Caucasian > Asian on the GFP, all ps < .001. Mean self-esteem values for each group are reported in Table 5. A one-way ANOVA revealed that there were significant differences between the three ethnic groups, $F(2, 515{,}296) = 164.6$, $p < .001$. The effect size, as indexed by η^2, was 0.001. Tukey post-hoc tests revealed that Blacks > Asians > Caucasians, all ps < .001.

Because Asians were higher than Caucasians on Self-Esteem, the prediction was not supported. Self-Esteem does not mediate the relationship between ethnicity and the GFP. However, the absolute difference in self-esteem values between Asians and Caucasians (0.04) was much smaller than that between Asians/Caucasians and Blacks (0.18 and 0.22, respectively). Even though self-esteem doesn't mediate the difference in GFP between Asians and Caucasians, it is possible that self-esteem mediates the difference in GFP between Asians/Caucasians and Blacks. Therefore, I report the results of these two mediation analyses, testing whether self-esteem is a mediator of the GFP difference between Asians and Blacks or Caucasians and Blacks. Due to technical issues, the size of the dataset could not be cut down and the total dataset (N > 9 million) was too large for bootstrapping using the PROCESS macro (Hayes, 2013) in SPSS. Thus, Baron and Kenny's (1986) four-step approach was used to test for mediation and Sobel (1982) tests were used as a significance test of partial mediation. Blacks had higher self-esteem than Asians, which in turn predicted higher scores on the GFP ($z = 2.88$, $p < .004$). Blacks also had higher self-esteem than Caucasians, which in turn predicted higher scores on the GFP ($z = 65.2$, $p < .001$). However, it should be noted that the effect of ethnicity on self-esteem was exceedingly small, especially in the Asian/Black analysis (see Fig. 1). For both analyses, a dummy-coded variable in which Black = 1 and Caucasian (or Asian) = 0 served as the predictor variable. Fig. 1 provides details of the mediation analyses.

4.4. Discussion

Study 5 replicates the results from the first four studies. Again, Blacks > Caucasians > Asians on the GFP. Contrary to previous studies (Twenge & Crocker, 2002), Asians had higher self-esteem than Whites, ruling out the hypothesis that all ethnic differences in the GFP are mediated by self-esteem. However, the difference between Asians/Caucasians and Blacks on the GFP appears to be partially mediated by self-esteem. The high self-esteem of Blacks may in part lead to a higher GFP because the GFP consists of socially desirable attributes. This explanation, however, cannot account for the GFP difference between Asians and Caucasians.

If the differences in GFP levels between ethnic groups aren't fully caused by differences in self-esteem, what might explain them? One obvious possibility is that the differences are, in fact, substantive, and that Caucasian individuals really are more Conscientious, Open, Agreeable, Emotionally Stable, and Extraverted than Asian individuals on average, and less so than Black individuals on average. This explanation is unlikely. Given that these personality traits reflect social effectiveness, a proposition for which there is a large amount of evidence (van der Linden et al., 2016), and given that we would expect social effectiveness to predict highly valued outcomes like college graduation, a high salary, and avoiding incarceration, then we should expect Asian individuals to be highest on most or all of the Big Five traits that make up the GFP. Asian Americans tend to have higher incomes, higher college graduation rates, and lower rates of incarceration than White or Black Americans (Bureau, 2010; Shapiro et al., 2017). Thus, even though there is plenty of evidence suggesting that the GFP itself is substantive (Erdle & Rushton, 2011; Musek, 2007; Rushton & Irwing, 2011), the differences in GFP between large ethnic groups may not reflect any actual differences in personality.

It has previously been suggested that people tend to make social comparisons based on perceived similarity (i.e., people tend to compare themselves to more similar others; Dakin & Arrowood, 1981; Festinger, 1954). This may partially explain the results. It may be that Asians tend to compare themselves to other Asians, Blacks to other Blacks, etc. However, this cannot explain why the differences array themselves opposite to the direction predicted by differential-K theory.

It is worth comparing the results of the present studies to the findings of Dunkel, Reeve, Woodley, and van der Linden et al. (2015). In three datasets, they found that people identifying as Jewish had higher levels of the GFP than Catholics, Protestants, and the non-religious. While this is a somewhat different level of analysis than the present studies (dealing with religious groups rather than ethnic/racial groups), it is the case that most Jews in the West (where these studies were conducted) are Ashkenazi Jews, and that the Ashkenazim are relatively genetically homogenous (Ostrer & Skorecki, 2013). Dunkel, Reeve, Woodley of Menie, and van der Linden's (2015) findings are less counter-intuitive than the present results. The educational, occupational, and cultural achievements of Jews in the West are well above those of most other groups (Lynn & Kanazawa, 2008). It makes sense, then, that Jews would have a higher average GFP, given that the GFP reflects (at least in part) social effectiveness. Why might there be a disparity between their results and the results presented herein? As alluded to previously, the most plausible explanation may be that Jews tend to compare themselves to all White people, while members of larger racial or ethnic groups compare themselves to other members of the same large group. The Jewish GFP advantage, then, may be substantive rather than a byproduct of self-esteem or same-group comparison. We might expect to find a similar pattern of results among other relatively small ethnic groups embedded within larger racial or ethnic categories. For example, Black Nigerian immigrants in the United States constitute an elite group, with substantially higher occupational and educational achievement than the general population. 29% of Nigerian immigrants hold an advanced degree compared to just 11% of the general population (Migration Policy Institute, 2015). It would be informative, then, to see if Nigerian immigrants have higher levels of the GFP than other Blacks. If so, this would suggest that GFP differences between smaller groups within

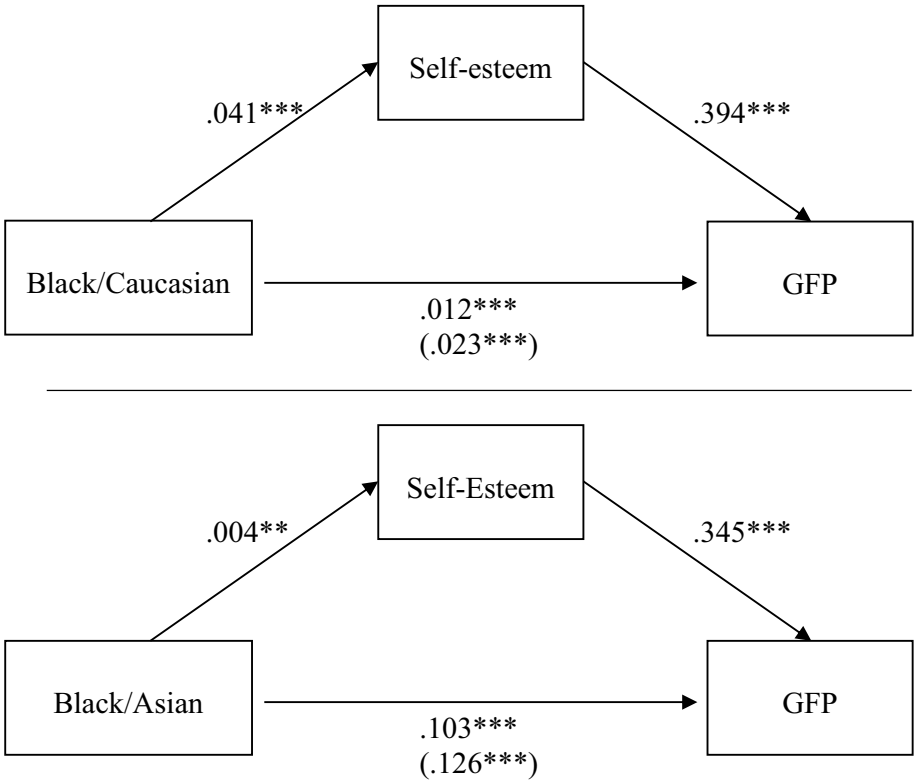

Fig. 1. Self-esteem partially mediates the relationship between ethnicity and the GFP. Note. *p < .05, **p < .01, ***p < .001. Parentheses contain standardized regression coefficient between ethnicity and the GFP without controlling for self-esteem.

larger ethnic groups are substantive, even if differences between large ethnic or racial groups are uninterpretable.

The findings in studies 1–5 are comparable to the phenomenon labelled "Rushton's Paradox" in intelligence research (Meisenberg & Woodley, 2013). Rushton's Paradox has to do with the fact that even though the general factor of intelligence (*g*) is related to LH traits when analyzing differences between countries, regions, and ethnic groups, there is no correlation between *g* and LH strategy at the level of the individual (Dunkel, Cabeza de Baca, et al., 2014; Woodley, 2011; Woodley & Madison, 2015). One plausible solution to Rushton's paradox is found in the discovery that there is a correlation between LH strategy and cognitive specialization (Woodley, 2011). People with slower LH strategies tend to have more differentiated cognitive ability profiles (i.e., the correlations between different kinds of cognitive abilities are weaker for people with slower LH strategies; see Figueredo et al., 2015; Woodley, 2011). This theory, called Cognitive Differentiation-Integration Effort theory, has been extended to be applicable to all LH traits rather than just intelligence. This more inclusive theory is called Strategic Differentiation-Integration Effort theory, and posits that slower life histories should predict greater differentiation of all LH traits in addition to intelligence (Figueredo et al., 2013, 2015). This theory has been tested in multiple populations, and all tests have lent support to the idea that LH traits are more differentiated among slower LH groups and individuals (Fernandes & Woodley, 2013; Figueredo et al., 2013; Woodley & Fernandes, 2014). The current paradox might be resolved, then, if it were found that the correlations among Big Five personality traits were strongest in Blacks and weakest in Asians, with Caucasians intermediate. I test for this possibility in study 6.

5. Study 6

5.1. Methods

All participants and descriptive statistics for study 6 are the same as in studies 1–4. In order to compute the covariation of personality traits, I calculated the mean bivariate correlations among the Big Five traits (plus "agency" from study 4) for each group from each study. First, each bivariate correlation was squared, and then the average of the r^2 values for each ethnic group was taken as the degree of covariation for that group (Lukaszewski, Gurven, Rueden, & Schmitt, 2017).

5.2. Results

The covariation values are reported in Table 6.

In all four samples, Blacks had the highest degree of covariation, lending some support for differential-K theory. However, Asians and Caucasians had very similar amounts of covariation. In the only study in which there was a relatively large difference in covariation between Asians and Caucasians (study 1), Asians had a greater level of covariation, opposite to what would be predicted by differential-K theory.

5.3. Discussion

The finding that Blacks tend to have greater covariation of personality traits can be interpreted in at least two ways. According to Rushton's (1985) differential-K theory, Black individuals have, on average, a faster LH due to underlying genetic differences. However, covariation among personality traits may also be caused by

Table 6
Covariation of personality traits for each group, studies 1–4.

Study	Asian	Caucasian	Arab	Black
1	0.045	0.032	N/A	0.058
2	0.027	N/A	0.032	0.052
3	0.021	0.020	0.019	0.030
4	N/A	0.107	N/A	0.170

socioecological factors (Lukaszewski et al., 2017). Black individuals are more likely to develop in poverty-stricken and/or unstable environments. Specialization (or more generally, adopting a slow LH strategy) is usually a poor strategy for those who find themselves in unstable, unpredictable environments (Brumbach et al., 2009; Del Giudice, Ellis, & Shirtcliff, 2011; Figueredo et al., 2015; Hertler et al., 2018). This is partly because there is no guarantee that the niche to which one becomes specialized for will exist for long in a highly unstable ecology or that one will live long enough to take advantage of highly specialized skills (Hertler et al., 2018). On the other hand, being a generalist can be especially advantageous in an unstable ecology because generalist abilities and dispositions allow one to be ready for unexpected threats and opportunities. Since there's good reason to suspect that Black individuals tend to be exposed to more cues indicating an unstable environment during development, it is not surprising that they tend to show less strategic differentiation of personality traits (Ellis & Giudice, 2017; Nettle, Frankenhuis, & Rickard, 2014). Since Caucasians did not tend to have more covariation than Asians, this finding does not unambiguously resolve the disconnect between the GFP and the hypothesized LH strategy differences between ethnic groups according to differential-K theory.

6. Conclusion

I have shown consistent ethnic group differences on mean levels of the GFP such that Blacks > Caucasians > Asians. I tested the hypothesis that these results could be accounted for by differences in average levels of self-esteem and found that they could not because Asians had higher levels of self-esteem than Caucasians. However, self-esteem did partially mediate the difference between Caucasians/Asians and Blacks. Furthermore, I showed that this paradox cannot be unambiguously resolved by observing the covariation of personality traits by ethnic group because Asians had similar or greater levels of covariation compared to Caucasians. However, Blacks showed more covariation than Asians and Caucasians, which may partially resolve the paradox. These results suggest that either a) the GFP should not be considered a pure measure of life history strategy, b) differential-K theory does not fully account for life history variation among ethnic/racial groups, or c) both. I conclude that, while the predictive power of the GFP suggests that it is substantive, the differences in the GFP between large ethnic or racial groups probably don't reflect actual differences in personality. Researchers may therefore benefit by controlling for ethnicity when studying outcome measures associated with the GFP.

Declaration of competing interest

None.

This work has not been previously published elsewhere nor is it under consideration for publication elsewhere.

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