



Light and dark trait subtypes of human personality – A multi-study person-centered approach



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ABSTRACT

Is human nature good or evil? Light or dark? Machiavelli described human nature as selfish and greedy. Abraham Lincoln appealed to the better angels of our nature. Drawing on primate research and human personality science we provide insight into this centuries-old debate. Latent profile analyses of self-reports from two general population samples (Total $N = 36,788$) uncovered distinct personality subtypes, a “dark” trait profile (Machiavellian, narcissistic, psychopathic traits), a “light” trait profile (Kantianism, humanism, faith in humanity), and a “middle” subtype threading between the other two. The light subtype evidenced affiliative interpersonal functioning and greater trust in others, as well as higher life satisfaction and positive self-image. The dark subtype reflected interpersonal dominance, competitiveness, and aggression. In both general population samples, the dark trait subtype was the least prevalent. However, in a third sample of U.S. Senators ($N = 143$), based on observational data, the dark subtype was most prevalent and associated with longer tenure in political office, though less legislative success. Results suggest that human nature reflects both light and dark features, serving affiliative (pro-social) and dominance (pro-self) functions, with subtype prevalence varying considerably based on profession.

“On the whole human beings want to be good, but not too good, and not quite all the time.”

George Orwell, *The Art of Donald McGill* (1941)

1. Introduction

1.1. What is human nature?

A Roman proverb, “Homo homini lupus” (man is wolf to man), suggests we have a dark disposition. Yet, renowned primatologist Frans de Waal (2005) proposes that we have both “light” (affiliative) and “dark” (aggressive) proclivities shared with our closest living relatives, the bonobos and the chimpanzees. As quoted above, Orwell also believed in some potential for human good. While humans have and continue to commit alarming acts of violence (Harari, 2014), it also is

the case that rates of violence have decreased across human history (Pinker, 2012). Thus, human nature appears to reflect both light and dark tendencies. Certainly, some people have more dark traits than others (Neumann & Hare, 2008), but what is less known are the proportions of light and dark traits in society.

The extent to which individuals display light versus dark propensities has implications for how our society functions, particularly in terms of knowing who we can trust, and who we should be wary of, who is benevolent and who is malevolent (Kaufman, Yaden, Hyde, & Tsykayama, 2019). As a social species, human societies are built on trust and cooperation (Ostrom, 2000). Trust is so vital to human society that people often trust and cooperate with strangers. In economic games, people choose to share personal resources with unknown individuals in the hope that returns of that investment will be shared (Fetchenhauer & Dunning, 2009). Bonobos also display similar trusting

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behaviors, even with unfamiliar non-group members (Tan, Ariely, & Hare, 2017). Interestingly, chimpanzees will only trust group members who are friends (Engelmann & Herrmann, 2016). Despite the benefits of trust, it is also an act of social risk-taking, leaving the trusting party vulnerable to exploitation by the trustee. Differences in social trust may be linked to why people vary in light versus dark trait propensities. Research suggests that light versus dark traits, respectively, are associated affiliation and cooperation versus dominance and aggression (Kaufman et al., 2019; Muris, Merckelbach, Otgaar, & Meijer, 2017). Also, evidence suggests that affiliative and dominance motivations shape personality trait expression (Hawley, 2014; Zeigler-Hill, Southard, & Besser, 2014).

It is likely that these different means of navigating through the world go back a long way in our early history, and thus, are firmly rooted in our human psychology (Brosnan & de Waal, 2014; Christov-Moore et al., 2014; de Waal, 2013). Indeed, apes display personality features consistent with human traits (Martin & Suarez, 2017; Weiss et al., 2015). Shared personality features across humans and apes support de Waal's (2005) proposal that we can understand our human nature by considering our closest living relatives. Drawing on comparisons to bonobo and chimpanzee societies we sought evidence for distinct light and dark trait human personality profiles and whether they were linked with affiliative (*pro-social*) versus dominance (*pro-self*) functions, respectively.

1.2. Personality: The Dark and Light Triads

The study of personality provides a window into our human nature (Soto, 2019). Personality involves consistent styles of thinking, feeling, and behaving, often measured in terms of traits, which are heritable but also shaped by experiences (Briley & Tucker-Drob, 2014; Kandler, 2012). The Dark Triad (narcissism, Machiavellianism, subclinical psychopathy; Furnham, Richards, & Paulhus, 2013) has become popular for the study of dark personality traits (DTs), given their links to aggression, erratic behavior, aversive relationships, socioemotional deficits, low well-being, and amoral behavior (Muris et al., 2017). It appears that elevated levels of DTs are present in approximately 5% to 25% of individuals across the globe (Neumann, Schmitt, Carter, Embley, & Hare, 2012). Males show elevations on all three dark trait domains compared to females, most prominently psychopathy (Muris et al., 2017). Notably, psychopathy has a robust inverse association with empathy (Seara-Cardoso, Queirós, Fernandes, Coutinho, & Neumann, 2019), and as it turns out, higher levels of empathy usually seen in females are linked with stronger activation of the neurobiological system involved in empathy (Schulte-Rüther, Markowitsch, Shah, Fink, & Piefke, 2008). Finally, psychopathic traits are the most virulent of the DTs (Vize, Collison, Miller, & Lynam, 2018), and are linked with aggressive antisociality in offender, psychiatric, and general population samples (Neumann, Hare, & Pardini, 2015).

The DTs are robustly associated with social dominance (Muris et al., 2017; Vize et al., 2018) and interpersonal competition. In mixed-motive negotiation scenarios, psychopathic traits predict greater personal monetary gains when success favors competition, but monetary loss when success depends on cooperation (ten Brinke, Black, Porter, & Carney, 2015). This competitive (*pro-self*) orientation may promote individual advancement in hierarchical structures, given DTs are linked with desire for power (Kaufman et al., 2019) and money (Foulkes, Seara-Cardoso, Neumann, Rogers, & Viding, 2014). It is estimated that the prevalence of psychopathy in high-level managers is about 4%—considerably higher than the general population (~1%; Babiak, Neumann, & Hare, 2010; Neumann & Hare, 2008). Bosses with DTs hold influential positions, despite bullying employees and poor performance as managers (Babiak et al., 2010; Mathieu, Neumann, Hare, & Babiak, 2014).

Recently, Kaufman and colleagues have attempted to balance out the DT literature by investigating light traits (LTs), which reflect a

benevolent (*pro-social*) orientation toward others. The Light Triad Scale (LTS; Kaufman et al., 2019) measures *Faith in Humanity* (believing in the fundamental goodness of humans), *Humanism* (valuing the dignity and worth of individuals), and *Kantianism* (treating people as ends unto themselves). In a multi-sample study, Kaufman et al. (2019) found that LTs and DTs were only moderately negatively correlated (-0.48), indicating that these domains are not simply two sides of the same coin and the presence of DTs does not necessarily indicate the absence of LTs, and vice-versa. Indeed, it is likely that people display differing levels, more or less, of LTs and DTs. Nevertheless, the LTs and DTs have a diversity of different external correlates. Thus, while dark trait research has been growing exponentially, the LTS provides an avenue for research on the humane aspects of our nature, and perhaps on propensities that are aligned with self-actualization and greater connectedness (Kaufman, 2020).

While the LTs and DTs are related to general personality, they offer something more in terms of capturing individual differences in human personality (Veselka, Schermer, & Vernon, 2012). For example, the LTs and DTs are strongly correlated (+ & - respectively) with general traits of honesty-humility and agreeableness, yet LTs and DTs account for a range of pro- and anti-social correlates beyond these general traits (Kaufman et al., 2019; Muris et al., 2017), including relatedness to others and gratitude (Kaufman et al., 2019) versus counter-productive workplace behavior (Cohen, Panter, Turan, Morse, & Kim, 2014; Scherer, Baysinger, Zolynsky, & LeBreton, 2013), aggression (Dinić & Wertag, 2018), and violence (Westhead & Egan, 2015). In essence, the dark traits are aligned with self-interest (Jonason, Strosser, Kroll, Duineveld, & Baruffi, 2015) and motives related to hedonism, power (Kajonius, Persson, & Jonason, 2015; Kaufman et al., 2019), and money (Foulkes et al., 2014; ten Brinke et al., 2014), each of which highlights a link with social dominance, while LTs are associated with social connectedness (affiliation).

More broadly, the LTs and DTs are associated (+ & - respectively) with intimacy, empathy, and compassion, as well as age (Kaufman et al., 2019). While there is an evolving literature on DTs and increased utilitarian moral reasoning (Bartels & Pizarro, 2011), one factor that appears relevant is DTs are associated with less adversity to doing harm to others (Conway & Gawronski, 2013; Duke & Bègue, 2015). Finally, among U.S. Senators, LTs (vs. DTs) have been shown to predict better legislative success via greater cooperation (ten Brinke, Liu, Keltner, & Srivastava, 2016). Evidence of LTs and DTs in a sample of U.S. Senators signifies the extent and implications of such traits in society.

Unfortunately, most LT-DT studies to-date have been variable-centered, which only provides information about variables aggregated across groups of individuals. In contrast, a person-centered approach provides information about individuals assessed on a set of variables. Latent profile analysis is a statistical method that clusters (subtypes) individuals in terms of unique profiles (Neumann, Vitacco, & Mokros, 2016). This person-centered approach provides an opportunity to study people with different trait profiles, such as those who display prominent LTs and lower DTs (and vice-versa), which can then be linked with different life strategies (Zeigler-Hill et al., 2014). As it turns out, emerging research suggests individuals do manifest different LT-DT (person-centered) profiles (Cohen et al., 2014), and these can be grounded in primate research (de Waal, 2005).

1.3. Ape nature

Chimpanzees resemble the darker side of human nature, using aggression to compete for dominance and access to sexual resources, with a lone male occupying the top of the hierarchy. In contrast, bonobos are relatively more peaceful, using sexual behavior to resolve conflict. In bonobo societies, unrelated individuals—particularly females—form affiliative relationships and share social influence (Parish, De Waal, & Haig, 2000). As de Waal (2005) puts it, “If the chimpanzee is our demonic face, then the bonobo must be our angelic one” (p. 30). Indeed,

psychopathic features have been identified in chimps (Lilienfeld, Gershon, Duke, Marino, & de Waal, 1999). Thus, given our long evolutionary lineage with these apes (de Waal, 2005), we sought evidence for distinct human LT-DT profiles and hypothesized they would be differentially linked to affiliation and dominance as reflected in intra- and inter-personal characteristics, consistent with the literature (Kaufman et al., 2019; Muris et al., 2017).

2. The present studies

If humans display a blend of the light and dark features that characterize our closest living relatives, a person-centered approach can be used to elucidate individual trait profiles (Cohen et al., 2014; Hallquist & Wright, 2014) and then determine whether certain profiles have distinct correlates (Neumann et al., 2016). In our first study, a very large sample (30 k+) was used to identify light and dark trait subtypes. In line with previous research, a 3-class (subtype) solution was expected to emerge with subtypes reflecting “light” (LTs > DTs) and “dark” (DTs > LTs) profiles, as well as a “middle” subtype that threaded between the two others (Cohen et al., 2014). Based on the literature, the light subtype was expected to report higher life and job satisfaction, relative to a dark subtype (Jonason, Wee, & Li, 2015; Muris et al., 2017). Next, we sought to replicate these subtypes using a large general population sample and further validated the subtypes via a range of intra- and interpersonal variables reflecting affiliation (e.g., empathy) versus dominance (e.g., aggression). We hypothesized that the light subtype profile would manifest higher life satisfaction and better intra- and interpersonal functioning, compared to the other subtypes. Specifically, we expected the light subtype would display greater affiliation in terms of positive attachment, and positive view of and empathy for others, as well as more positive view of self. For the dark subtype profile, we expected it would be linked with dominance in terms of aggression and desire for money (Kaufman et al., 2019), more avoidant attachment, as well as utilitarian thinking (Duke & Bègue, 2015). Based on previous primate (de Waal, 2005) and human research (Cohen et al., 2014; Kaufman et al., 2019; Muris et al., 2017), we expected more females would represent the light subtype and that this subtype would be older. Variables tapping religious/spiritual experiences were also included, given their potential relevance to light/dark traits, though no hypotheses were generated for these. Finally, using a sample of U.S. Senators, we expected a greater proportion of dark versus light subtypes, given the naturally competitive nature of politics, and that the former would have greater political tenure (dominance), but less co-sponsors for their bills (cooperation). All three studies involved secondary data analyses.

3. Study 1 (archival sample)

To uncover evidence for the hypothesized profiles, Study 1 relied on an archival sample ($N = 35,270$) from visitors to an educational website (scottbarrykaufman.com/lighttriadscale/) designed for people to anonymously explore their own light and dark traits. The subtypes were validated in terms of life satisfaction and job satisfaction.

3.1. Method

3.1.1. Archival sample characteristics

The mean age of website visitors was 36.40 ($sd = 13.93$) with 18,913 males (54%) and 16,357 females (46%). For education, 27% reported professional degrees (MA/PhD/JD/MD), 39% Bachelor's, and 20% high school degrees. Regarding income range, 41.4% reported a 12-month income level of < 35 k. Other income ranges (% individuals) were as follows, 35–49 k (15.5%), 50–74 k (16.7%), 75–99 k (10.1%), 100 k or greater (16.2%). Country of origin reported was primarily the United States (51.3%), Great Britain (10.7%), Canada (6.2%) or outside one of these three countries (29.3%). There were 2.5% of individuals who skipped this question.

3.2. Measures

3.2.1. LPA indicators

3.2.1.1. Light Triad Scale (LTS; Kaufman et al., 2019). The 12-item LTS has three scales assessing *Faith in Humanity* (believing in the fundamental goodness of humans), *Humanism* (valuing the dignity and worth of individuals), and *Kantianism* (treating people as ends unto themselves). Each item is rated on a five-point scale, from strongly disagree to strongly agree. Scale scores were represented by proportion of endorsement (i.e., mean item score/5).

3.2.1.2. Dark Triad Scale. A standard DT scale, the Dirty Dozen (Jonason & Webster, 2010: doi.org/10.1037/a0019265) was used to assess dark traits: Machiavellianism (MAC), psychopathy (PSY), and Narcissism (NAR). Each item is rated on a five-point scale, from strongly disagree to strongly agree. DT scales were represented by proportion of endorsement.

3.2.2. LPA subtype validation variables

3.2.2.1. Life satisfaction and job satisfaction. Each of these domains were assessed via a single question (How satisfied are you with your life/job?) using a 7-point scale (1 = not at all to 7 = very satisfied).

3.3. Analytic strategy

Latent profile analysis (LPA) was used to identify subtypes of individuals based on the LTS and DT scales. LPA is a variant of finite-mixture modeling used to identify nominal variables that underlie continuous data and classifies individuals who are similar on the indicators into latent classes (Hallquist & Wright, 2014; Vermunt & Magidson, 2006). The Bayesian Information Criterion (BIC) and sample-size adjusted BIC are considered reliable indices for selecting the optimal model (Nylund, Asparoutiov, & Muthen, 2007). Models with lower BIC values are preferred, and similarly for the Akaike Information Criterion (AIC). The Lo-Mendel-Rubin (LMR) likelihood difference compares the fit of two nested models that differ by one class, and a significant p -value indicates that a model fits significantly better than a model with one less class. Theoretical considerations and classification accuracy are also useful for selecting optimal models (Neumann et al., 2016). Viable LPA solutions are obtained when the average latent class probabilities for the most likely class membership are ≥ 0.80 (Rost, 2006). Monte Carlo simulations indicate larger samples, more indicators, and greater degree of class separation help to uncover the true latent class solution (Tein, Cox, & Cham, 2013). For the current study, $N = 35\text{ k}+$, LPA indicators = 6, and class separation was expected to be large (partial $\eta^2 > 0.20$). All LPAs were conducted in Mplus (Muthén & Muthén, 2013) using full information maximum likelihood estimation. Subtype validation was conducted via multivariate analysis of variance (MANOVA). For each MANOVA, a gender factor was included to check for subtype \times gender interactions. Significant multivariate effects for subtype were followed up with planned comparisons (Light vs. Dark; Light vs. Middle; Middle vs. Dark). Effect sizes are reported as partial η^2 or Cohen's d .

3.4. Results

3.4.1. Latent profile analysis (LPA)

Study 1 results indicated a 3-class solution was best, given little change in BIC/AIC between the 3- and 4-class solutions (See Fig. 1). Class separation average effect size was large ($\eta^2 = 0.36$) for the 3-class model, classification accuracy was good ($M = 0.89$), and better than a 4-class solution ($M = 0.84$). The LRT was not helpful in determining class solution, given it continued to show significance with increasing numbers of latent classes, despite poorer classification accuracy. For the subtypes, 7% represented the DT > LT (“dark”) subtype, 50% the LT > DT (“light”) subtype, and 43% a “middle” subtype (see Fig. 2).

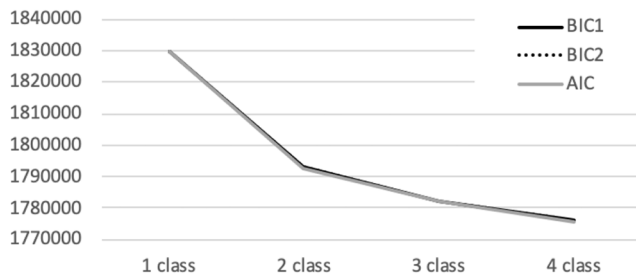


Fig. 1. LPA model fit indicators highlighting 3-class solution as optimal.

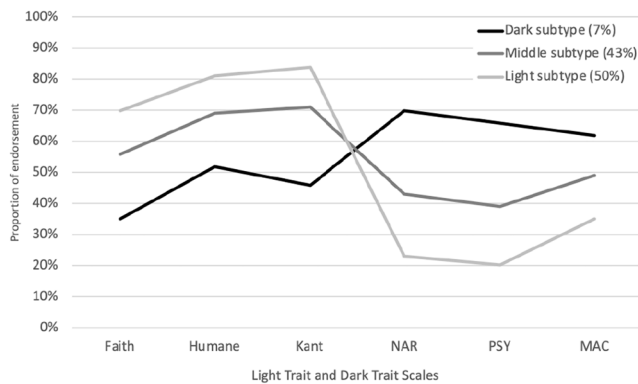


Fig. 2. Light, Dark, and Middle trait subtypes. Note. Faith = Faith in humanity, Humane = Humanism, Kant = Kantianism, NAR = Narcissism, PSY = Psychopathy, MAC = Machiavellian.

3.4.2. Subtype demographics

As predicted, more females (59% vs 41% males) evinced a light trait (LT > DT) profile and many more males (76% vs 24% females) a dark trait (DT > LT) profile. The middle trait profile also had more males (62% vs females 38%), $\chi^2(2) = 1785.55, p < .001$. There were age differences, $F(2,32,136) = 998.37, p < .001, \eta^2 = 0.06$. On average, light subtypes were the oldest ($M = 40.01, SD = 14.46$), followed by the middle subtypes ($M = 34.25, SD = 13.02$), and dark trait subtypes the youngest ($M = 29.42, SD = 10.36$). As such, age was included as a covariate in subtype validation analyses. The subtypes also differed in education level, $\chi^2(4) = 332.50, p < .001$. Proportions of high school, bachelor's, and professional degrees, respectively, by subtype were, light (16%, 39%, 45%), middle (22%, 40%, 38%) and dark (30%, 38%, 32%). Thus, education level was included as a factor in validation analyses. The subtypes showed few differences in income range, $F(2,23,945) = 3.37, p = .040, \eta^2 = 0.00$, when gender, $F(1,23,945) = 50.07, p < .001, \eta^2 = 0.00$, and education level, $F(2,23,945) = 163.37, p < .001, \eta^2 = 0.01$, were included as factors, as well as the age covariate, $F(1,23,945) = 2166.81, p < .001, \eta^2 = 0.08$. The only significant interaction was for subtype \times gender, $F(2,23,945) = 6.70, p < .01, \eta^2 = 0.00$, which involved modest gender differences (males > females) for the light subtypes ($d = 0.04$). However, results for income are limited, given the light (25%), middle (30%), and dark (38%) subtypes differed in proportions of those who did not report income range, $\chi^2(2) = 208.91, p = .000$.

3.4.3. Subtype validation

A 3-way MANOVA (Subtype \times Gender \times Education level) with age as covariate was used to examine the life and job satisfaction DVs. None of the interactions were significant (p 's > 0.05). The largest main effect was for subtype, $F(4,50,110) = 141.71, p < .001$; Wilk's $\Lambda = 0.977, \eta^2 = 0.01$, followed by education level, $F(4,50,110) = 43.49, p < .001$; Wilk's $\Lambda = 0.993, \eta^2 = 0.00$, and gender, $F(2,25,055) = 4.62, p < .01$; Wilk's $\Lambda = 0.990, \eta^2 = 0.00$. The age covariate effect was also significant, $F(2,25,055) = 178.84, p < .001$;

Wilk's $\Lambda = 0.985, \eta^2 = 0.01$.

Planned comparisons indicated the light subtype reported greater life satisfaction ($M = 5.34, SD = 1.53$) and job satisfaction ($M = 5.09, SD = 1.74$), respectively, compared to the middle subtype (life satisfaction: $M = 4.75, SD = 1.64$; job satisfaction: $M = 4.65, SD = 1.75$) ($\eta^2 = 0.03, p < .001$; $\eta^2 = 0.02, p = .000$) and the dark subtype (Life: $M = 4.24, SD = 1.80$; Job: $M = 4.29, SD = 1.84$) ($\eta^2 = 0.04, p = .000$; $\eta^2 = 0.02, p < .001$). In contrast, the middle and dark subtypes displayed no substantive differences in life or job satisfaction (Life: $\eta^2 = 0.00$; Job: $\eta^2 = 0.00$).

4. Study 2 (MTurk/prolific academic sample)

Using Kaufman et al. (2019) data, LPA was conducted with LTs-DTs and normal range trait variables. We sought to replicate the 3-class solution and test the incremental classification accuracy of the LT-DTs compared to normal range traits. Research suggests the former are not psychometrically (Kaufman et al., 2019) or genetically (Veselka et al., 2012) isomorphic with the latter. We expected females to primarily represent the light subtype (Cohen et al., 2014), and this subtype would report higher life satisfaction. In addition, based on a wealth of literature of dark traits (Muris et al., 2017), we expect the dark subtype would display more dominance motives (e.g., aggression, desire for money) and the light subtype more affiliative motives (e.g., close attachment, empathy) via a set of variables reflecting intra- and interpersonal functioning.

4.1. Method

4.1.1. Participants

In Kaufman et al. (2019), the authors relied on a variable-centered approach (i.e., data aggregated across individuals to ascertain variable associations). These same data were used for the current study, though original person-centered analyses (LPA) were conducted on the aggregate sample of 1518 participants from Kaufman et al., based on four diverse samples recruited using two different data collection platforms (MTurk & Prolific Academic). The mean age for participants was 35.49 ($SD = 11.45$), and 52.6% were females. For education, 11% reported professional degrees (MA/PhD/JD/MD), 39% Bachelor's, 35% some college, and 14% high school degrees. The majority of the sample identified as White (83.25%) with the remainder of the sample mostly identifying as either Hispanic, Latino, Black, or Asian. Most participants resided in the United States (82%) with smaller proportions from the United Kingdom or Ireland (18%).

4.2. Measures

Detailed information on Study 2 measures can be found in Kaufman et al. (2019) and supplementary material (<https://www.frontiersin.org/articles/10.3389/fpsyg.2019.00467/full#supplementary-material>).

4.2.1. LPA indicators

4.2.1.1. *Light Triad Scale.* The LTS (LTS; Kaufman et al., 2019) used in Study 1 was used for Study 2. Scale scores were represented by proportion of endorsement.

4.2.1.2. *Dark trait assessments.* All DT scales were represented by proportion of endorsement.

4.2.1.3. *Short Dark Triad.* Short Dark Triad (SD3; Jones & Paulhus, 2014) was the primary DT measure used for all but one of the Kaufman et al. (2019) studies. It is a 27-item self-report questionnaire that measures Dark Triad traits, divided into three nine-item subscales: Machiavellianism (i.e., "It's not wise to tell your secrets"), narcissism (i.e., "People see me as a natural leader"), and psychopathy (i.e., "I like

to get revenge on authorities”). SD3 questions are on a five-point scale, with options ranging from “disagree strongly to “agree strongly”. See doi.org/10.1177/1073191113514105

4.2.1.4. The Psychopathic Personality Inventory – Short Form (PPI-SF; Tonnaer, Cima, Sijtsma, Uzieblo, & Lilienfeld, 2013). The eight-item Machiavellianism-Egocentricity (“I sometimes try to get others to ‘bend the rules’ for me) was used in one of the Kaufman et al. (2019) studies. Each item is rated on a four-point scale, “false,” “mostly false,” “mostly true,” and “true.” See, doi: <https://doi.org/10.1007/s10862-012-9333-2>.

4.2.1.5. The Triarchic Personality Measure. The Triarchic Personality Measure (TriPM; Patrick, 2010), was administered in one of the Kaufman et al. (2019) studies to assess Psychopathy. It is a 58-item self-report measure that proposes three components: boldness (i.e., “If I really wanted to, I could convince most people of just about anything”), meanness (i.e., “I get a kick out of startling or scaring other people”), and disinhibition (i.e., “I generally prefer to act first and think later”). Each item is rated on a four-point scale, “false,” “somewhat false,” “somewhat true,” or “true.” For more see, <https://patrickcnslab.psy.fsu.edu/wiki/images/b/b2/TPMmanual.pdf>.

4.2.1.6. The Five-Factor Narcissism Inventory-Short Form (FFNI-SF). The Five-Factor Narcissism Inventory-Short Form (FFNI-SF) is a 60-item short form of the original Five-Factor Narcissism Inventory (FFNI; Glover, Miller, Lynam, Crego, & Widiger, 2012). Used in one of the Kaufman et al. (2019) studies, it is designed to assess the basic elements of narcissism from the perspective of a five-factor model. For more see, doi: <https://doi.org/10.1080/00223891.2012.670680>

4.2.1.7. HEXACO Personality Inventory-Revised: Honesty Humility. HEXACO Personality Inventory-Revised: Honesty Humility (HEXACO-60, Ashton & Lee, 2009) is one of six subscales comprising the HEXACO personality inventory. It contains 10 items divided into four facets: *sincerity* (e.g., “I wouldn't pretend to like someone just to get that person to do favors for me”), *fairness* (e.g., “I would never accept a bribe, even if it were very large”), *greed-avoidance* (e.g., “Having a lot of money is not especially important to me”), and *modesty* (e.g., “I want people to know that I am an important person of high status”; reversed). Each item is rated on a five-point scale from “disagree strongly” to “agree strongly.” For more see, doi: <https://doi.org/10.1080/00223890902935878>.

4.2.1.8. The Big Five Inventory-2. The Big Five Inventory-2 (BFI-2; Soto & John, 2017) is a 60-item scale that measures facets for each of the Big Five domains of personality. The current study used facets from the Agreeableness domain (*compassion, respectfulness, trust*). Items are rated on a five-point scale from “disagree strongly” to “agree strongly.” For more see, doi: <https://doi.org/10.1037/pspp0000096>

4.2.2. LPA subtype validation variables

4.2.2.1. Cognitive, Affective, and Somatic Empathy Scale. Cognitive, Affective, and Somatic Empathy Scale (CASES, Raine & Chen, 2018) is a 30-item measure containing three subscales. We administered the 10-item cognitive empathy subscale, which refers to the capacity to cognitively understand how others feel, and the 10-item affective empathy subscale, which refers to the capacity to experience the emotions of how others feel. Item were rated on a three-point scale “rarely,” “sometimes,” or “often.” For more see, doi.org/10.1080/15374416.2017.1295383

4.2.2.2. Reactive-Proactive Aggression Questionnaire. Reactive-Proactive Aggression Questionnaire (RPQ, Raine et al., 2006) is a 23-item scale that measures the two aggression domains, reactive and proactive aggression. Participants were asked “how often” they agree with

aggression related acts, with response options including 0 (never), 1 (sometimes), or 2 (often). For more see, doi: <https://doi.org/10.1002/ab.20115>

4.2.2.3. Utilitarian moral dilemmas. Utilitarian Moral Decision-Making was assessed using three condensed versions of high-conflict personal dilemmas—*crying baby, footbridge, sacrifice*—in accordance with Glenn, Raine, and Schug (2009). Participants were asked to rate how morally acceptable they found utilitarian actions (ones that are harmful but benefit the greater good) on a seven-point scale with 1 indicating “extremely inappropriate” to 7 indicating “extremely appropriate.” For more see, doi: <https://doi.org/10.1038/mp.2008.104>

4.2.2.4. Dictator game. An experimental economic task in which participants decide how much, if any, of the money awarded to them by the experimenter they wish to donate to *Save the Children*, without any negative consequences. Participants were informed that they would be given an additional \$0.70 for their participation in the study and were asked how much they would be willing to donate.

4.2.2.5. Spiritual experiences (Yaden & Newberg, in prep). Participants were asked: “Have you had a spiritual experience, such as brief, intense, and vivid subjective experiences involving perceiving an unseen order or connecting to something larger than yourself? Spiritual experiences were rated on a five-point scale, “definitely not” to “definitely yes.”

4.2.2.6. The Varieties of Religious Experience Scale (Yaden & Newberg, in prep). This scale operationalized William James's (1902) *The Varieties of Religious Experience*. Participants were asked to indicate the extent to which they have had an experience involving a sense of unity, with items such as “I felt a sense of oneness with all things” or of God/divinity, with items such as “I felt that I encountered the divine.” Participants rated the extent to which they had such experiences on a seven-point scale, ranging from “strongly disagree” to “strongly agree.”

4.2.2.7. How religious & spiritual. Participants were asked how religious and how spiritual they considered themselves to be on a four-point scale to report their religious views: [0] Not religious [1] Somewhat religious [2] Very religious [3] Extremely religious.

4.2.2.8. The Cognitive Triad Inventory. The Cognitive Triad Inventory (CTI; Beckham, Leber, Watkins, Boyer, & Cook, 1986) is a 30-item questionnaire that measures persons perceptions of their self (e.g., “I am a failure” reversed), world (e.g., “The world is a very hostile place” reversed), and future (e.g., “Things will work out for me in the future”). This scale was coded in the positive direction (i.e., better sense of self, world, future) and each item is on a five-point scale, ranging from “disagree strongly” to “agree strongly.” For more see, doi.org/10.1037/0022-006X.54.4.566

4.2.2.9. Beliefs about goodness. Participants rated agreement with the statements “Humans are good” and “I am good” on a five-point scale, ranging from “disagree strongly” to “agree strongly.”

4.2.2.10. The Adult Attachment Scale-Revised. The Adult Attachment Scale-Revised (AAS; Collins, 1996) is an 18-item scale that measures two attachment styles of adults: *anxious* (e.g., “I often worry that romantic partners won't want to stay with me”) and *avoidant* (e.g., “Romantic partners often want me to be emotionally closer than I feel comfortable being”). Since the avoidant attachment subscale contains items reflecting two related but different content domains, we also computed in the positive direction separate subscales reflecting whether people can depend on others (Depend) and whether they can get close to others (Close). For more see, doi.org/10.1037/0022-3514.71.4.810

4.2.2.11. *Life Satisfaction.* Life satisfaction was assessed via the Satisfaction with Life Scale (SWLS; Diener et al., 1985), a self-report measure with five items. For the current study items were rated on a five-point scale, ranging from “strongly disagree” to “strongly agree.” For more see, doi: https://doi.org/10.1207/s15327752jpa4901_13

4.3. Analytic strategy

The same LPA approach used in Study 1 was employed for Study 2, except for the added component of assessing incremental validity of the DT-LTs. The LT and DT scales, with and without the Honesty-Humility facets (Sincerity, fairness, greed-avoidance, modesty) and Big Five Inventory Agreeableness facets (compassion, respectfulness, trust), were used in the LPAs. Similar to Study 1, subtype validation was conducted via MANOVA, using sets of commensurate variables. Since the current large sample was an aggregate of four smaller samples, not all participants had data for all validation analyses.

4.4. Results

4.4.1. Latent profile analysis (LPA)

The results indicated a 3-class solution was best, with the LMR adjusted likelihood ratio test (LRT) indicating non-significance for the 4-class solution (LMR adj. LRT = 581.28, $p = .09$). Also, Fig. 3 displays little change in BICs between the 3- and 4-class solutions. Finally, the class separation average effect size was large ($\eta^2 = 0.38$) for the 3-class model, and classification accuracy was excellent ($M = 0.91$). Fig. 4 displays the subtype profiles, with 26% representing the DT > LT (‘Dark’) subtype, 33% the LT > DT (‘Light’) subtype, and 41% the ‘Middle’ subtype. The BFI-HH indicators are not shown, given they only separated the subtypes by level (low, medium, high) instead of unique trait profiles as found with the LT-DTs. The 3-class solution was also the best solution when only the LT-DT indicators were used in the LPA. In addition, LPA with only the HH-BFI indicators also revealed an optimal 3-class solution but resulted in lower classification accuracy than the full set of 13 indicators (0.85 versus 0.91), or the LT-DTs alone (0.89), thus attesting to the critical and unique role of the LT-DTs.

4.4.2. Subtype demographics

Proportionally more females (69% vs 31% males) displayed a light profile (LT > DT) and more males (66% vs 34% females) a dark trait profile (DT > LT), while the middle trait profile was roughly equal between genders (females 52% vs males 48%), $\chi^2(2) = 107.24$, $p < .000$. The three subtypes did not differ in terms of education, $F(2,1515) = 0.93$, $p > .05$, $\eta^2 = 0.001$, or income, $F(2,1517) = 0.43$, $p > .05$, $\eta^2 = 0.001$. However, there were differences in age, $F(2,1515) = 83.30$, $p < .000$, $\eta^2 = 0.100$. Light trait subtypes were oldest ($M = 39.69$, $SD = 11.45$), followed by the middle subtypes ($M = 35.53$, $SD = 10.80$), and then the dark trait subtypes ($M = 30.21$, $SD = 8.33$). Age was used as a covariate for validation analyses.

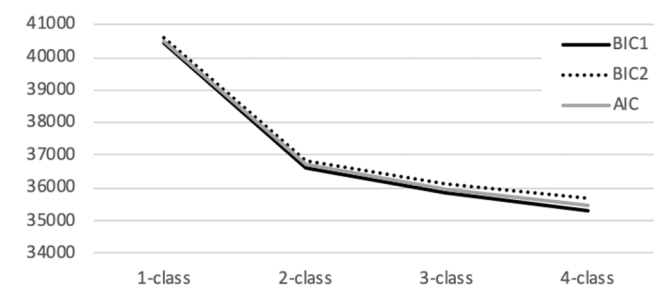


Fig. 3. Latent profile analysis (LPA) model fit indicators highlighting 3-class solution as optimal.

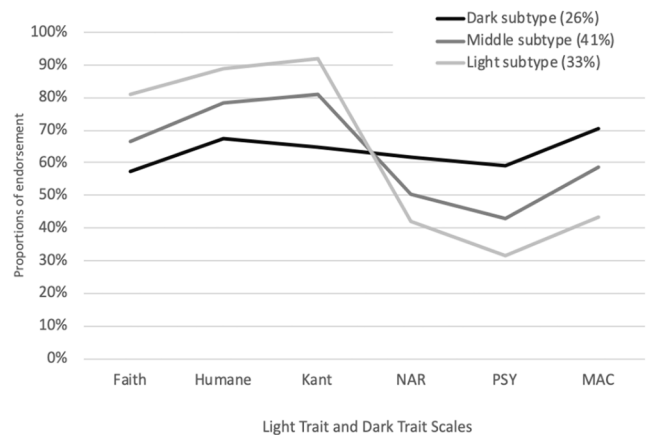


Fig. 4. Latent profile analysis (LPA) Light, Dark, and Middle trait subtypes. Note. Faith = Faith in humanity, Humane = Humanism, Kant = Kantianism, NAR = Narcissism, PSY = Psychopathy, MAC = Machiavellian.

Table 1

MANOVA effects by dependent variable (DV) commensurate set.

	F	p	Wilk's Δ	η^2
Affective, cognitive empathy, proactive, reactive aggression, dictator task, utilitarian reason				
Subtype	$F(12,1316) = 38.50$	$p < .001$	0.548	0.26
Gender	$F(6,658) = 9.56$	$p < .001$	0.920	0.08
Subtype × Gender	$F(12,1316) = 1.53$	ns	0.973	0.01
Covariate age	$F(6,658) = 1.98$	ns	0.982	0.01
God, spiritual, and oneness experiences, and degree of religiousness, spirituality				
Subtype	$F(10,1318) = 1.69$	ns	0.975	0.01
Gender	$F(5,659) = 3.77$	$p < .01$	0.972	0.03
Subtype × Gender	$F(10,1318) = 0.65$	ns	0.990	0.00
Covariate age	$F(5,659) = 1.69$	ns	0.986	0.01
Cognitive triad subscales (self, world, future)				
Subtype	$F(6,516) = 5.70$	$p < .001$	0.878	0.06
Gender	$F(3,258) = 3.37$	$p < .05$	0.962	0.04
Subtype × Gender	$F(6,516) = 1.95$	ns	0.955	0.02
Covariate age	$F(3,258) = 7.57$	$p < .001$	0.918	0.08
Sig. correlations with age: Self ($r = 0.25$, $p = .000$), World ($r = 0.24$, $p = .000$)				
“Humans are Good” and “I am Good”				
Subtype	$F(4,372) = 1.67$	$p < .001$	0.803	0.10
Gender	$F(2, 186) = 0.06$	ns	0.999	0.00
Subtype × Gender	$F(4, 372) = 0.56$	ns	0.988	0.01
Covariate age	$F(2,186) = 3.33$	$p < .05$	0.964	0.03
Sig. correlations with age: Humans are good ($r = 0.19$, $p = .009$), I am good ($r = 0.24$, $p = .001$)				
Anxious and Avoidant attachment scales				
Subtype	$F(4,518) = 7.65$	$p < .001$	0.892	0.06
Gender	$F(2,259) = 2.40$	ns	0.982	0.01
Subtype × Gender	$F(4,518) = 0.61$	ns	0.991	0.00
Covariate age	$F(2,259) = 2.78$	ns	0.979	0.01
Close and dependable attachment styles				
Subtype	$F(4,518) = 7.17$	$p < .001$	0.898	0.05
Gender	$F(2,259) = 2.76$	ns	0.978	0.02
Subtype × Gender	$F(4,518) = 2.98$	$p < .05$	0.955	0.02
Covariate age	$F(2,259) = 2.37$	ns	0.982	0.02
Life Satisfaction (ANCOVA)				
Subtype	$F(2,380) = 8.98$	$p < .001$		0.04
Gender	$F(1,380) = 0.26$	ns		0.00
Subtype × Gender	$F(2,380) = 1.15$	ns		0.00
Covariate age	$F(1,380) = 1.08$	ns		0.00

4.4.3. Subtype validation

Table 1 displays MANOVA results (Subtype x Gender with age covariate). The subtype effect was generally robust, along with some gender effects, though little evidence for subtype x gender interactions. Breakdown of the one significant interaction revealed, for the light subtypes, males had significantly higher Depend scale scores than

Table 2
External validation variable means (*M*) and standard deviations (*sd*) for LT-DT subtypes and pairwise comparison results.

Validation variables	Light (L) Subtype			Middle (M) Subtype			Dark (D) Subtype			η^2		η^2		η^2	
	M	sd	N	M	sd	N	M	sd	N	L vs D	p <	L vs M	p <	M vs D	p <
Empathy Total	31.43	5.45	220	29.72	6.05	257	22.85	7.52	193	0.30	0.001	0.02	0.01	0.20	0.001
Cognitive Empathy	1.51	0.35	220	1.45	0.35	257	1.16	0.40	193	0.18	0.001	0.01	ns	0.13	0.001
Affective Empathy	1.64	0.31	220	1.52	0.36	257	1.12	0.43	193	0.32	0.001	0.03	0.01	0.20	0.001
Aggression Total	1.33	0.18	220	1.45	0.22	257	1.73	0.36	193	0.34	0.001	0.08	0.001	0.20	0.001
Reactive Aggression	1.60	0.30	220	1.73	0.31	257	1.87	0.39	193	0.14	0.001	0.05	0.001	0.04	0.001
Proactive Aggression	1.06	0.11	220	1.16	0.19	257	1.59	0.41	193	0.45	0.001	0.09	0.001	0.33	0.001
Utilitarian Dilemmas	2.57	1.57	220	3.27	1.62	257	3.83	1.35	193	0.15	0.001	0.05	0.001	0.03	0.001
Dictator Game	1.03	0.76	220	0.75	0.73	257	0.51	0.72	193	0.11	0.001	0.03	0.001	0.03	0.01
Spiritual Experiences	2.96	1.56	220	2.85	1.43	257	2.81	1.33	193	0.00	ns	0.00	ns	0.00	ns
Oneness Experiences	3.70	2.24	220	3.95	1.96	257	3.78	1.83	193	0.00	ns	0.00	ns	0.00	ns
God Experiences	3.49	2.36	220	3.23	2.03	257	3.56	2.00	193	0.00	ns	0.00	ns	0.01	ns
How religious?	0.37	0.48	491	0.28	0.45	630	0.34	0.48	397	0.00	ns	0.01	0.01	0.00	ns
Spiritual	0.54	0.50	491	0.44	0.50	630	0.44	0.50	397	0.01	0.05	0.01	0.01	0.00	ns
Cognitive Triad Total	3.98	0.72	84	3.50	0.81	125	3.23	0.76	58	0.20	0.001	0.09	0.001	0.03	ns
CT View Self	4.10	0.86	84	3.54	0.96	125	3.14	1.00	58	0.21	0.001	0.08	0.001	0.04	0.05
CT View World	3.88	0.65	84	3.44	0.70	125	3.21	0.62	58	0.21	0.001	0.09	0.001	0.03	ns
CT View Future	3.97	0.85	84	3.52	0.98	125	3.33	0.93	58	0.11	0.001	0.05	0.01	0.01	ns
Humans Are Good	4.00	0.47	56	3.42	0.86	99	3.03	0.90	39	0.34	0.001	0.12	0.001	0.04	0.01
I Am Good	3.80	0.44	56	3.49	0.58	99	3.05	0.79	39	0.27	0.001	0.07	0.01	0.09	0.001
AAS Anxiety	2.90	1.11	84	3.16	1.06	125	3.47	1.08	58	0.06	0.01	0.01	ns	0.02	ns
AAS Avoidance	2.65	0.84	84	3.15	0.78	125	3.42	0.80	58	0.18	0.001	0.09	0.001	0.03	ns
AAS Close	3.65	0.96	84	3.03	0.90	125	2.72	0.93	58	0.19	0.001	0.10	0.001	0.03	ns
AAS Depend	3.05	0.92	84	2.68	0.80	125	2.44	0.84	58	0.11	0.001	0.05	0.01	0.02	ns
Life Satisfaction	3.65	1.23	131	3.30	1.13	149	2.97	1.14	107	0.08	0.001	0.02	0.05	0.02	ns

females ($t(82) = 2.95, p < .01, d = 0.72$).

Table 2 displays descriptive statistics for each validation variable and the overall results for each subtype comparison in terms of (partial) η^2 and *p*. In Fig. 5 are variables that maximally discriminated the light subtype from the other two subtypes. The light trait subtype reported higher life satisfaction, a more positive evaluation of self, the world and the future, more secure attachment to and positive view of others, and less utilitarian thinking or aggressive behavior, compared to both the middle and dark trait subtypes. Fig. 6 shows the light and middle trait subtypes were similar in terms of empathy compared to the dark trait subtype. Finally, the dark subtype donated less money on the Dictator task, compared to both the light ($\eta^2 = 0.11$) and middle ($\eta^2 = 0.03$) subtypes. Interestingly, there were no substantive differences on the spiritual/religious variables across subtypes.

Females were more empathic, less aggressive and utilitarian, donated more money on the dictator game, reported a greater belief in

God, sense of oneness with the rest of humanity, and spiritual experiences, and reported higher life satisfaction than males. There was more similarity between males and females for the belief statements (“Humans are good,” “I am good”) and the cognitive triad and attachment style variables (results available upon request). Subtype proportions across the variable sets were consistent with the total sample subtype proportions.

To compare Study 1 (7-point scale) and Study 2 (5-point scale) results on life satisfaction, proportions of endorsement were computed. A neutral rating equals 57% for Study 1 and 60% for Study 2. Light subtypes had the highest life satisfaction across studies and the dark subtypes reported little satisfaction with life (Fig. 7).

5. Study 3 (U.S. senators sample)

For Study 3, we sought further evidence for LT-DT subtypes, using

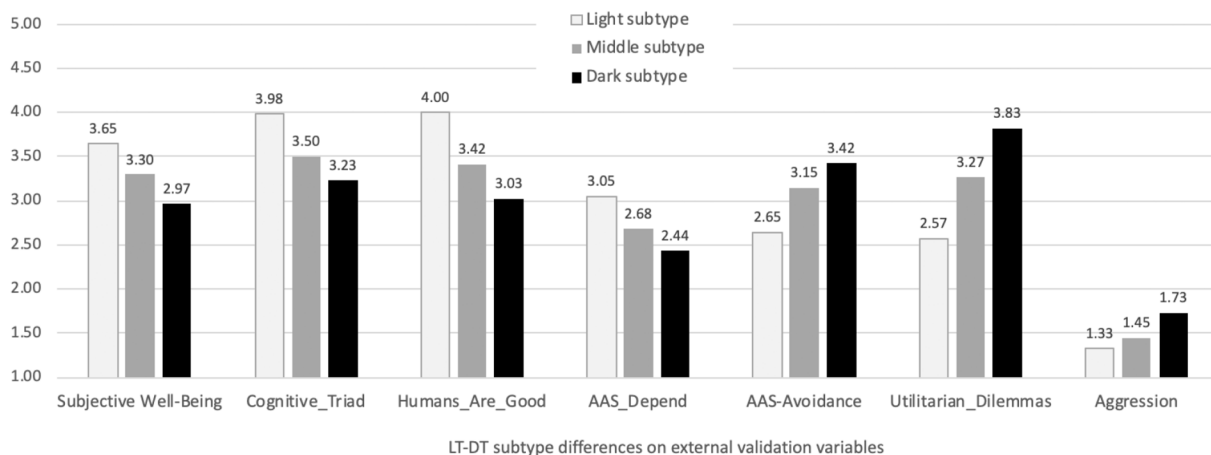


Fig. 5. External validation variables that maximally discriminated Light from both Middle and Dark trait subtypes. *Note.* Cognitive Triad scale coded in positive direction (i.e., better view of self, world, & future). Adult attachment scale (AAS) Depend scale also coded positively (i.e., can depend on others). Aggression is 3-point scale (never = 0, sometimes = 1, often = 2).

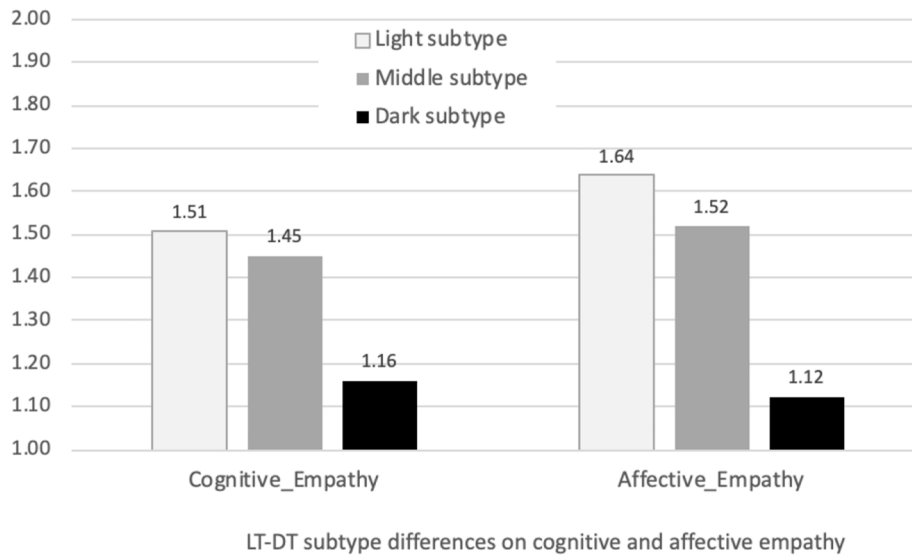


Fig. 6. Empathy variables discriminate Light and Middle from Dark trait subtypes.
 Note. Cognitive and Affective Empathy on a 3-point scale (rarely = 0, sometimes = 1, often = 2).

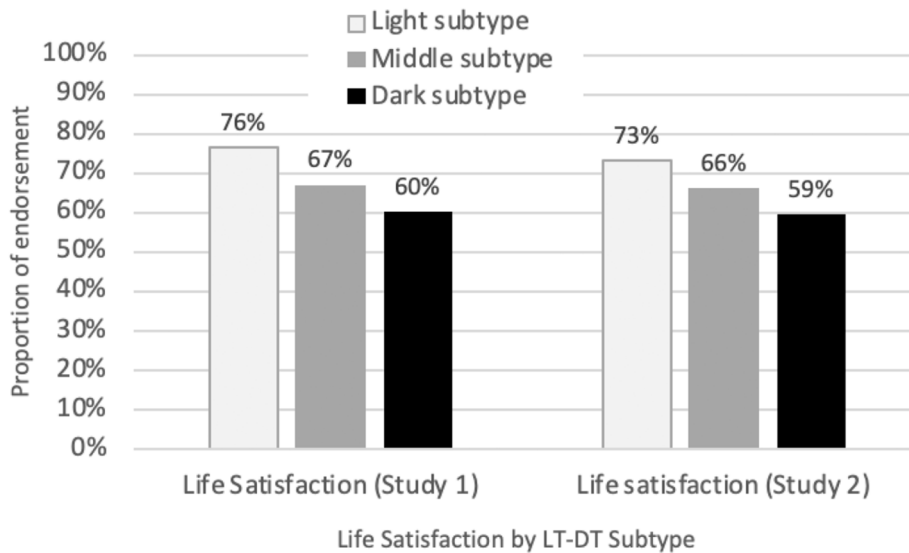


Fig. 7. Percentage of Life satisfaction (Study 1 & Study 2) by subtype.

data from [ten Brinke et al. \(2016\)](#). U.S. Senators were rated in terms of traits reflecting virtues (e.g., courage, wisdom) and vices (e.g., Machiavellianism, psychopathy) that reflected LT-DT's. Given the nature of political arenas, more dark than light subtypes were hypothesized and that the former would display metrics of success requiring competition (tenure in political leadership), while the latter would evince success that required cooperation (co-sponsorship on originated bills).

5.1. Method

5.1.1. Participants

In the original study ([ten Brinke et al., 2016](#)), publicly available C-SPAN videos were used to code speeches during U.S. Senate floor proceedings, which involved 502 videos of 151 U.S. senators who held office in the 101st to 105th Congresses (January 1989 through December 1998). Thus, some Senators were represented multiple times in the data. For the current study, we only employed single cases, and choose the most senior tenured term for each Senator. This resulted in a sample of 143 Senators. Data are publicly available via Open Science Framework (<https://osf.io/6d3ry/>).

5.2. Measures

5.2.1. Virtues and vices

A thin-slice approach was used to code the videos ([ten Brinke et al., 2016](#)). Verbal and nonverbal signals for six virtues (wisdom, courage, justice, humanity, transcendence, and temperance) and three vices (Machiavellianism, narcissism, and psychopathy) were based on the established literature to capture behaviors empirically and conceptually linked to the virtues and vices. Reliability ratings of videos were good ($\alpha = 0.70-0.82$).

We operationalized competitive success (i.e., in elections) as tenure, measured in years in office, at the time of the coded video. Additionally, we operationalized collaborative success as co-sponsorship on originated bills. This measure reflected ability to successfully enlist colleagues as collaborative cosponsors on bills that a given Senator originated in a given Congress. To ensure collaborations were meaningful (vs. symbolic) analyses involved bills with up to three cosponsors ([Theriault, 2013](#)). All variables were in standardized (Z-score) form.

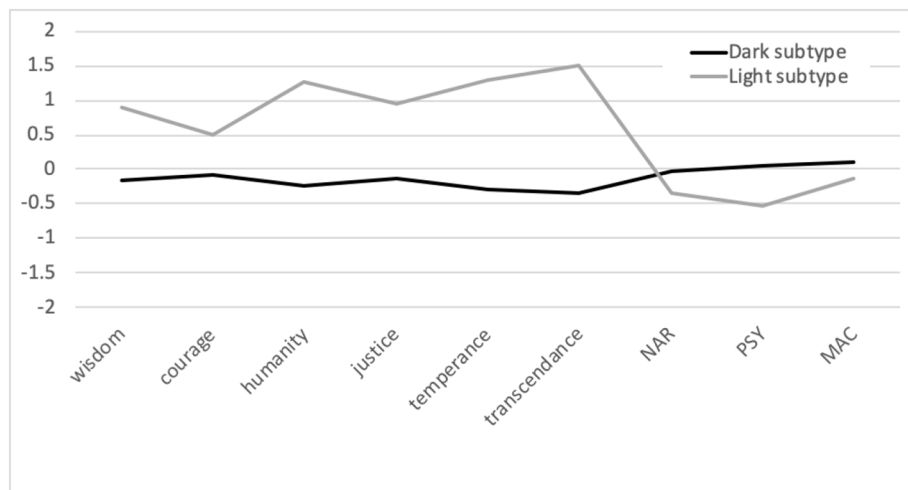


Fig. 8. LPA results for U.S. senator data: 2-class solution.

5.3. Results

5.3.1. Latent profile analysis (LPA)

The LPA results indicated that a 2-class solution was optimal based on a substantial drop in BIC between the 1-class (3872.730) and 2-class solutions (3775.831), and little change for the 3-class solution (3713.297). Also, classification accuracy was better for the 2- (95%) versus 3-class (89%) solution. Class separation average effect size was moderately strong ($\eta^2 = 0.16$), which was due to greater class separation for light ($\eta^2 = 0.22$), compared to dark traits ($\eta^2 = 0.02$). As predicted, there were substantially more dark subtypes (80% of the sample), compared to light subtypes (20% of the sample). See Fig. 8.

5.3.2. U.S. Senator subtypes: Competitive vs. collaborative success

With respect to competitive success, Senators reflecting the dark subtype ($M = 7.32$, $SD = 4.52$) had longer tenure compared to those in the light subtype ($M = 4.04$, $SD = 2.74$) $F(1,141) = 13.06$ ($p < .001$, $\eta^2 = 0.08$). However, dark subtype Senators had less collaborative success (see Fig. 9). The light subtype garnered greater support for their bills, $F(1,141) = 5.54$, $p < .05$, $\eta^2 = 0.04$.¹ Notably, the subtypes did not differ in party affiliation, $\chi^2(1) = 0.15$, $p > .05$.

6. Discussion

As expected, the results revealed evidence of personality subtypes with light versus dark trait profiles. Also, the light and dark traits improved classification accuracy beyond general personality traits, highlighting the added value of the LT-DT domains for understanding human nature. From the two large general population samples, a middle subtype emerged, consistent with previous research (Cohen et al., 2014).² Notably, the dark trait profile was far less prevalent than the other subtypes in these samples, consistent with research showing extreme malevolence is rare in the general population (Kaufman et al., 2019; Neumann & Hare, 2008). Also, in line with previous meta-analytic research (Muris et al., 2017), our results revealed that more males evidence a dark trait profile, relative to females. However, our results expand on this literature with the finding that more females displayed a light trait profile.

The light subtypes were linked with affiliative processes

¹Using up to 5 co-sponsors we found a similar effect: $F(1,141) = 3.74$, $p = .055$, $\eta^2 = 0.03$.

²In the U.S. Senate data, there was evidence for a 3-class solution. Nevertheless, the 2-class solution showed better fit, which may be due to sample size.

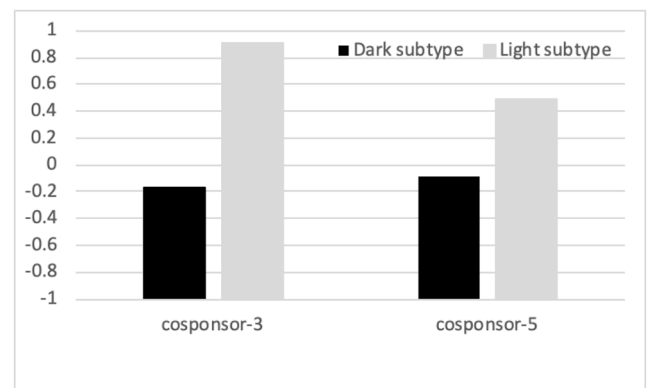


Fig. 9. Collaborative success as a function of Senator Light vs. Dark trait subtypes.

(attachment, empathy) and success in collaborative governance. The dark subtypes were linked with dominance involving aggression, money, and competitive success in politics (winning elections and remaining in office). Critically, the subtype main effect was generally the strongest, and while there were some main effects for gender, there was little evidence of subtype \times gender interactions, thus attesting to the robustness of the subtype effect.

Overall, the results suggest opposing life strategies are involved with light versus dark trait propensities, consistent with other research that finds affiliative versus dominance strategies are linked to personality trait expression (Hawley, 2014; Zeigler-Hill et al., 2014). In the current study, a DT vs. LT dynamic was clearly evident among U.S. Senators with respect to being elected versus obtaining legislative success: traits employed to get elected were incongruent with the traits required to undertake the job. Taken together, the subtype results parallel what is documented in bonobo versus chimp societies (de Waal, 2005), the “angelic” bonobos are matriarchal groups characterized by affiliative relationships while the “demonic” chimps are patriarchal groups characterized by aggressive competition for dominance.

The dominance associated with the dark subtype appears to sometimes come at a cost. Our results are in line with meta-analytic research showing dark traits are associated with poorer intra- and interpersonal functioning (Muris et al., 2017; Vize et al., 2018). In addition, we found that the dark subtype manifested an avoidant attachment style, consistent with research on psychopathy (Walsh et al., 2019) and thus emphasizing a lack of affiliation for the dark subtype (Viding & McCrory, 2019). Interestingly, the middle and dark subtypes were often

similar, with the middle subtype slightly less dark than the dark subtype, except when it came to empathy, where the middle subtype was more akin to the light subtype. These results suggest that an affiliative process (empathy) may be in part what drives the propensity toward a LT > DT profile. The light subtype also reported the most positive views of others, as well as willingness to be close to and depend on others, thus signifying the role of social trust. Relatedly, the light trait subtype displayed the lowest level of utilitarian reasoning, consistent with research suggesting affiliative processes are linked with more aversion to endorsing moral hypotheticals involving harm (Duke & Bègue, 2015). Relatedly, a neural system linked to empathy and regulation of aggressive impulses in humans is more robust in bonobos than chimps (Rilling et al., 2012), which may help in interpretation of our results for the light subtype. Notably, the subtypes did not differ in religious or spiritual experiences. This finding adds weight to the suggestion that social affiliation (versus adherence to a particular religious perspective) and empathic capacity are what account for a light subtype profile.

The findings of age differences by subtype fit with previous research (Cohen et al., 2014), and are consistent with the idea that personality is a maturational process. Specifically, Bleidorn (2015) found increases in emotional stability, conscientiousness, and agreeableness from age 30 to 40, a similar age band that separated the dark and light trait subtypes. In addition, the light subtypes reported the highest life satisfaction and positive self/world views, even while accounting for age, which suggests the light subtype is linked with a particular type of maturational process and not simply a function of being older. As such, the results suggest an association between inter-connectedness (affiliation) and self-development (self-image, life satisfaction), consistent with Kaufman's (2020) proposal that self-actualization is tied to a greater connectedness to humanity.

Along with heredity, psychosocial experiences play a critical role in personality trait expression across the lifespan (Kandler, 2012). Lower education is associated with increased dark trait expression in the general population (Lilienfeld, Lutzman, Watts, Smith, & Dutton, 2014). In this context, the Study 1 sample, compared to Study 2, had proportionally more persons with advanced degrees (27% vs. 11%), which may have resulted in a higher proportion of light trait subtypes in Study 1 (50% vs. 33%). But of course, the U.S. Senate sample was perhaps the most accomplished, professionally, and yet contained a very high proportion of dark subtypes. Clearly the nature of a given sample can influence the proportion of light versus dark subtypes, and it appears that samples characterized by dominance influence the expression of dark traits.

6.1. Limitations

Our results are limited to North American, European, and U.S. Senatorial samples. Two of the studies used self-report data, though the findings from a third study, based on observational data, were consistent with the other two studies. A latent profile analytic method was employed, which can result in different subtype solutions, yet we found similar subtypes across independent samples.

7. Conclusion

Informed by comparisons to our closest primate relatives we found support for opposing views on human nature. The results revealed replicable light and dark trait subtypes. Light subtypes were motivated to affiliate, empathize, and cooperate with others: dark subtypes were motivated to dominate via status, aggression, and money. Of course, just as bonobos may show aggression and chimps nurturance, humans too have the potential to display a mix of dark versus light traits, more or less. Thus, it is reasonable to suggest human nature is akin to a "Janus head" and the "product of opposing forces, such as the need to think of our own interests and the need to get along" (de Waal, 2005, p.

220). Perhaps it would be wise to adopt a dialectical mindset and accept our dark and light sides, being aware of the functions of these traits and the contexts which they are expressed, rather than ignoring such tendencies within ourselves and in others (Wong, 2020). Our results suggest that the balance of light and dark traits has important implications. Social trust and affiliation with others, and a relatively lower expression of an antagonistic and exploitative orientation, appears to be a particularly productive path to personality development, life satisfaction, and a deeper connection with humanity.

Author contributions

CSN developed the study concept, conducted all data analyses, and provided the initial manuscript draft. LTB and SBK provided critical comments and manuscript revisions. All authors read through the final draft and approved the final version of the manuscript for submission.

Declaration of competing interest

None.

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