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Theoretical and empirical dissociations between the Dark Factor of Personality and low Honesty-Humility

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Abstract

Recent research suggests that the common core of all aversive traits can be understood through the Dark Factor of Personality (D). Previously, the overlap among aversive traits has also been described as the low pole of HEXACO Honesty-Humility. Relying on longitudinal data and a range of theoretically derived outcome criteria, we test in four studies (total $N > 2,500$) whether and how D and low Honesty-Humility differ. Although the constructs shared around 66% of variance (meta-analytically aggregated across all studies), they longitudinally differently accounted for diverse aversive traits and showed theoretically meaningful and distinct associations to pretentiousness, distrust-related beliefs, and empathy. These results suggest that D and low Honesty-Humility are best understood as strongly overlapping, yet functionally different and nomologically distinct constructs.

Keywords: Honesty-Humility; D Factor; Dark Factor of Personality; Dark Traits

Highlights

- The Dark Factor of Personality (D) and low Honesty-Humility (HH) overlap strongly.
- Nevertheless, D and low HH appear to be functionally and nomologically distinct.
- D outperformed low HH in longitudinally predicting a range of aversive traits.
- Low HH explained incremental variance over D in pretentiousness.
- D explained incremental variance over low HH in distrust-related beliefs and empathy.

Theoretical and empirical dissociations between the Dark Factor of Personality and Honesty-Humility

1. Introduction

People sometimes engage in socially and morally questionable or downright malevolent behavior. From the viewpoint of Personality Psychology, this is attributed to socially and ethically aversive (“dark”) traits, with the Dark Triad components Machiavellianism, Narcissism, and Psychopathy being particularly prominent (Furnham, Richards, & Paulhus, 2013; Muris, Merckelbach, Otgaar, & Meijer, 2017; Paulhus & Williams, 2002). Given that aversive traits show substantial theoretical and empirical overlap, consensus has emerged that they share a common core (Jonason, Zeigler-Hill, & Okan, 2017; Muris, Merckelbach, Otgaar, & Meijer, 2017; Schreiber & Marcus, 2020; Vize, Collison, Miller, & Lynam, 2020). Next to other suggestions, this common core has been suggested to reflect the low pole of Honesty-Humility from the HEXACO model of personality structure (Hodson et al., 2018; Lee et al., 2013; Muris et al., 2017).

Honesty-Humility is one of the six basic personality dimensions in the lexically derived HEXACO model of personality structure (Lee & Ashton, 2008). Like any such lexically and thus inductively derived trait dimension, it is defined by the trait-descriptive adjectives that show particularly high loadings on the corresponding factor—adjectives like trustworthy, loyal, and humble versus deceitful, selfish, and pretentious in the case of Honesty-Humility. Within each of the broader HEXACO dimensions, the defining adjectives are further subsumed in narrower facets, which in the case of Honesty-Humility are Modesty, Sincerity, Fairness, and Greed Avoidance (Lee & Ashton, 2006). As a consequence of being defined by the co-occurrence of

certain adjectives or trait aspects, the verbal definition of the construct itself is essentially a generic summary of these defining adjectives, namely, that Honesty-Humility represents “the
25 tendency to be fair and genuine in dealing with others, in the sense of cooperating with others even when one might exploit them without suffering retaliation” (Ashton & Lee, 2007, p. 156). Accordingly, individuals at the low pole of Honesty-Humility “will flatter others or pretend to like them to obtain favors, [...] are willing to gain by cheating or stealing, [...] enjoy and display wealth and privilege, [...] and] consider themselves as superior and entitled to privileges that
30 others do not have” (Ashton & Lee, 2005, p. 1331). Clearly, both the defining aspects of Honesty-Humility and its definition are compatible with the notion that (low) Honesty-Humility overlaps with (the common core of) aversive traits.

Correspondingly, (low) Honesty-Humility was repeatedly shown to be the strongest predictor of the Dark Triad traits out of all basic personality dimensions (with up to 90% shared
35 variance, Hodson et al., 2018), including stronger relations than Agreeableness from the Five-Factor Personality Model (Book et al., 2016; Howard & Van Zandt, 2020; Moshagen et al., 2018). Such findings have nourished conclusions that “the Dark Triad latent covariation almost fully overlaps with the low pole of Honesty-Humility” (Hodson et al., 2018, p. 128) and that “the dark triad concept largely is redundant and has little to add to traditional personality models”
40 (Muris et al., 2017, p. 196).

Whereas previous research focused on testing the overlap of the Dark Triad variables with basic personality dimensions, recent research has conceptualized another factor as the common core of—*expressis verbis*—all aversive traits. That is, Moshagen, Hilbig, and Zettler (2018) introduced the Dark Factor of Personality (D) as the basic disposition underlying all
45 aversive traits, defined as “the general tendency to maximize one’s individual utility—

disregarding, accepting, or malevolently provoking disutility for others—, accompanied by beliefs that serve as justifications” (Moshagen et al., 2018, p. 656).

Notably, a central idea underlying the conceptualization of D is that *any* aversive trait can be understood as a specific, flavored manifestation of D which, in turn, subsumes the malevolent aspects of *all* aversive traits. More generally speaking, the theoretical conceptualization of D is akin to the *g*-factor of intelligence and implies that “D is responsible for the commonalities between various traits and thereby represents their common core” (Moshagen et al., 2018, p. 658). Accordingly, the internal structure of D is best represented by a bifactor model (Moshagen et al., 2018) in which D is represented by a general factor on which all observed (aversive) items load and which thus captures their shared variance. Additionally, each item loads on one of five orthogonal specific factors, or themes – Callousness, Deceitfulness, Narcissistic Entitlement, Sadism, and Vindictiveness -, which capture the remaining common variance among subsets of items that is not accounted for by D (Bader, Hartung, et al., 2021). This modeling approach closely maps onto the theoretical conceptualization of D in that the general factor in a bifactor model functions as the prime and direct source of individual differences on the indicator level and represents their common underlying disposition. The specific factors, in turn, reflect themes within D as well as sets of unique aspects beyond the scope of D (Moshagen, Zettler, & Hilbig, 2020).

Clearly, as is apparent from the theoretical definitions, D and low Honesty-Humility share various similarities. On the theoretical level, the aspect of utility maximization in the definition of D is mirrored in the aspects of greed and lack of sincerity in Honesty-Humility. Moreover, the aspect of justifying beliefs in the definition of D is—in part—mirrored in the aspect of lack of modesty in Honesty-Humility. Correspondingly, it is unsurprising that D and

Honesty-Humility show substantial empirical associations, sharing up to 64% of their variance
70 (Moshagen et al., 2018).

However, neither the correspondence in some defining aspects nor about two thirds of
shared variance are sufficient to conclude that D and low Honesty-Humility essentially
represent the same construct.¹ Indeed, their respective origins and conceptualizations differ
fundamentally with regard to several aspects. First and foremost, Honesty-Humility was
75 inductively derived from lexical studies and is thus tied to a model of basic personality
structure. D, by contrast, was deductively derived from the theoretical definitions of aversive
trait constructs, disregarding whether and where such aspects are located in models of
personality structure. Correspondingly, D is also substantially related to other basic personality
dimensions in the HEXACO model from which Honesty-Humility is, by definition, expected to
80 be independent. This holds in particular for (HEXACO) Agreeableness ($r = -.45$), but also
Conscientiousness ($r = -.32$; Moshagen et al., 2018). Similarly, loadings of Honesty-Humility ($\lambda =$
 $-.69$), Agreeableness ($\lambda = -.39$), and Conscientiousness ($\lambda = -.17$) on the common core of the Dark
Triad (as an approximation of D) were recently confirmed meta-analytically (Schreiber &
Marcus, 2020). These associations are to be expected given that low HEXACO-Agreeableness
85 involves aspects clearly aligned with the definition of D (being ill-tempered, quarrelsome, and
vengeful) as does low Conscientiousness, though less prominently so (being irresponsible,
delinquent, or disobedient, see Lee & Ashton, 2008). As such, D involves aspects that are defined
to be subsumed across basic (HEXACO) dimensions, including dimensions other than Honesty-
Humility.

90 Second, the conceptual differences between D and Honesty-Humility imply several
important differences in their respective content: Whereas D explicitly includes all beliefs and

¹ Consider, for example, foot length and body weight. They, too, are strongly associated ($r = .82$ for males, $r = .76$ for females; Green, 1961; Grivas et al., 2008;) despite obviously measuring different physical entities.

attitudes that may serve as justifications for malevolent behaviors (as reflected in items such as “Doing good deeds serves no purpose; it only makes people poor and lazy.”, or “People who get mistreated have usually done something to bring it on themselves.”), low Honesty-Humility is limited to beliefs that express a sense of superiority or entitlement (“I deserve more influence and authority than most other people do.”, “I am special and superior in many ways”). Although Honesty-Humility may also empirically relate to other beliefs, these are neither included in its theoretical conceptualization, nor in items used to indicate Honesty-Humility, nor in adjective lists Honesty-Humility was derived from (Ashton et al., 2015). Moreover, low Honesty-Humility places a focus on pursuing and displaying materialistic gains or high social status (“If I knew that I could never get caught, I would be willing to steal a million dollars.”, “I would enjoy being a member of a fancy, high-class casino.”). By comparison, D explicitly extends to any type of utility, such as joy or self-enhancement—even to the extent that such utility may involve costs (“I think about harassing others for enjoyment.”, “If I had the opportunity, then I would gladly pay a small sum of money to see a classmate who I do not like fail his or her final exam.”). Specifically, D covers behavior characterized by deriving utility from the very act of harming others (e.g., sadistic and spiteful behavior) which may actually cost money or reputation and thus seems incompatible with low Honesty-Humility.

In addition, it has been argued that callousness is a prerequisite for aversive traits to emerge or manifest themselves (Jones & Figueredo, 2013; Paulhus, 2014). Indeed, a lack of empathy plays an important role within D, as disregarding potential disutility for others in pursuing one’s own utility is part of its definition (“I feel sorry if things I do upset people”, reverse coded). Correspondingly, previous studies have reported substantial correlations between D and lack of empathic concern (Moshagen, Zettler, & Hilbig, 2020; Moshagen, Zettler, Horsten, et al., 2020). In the HEXACO model, however, empathy is comprised in the

sentimentality facet of Emotionality (e.g., “I feel like crying when I see other people crying”) and is thus theoretically independent of Honesty-Humility (Ashton et al., 2014). In conclusion, (lack of) empathy is vital to the concept of D, whereas it lies outside of the theoretical scope of Honesty-Humility.

120 As implied by these conceptual differences, D and low Honesty-Humility—despite their overlap—may well constitute functionally distinct constructs in the sense that they comprise different behaviorally relevant variance components; each may carry meaning not carried by the other. To some extent, corresponding evidence is already available, given that D explained incremental variance beyond low Honesty-Humility in several aversive outcomes (Moshagen et al., 2018; Hilbig et al., 2020) and vice versa.² Thus, there are hints that—despite notable overlap—D and low Honesty-Humility are functionally different and comprise meaning not carried by the other.

The criteria to which D and Honesty-Humility were differentially related were, however, only selected to inspect the relation between D and socially aversive outcomes, rather than to explicitly test the distinctiveness between D and low Honesty-Humility. For a more conclusive test of the functional equivalence of D and low Honesty-Humility, it is thus necessary to put forward and test a priori hypotheses about theoretically-implied differences as sketched above. If D and low Honesty-Humility are indeed functionally equivalent, neither will account for unique variance in thus selected criteria.

135 Based on the above, two steps are needed. As low Honesty-Humility has only been suggested and tested to represent the common core of the Dark Triad so far, it is first necessary to test whether it also accounts for the commonalities of *all* aversive traits to an equivalent

² We performed a re-analysis of the Moshagen et al. (2018, Study 3) data showing that Honesty-Humility also explains incremental variance beyond D in some criteria (see additional material at https://osf.io/35sdh/?view_only=cfbff4c5b2934ccf8351aef6c0312b3b).

extent as D does. Arguably, if the core of all aversive traits was captured in an already established basic personality dimension (like Honesty-Humility), one ought not to add a novel
140 construct (such as D)—for parsimony and to avoid jangle fallacies. Thus, the first goal of this paper is to test whether D and low Honesty-Humility predict the same aversive traits to a comparable extent: a necessary condition for the assumption that both D and low Honesty-Humility are equivalent representations of the common core of all aversive traits. If, by contrast, the predictions differ, the second necessary step is to test whether D and (low)
145 Honesty-Humility can be empirically dissociated by their theoretically implied differences.

2. Study 1

We re-analyzed data from a previous study (Moshagen et al., 2018, Study 3; Zettler, Moshagen, et al., 2020) to investigate whether D and (low) Honesty-Humility differently predict aversive traits on a longitudinal basis. If D and low Honesty-Humility are equivalent
150 representations of the common core of all aversive traits, they will equally determine the development of these traits and neither will predict incremental variance over the other in longitudinally accounting for these traits.

In a first step, we tested whether D and low Honesty-Humility are correlated with aversive traits to a comparable extent. Importantly, comparing the size of correlations of D and
155 low Honesty-Humility with criteria is only a weak indicator of whether the two constructs are functionally different: Even if the correlations were equal, D and low Honesty-Humility could account for different, non-overlapping parts of variance and thus explain incremental variance. Consequently, after comparing correlations, we conducted sequential latent multiple regression analyses to test whether D and low Honesty-Humility predict incremental variance
160 over the other.

2.1 Methods

2.1.1 Procedure

The study was not pre-registered. We re-analyzed data that was collected for two previous studies investigating D (Moshagen et al., 2018, Study 3; Zettler, Moshagen, et al., 2020).

165 More detailed descriptions of measures and procedures can be found in the corresponding publications. Participants were recruited and compensated through a German professional panel provider. Two measurement occasions were realized (in 2014 and in 2018; interval $M = 46.7$, $SD = 0.1$ months). At the first measurement occasion, participants completed nine self-report scales measuring aversive traits and a measure assessing the HEXACO traits, and at the
170 second measurement occasion participants completed the nine self-report scales measuring aversive traits again. Each measurement occasion started with asking participants for informed consent and demographics, followed by the self-report scales, and ended with debriefing.

2.1.2 Measures

Honesty-Humility was assessed using the German 60-item version of the HEXACO
175 Personality Inventory-Revised (HEXACO-60; Moshagen et al., 2014), consisting of 10 items per dimension. D was assessed using nine scales that measure aversive traits as specified in Moshagen et al. (2018). A short overview is given in Table 1; a more detailed description is available in the aforementioned publication. Note that the results in the original publication showed that two of these nine aversive traits were operationalized such that their aversive
180 components were not fully represented (i.e., Self-Interest and agentic Narcissism³). They will thus necessarily be accounted for by D to a lower extent than the other aversive traits. Both the

5 3 The Narcissism subscale of the Short Dark Triad predominantly measures grandiosity and authoritativeness, which are core features of Agentic Narcissism (Back et al., 2013; Miller et al., 2016) and as such related to the modesty aspect of Honesty-Humility. It does not, however, measure the aggressive and exploitative Antagonistic Narcissism, which bears the stronger theoretical overlap with D (Moshagen et al., 2018). Analogously, self-interest describes utility maximization in socially valued domains, but does not imply causing disutility for another person (Gerbası & Prentice, 2013). As such, it is beyond the scope of D, but actually well aligned with Honesty-Humility, which includes seeking wealth and status at the lower pole.
10

HEXACO and all trait scales were answered on a five-point Likert scale ranging from 1 = “strongly disagree” to 5 = “strongly agree”.

Table 1

Overview of included dark traits and corresponding inventories (Study 1)

Trait	Scale	Number of items	Sample item	Source
Egoism	Egoism Scale	12	It is hard to get ahead without cutting corners here and there.	Weigel et al., 1999
Machiavellianism	Short Dark Triad	10	I like to use clever manipulation to get my way.	Jones & Paulhus, 2014
Moral Disengagement	Propensity to Morally Disengage Scale	8	Considering the way people grossly misrepresent themselves, it's hardly a sin to inflate your own credentials a bit.	Moore et al., 2012
Agentic Narcissism	Short Dark Triad	9	I know that I am special because everyone keeps telling me so.	Jones & Paulhus, 2014
Psychological Entitlement	Psychological Entitlement Scale	9	I honestly feel I'm just more deserving than others.	Campbell et al., 2004
Psychopathy	Short Dark Triad	9	It's true that I can be mean to others.	Jones & Paulhus, 2014
Sadism	Short Sadistic Impulse Scale	10	Hurting people would be exciting.	O'Meara et al., 2011
Self-Interest	Self- and Other-Interest Inventory	9	Hearing others praise me is something I look forward to.	Gerbasi & Prentice, 2013
Spitefulness	Spitefulness Scale	17	It is sometimes worth a little suffering on my part to see others receive the punishment they deserve.	Marcus et al., 2014

185 2.1.3 Participants

The final sample was the same as described in more detail in Zettler, Moshagen, et al. (2020). Out of initially 1,261 participants (48% female) in 2014, a final sample of $N = 470$ completed both measurement occasions. At the first measurement occasion, participants were aged 18-65 ($M = 41.6$, $SD = 13.2$) years.

190 2.2 Data analysis

We tested our hypotheses in R (Version 3.6.3; R Core Team, 2020) based on structural equation modeling using *lavaan* (Version 0.6.5; Rosseel et al., 2019). Assuming data are missing at random, we addressed incomplete data at the second measurement occasion by employing full information maximum likelihood estimation. To account for non-normality in the data, we
195 used maximum likelihood estimation with robust Huber-White standard errors and a scaled test statistic that is asymptotically equivalent to the Yuan-Bentler test statistic.

D was estimated using bifactor modeling as described in more detail in Moshagen et al. (2018). That is, D was modeled as the general factor on which each observed item of the nine aversive trait scales loaded. This general factor thus captures the commonalities among all
200 included aversive trait items. Further, we modeled one specific factor for each aversive trait on which each item of the measure of that particular trait loaded. These nine specific factors capture only the remaining covariance among their respective indicators which is not absorbed by D and thus typically yield little variance which does not represent the original construct. They are thus not considered substantively but must nonetheless be included in the
205 measurement model in order to avoid biased estimates of the correlations between D and covariates (Moshagen, 2021). For identification, all correlations among the specific factors as well as between the specific factors and D were fixed to zero.

Additionally, we modeled one latent factor indicating low Honesty-Humility (by reversing the item coding). The basic model thus consisted of eleven latent factors, representing D, low Honesty-Humility, and nine aversive traits residualized for D in 2014, using the item responses at the first measurement occasion. Detailed estimates of factor loadings on the general and specific factors (for this and all further studies reported herein) are provided in the additional materials on the OSF (<https://osf.io/35sdh/>).

For the longitudinal predictions, we altered this basic model for each of the nine aversive traits. Specifically, we added a latent factor for the unresidualized particular trait in 2018 and, crucially, omitted the indicators for that trait from the general factor representing D in 2014 to avoid predictor-criterion contamination. Thus, in the prediction of a particular aversive trait in 2018 by D in 2014, D was modeled without the items of said trait.

We first tested whether D and low Honesty-Humility were correlated with the aversive traits to a comparable extent. To this end, we conducted nested model comparison based on the scaled χ^2 -difference (Gonzalez et al., 2020) and normalized evidence ratios (ER) computed from weighted BICs (Wagenmakers & Farrell, 2004; Wu et al., 2020). ERs quantify the support in favor of the less parsimonious model over the more parsimonious model. The ER ranges from 0 to 1, with $ER = 1$ representing perfect evidence for the less parsimonious model, whereas $ER = 0$ represents no evidence for the less parsimonious model. As an effect size measure for the difference between the correlations, we provide Cohen's q and the associated Holm-Bonferroni corrected p -values according to Williams (1959).

2.3 Results and discussion

Descriptive statistics, internal consistencies of the scales, and inter-correlations are summarized in Tables A1 and A2 on the OSF. Model fit statistics for the base-models were

$\chi^2(4,092) = 11,780, p < .01, RMSEA = .04, SRMR = .06$ for D, and $\chi^2(35) = 707, p < .01, RMSEA = .12, SRMR = .08$ for low Honesty-Humility, respectively. The latent correlation between D(2014) and low Honesty-Humility(2014) was $r = .80$, and thus smaller than unity ($\Delta\chi^2(1) = 17.02, p < .01, ER > .999$).

235 To evaluate the correlations of the unresidualized aversive traits in 2018 with D(2014) and low Honesty-Humility(2014), respectively, we estimated one model for each aversive trait in which its correlations with D and low Honesty-Humility, respectively, were allowed to vary freely, and one in which they were constrained to be equal. As can be seen in Table 2, D showed significantly stronger correlations in five out of nine cases (Egoism, Moral Disengagement, 240 Machiavellianism, Psychopathy, and Spitefulness), whereas low Honesty-Humility showed stronger correlations to Agentic Narcissism and Self-Interest. The evidence ratios indicated moderate to strong evidence in favor of the less restrictive models (except for Sadism and Psychological Entitlement). On average, the absolute difference between the correlations corresponds to a moderate effect ($q = .17$).

Table 2

Unconstrained longitudinal latent correlation coefficients (Study 1)

Dark trait 2018	D 2014 (\neg DT2014) [95% CI]	low HH 2014 [95% CI]	$\Delta\chi^2$	p (Holm- Bonferroni- corrected p)	ER	q	p (Holm- Bonferroni- corrected p)
Egoism	.56 [.47; .66]	.39 [.28; .50]	19.36	< .001 (< .001)	.996	.22	< .001 (< .001)
Machiavellianism	.68 [.59; .77]	.57 [.47; .67]	7.96	.005 (.024)	.576	.18	< .001 (< .001)
Moral Disengagement	.69 [.61; .78]	.54 [.43; .64]	17.32	< .001 (< .001)	.976	.24	< .001 (< .001)
Agentic Narcissism	.37 [.26; .48]	.50 [.38; .61]	4.67	.031 (.092)	.614	-.16	< .001 (< .001)
Psychological Entitlement	.52 [.43; .61]	.52 [.42; .62]	0.00	.970 (.970)	.027	.00	.399 (.399)
Psychopathy	.76 [.69; .84]	.64 [.55; .74]	51.67	< .001 (< .001)	.868	.24	< .001 (< .001)
Sadism	.53 [.44; .61]	.45 [.36; .54]	4.18	.041 (.082)	.153	.11	< .001 (< .001)
Self-Interest	.30 [.18; .41]	.43 [.30; .56]	5.87	.015 (.062)	.720	-.15	< .001 (< .001)
Spitefulness	.66 [.58; .73]	.48 [.38; .57]	43.44	< .001 (< .001)	> .999	.27	< .001 (< .001)

245 Note: $N = 1,261$. D 2014(\neg DT2014): Dark Factor of Personality in 2014, defined by omitting the indicators of the to-
 be-predicted aversive trait, low HH2014: low Honesty-Humility in 2014, ER : normalized evidence ratio comparing
 the less restricted to the restricted model. All correlation coefficients differ significantly from zero at $p < .001$. $\Delta\chi^2$:
 (scaled) log-likelihood ratio test. q : difference in the (absolute) zero-order correlations with an outcome between
 Honesty-Humility and D as measured by Cohen's q with associated (one-sided and Holm-Bonferroni corrected) p -
 250 value.

To investigate whether either D or low Honesty-Humility predict incremental variance in the aversive traits, we regressed the unresidualized traits in 2018 on both D (again omitting the items of the to-be-predicted trait) and Honesty-Humility in 2014. As can be seen in Table 3,

255 for each aversive trait either D or low Honesty-Humility predicted incremental variance. D explained incremental variance ($\Delta R^2 > .05$) in all aversive traits whereas low Honesty-Humility explained incremental variance in Agentic Narcissism, Psychological Entitlement, and Self-Interest. For Agentic Narcissism and Self-Interest, this was expected, given that both—arguably due to their specific operationalizations—only show limited saturation in D, thus involving

260 more unique variance beyond D than the other socially aversive traits considered (Moshagen et al., 2018). Psychological Entitlement, in turn, is defined as „a stable and pervasive sense that one deserves more and is entitled to more than others” (Campbell et al., 2004) which closely relates to the lower pole of Honesty-Humility. In other words, unlike D, which covers a wide range of justifying beliefs (Moshagen, Zettler, Horsten, et al., 2020), Honesty-Humility

265 addresses entitlement specifically in describing low scorers on the modesty facet as considering themselves “as superior and as entitled to privileges that others do not have” (Lee & Ashton, 2004, p. 334). Thus, it is plausible that low Honesty-Humility captures incremental variance in Agentic Narcissism, Psychological Entitlement, and Self-Interest beyond D.

Table 3

Latent regression results for longitudinally predicting unresidualized dark traits by D and Honesty-Humility (Study 1)

Dark trait 2018	$\beta_{D2014(-DT2014)}$ [95% CI]	β_{HH2014} [95% CI]	$R^2_{(D, HH)}$	$\Delta R^2_{(HH)}$	$\Delta R^2_{(D)}$
Egoism	0.71 [0.53; 0.90]	-0.17 [-0.38; 0.05]	.35	< .01	.21
Machiavellianism	0.55 [0.39; 0.71]	0.15 [-0.03; 0.33]	.46	.02	.15
Moral Disengagement	0.67 [0.49; 0.85]	-0.02 [-0.22; 0.19]	.43	< .01	.19

Agentic Narcissism	-0.19 [-0.41; 0.03]	0.71 [0.47; 0.96]	.33	.21	.05
Psychological Entitlement	0.10 [-0.09; 0.29]	0.53 [0.33; 0.73]	.37	.12	.05
Psychopathy	0.70 [0.53; 0.87]	0.06 [-0.15; 0.27]	.56	< .01	.20
Sadism	0.52 [0.31; 0.72]	0.01 [-0.21; 0.23]	.28	< .01	.11
Self-Interest	-0.32 [-0.56; -0.09]	0.81 [0.56; 1.06]	.35	.27	.08
Spitefulness	0.80 [0.64; 0.97]	-0.19 [-0.38; 0.00]	.43	.01	.25

270 Note: $N = 1,261$. Standardized latent linear regression coefficients. D = Dark Factor of Personality, HH = low Honesty-Humility. $R^2(D, HH)$: variance explained by the full model. $\Delta R^2(HH)$: increase in R^2 after adding Honesty-Humility to the model. $\Delta R^2(D)$: increase in R^2 after adding D to the model.

275 Across the aversive traits, D accounted on average for substantially more incremental variance ($\Delta R^2 = .14$) than low Honesty-Humility ($\Delta R^2 = .07$). These results illustrate why it is necessary to consider the explained variance in addition to the mere comparison of bivariate correlations. For example, judging from the correlations alone, D and low Honesty-Humility would appear to be almost functionally equivalent with respect to Sadism. Taking into account the uniquely explained variance, however, demonstrates that D comprises variance relevant
280 for Sadism that is not comprised in low Honesty-Humility.⁴

For a fairer comparison of D and low Honesty-Humility, we repeatedly reran the analyses with randomly sampled subsets of only ten items loading on D to match the length of the Honesty-Humility scale. Median results were essentially equivalent to those reported above, ruling out the alternative explanation that D covers a broader range of aversive

⁴ For another clear example in the opposite direction, consider Psychological Entitlement.

285 outcomes than low Honesty-Humility merely due to the larger number of items. The
corresponding analysis scripts and results are provided on the OSF.

Taken together, neither the extent to which D and low Honesty-Humility are
longitudinally associated with aversive traits nor the variance components they uniquely
explain in aversive traits are equal. These results thus corroborate that D and low Honesty-
290 Humility are not functionally equivalent in general and that D seems to be the better
representation of the core of all aversive traits. Next to this, one can derive additional and
more specific theoretically implied differences between low Honesty-Humility and D.
Confirming such differences would extend the (so far preliminary) conclusion *that* low
Honesty-Humility and D are functionally distinct by specifying *how* exactly the two constructs
295 differ.

3. Study 2

If two constructs are functionally equivalent, they must—besides being strongly
interrelated—show nomological consistency (Hilbig et al., 2016; Thielmann & Hilbig, 2019) and
extrinsic convergent validity (Gonzalez et al., 2020). Investigating nomological consistency and
300 extrinsic convergent validity is a critical test whether two constructs are associated to external
criteria to similar extents and thus embedded within similar nomological nets. With regard to
the current investigation, an informative criterion speaking against nomological consistency
(and thus equivalence) of D and low Honesty-Humility will be differentially subsumed by or
represented in—and, in turn, correlate differently with—the two constructs.

305 As sketched above, individuals low in Honesty-Humility pursue materialistic gains or
high social status. A person high in D, on the other hand, may strive for material possessions,
but not necessarily for social admiration. In fact, spiteful and sadistic behavior is often

incompatible with seeking admiration. Correspondingly, money-related variables such as Materialism and Conspicuous Consumption have been found to correlate more strongly with
310 Honesty-Humility than with a composite Dark Triad measure (Lee et al., 2013). We therefore expect the desire for social recognition and admiration to be more strongly encompassed by low Honesty-Humility than by D.

Vice versa, whereas spitefulness and sadism are a defining aspect of D, they are not covered by the theoretical definition of Honesty-Humility. Spiteful or sadistic behavior towards
315 other people, possibly at own costs or negative consequences, is well in line with the definition of D, because utility maximization explicitly covers immaterial gains such as feelings of satisfaction one can experience from causing somebody disutility (Moshagen et al., 2018). By comparison, low Honesty-Humility is essentially limited to individualism, that is, those low in Honesty-Humility might accept causing somebody harm in order to achieve their own goals
320 (e.g., cheating or stealing; Lee & Ashton, 2004), but not at the risk of costs to themselves. In essence, for those low in Honesty-Humility, causing others harm is a byproduct of the pursuit of their own utility maximization rather than a source of utility in and of itself as it is in D (Moshagen et al., 2018). We therefore expected spiteful and sadistic behavior to be more strongly encompassed by D than by low Honesty-Humility.

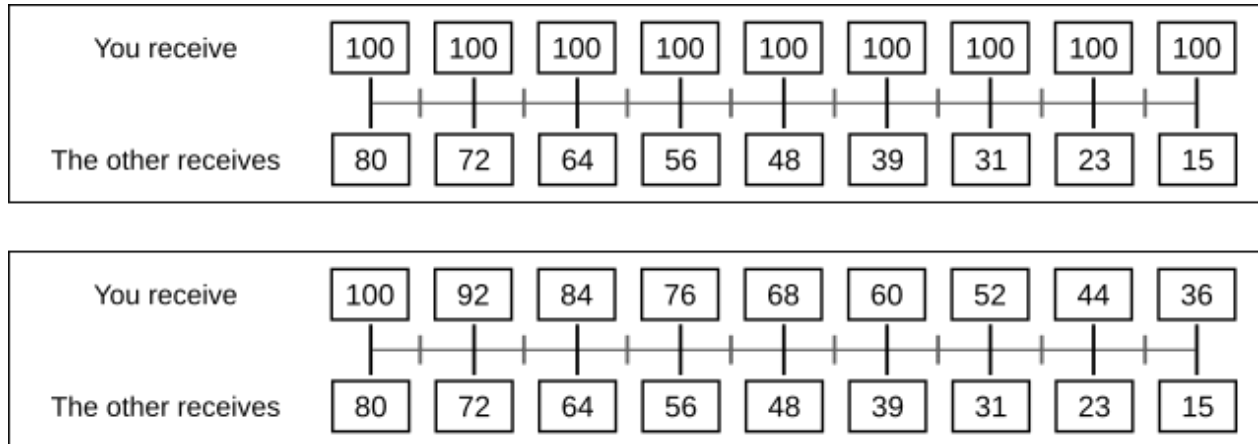
325

3.1 Methods

3.1.1 Measures

D and Honesty-Humility were assessed as in Study 1. The desire for social recognition was assessed using a German translation of the Unpretentiousness Scale from the Six Factor Personality Questionnaire (6FPQ; Jackson et al., 2000, available via ipip.ori.org). Each of these
330 self-report scales were answered on a five-point-Likert scale ranging from 1 = "strongly

disagree” to 5 = ”strongly agree”. Spiteful behavior was assessed using a behavioral measure of sadism which is referred to as Sadistic SVO (Moshagen, Zettler, & Hilbig, 2020). It consists of 9 tasks that are structurally similar to the Social Value Orientation (SVO) measure which is used to assess social preferences in terms of the weight an individual attaches to their own versus someone else’s outcome (Murphy, Ackermann, & Handgraaf, 2011). Like a regular SVO, each Sadistic SVO task asks the participants to allocate points (worth 5€ per 100 points, i.e., around \$5.70 at the time of data collection) between themselves and an unknown other. In this regard, it is conceptually similar to a dictator game (Forsythe, 1994). More specifically, the items were adapted to measure the participants’ inclination for spiteful behavior and differed in how many points participants needed to forego in order to reduce the other’s outcomes (see Figure 1 for two examples; the full set of items is available on the OSF). The only motives to explain why an individual would forego own points to reduce the other’s points are competitiveness (i.e., maximizing the difference between one’s own and the other’s outcome) and/or spitefulness (i.e., minimizing the other’s outcome) and thus sadism. Any other motive, by contrast, would lead to a choice towards the opposite end of the continuum (see also Thielmann et al., 2021). Thus, the Sadistic SVO is a suitable measure to assess spiteful behavior. The options were represented by a scale from 1 to 9, with higher scores on this measure representing a higher tendency towards spiteful behavior. To make the measure less extreme overall, we interweaved it with the six original SVO items (which were not included in the analyses). Additionally, for each Sadistic SVO item we created a reverse coded version with the more spiteful options on the left hand of the scale. To each participant, the Sadistic SVO items were presented in random order and direction.

Figure 1

Two examples of the Sadistic SVO, representing the two most extreme items (forego no points to take away from the other vs. forego as many points as are taken away from the other).

3.1.2 Procedure

The study was pre-registered (<https://osf.io/qsvy7>) before starting data collection.

355 Participants were recruited and compensated through a German professional panel provider. The study consisted of two measurement occasions with about three weeks in between ($M = 21.0$, $SD = 5.2$ days). Each measurement occasion started with asking participants for informed consent and demographics. At the first measurement occasion, we randomized whether participants first completed the HEXACO-60 or the dark trait scales (which were also presented
360 in random order). At the second measurement occasion, participants completed, again in randomized order, the Unpretentiousness Scale and all 15 SVO items. Participants were informed that one of the (sadistic and original) SVO items would be drawn at random and be fully consequential for their own and the other's bonus payment.⁵ They were fully debriefed about the purpose of the study after completion of the second measurement occasion.

⁵ The points allocated to the other person were later randomly paid out to participants of an independent study.

365 3.1.3 Participants

In order to estimate the bifactor model, we aimed at 300 complete datasets. A total of 462 participants completed the measures at the first measurement occasion (and passed an attention check item), of which 327 also completed the measures at the second measurement occasion. We excluded 12 participants for inconsistent demographic information between the two measurement occasions and an additional two participants for speedy responses (< 2 sec per item). Thus, we achieved a final sample of $N = 313$. Approximately 55% of the sample were female. The participants were aged between 18 and 65 ($M = 41.5$, $SD = 12.3$) years, 63% of them were employees.

3.2 Data analysis

375 The modeling strategy was largely identical to the one used in Study 1. We used robust standard errors and Satorra-Bentler scaled test statistics to address non-normality. Again, D was estimated using bifactor modeling. Additionally, we modeled one latent low Honesty-Humility-factor, one latent Unpretentiousness-factor and one latent sadistic SVO-factor based on the respective items. The basic model thus consisted of 13 latent factors, including nine specific aversive traits residualized for D.

3.3 Results and discussion

Descriptive statistics, internal consistencies of the scales, and inter-correlations are summarized in Table A3 on the OSF. Model fit statistics for the base-models were $\chi^2(4,092) = 6,571$, $p < .01$, $RMSEA = .05$, $SRMR = .07$ for D, and $\chi^2(35) = 184$, $p < .01$, $RMSEA = .13$, $SRMR = .09$ for low Honesty-Humility, respectively. The latent correlation between D and low Honesty-Humility was $r = .87$ and significantly smaller than unity ($\Delta\chi^2(1) = 11.23$, $p < .01$, $ER > .999$).

To evaluate the latent correlations of Sadistic SVO and Pretentiousness with D and low Honesty-Humility, we estimated (1) one baseline model, $\chi^2(7,013) = 10,939, p < .01, RMSEA = .05, SRMR = .07$, in which the correlations of Sadistic SVO and Pretentiousness with D and low Honesty-Humility were each allowed to vary freely (so that the criteria were allowed to exhibit different correlations to both D and low Honesty-Humility); one model each in which (2a) either the correlations of Sadistic SVO or (2b) the correlations of Pretentiousness with D and low Honesty-Humility were constrained to be equal (and the respective other allowed to vary freely), and (3) one in which both Sadistic SVO and Pretentiousness were constrained to be correlated equally strongly with D as with low Honesty-Humility.

Table 4

Unconstrained latent correlations and model comparisons (Study 2)

Outcome variable	D [95% CI]	low HH [95% CI]	$\Delta\chi^2(1)$ (2)-(1)	$\Delta\chi^2(1)$ (3)-(2)	ER	<i>q</i>
a) Sadistic SVO	.13 [.00; .26]	.19 [.06; .31]	0.95	14.55 *	.090	-.05
b) Pretentiousness	.58 [.49; .67]	.74 [.67; .82]	14.78 *	.72	.982	-.30 *

Note: $N = 313$. D = Dark Factor of Personality, HH = Honesty-Humility. (2)-(1): change in model fit after restricting respective correlations to be equal, (3)-(2): change in model fit after restricting both criteria to each correlate equally (compared to only respective correlation constrained). ER: normalized evidence ratio comparing the less restricted to the restricted model. *q*: difference in the (absolute) zero-order correlations with an outcome between HH and D as measured by Cohen's *q* with associated (one-sided and Holm-Bonferroni corrected) *p*-value
* $p < .05$

As can be seen in Table 4, the correlations of Pretentiousness with D and low Honesty-Humility differed significantly. On the other hand, constraining the correlation of Sadistic SVO with D and low Honesty-Humility did not significantly worsen model fit. The model comparisons thus suggested to choose the model with the correlations to Pretentiousness allowed to vary freely and the correlations to Sadistic SVO constrained to be equal to $r = .16$ (p

= .006; $\chi^2(7,122) = 13,185, p < .01, RMSEA = .05, SRMR = .07$), which was further supported by the evidence ratios and Cohen's q . This is well in line with our prediction that Pretentiousness is more strongly correlated with low Honesty-Humility than with D. It is not, however, in line
410 with our prediction that Sadistic SVO is more strongly correlated with D than with low Honesty-Humility.

To investigate incremental variance prediction, we regressed Sadistic SVO and Pretentiousness on both D and low Honesty-Humility. This was not preregistered, but given the inconclusiveness of comparable zero-order associations (Gonzalez et al.; 2020, Pletzer, 2019;
415 Sechrest, 1963), adding a test for incremental variance prediction is crucial as also demonstrated in Study 1. As can be seen in Table 5, neither D nor low Honesty-Humility explained incremental variance in Sadistic SVO. Along with the equal correlations, this suggests that both constructs explain similar portions of variance in this behavioral measure. Notably, this finding is somewhat contrary to the Study 1 findings that D substantially
420 improved the prediction of self-reported Sadism and Spitefulness over low Honesty-Humility. Further, low Honesty-Humility explained more unique variance in Pretentiousness as compared to D. D, however, also explained incremental variance in Pretentiousness, showing that both D and low Honesty-Humility comprise different portions of variance that are relevant for Pretentiousness.

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Table 5

Latent regression results predicting the outcomes by low Honesty-Humility and D (Study 2)

Outcome variable	β_D [95% CI]	β_{HH} [95% CI]	$R^2_{(D, HH)}$	$\Delta R^2_{(HH)}$	$\Delta R^2_{(D)}$
Sadistic SVO	0.27 [-0.14; 0.67]	-0.08 [-0.47; 0.32]	.04	< .01	< .01
Pretentiousness	-0.47 [-0.79; -0.15]	1.20 [0.90; 1.49]	.67	.31	.08

Note: $N = 313$. Standardized latent regression coefficients. D = Dark Factor of Personality, HH = low Honesty-Humility. $R^2_{(D, HH)}$: variance explained in the full model. $\Delta R^2_{(HH)}$: increase in R^2 after adding low Honesty-Humility to the model. $\Delta R^2_{(D)}$: increase in R^2 after adding D to the model.

Like in Study 1, we repeatedly reran the analyses with randomly sampled subsets of only ten items loading on D to match the length of the Honesty-Humility scale, which again yielded results essentially equivalent to the reported ones. The corresponding analysis scripts and results are provided on the OSF.

430

4. Study 3

In Study 2, we showed that both D and low Honesty-Humility comprise meaningful variance beyond each other, with low Honesty-Humility explaining more unique incremental variance in Pretentiousness than D. The question remains, however, whether D and low Honesty-Humility can also be dissociated with a criterion that is better accounted for by D. To this end, we focused on justifying beliefs, which are an explicit, core part of the definition of D (Moshagen et al., 2018), but not of Honesty-Humility as sketched in the introduction.

Although a subset of justifying beliefs are implied in the modesty facet of Honesty-Humility (specifically a sense of superiority and entitlement to preferential treatment; Lee & Ashton, 2004), other beliefs are beyond the scope of Honesty-Humility – in particular those related to general distrust. Hilbig et al. (2018) showed that the exploitative behavior of those low in Honesty-Humility is driven by temptation rather than distrust or fear of exploitation. D, by contrast, explicitly includes all beliefs that can serve as justifications for utility

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maximization at others' costs which explicitly involves distrust-related beliefs. Indeed, D has shown substantial relations to several distrust-related beliefs, including Competitive Jungle
445 and Dangerous Worldviews (Moshagen, Zettler, & Hilbig, 2020) and explains about twice as much variance compared to Honesty-Humility in paranoid tendencies (Hilbig et al., 2020).

4.1 Methods

4.1.1 Measures

We pretested a set of beliefs that would justify aversive behaviors. Specifically, we
450 included constructs that reflect a negative worldview or negative expectations of others. A more detailed description and the results of the pretest are provided on the OSF. Especially distrust-related beliefs (Dangerous and Threatening World View by Sibley & Duckitt, 2009; Trust Scale by Yamagishi, 1986) showed strong relations to D. Thus, in the main study, we assessed these again with higher statistical power, and additionally replaced the Propensity to
455 Trust Scale, which only showed weak associations to both D and low Honesty-Humility, by the IPIP Distrust Scale (Conn & Rieke, 1994), consisting of 10 items. Honesty-Humility was assessed using the corresponding 32 items of the HEXACO-200 (Lee & Ashton, 2004), D was assessed using the D35 (Moshagen, Zettler, & Hilbig, 2020).

4.1.2 Procedure

460 The study was pre-registered before the start of data collection (<https://osf.io/epshf/>). Through a professionally managed online panel, we recruited and compensated participants from the UK. In the beginning, participants were asked to provide informed consent and demographics. Next, all participants answered the D and Honesty-Humility questionnaires (in random order), followed by the three scales measuring justifying beliefs (in random order). At
465 the end, participants were fully debriefed about the purpose of the study.

4.1.3 Participants

Based on the pretest data, we ran a power simulation (Beaujean, 2014), which showed that 500 participants would suffice to achieve desired power ($1-\beta \geq .80$) for the latent correlations between D, low Honesty-Humility, and trust, respectively. A total of 552
470 participants completed the survey (and passed an attention check item), 44 of which had to be excluded due to speedy responding (<2 sec per item) or suspicious response styles (i.e., selecting the same response option for more than 15 consecutive items). Thus, we included $N = 508$ valid datasets in our analyses. Approximately 46% of the sample was female. The participants were aged between 18 and 65 ($M = 45.7$, $SD = 11.6$) years. 55% of them were
475 employees, 37% held a college/university degree.

4.2 Results and discussion

Descriptive results, internal consistencies and inter-correlations can be found in Table A5 on the OSF. Model fit statistics for the base models were $\chi^2(560) = 1,297$, $p < .01$, $RMSEA = .06$, $SRMR = .06$ for D, and $\chi^2(464) = 2,211$, $p < .01$, $RMSEA = .10$, $SRMR = .09$ for low Honesty-Humility,
480 respectively. The latent correlation between D and low Honesty-Humility was $r = .82$ ($p < .001$) and significantly smaller than unity ($\Delta\chi^2(1) = 39.91$, $p < .001$, $ER > .999$).

For each criterion, we estimated a separate model containing the latent factors for D and Honesty-Humility, as well as one for the latent factor which was modeled from the items of the respective criterion. The factors were assigned a scale by fixing their variances to 1. We first
485 considered the latent bivariate correlations of both D and low Honesty-Humility with the justifying beliefs. For each justifying belief, we estimated one model in which its correlations with D and low Honesty-Humility were allowed to vary freely, and one in which they were

constrained to be equal. For each justifying belief, we compared the two models by examining the χ^2 -difference and the *ER*.⁶

490 As can be seen in Table 6, all scales were correlated significantly more strongly with D than with low Honesty-Humility. The magnitude of differences averaged at $q = .13$, corresponding to a moderate effect size.

⁶ Omitting item 5 from the measurement of D, which includes trust-related content, yielded essentially equivalent results. Analysis scripts and results are provided on the OSF.

Table 6*Unconstrained latent correlations and model comparisons (Study 3)*

	D [95% CI]	low HH [95% CI]	$\Delta X^2(1)$	p (Holm- Bonferroni- corrected p)	ER	q	p (Holm- Bonferroni- corrected p)
Distrust	.47 [.39; .54]	.27 [.17; .37]	30.46	< .001 (< .001)	> .999	.23	< .001 (< .001)
Trust Scale	-.33 [-.43; -.22]	-.22 [-.33; -.10]	6.01	.014 (.028)	.611	.11	< .001 (< .001)
Threatening world	.18 [.09; .28]	.11 [.02; .22]	4.60	.032 (.032)	.316	.08	.025 (.025)

495 *Note:* $N = 508$. D: Dark Factor of Personality, HH: Honesty-Humility, $\Delta\chi^2$: (scaled) log-likelihood ratio test (change in model fit after restricting correlations to be equal) ER : normalized evidence ratio comparing the less restricted to the restricted model. q : difference in the (absolute) zero-order correlations with an outcome between low Honesty-Humility and D as measured by Cohen's q with associated (one-sided and Holm-Bonferroni corrected) p -values.

500 To investigate the incremental variance prediction, we further regressed each justifying belief on both D and low Honesty-Humility (thereby deviating from the preregistration, see above). As can be seen in Table 7, D explained incremental variance over low Honesty-Humility in each of the three justifying beliefs, though neither D nor low Honesty-Humility explained much incremental variance in Threatening Worldview. Overall, distrust-related beliefs are thus
505 more strongly subsumed in D as compared to low Honesty-Humility, that is, individuals high in D have stronger negative expectations of the world and others than do those low in Honesty-Humility.

Table 7*Latent regression results predicting the outcomes by D and low Honesty-Humility (Study 3)*

Outcome variable	β_D [95% CI]	β_{HH} [95% CI]	$R^2_{(D, HH)}$	$\Delta R^2_{(HH)}$	$\Delta R^2_{(D)}$
Distrust	0.75 [0.59; 0.92]	-0.35 [-0.53; -0.17]	.26	.05	.16
Trust Scale	-0.45 [-0.69; -0.24]	0.15 [-0.10, 0.40]	.11	.01	.05
Threatening world	0.29 [0.09; 0.49]	-0.13 [-0.33; 0.06]	.04	.01	.02

Note: $N = 508$. Standardized latent linear regression coefficients. D = Dark Factor of Personality, HH = low Honesty-Humility. $R^2_{(D, HH)}$: variance explained in the full model. $\Delta R^2_{(HH)}$: increase in R^2 after adding low Honesty-Humility to the model. $\Delta R^2_{(D)}$: increase in R^2 after adding D to the model.

5. Study 4

510 In Study 3, we corroborated both that low Honesty-Humility comprises meaningful
variance beyond D (for pretentiousness), and that the same applies vice versa (for distrust). In a
final study, we sought to conceptually replicate this finding by examining the role of
callousness, which has been considered to be fundamental for aversive traits (Jones &
Figueredo, 2013; Paulhus, 2014) and which is a defining part of D. By contrast, within the
515 HEXACO model, empathy (the opposing pole of callousness) is part of Emotionality (more
specifically, its Sentimentality facet; Ashton et al., 2014) and thus theoretically distinct from
Honesty-Humility. Thus, D ought to relate more strongly to callousness than low Honesty-
Humility.

5.1 Methods

520 5.1.1 Measures

Given that D was measured very broadly in the previous studies and, in some cases, with
a larger item set than Honesty-Humility, D was herein assessed using the D16 (Moshagen,
Zettler, & Hilbig, 2020; Bader, Horsten, et al., 2021). On par, Honesty-Humility was assessed

using the 16 items of the corresponding scale in the HEXACO-100 (Lee & Ashton, 2018). For
525 empathy, we assessed both the positive and the negative pole: the positive pole was assessed
using the Empathic Concern and Perspective Taking subscales of the Interpersonal Reactivity
Index (7 items each; Davis, 1983), whereas the negative pole was assessed using the 14 items of
the callousness facet from the Personality Inventory for DSM-5 (Maples et al., 2015;
Zimmermann et al., 2014). The callousness items were answered on a 4-point Likert scale (1 =
530 “completely disagree”, 4 = “completely agree”), all other items were answered on a 5-point
Likert scale (1 = “strongly disagree”, 5 = “strongly agree”). We used the respective German
translations of each measure.

5.1.2 Procedure

The study was pre-registered (<https://osf.io/f4bnu/>) before starting data collection.
535 Participants were recruited and compensated through a German professional panel provider.
Each participant first provided informed consent and demographics. The first block of the
study consisted of the D and Honesty-Humility scales, the second of the empathy and
callousness scales. The order of scales was randomized within each block. Additionally, we
embedded one attention check item (e.g., “Please select ‘strongly disagree’ here. This serves to
540 check your attention.”) in each block. After completion, participants were debriefed about the
purpose of the study.

5.1.3 Participants

We ran a power analysis in semPower (Moshagen, 2020), aiming to achieve a power
of .90 based on an alpha error probability of .05 to reject the null hypothesis that D predicts no
545 incremental variance over low Honesty-Humility. To this end, we defined a model with
regression slopes of .50 for D and .10 for low HH and a model in which we assumed a slope of

zero for D. We then obtained a variance-covariance matrix from the former model and fit the latter model to it to obtain the model-implied variance-covariance matrix. Plugging these two matrices into the *semPower.aPriori* command revealed a required sample size of $N = 204$ to detect the assumed effect. However, in order to be able to estimate the structural equation model reliably, we aimed at a final sample size of 500.

A total of 542 participants completed the survey (and passed the attention check items), 57 of which had to be excluded due to speedy responding (<2 sec per item) or suspicious response styles (showing very low variation, i.e., $SD < 0.2$, in responses on any of the scales that contain at least 25% reverse-keyed items, i.e., all except Callousness). Thus, we included $N = 485$ valid datasets in our analyses. Approximately 52% of the sample was female. The participants were aged between 18 and 66 ($M = 41.6$, $SD = 13.1$) years, 33% of them held a college/university degree.

5.2 Results and Discussion

We used robust standard errors and Satorra-Bentler scaled test statistics to account for non-normality. One latent factor each was modeled for D, low Honesty-Humility, Empathic Concern, Perspective Taking, and Callousness. Model fit statistics were $\chi^2(104) = 315$, $p < .01$, $RMSEA = .07$, $SRMR = .06$ for D, and $\chi^2(104) = 728$, $p < .01$, $RMSEA = .12$, $SRMR = .10$ for low Honesty-Humility, respectively. The latent correlation between D and low Honesty-Humility was $r = .63$ ($p < .001$) and significantly smaller than unity ($\Delta\chi^2(1) = 74.191$, $p < .001$, $ER > .999$). Descriptive results, internal consistencies, and observed inter-correlations for all scales can be found in Table A6 on the OSF.

Again, we first considered the latent bivariate correlations of both D and low Honesty-Humility with the empathy measures. To this end, we specified two separate models for

570 empathy and callousness. More specifically, each model contained the factors for D and low
 Honesty-Humility, along with either two factors for empathic concern and perspective taking
 or one factor for callousness. We then first estimated each model allowing the correlations to
 vary freely. Next, we modified the empathy model such that either the correlation of empathic
 concern or the correlation of perspective taking with D and Honesty-Humility were
 575 constrained to be equal. Given that both restrictions lead to significant decreases in model fit,
 we did not estimate an additional model in which the correlations of both subscales were
 constrained. Additionally, we estimated the callousness model with the correlations of
 callousness with D and low Honesty-Humility constrained to be equal.

Again, the nested models were compared by examining the χ^2 -differences and the *ERs*.
 580 As can be seen in Table 8, all scales were correlated significantly more strongly with D than
 with low Honesty-Humility, corresponding to large effects for empathic concern and
 callousness, and a medium-sized effect for perspective taking.

Table 8*Unconstrained latent correlations and model comparisons (Study 4)*

Outcome variable	D [95% CI]	low HH [95% CI]	$\Delta\chi^2(1)$	<i>ER</i>	<i>q</i>
Empathic concern	-.76 [-.83; -.70]	-.41 [-.51; -.31]	30.34 *	> .999	.57
Perspective taking	-.60 [-.68; -.52]	-.33 [-.43; -.23]	56.35 *	> .999	.35
Callousness	.86 [.81; .90]	.54 [.45; .63]	53.76 *	> .999	.62

585 Note: *N* = 485. D = Dark Factor of Personality, HH = Honesty-Humility. $\Delta\chi^2(1)$: change in model fit after restricting
 respective correlations to be equal. *ER*: normalized evidence ratio comparing the less restricted to the restricted
 model. *q*: difference in the (absolute) zero-order correlations with an outcome between low Honesty-Humility and
 D as measured by Cohen's *q*

* *p* < .05

590 To investigate incremental variance prediction, we further regressed each of the three empathy factors on both D and Honesty-Humility. As can be seen in Table 9, D explains substantial incremental variance over Honesty-Humility in all three criteria, while Honesty-Humility practically explains no unique variance. Thus, in line with theory and our predictions, empathy is more strongly subsumed in D as compared to Honesty-Humility.

Table 9

Latent regression results predicting the outcomes by D and low Honesty-Humility (Study 4)

Outcome variable	β_D [95% CI]	β_{HH} [95% CI]	$R^2_{(D, HH)}$	$\Delta R^2_{(HH)}$	$\Delta R^2_{(D)}$
Empathic concern	-0.84 [-0.95; -0.72]	0.12 [-0.01; 0.25]	.59	.02	.35
Perspective taking	-0.66 [-0.77; -0.54]	0.08 [-0.05; 0.22]	.37	.01	.21
Callousness	0.85 [-0.76; -0.94]	-0.03 [.14; .08]	.69	.00	.30

Note: $N = 485$. Standardized latent linear regression coefficients. $R^2_{(D, HH)}$: variance explained in the full model. $\Delta R^2_{(HH)}$: increase in R^2 after adding low Honesty-Humility to the model. $\Delta R^2_{(D)}$: increase in R^2 after adding D to the model.

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6. General Discussion

Recent research suggests that the shared variance of all aversive traits and thus their common core can be understood through the so-called Dark Factor of Personality, D, which is the fluid underlying disposition subsuming the aversive aspects of all aversive traits. Relatedly, the overlap of aversive traits, in particular the Dark Triad traits, has been described as the low pole of Honesty-Humility (Hodson et al., 2018; Lee et al., 2013; Muris et al., 2017), one of the basic dimensions of the HEXACO personality model (Lee & Ashton, 2008). Notwithstanding other findings casting doubt on this particular conclusion (Howard & Van Zandt, 2020; McLarnon & Tarraf, 2021; Schreiber & Marcus, 2020), low Honesty-Humility may adequately

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represent the common core of *all* aversive traits, in turn implying that D may essentially be
605 equivalent to low Honesty-Humility. Thus, the present study sought to extend previous
research by explicitly testing the overlap of Honesty-Humility with the common core of *all*
aversive traits.

Meta-analytically aggregated across the present studies, D and low Honesty-Humility
shared about 66% of their variance (see additional material on the OSF), which is considerably
610 less than the overlap of 90% found between low Honesty-Humility and the common core of
Dark Triad traits (Hodson et al., 2018). This difference is likely due to the broader range of
aversive traits covered by D (as compared to the common core of the Dark Triad traits) which
may also comprise aspects accounted for by other HEXACO dimensions. Yet, the overlap is
sizable enough that D and low Honesty-Humility must be expected to show similar relations
615 with many aversive outcomes. These similarities, however, are not sufficient to consider them
functionally equivalent. Instead, a more critical test of the equivalence assumption
complements the assessment of their correlation by testing their nomological consistency for a
range of theoretically derived criteria. If D and low Honesty-Humility were essentially
equivalent, both would have to be associated with theoretically derived criteria to
620 approximately the same extent, and neither should account for incremental variance in said
criteria over the other.

Conceptually, one crucial difference between Honesty-Humility and D is that the former
was inductively derived from lexical studies and subsequently included as an orthogonal
dimension in a model of basic personality structure (Ashton & Lee, 2007; Zettler, Thielmann, et
625 al., 2020), whereas D was derived deductively, theoretically comprises aspects related to several
dimensions in the HEXACO model, and indeed empirically relates to these (Moshagen et al.,
2018; Schreiber & Marcus, 2020). These theoretical differences, alone, render it unlikely that D

and low Honesty-Humility represent the exact same construct. Moreover, although low Honesty-Humility and D share the aspect of utility maximization, they also differ in the extent to which utility is accompanied by or even achieved through inflicting disutility on others as well as beliefs and attitudes that are used to justify malevolent behaviors. Thus, in four studies, we investigated more closely whether D and Honesty-Humility are not only theoretically, but also empirically dissociable and how exactly they differ.

Specifically, in the first study we demonstrated that D and low Honesty-Humility do not equally determine aversive traits longitudinally. For the majority of the aversive traits considered, D outperformed Honesty-Humility—with the exception of Agentic Narcissism, Psychological Entitlement, and Self-Interest, all of which are conceptually and operationally more closely related to low Honesty-Humility than to D. Given that D and low Honesty-Humility accounted for unique variance in every aversive trait included in the study, the two cannot be equivalent representations of the common core of all aversive traits.

In Studies 2, 3, and 4 we investigated the specific differences between low Honesty-Humility and D in terms of content. To this end, we theoretically derived criteria which should be subsumed in Honesty-Humility and D to a different extent and should thus have unique variance accounted for by the two constructs. To summarize our findings, Table 10 provides an overview of the unique contributions of low Honesty-Humility and D, respectively, relative to the total explained variance in these criteria (i.e., as the relation of their respective ΔR^2 to the total R^2).

Table 10

Unique contributions of D and low Honesty-Humility, respectively, relative to the total explained variances in each criterion (Studies 2-4)

Study	Criterion	Honesty-Humility	D
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2	Sadistic SVO	-	-
2	Pretentiousness	45%	10%
3	Distrust	15%	69%
3	Trust Scale	9%	55%
3	Threatening World	25%	75%
4	Empathic Concern	3%	59%
4	Perspective Taking	3%	57%
4	Callousness	16%	43%
	Median	15%	57%

Note: The table displays the relation of ΔR^2 (of each predictor) to total R^2 combined.

As expected on theoretical grounds, Pretentiousness (i.e., the desire for social recognition) was more strongly linked to low Honesty-Humility than to D. This is consistent with theory, as the greed avoidance facet of Honesty-Humility includes the desire for wealth and social status at the lower pole, whereas D does not involve seeking admiration as a prominent aspect and may actually be incompatible, given that D comprises provoking disutility for others (i.e., sadistic or spiteful behavior). Note, however, that the aspect of utility maximization refers to an individual's goals and also comprises non-materialistic utility. It is therefore not surprising that D and Pretentiousness are still related, as one can certainly derive utility from impressing others with one's wealth and also use it to gather admirers that can then be exploited and manipulated more easily. Nevertheless, in line with our hypothesis, low Honesty-Humility was more strongly related to Pretentiousness than D.

Vice versa, we expected D to be more strongly related to spiteful behavior as
660 operationalized by the Sadistic SVO (Moshagen, Zettler, & Hilbig, 2020). Unexpectedly, D and
low Honesty-Humility were not dissociable via this measure and both accounted only for a
comparatively (though not untypically; Thielmann et al., 2020) small proportion of variance.
Considering that self-reported Sadism and Spitefulness were substantially predicted by both,
and indeed better by D than Honesty-Humility in Study 1, this finding was unexpected. A
665 possible explanation might be that participants had to weigh the utility of the immaterial gain
of harming the other person against the utility of the possible monetary gain. Our implicit
assumption was that the immaterial gain would often outweigh the material gain, which might
not hold because participants could not actually experience the “suffering” of their
counterpart. Thus, the subjective utility of harming the other person might have been small, at
670 best. Future research may thus seek a more suitable behavioral measure of spiteful and/or
sadistic behavior.

Then, we considered another aspect that actually defines D but is only loosely related to
(some aspects of) Honesty-Humility, namely, “beliefs that serve as justifications” (Moshagen et
al., 2018, p. 657) for malevolent behavior, especially distrust-related beliefs. Results
675 consistently showed that D relates more strongly than low Honesty-Humility to those beliefs
reflecting rather negative expectations of one’s surroundings and regarding other people as a
potential threat. These types of beliefs serve as particularly strong justifications for malevolent
behavior: If one believes others are a threat and will be exploitative, it is actually normatively
necessary to behave uncooperatively to prevent being exploited (Gächter, 2004).

680 Finally, we demonstrated empirically the theoretically implied difference between D
and low Honesty-Humility with respect to callousness or lack of empathy: as empathy is
assigned to the Emotionality dimension (rather than Honesty-Humility) within the HEXACO

model, it should not be comprised in Honesty-Humility. By contrast, (lack of) empathy is of central theoretical relevance to D (Moshagen et al., 2018, p. 656). Correspondingly, even though
685 Honesty-Humility showed medium-sized bivariate correlations with callousness and two facets of empathy, it explained virtually no variance once D was accounted for. In turn, D was strongly related to all measures of (low) empathy and accounted for up to 35% of unique variance beyond Honesty-Humility.

Taken together, results from longitudinal data on a range of theoretically selected
690 outcome criteria showed that low Honesty-Humility and D are best understood as operationally strongly related, but nonetheless functionally different and nomologically distinct constructs. Both low Honesty-Humility and D carry psychologically relevant meaning beyond each other (despite their substantial correlation). In particular, low Honesty-Humility and D longitudinally accounted for diverse aversive traits to different extents (with D predicting a larger range and
695 thus appearing to be the more comprehensive representation of their common core). Furthermore, D and low Honesty-Humility are theoretically and empirically distinct on at least three dimensions: whereas low Honesty-Humility is more strongly related to Pretentiousness, D is more strongly related to justifying beliefs, especially those related to distrust and negative expectations of the world, as well as to callousness. The criteria we investigated should,
700 however, not be considered to be exhaustive given that the longitudinal predictions suggest that D and low Honesty-Humility are actually distinct with regard to most aversive traits, so that further exploration of their differences is warranted.

Notably, the findings reported herein are aligned with a recent meta-analysis showing that while low Honesty-Humility and the Dark Triad traits share large parts of their respective
705 nomological nets, they do not overlap perfectly, indicating that they should rather be regarded as having a common theoretical basis than as being redundant constructs (Howard & Van

Zandt, 2020). Correspondingly, the findings presented herein show that low Honesty-Humility is not only distinct from the common core of the Dark Triad, but more generally from the common core of all dark traits.

710 The findings of the present studies are further compatible with another recent meta-
analysis revealing that low Honesty-Humility converged with the Dark Triad traits and other
basic personality dimensions such as Agreeableness on a common higher-order factor
representing D (Schreiber & Marcus, 2020). By this logic, too, D and low Honesty-Humility
cannot be functionally equivalent. Importantly, this does not imply that D should either
715 replace Honesty-Humility or be considered as a seventh basic trait in the HEXACO personality
model, as D explicitly comprises aspects across basic traits and thus cannot represent an
approximately orthogonal personality dimension (Moshagen et al., 2018). Rather, these meta-
analytic findings are aligned with the present conclusion that neither is D perfectly indicated
by low Honesty-Humility nor is low Honesty-Humility perfectly predicted by D, and thus that
720 both carry unique variance components and theoretical meaning. Thus, although low Honesty-
Humility appears to be the best proxy for the common core of aversive traits among all basic
personality dimensions, and although low Honesty-Humility and D are closely related
operationally and empirically, they differ conceptually—both in terms of their relations with
other basic personality dimensions and in terms of defining aspects—and are functionally
725 distinct in that both carry behaviorally relevant variance beyond each other.

Appendix A Supplementary material

Supplementary data to this article can be found at <https://doi.org/10.1016/j.jrp.2021.104154>.

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