Shrouded in the Veil of Darkness: Machiavellians but not narcissists and psychopaths profit from darker weather in courtship

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ABSTRACT

We proposed in the "Veil of Darkness" hypothesis that dark personalities (narcissists, Machiavellians, psychopaths) profit from conditions of less illumination where they can better manipulate others. As an initial test of this hypothesis in the domain of mating, we predicted that male dark personalities should be more successful in their courtship during dark/cloudy rather than bright/sunny weather. In a large naturalistic field-study, 59 men romantically advanced 1395 women on the street, while they were unobtrusively followed by confederate observers. We thus obtained ratings from men, women, and observers on women's reactions to men's advances. Machiavellians, but not narcissists and psychopaths, elicited more positive reactions from women during cloudy weather. This effect was mediated by Machiavellian men's assuredness. We discuss different mechanisms that may constitute the observed Veil of Darkness effect for Machiavellianism.

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1. Background

When are women drawn to shady, self-centered, sly, cunning, and manipulative men? Popular media, lay beliefs, and empirical research suggest that this is the case under some conditions (Jonason, Webster, Schmitt, Li, & Crysel, 2012; Kruger, Fisher, & Jobling, 2003; Li & Kenrick, 2006). In this work, we postulate in our novel *Veil of Darkness* hypothesis that men with "dark" personality traits fare particularly well in contexts of less illumination. We test this hypothesis in the mating/courtship domain with the example of dark/cloudy vs. bright/sunny weather. Specifically, we examine whether weather conditions may function as a moderator of beneficial courtship outcomes of male dark personalities.

1.1. The Dark Triad

A large body of literature (Furnham, Richards, & Paulhus, 2013; Jonason, Luevano, & Adams, 2012) suggests that dark personalities score highly on the sub-clinical Dark Triad traits narcissism, Machiavellianism, and psychopathy (Paulhus & Williams, 2002). These traits share an exploitative behavioral style at the expense of or

disregard for others' welfare (Jonason & Webster, 2010; Jones & Paulhus, 2011; Paulhus & Williams, 2002). Narcissism encompasses the seeking of admiration and attention; a grandiose self-view; vanity and arrogance; exhibitionism and charm; manipulation; and feelings of superiority and entitlement (Morf & Rhodewalt, 2009; Raskin & Hall, 1979). Machiavellianism encompasses immoral, pragmatic, and cynical thinking; coldness; agentic striving for money, status, and power; and deceit, exploitation, and strategic manipulation tactics (Christie & Geis, 1970; Fehr, Samsom, & Paulhus, 1992; Rauthmann, 2012). Psychopathy encompasses callousness and a lack of empathy; interpersonal manipulation; impulsivity and thrill-seeking; and anti-social behaviors (Hare, 2003). The adaptive purposes of the Dark Triad traits for short-term mating have been repeatedly emphasized (e.g., Jonason et al., 2012).

1.2. The Dark Triad and short-term mating

Low empathy and low agreeableness – hallmarks of the Dark Triad (Paulhus & Williams, 2002) – have been found to facilitate exploitative mating strategies (Jonason, Li, Webster, & Schmitt, 2009). Accordingly, dark personalities – particularly males – have been described as opportunistic, casual, volatile, and manipulative in mating contexts (Jonason & Kavanagh, 2010; Jonason, Li, & Buss, 2010; Jonason, Valentine, Li, & Harbeson, 2011; Jonason & Webster, 2010; Jonason et al., 2009, 2012). It has been suggested that the Dark Triad co-evolved as a set of exploitative tendencies that

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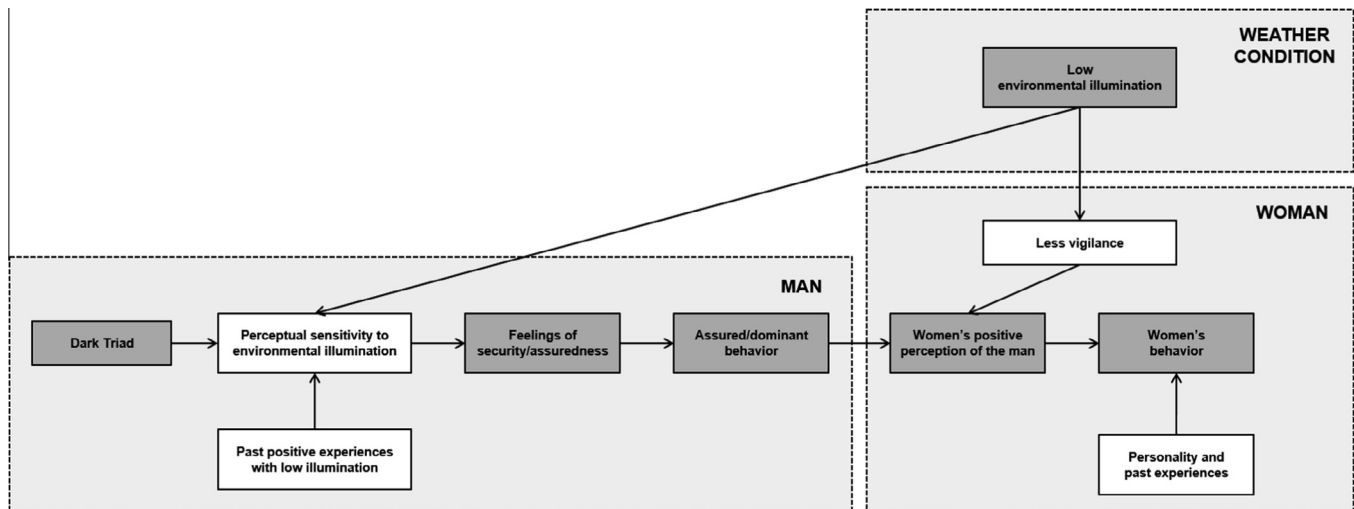*E-mail address:* jfrauthmann@gmail.com (J.F. Rauthmann).

Fig. 1. A process model of potential variables involved in the Veil of Darkness effect in the domain of courtship and mating.

prioritize and facilitate short-term mating particularly in men (Jonason & Kavanagh, 2010; Jonason & Webster, 2010; Jonason et al., 2009, 2010, 2011, 2012). However, there has so far not been any ecologically valid investigation under which conditions male dark personalities fare well in *actual* courtship situations (i.e., not self-reported, recalled, hypothetical, or in a laboratory).

1.3. The Veil of Darkness Hypothesis

If dark traits have evolved as social exploitation and cheater strategies, dark personalities should fare particularly well in their manipulation of others in ambiguous, secretive, and anonymous contexts where they can covertly unfold their dark intentions and tactics (Jonason et al., 2012; Wilson, Near, & Miller, 1996). Less illumination or "darkness" in surroundings (e.g., when clouds obstruct sunshine, at night, etc.) may provide such ambiguity, secrecy, and anonymity. It may function in two ways. First, selfish/agonistic behavior may be difficult to detect by those who are being exploited or cheated on so that aversive consequences (e.g., getting caught, punishment, social exclusion) for cheaters are reduced. Second, cheaters may feel more secure in their selfishness, agonism, or exploitation of others (perhaps in the hopes of better getting away of it). Hence, particularly dark personalities should benefit from less environmental illumination. We refer to this as the "Veil of Darkness" (VoD) hypothesis. In the current study, we test the idea that less illumination due to cloudy weather ("dark skies" in lay language) may be conducive to dark personalities in courtship endeavors. Figure 1 illustrates the VoD hypothesis for a courtship situation of a male dark person.[1] This process model is to describe potential mechanisms that constitute the effect. Male dark personalities may be consciously or unconsciously perceptively attuned to recognizing situations in which interpersonal manipulation strategies may unfold well. One such situation may be less illumination because dark personalities may have learned that they are beneficial (e.g., more anonymity, more stealth, etc.). In this work, less illumination is caused by cloudiness obstructing sunshine. Not only night-time vs. day-time (as extreme poles of illumination) may have effects on behavior and decision-making as human perception is sensitive to even small variations of darkness (Steidle, Werth, & Hanke, 2011) as well as weather

conditions (see Guéguen, 2013 for an application in a mating context). The explicit or implicit perception of less illumination may trigger feelings of assuredness which then manifest in assured, dominant, and bold approaching behavior. Such behavior is positively evaluated by the approached women (see Dufner, Rauthmann, Czarna, & Denissen, 2013), entailing beneficial courtship outcomes (e.g., smiling). Low environmental illumination may not only impact male dark personalities, but also approached women. The women could be less vigilant in darker weather conditions and allocate less attention to the approaching male (e.g., because of being in a hurry). This may impact their evaluations and according behavior. In sum, low environmental illumination may operate in two ways: It may boost men's assuredness or decrease women's attention. As we focus in the current study solely on male dark personalities, we examine the former mechanism only (see gray-shaded boxes in Fig. 1).

1.4. Evidence for a Veil of Darkness effect

Circumstantial evidence suggests that dark personalities could indeed be particularly successful in contexts of less illumination. First, less light means less visibility, more secrecy, and more anonymity – and hence more freedom for "shady operations." For instance, crimes and sexual activity are much more common at night (e.g., Atkins, Husain, & Storey, 1991; Reinberg & Lagoguey, 1978). Particularly dark personalities may have evolved strategies to avoid their detection by others (Jonason & Webster, 2012) by seeking out times, situations, and areas with less illumination that represent generally underexploited niches (because less people are active at night) (for this argument, see Jonason, Jones, & Lyons, 2013). As most people dislike going out in "bad" or "dark" (i.e., cloudy, rainy, etc.) weather, such weather represents an underexploited niche that dark personalities could use to their advantage. Second, the Dark Triad traits have been linked to a nocturnal chronotype (Jonason et al., 2013). This chronotype – same as the Dark Triad – has also been linked to increased short-term mating success (Gunawardane, Piffer, & Custance, 2011; Piffer, 2010). The tendency towards a nocturnal chronotype in dark personalities may be taken as an indication that dark traits may be attuned to reaping mating benefits in underexploited niches of less illumination. Taken together, we hypothesized that dark personalities should be able to take advantage of less light to successfully lure potential mates into their fangs. We test this with dark weather as the VoD hypothesis predicts that more cloudiness should lead to more positive outcomes for dark personalities (see Fig. 1).

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[1] Previous literature suggests that effects are strongest for male dark personalities. Moreover, the current design was limited to men approaching women. It is desirable to investigate in future research to which extent findings generalize to female–male approaches.

2. The current work

Previous studies examining women's mate choices were usually limited to utilizing vignettes of hypothetical mating partners (e.g., Herold & Milhausen, 1999; Urbaniak & Kilman, 2003), laboratory settings with little ecological validity (e.g., Sadalla & Kenrick, 1987), self-reports of mate choice (e.g., Herold & Milhausen, 1999), and semi-naturalistic field-studies with a restricted range of male behavior (e.g., Clark & Hatfield, 1989; Hald & Høgh-Olesen, 2010). Researchers have called for studies with real people interacting with other real people (Baumeister, Vohs, & Funder, 2007; Buss, 1988). In our design, women were approached by men on the street and were unobtrusively observed by research assistants who subsequently interviewed them. Our design thus overcomes several limitations. We examined genuine, non-hypothetical, and possibly consequential interactions between previously unacquainted men and women in a real setting. Also, we obtained various data from four sources: men, women, observers, and lab-raters. Hence, we could compare the effects of men's narcissism, Machiavellianism, and psychopathy on spontaneous mate attraction at zero-acquaintance (assessed by different data sources) under different weather conditions.

3. Method

3.1. Participants

The study was advertised as "The Courtship Project" via e-mailing, online social networking ads, word-of-the-mouth, and flyers. Eligible for participation were single heterosexual men, aged at least 18, which would participate in Munich (third-largest city in Germany) during summer 2011. As an incentive, participants obtained feedback about their personality traits and in-field performance as well as 25 Euro (about 32 US$) if they could approach 25 women in about 5 h. In total, 59 men ($M = 25.28$, $SD = 5.49$ years) approached 1395 women ($M = 21.67$, $SD = 4.80$ years). Due to missing values, sample sizes of men and women dropped in some analyses. In our analyses, 424 women were single, and 815 were not single. We controlled for women's relationship status in all analyses.

3.2. Procedure

Men were first invited to a seminar in which we (a) explained aims, scope, and instructions of the study, (b) obtained their informed consent, (c) assessed several personality variables (only the Dark Triad will be considered here), and (d) had them introduce themselves on camera for short 20–30 s video-clips (which lab-raters judged later on). One to three weeks later, men approached about 25 self-chosen women in approx. 5 h on the street to obtain their contact data (e.g., email, phone number, etc.). They also provided several assessments about the woman, the interaction, and themselves after each interaction. Additionally, each man was followed by two trained female observers (out of a pool of 12; ages 18–22 years) to their knowing, but unobtrusively to the approached women (which were subsequently informed about the study). One observer rated the women's and men's behavior and communication, while the other protocolled context variables such as time, weather, and location. The approached women were subsequently asked by the observers how they evaluated the men and their advances. Additionally, men's video clips were judged by independent lab-raters on several dimensions (only attractiveness will be considered here). With ratings from four different sources (men, women, observers, lab-coders), our design represents a naturalistic yet standardized field-study with a multi-method approach.

3.3. Ethics

The current project was approved by the ethics committee of the Humboldt-University of Berlin. We took several measures to protect all persons involved (observers, participants, and approached women). First, observers were informed about the project's content and trained. They could quit at any time if they felt uncomfortable. Second, male participants could inform themselves about the Courtship Project on a registration website before they were invited to our seminar. On that page, they submitted their application to be considered as a participant and confirmed that they have read and understood all information on the study. In the seminar, all participants were again provided extensive information about the nature, scope, benefits, and potential risks of the study. Men could then sign a detailed informed consent form. They could abort the study at any time without any consequences. Observers were to assist the participants in any way possible, and the participants could also contact the investigators at all times. Third, participants should only approach women they genuinely wanted to know better to prevent disappointment in the women. All women were extensively debriefed by the observers after the interactions. Further, our observers were all female, and they were instructed to interrupt interactions immediately if they thought men behaved in any way inappropriate. Finally, we also would not use the approached women's data if requested. We could thus obtain data from about 70% of all approached women.

3.4. Measures

3.4.1. Dark Triad

Men rated themselves on narcissism (e.g., I tend to want others to admire me; $M = 2.35$, $SD = 0.87$; $\alpha = .77$), Machiavellianism (e.g., I have used deceit or lied to get my way; $M = 1.84$, $SD = 0.86$, $\alpha = .71$), and psychopathy (e.g., I tend to lack remorse; $M = 1.55$, $SD = 0.92$; $\alpha = .54$) with the Dirty Dozen (Jonason & Webster, 2010; Küfner, Dufner, & Back, 2012) on a five-point Likert-type scale (0 = totally disagree, 4 = totally agree).

3.4.2. Lab-ratings

We sampled men's attractiveness by having eight independent lab-raters (three male, five female) rate each man on body and face attractiveness on a seven-point Likert-type scale (1 = totally disagree, 7 = totally agree). As these ratings were highly correlated ($r = .85$, $p < .001$), we aggregated them to a global composite-index of attractiveness ($M = 3.52$, $SD = 0.92$, $\alpha = .92$). This score served as a control variable to examine the effects of the Dark Triad independent of men's physical attractiveness.[2]

3.4.3. Courtship outcomes

We sampled courtship outcomes from women, observers, and men. Women indicated on a seven-point Likert-type scale (0 = not at all, 6 = completely) (a) how attractive the man was ($M = 2.34$, $SD = 1.86$), (b) how likeable the man was ($M = 4.04$, $SD = 1.67$), and (c) how good they found the advance of the man ($M = 2.78$, $SD = 1.89$). Observers rated on a seven-point Likert-type scale (0 = very bad, 6 = very well) how well (i.e., fluent, smooth, and natural) the communication between the men and each woman went ($M = 3.22$, $SD = 1.79$) and how assured the men acted to-

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[2] Effects of physical attractiveness as a general strong indicator of courtship/mating success should be removed to test "pure" effects of personality traits, particularly when examining dark personality traits (Dufner et al., 2013; Holtzman & Strube, 2010).

Table 1
Prediction of men's courtship success by men's Dark Triad traits and weather condition.

Predictors	Men's attractiveness (women-rated)				Men's likability (women-rated)				Appeal of men's advance (women-rated)				Quality of communication (observer-rated)				Amount of smiling (men-rated)			
	B	SE	T-ratio	df	B	SE	T-ratio	df	B	SE	T-ratio	df	B	SE	T-ratio	df	B	SE	T-ratio	df
Dark weather × narcissism	−.25	.25	−1.00	816	−.42	.26	−1.58	824	.06	.25	0.25	817	−.07	.21	−0.32	1030	−.34	.21	−1.64	1109
Dark weather × Machiavellianism	.53*	.27	1.96	816	.67*	.29	2.29	824	.67*	.28	2.40	817	.56*	.23	2.41	1030	.66**	.23	2.84	1109
Dark weather × psychopathy	−.06	.18	−0.36	816	−.27	.20	−1.38	824	−.05	.19	−0.25	817	−.04	.18	−0.24	1030	−.14	.17	−0.80	1109

Note: Level 1 units: $N = 827$–1120. Level 2 units: $N = 54$–56.
Women's relationship status and men's physical attractiveness were controlled in all analyses.
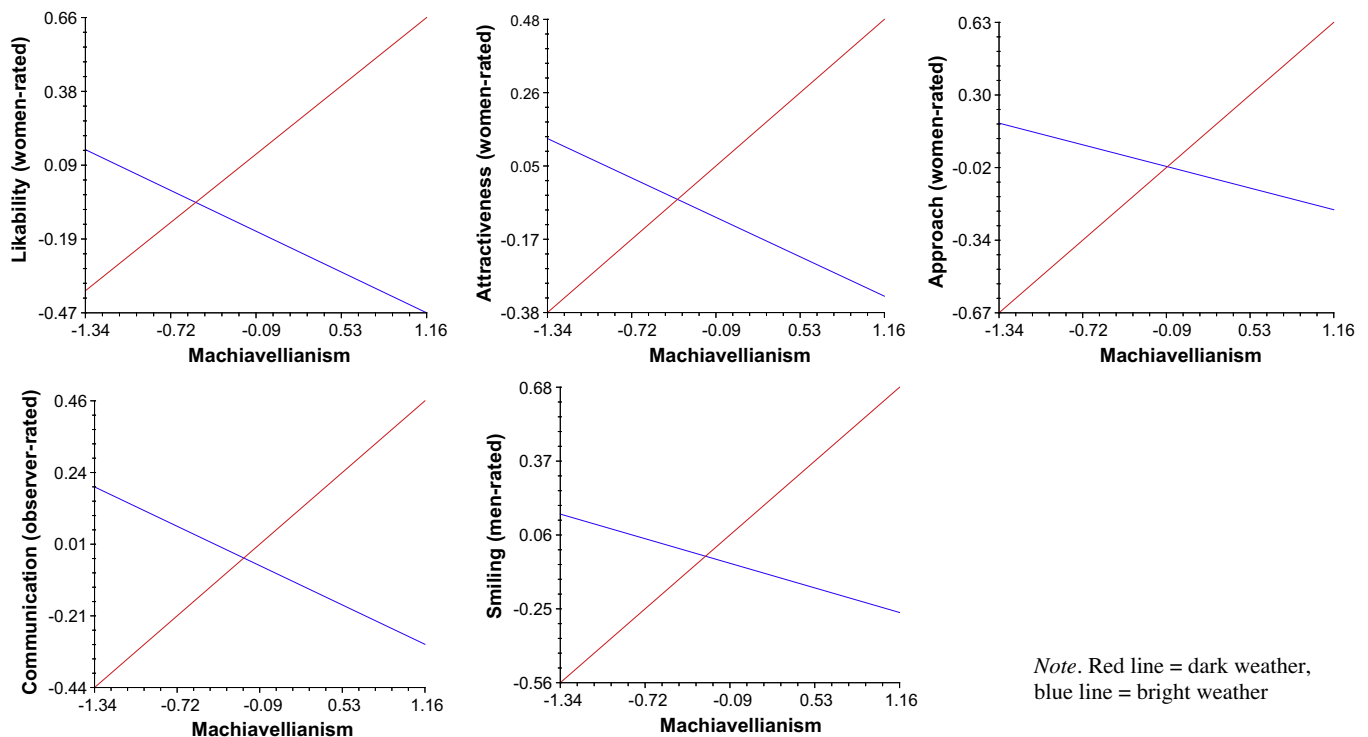** $p < .01$.
* $p < .05$.

Fig. 2. Interaction plots of men's Machiavellianism predicting courtship outcomes under dark vs. bright weather conditions.

Note. Red line = dark weather, blue line = bright weather

wards the women ($M = 4.25$, $SD = 1.50$). *Men* rated on a seven-point Likert-type scale (0 = *never*, 6 = *the entire time*) how assured they felt ($M = 4.32$, $SD = 1.87$) and how much each approached woman smiled at them during the interaction ($M = 3.21$, $SD = 1.88$).

3.4.4. Dark weather

Observers reported weather conditions (e.g., sunny, cloudy, etc.) when a man approached a woman. We discarded ambiguous cases (e.g., reports of a little sun with some clouds) as well as cases with missing weather information. In the current analyses, the sun was shining for 634 interactions (coded as "0"), while there was dark weather for 605 interactions (coded as "1").[3] "Dark" weather refers to strong cloudiness with no sunshine

4. Results

4.1. Demonstration of the Veil of Darkness effect

As women were nested in men, we performed multi-level analyses to predict each of the five courtship outcomes (women-rated: men's attractiveness, likability, appeal of approach; observer-rated: quality of communication; man-rated: women's smiling) from men's Dark Triad traits (narcissism, Machiavellianism, psychopathy) and dark weather. We additionally controlled for women's relationship status and men's coded attractiveness.[4] To test the VoD hypothesis, we were interested in the cross-level interaction between dark weather (level 1) and men's Dark Triad traits (level 2) predicting courtship success.

Findings are presented in Table 1. As can be seen, we could detect across all four courtship outcomes positive cross-level interac-

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[3] To cross-validate these ratings *in situ*, we also gathered weather data from an official German source for the respective days (online: http://www.dwd.de/). We then predicted dark weather from the daily mean degree of cloud coverage. Both variables converged strongly, Odds coefficient = 0.75, T-ratio ($df = 54$) = 4.21, $p < .001$.

[4] We also controlled for the durations of the interactions between men and women, but the pattern of results remained virtually identical.
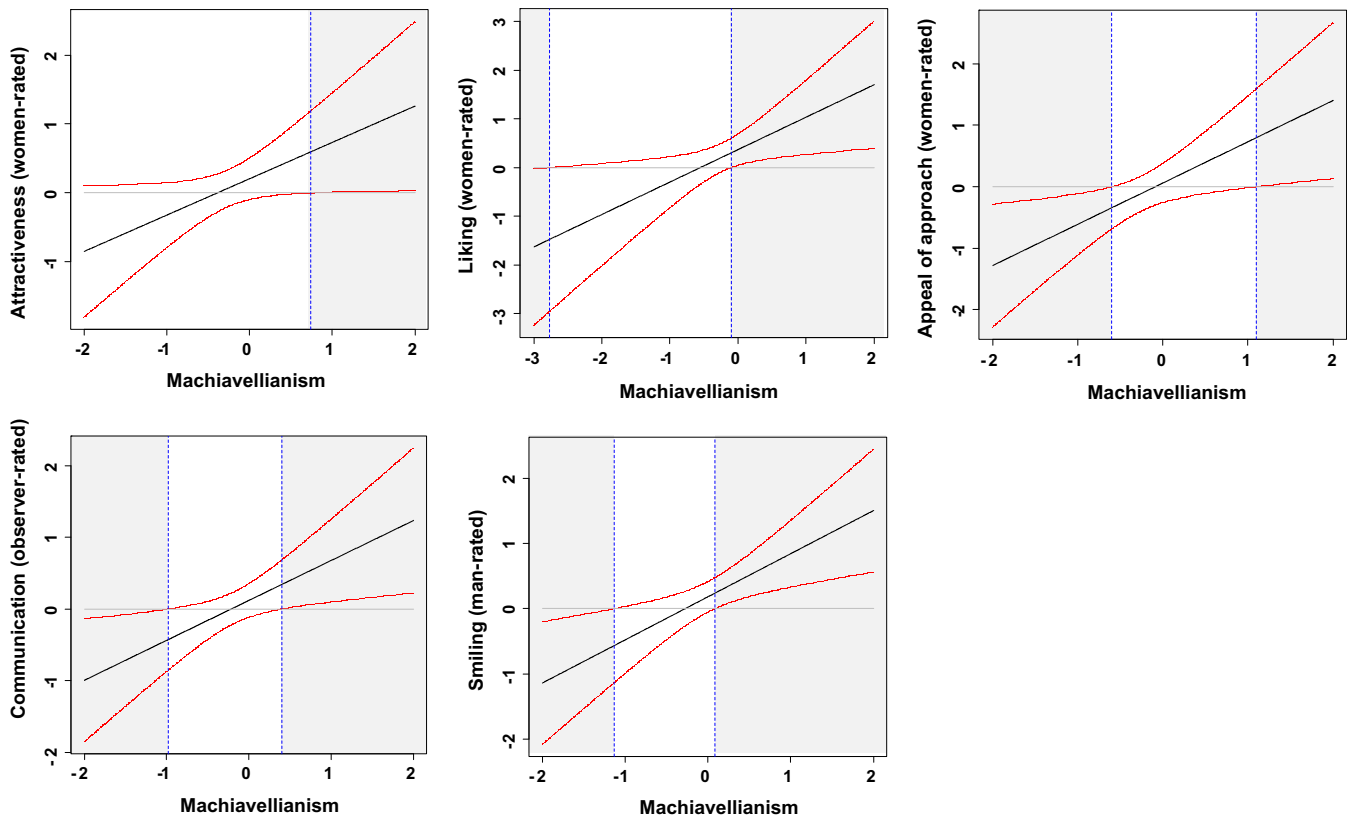
Fig. 3. Regions of significance (gray areas) and confidence bands for the interaction between Machiavellianism and dark weather predicting courtship outcomes.

Table 2
Mediation analyses for assuredness feelings.

Statistics	Liking	Attractiveness	Approach	Communication	Smiling
Total effect (Mach + Assuredness)	.09†	.02	.16**	.07	.12**
Direct effect (Mach)	.05	.01	.13*	.03	.08†
Effect (Assuredness)	.03	.01	.03	.04	.05
Sobel's z	2.46*	1.48	2.20*	3.03**	3.53***
Boot CI	.01–.06	.00–.04	.01–.07	.02–0.7	.03–.08
Mediation?	(Yes)	No	Partial	(Yes)	Yes

Note: Boot CI = bootstrapped bias corrected confidence intervals from 5000 resamples.
† $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

tions between dark weather and men's Machiavellianism, but not narcissism and psychopathy. This finding supported our VoD hypothesis for Machiavellianism only. Interaction plots are displayed in Fig. 2. Next, we performed simple slope analyses to further investigate these interaction effects. These findings are displayed in Fig. 3. Gray-shaded areas reflect significant regions of simple slopes. As can be seen, higher levels of Machiavellianism entailed significantly more, and lower levels of Machiavellianism significantly less positive courtship outcomes (except for women's evaluations of men's attractiveness). Thus, men high on Machiavellianism performed better under dark/cloudy weather.

4.2. Explanation of the Veil of Darkness effect

What happened during dark weather that led to the Machiavellian VoD effect (see Section 4.1.)? To examine men's self-perceived assuredness as a possible explanatory variable of this effect, we computed Hayes' (2012), Hayes' (2013) PROCESS Macro whether and to what extent self-perceived assuredness mediated the effect of men's Machiavellianism on the five courtship outcomes under dark weather conditions. Findings are summarized in Table 2. As can be seen, assuredness functioned either as a partial or full mediator, specifically for women's approach evaluation and their smiling behavior.

Based on these findings, we additionally sought to explain the VoD effect by a meditational process model (see Hayes, 2013). Specifically, we aimed to test the process model being constituted of the gray boxes in Fig. 1 for which we had data in this study. Analyses were run with Hayes' (2012), Hayes' (2013) PROCESS macro for the dark weather condition, with IV = men's Machiavellianism → M_1 = men's self-perceived assuredness → M_2 = men's assured behavior (observer-rated) → M_3 = women's positive evaluations of men's approach → DV = women's smiling behavior (men-rated). As can be seen summarized in Table 3 and graphically illustrated

Table 3
Mediational process models.

Models	Effect	Boot SE	Boot CI	Mediation?
Total	.042	.020	[.005–.084]	Yes
Mach → assured feelings → smiling	.020	.010	[.005–.047]	Yes
Mach → assured feelings → assured behavior → smiling	.004	.002	[.001–.011]	Yes
Mach → assured feelings → approach evaluation → smiling	.007	.004	[.002–.017]	Yes
Mach → assured feelings → assured behavior → approach evaluation → smiling	.001	.001	[.000–.002]	Yes
Mach → assured behavior → smiling	−.016	.008	[−.038−−.004]	Yes
Mach → assured behavior → approach evaluation → smiling	−.002	.002	[−.007−.000]	No
Mach → approach evaluation → smiling	.029	.013	[.009–.060]	Yes

Note: 5000 bootstrapped resamples were used. BOOT SE = bootstrapped standard error, BOOT CI = bootstrapped confidence interval.
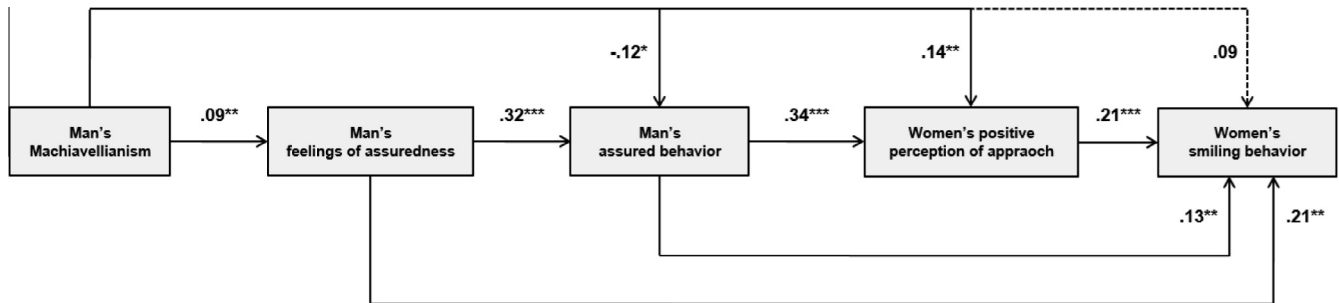

Fig. 4. Process model of men's Machiavellianism leading to beneficial courtship outcomes under dark weather conditions. *Note:* Only significant paths are included. The dotted lines represent the direct effect of Machiavellianism on smiling ($p > .05$). $^{***}p < .001$ $^{**}p < .01$, $^*p < .05$.

in Fig. 4, men's Machiavellianism led to smiling via the proposed mediators (total effect: .14, $p < .01$, direct effect: .09, *n.s.*). Thus, we could demonstrate initial evidence for the process model outlined in Fig. 1.

5. Discussion

We formulated the VoD hypothesis, which states that dark personalities should fare well in conditions of less illumination. We put this hypothesis to an initial test in the domain of courtship success and mate attraction within a naturalistic field-study. In this setting, the VoD hypothesis could only be confirmed for Machiavellianism: High Machiavellians profited from dark weather. We additionally sought to explain this finding by looking at the mechanisms underlying the Machiavellian VoD effect. Our data suggest that Machiavellians elicited more positive reactions from women primarily because of a boost in self-esteem: They felt assured which lead to positive courtship outcomes. We explicitly do not advocate that clouds per se lead to more attraction for Machiavellians. Rather, the psychological effects of dark weather may be important, affecting the Machiavellian (here: his assuredness) and/or the woman.

The limitations of this study point towards several lines of future research that should replicate, corroborate, and expand the VoD hypothesis. First, the VoD hypothesis should be tested with and replicated in other designs. The current research was limited to weather variables, only males approaching females, the Dirty Dozen, and attraction outcomes. Replications and extension should involve (a) experimental variations in the amount of light (in lux) or day-time vs. night-time, (b) investigations of female effects, (c) different Dark Triad measures (possibly with facet-scales), and (d) outcome variables other than mate attraction (e.g., making friends, persuasion, cheating, aggression, retaliation). It will be of particular interest whether the (Machiavellian) VoD effect generalizes beyond the mating domain as it, if robust, should be confirmed across different methods (i.e., designs, instruments) and areas (i.e., domains of outcome variables).

Second, the processes that contribute to Machiavellians' success in conditions of less light should be explored in more detail. This work focused on the feelings and behaviors of Machiavellians (see Figs. 1 and 4), but we could not address variables of the approached women. To understand the complete picture of processes unfolding in a VoD effect, it is necessary to track cognitions, feelings, and behaviors of the cheaters (i.e., dark personalities) and the cheated.

Third, the differential effects of Machiavellianism versus narcissism and psychopathy should be elucidated: Why are Machiavellians different from the other dark personalities? Previous findings also indicate that Machiavellians show distinct personality structures and processes (Rauthmann, 2012a, 2012b; Rauthmann & Kolar, 2012; Rauthmann & Kolar, 2013), and our current findings underscore this: Machiavellians *uniquely* showed a VoD effect in courtship and mate attraction success.

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