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Threat Perception: How Psychopathy and Machiavellianism Relate to Social Perceptions During
Competition

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1. Introduction

Psychopathy and Machiavellianism are highly correlated antisocial trait constructs. This overlap has been well documented in community samples in which sub-clinical trait psychopathy (hitherto referred to simply as “psychopathy”)—which includes elements of impulsivity, thrill-seeking, and callousness—is correlated with Machiavellianism: a disposition to be sly, deceptive, and manipulative (Jonason & Krause, 2013; Jonason, Slomski, & Partyka, 2012; Lee & Ashton, 2005; McHoskey, Worzel, & Szyarto, 1998; Paulhus & Williams, 2002). This empirical and theoretical overlap has led to arguments that Machiavellianism is nothing more than successful psychopathy (Stellwagen, 2011; Williams, Nathanson, & Paulhus, 2010). Researchers have made efforts to utilize social cognitive tasks to meaningfully distinguish these two constructs (Ali, Amorim, & Chamorro-Premuzic; 2009; Ali & Chamorro-Premuzic, 2010; Jonason et al., 2012; Jonason & Webster, 2012). In the present study, the relationship between psychopathy and Machiavellianism was evaluated in the context of threat perception.

Threat perception is a multifaceted process necessary for successful interpersonal interactions. From a Darwinian evolutionary perspective, sensitive threat perception confers an ability to avoid danger and is therefore important for species survival. Perception of threat has become operationalized through facial expressions of emotions, often using visual search tasks. For example, attentional bias to and rapid processing of angry faces, compared to happy or neutral faces, is known as the angry superiority affect (Fox & Damjanovic, 2006; Fox et al., 2011; Hansen & Hansen, 1988). The angry superiority affect has practical importance for the detection of threats to physical integrity (e.g., police officers managing crowds; Damjanovic,

Pinkham, Clarke, & Phillips, 2014). Beyond the need to assess danger to physical integrity is the perception of social or relational threat. When competing for scarce interpersonal resources (e.g., jobs, romantic partners) in zero-sum situations, individuals need to identify those who pose a threat to their own success. In terms of interpersonal features, smiling has been linked to increased subjective impressions of attractiveness, dominance, and intelligence (Lau, 1982; Quadflieg, Vermeulen, & Rossion, 2013). Moreover, smiling is evidenced to communicate wellbeing (Keltner, 1995), to successfully conceal negative emotions (Keltner & Bonanno, 1997) and has even been investigated in the context of interpersonal manipulation (Ekman, Friesen, & O'Sullivan, 1988). Smiling faces are associated with positive perceptions that could pose a reasonable threat in an interpersonal competition. Moreover, these threat ratings may be further influenced by demographic variables such as gender and age (Boshyan, Zebrowitz, Franklin, Carre, & McCormick, 2013; Neel, Becker, Neuberg, & Kenrick, 2012).

Described as interpersonally toxic, both psychopathy and Machiavellianism have been associated with global empathy deficits and the perception of emotions from faces (Ali et al., 2009; Ali & Chamorro-Premuzic, 2010; Wai & Tiliopoulos, 2012). In clinical populations, psychopathy has been linked with deficits in the recognition of fear, sadness, and surprise from faces, but not with anger or happiness (Marsh & Blair, 2008). These results have been mirrored in community samples where researchers further found that psychopathy predicted misperceptions of sad faces as displaying positive affect and neutral faces as displaying negative affect (Ali et al., 2009). On the other hand, researchers have argued that empathy deficits associated with Machiavellianism are confounded with alexithymia (Al Ain, Carre, Fantini-Hauwel, Baudouin, & Besche-Richard, 2013; Wastell & Booth, 2003). However, it is unclear whether social cognitive biases in psychopathy and Machiavellianism relate to threat perception.

In the present study, we sought to further clarify whether the emotion processing deficits associated with psychopathy and Machiavellianism extend to the detection of social threat using a hypothetical competition task. Based upon evidence for socio-cognitive deficits in face perception, it is reasonable to expect that Machiavellianism and psychopathy would demonstrate biases in threat perception irrespective of facial affect. Therefore, we hypothesized (1) that threat perception would vary by targets' emotional expressions, (2) that psychopathy and Machiavellianism would be highly correlated, and (3) that psychopathy and Machiavellianism would be related to a bias in threat perception independent of the target's specific emotional expression.

2. Method

As we were interested in studying antisocial personality traits in a relatively normative sample, we recruited 429 community members (55.2% female) from the Toronto metropolitan area to participate in the current study.

2.2 Measures

Machiavellianism. The Mach IV (Christie & Geis, 1970) is a 20-item self-report measure of Machiavellianism in which respondents are asked to indicate along a 5-point scale how much they agree with a series of statements, ranging from 1 “strongly disagree” to 5 “strongly agree.” Individual scores are calculated by summing the scores for each item (scale range 20—100).

Psychopathy. The Self-Report Psychopathy Scale III (SRP-III; Paulhus, Neumann, & Hare, 2009) is a 64-item self-report measure of psychopathic traits used in non-clinical populations. Individuals were asked to rate how much they agreed with the 64 statements on a scale ranging from 1 “strongly disagree” to 5 “strongly agree.” The scale provides a global score

of psychopathy, as well as scores for four subscales: Antisocial Behavior (ASB), Interpersonal Manipulation (IPM), Callous Affect (CA), and Erratic Life Style (ELS).

Threat Perception. To measure perceptions of interpersonal threat from faces, we first provided participants with a series of prompts. Specifically, we asked them to imagine that they were competing for a promotion at a large company that would include a substantial pay increase and health benefits. These incentives were included to prime competition through love of money, which is related to both Machiavellianism (Tang & Chen, 2008) and psychopathy (Glenn, Iyer, Graham, Koleva, & Haidt, 2009). Participants were told that several other individuals were competing for this position and that they would view photos of their competitors. They were asked to measure on a scale from 1 “is incompetent and could be used to my advantage” to 5 “is a threat to me,” with a score of 3 as “neutral.” Participants were randomly assigned to view 41 faces of undergraduates (27 female, 14 male) affecting one of three emotional expressions in a between-subjects design: neutral ($n = 137$), happiness ($n = 133$), and anger ($n = 159$); all of the photos were taken in the laboratory under the same standardized conditions.¹

3. Results

As tests of normality showed that most of the variables were not normally distributed, we analyzed all of our data by drawing 5000 bootstrapped resamples. ANOVA was used to evaluate our first hypothesis that threat perceptions would be influenced by facial affect. Results showed that there were significant differences between the three affect conditions, $F(2, 426) = 4.08$, $p = .018$, $\eta^2_{\text{partial}} = .019$. Planned comparisons between the conditions showed that smiling (happy) targets ($M = 2.93$, $SD = 0.54$) were viewed as more threatening than those with angry expressions ($M = 2.76$, $SD = 0.62$), bootstrapped 95% CI of difference [0.047, 0.31], and neutral

faces ($M = 2.81$, $SD = 0.43$), bootstrapped 95% CI of difference [0.0075, 0.24], though angry and neutral faces did not significantly differ: bootstrapped 95% CI of difference [-0.18, 0.066].

Bivariate correlations were used to test our second hypothesis that psychopathy and Machiavellianism are correlated. Participants' Mach IV scores were significantly correlated with SRP-III total scores and all SRP-III facets (see Table 1). In addition, participant age was negatively related to SRP-III scores, indicating that younger participants had higher levels of psychopathy, whereas older participants were more likely to view participants as more threatening (irrespective of condition). Also, participant gender was significantly related to Machiavellianism and psychopathy; men were more likely to have higher scores in all respects. Lastly, participant gender and psychopathy were significantly associated with threat ratings over all conditions such that women were more likely than men to view faces as threatening. Lastly, increased levels of psychopathy, measured by both the total SRP-III score and the individual facets, were associated with lower threat ratings when condition was not taken into account.

A hierarchical regression was then used to evaluate our third hypothesis that psychopathy and Machiavellianism would be related to decreased threat perception regardless of the targets' emotional expression. Target emotional expression (the between-subjects factor), participant gender, and psychopathy scores were used as predictor variables as they were significantly related to threat perception. Although Machiavellianism was not significantly related to threat perception in the bivariate correlations, we also included it in the final step of the present model-fitting procedure to assure that it was distinguished from psychopathy in predicting perceptions of threat in light of our a prior interest in the difference between the two constructs. Data were analyzed using a series of nested regression models.

Participant gender was modeled in the first step and significantly predicted the participants' threat ratings, reflecting the results of the correlation reported above: $F(1, 425) = 10.87, p = .0011, R^2 = .025$. The between-subjects variable of target emotional expression was then dummy-coded (with the neutral condition serving as the referent group) and added in the second step: $F(3, 423) = 6.50, p = .00026, R^2 = .044$. The model fit between steps 1 and 2 improved significantly, $\Delta F(2, 423) = 4.24, p = .015, \Delta R^2 = .019$, underscoring the importance of differences in targets' emotional expressions for predicting participants' perceptions of threat from the faces. Similar to the simple-effects tests reported in the ANOVA, the bootstrapped 95% confidence interval coefficients contained 0 for the effect of the dummy-coded variable representing the angry [-0.19, 0.051] but not the happy [0.0010, 0.23] condition. We added participants' scores on the SRP-III in step 3, which again produced a significant model fit, $F(8, 423) = 8.02, p = .0000030, R^2 = .071$, that significantly improved upon that of the previous model: $\Delta F(1, 422) = 12.06, p = .00057, \Delta R^2 = .027$. To provide more fine-grained analysis, we modeled the four subscales of the SRP-III rather than the total score in a separate model. The outcome of the model fit, $F(7, 419) = 5.45, p = .0000050, R^2 = .083$, and improvement over step 2, $\Delta F(4, 419) = 4.49, p = .0015, \Delta R^2 = .039$, were similar. We also observed that only the CA subscale significantly predicted participants' perceptions of threat from the faces, bootstrapped 95% CI [-0.33, -0.059], whereas the confidence intervals for the other three subscales all contained 0. We then added participants' Machiavellianism scores in a fourth step. Although this resulted in a significant model fit, $F(8, 418) = 5.03, p = .0000060, R^2 = .088$, the improvement in model fit was not significant, $\Delta F(1, 418) = 2.05, p = .15, \Delta R^2 = .0045$. Participants' scores on the CA subscale continued to serve as a reliable predictor in this model, bootstrapped 95% CI [-

0.35, -0.0073], whereas Machiavellianism did not, bootstrapped 95% CI [-0.0022, 0.016].ⁱⁱ See Table 2 for regression coefficients and 95% confidence intervals.ⁱⁱⁱ

4. Discussion

By combining a socio-cognitive task and self-report measures, we were able to extract information about how participants' gender and psychopathy affected their perceptions of targets as threatening overall and as a function of those targets' emotional expressions. In support of our first hypothesis, targets with happy expressions were perceived as significantly more threatening than targets with angry expressions. Although it may seem strange that happy targets would seem more threatening than angry targets, anger is typically associated with physical threat whereas the present context (competition for employment) is less amenable to physical challenges. Rather, social competence is threatening in the job environment and smiling individuals are typically perceived as more socially skilled, attractive, and competent—all qualities that would make them more competitive job applicants (Quadflieg et al., 2013). These findings also contrast with previous work demonstrating an anger superiority affect in visual search (i.e. angry faces are more rapidly identified in a search task due to their threatening nature). However, this is likely again a difference between the communication of physical versus social threat. Nevertheless, future research should strive to further investigate what unique factors may be associated with social (or socioeconomic) threats.

Although psychopathy and Machiavellianism were correlated (consistent with our second hypothesis), we found that only psychopathy was associated with individuals' perceptions of others' social threat. Specifically, individual differences in self-reported psychopathy (but not Machiavellianism) predicted participants' tendency to view people as less threatening. More important, this relationship was significant even after controlling for variance contributed by

participants' gender and Machiavellianism and the targets' emotional expression. Although previous research found that age systematically affects psychopathy and Machiavellianism scores (Harpur & Hare, 1994; Jonason, Lyons, Bethell, & Ross, 2013; Jones & Paulhus, 2010), participants' ages also did not contribute significantly to the present effects. These data differ from previous findings that psychopathy is not reliably related to perceptions of others and that Machiavellianism may be associated with perceptions of others as low in interpersonal skills, global intelligence, Nurturance, Gregariousness, and Openness (Rauthmann, 2012a).

Psychopathy has been related to trait arrogance and condescension (Widiger, 2006). The pattern of results observed here may therefore relate to a bias unique to psychopathy that causes others to be viewed as inferior, especially as callous affect was the only facet of psychopathy related to these perceptions. Moreover, the present data suggest that Machiavellianism may not promote the same condescending biases that psychopathy does. This is interesting as Machiavellianism, like all dark personalities, is associated with empathy deficits (Jonason et al., 2013). Though theoretically related, empirically juxtaposing psychopathy and Machiavellianism helps to improve understanding of the unique aspects of each trait.

Naturally, this study had a number of limitations that may reveal fruitful directions for future research. Although our participants were drawn from a community sample, our targets were mostly undergraduates. Future research may wish to extend these effects to older targets who may better fit the context of competition for job promotion to increase the ecological validity of the present work. Another interesting direction to pursue might be to consider varying the emotional expressions of targets in a within-subjects fashion. Although it is quite natural to observe a series of photos in which targets are either neutral or smiling, it is rare for one to openly express anger in a portrait. Although we received no such feedback during debriefing, it

remains possible that this particular condition might have therefore seemed a bit odd. One outcome of doing so, however, could be that the context created by the scowling faces might exacerbate the effects that we observed for the threatening nature of the smiling (happy) faces (see Rule, Krendl, Ivcevic, & Ambady, 2013, for similar context-stimulus effects); empirical testing would be needed to elucidate any such differences. More technically, the internal consistency of the Mach-IV (Cronbach's $\alpha = 0.54$) was lower than has been found previously, consistent with criticisms of the scale's construction (Rauthmann & Will, 2011). Although new measures of Machiavellianism have been proposed, they have yet to be validated on English-speaking samples (Rauthmann, 2012b).

These results highlight the need to understand Machiavellianism and psychopathy in the context of social interaction. Manipulation of others cannot happen in a vacuum; it requires people. Successful manipulation must enable the individual to identify others who pose a threat. Our finding that threat biases in social perception are uniquely associated with psychopathy provides some evidence for a meaningful divergence from Machiavellianism. Recent research has focused on a subtype of psychopathy that is interpersonally successful: individuals whose personality traits and behaviors are consistent with psychopathy but who are high-functioning enough to successfully exploit others, usually in career pursuits (Hall & Benning, 2006; Mullins-Sweatt, Glover, Derefinko, Miller, & Widiger, 2010). With respect to researchers advancing the field of 'successful psychopathy,' a serious concern is how psychopathy can confer adaptive functioning through interpersonal manipulation when it simultaneously reduces the individual's ability to perceive threats. Future research may therefore consider the possibility that psychopathy and Machiavellianism could occupy different roles in the perception and cognition of social interactions, showing close similarities but important context-specific differences.

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Table 1

Descriptive statistics and interrelationships for participants' demographic characteristics and threat perception scores

	<i>M</i>	<i>SD</i>	α	2	3	4	5	6	7	8	9
Age	21.14	4.44		[.066, .26]	[-.16, .053]	[-.20, -.021]	[-.18, -.0030]	[-.20, -.0050]	[-.17, .0010]	[-.15, .044]	[-.0030, .20]
Gender					[-.21, -.024]	[-.41, -.24]	[-.37, -.19]	[-.46, -.30]	[-.32, -.13]	[-.20, -.005]	[.066, .25]
Mach IV	59.32	7.11	0.52			[.43, .58]	[.54, .67]	[.38, .54]	[.20, .37]	[.063, .27]	[-.15, .035]
SRP-III	2.42	0.37	0.86				[.75, .82]	[.74, .81]	[.71, .79]	[.64, .74]	[-.32, -.15]
IPM	2.76	0.50	0.73					[.51, .63]	[.35, .51]	[.27, .43]	[-.26, -.094]
CA	2.47	0.50	0.69						[.34, .49]	[.27, .45]	[-.33, -.16]
ELS	2.67	0.51	0.69							[.32, .48]	[-.21, -.025]
ASB	1.78	0.48	0.69								[-.27, -.086]
Threat	2.83	0.54	0.92								

Note. Correlations represented by 95% confidence intervals based on 5000 bootstrapped resamples; *M* = Mean, *SD* = standard deviation, α = Cronbach's α ; Gender: Male = 0, Female = 1

Table 2

Hierarchical regression results for participants' evaluation of threat perception as a function of their age, gender, the targets' affective expression, and participants' psychopathy and Machiavellianism scores.

	<i>B (SE)</i>	Bootstrapped 95% Confidence Intervals	
		Lower	Upper
Model 1			
Gender	0.17 (0.084)	0.070	0.28
Model 2			
Gender	0.17 (0.052)	0.070	0.28
Target Affect			
Happy	0.11 (0.058)	0.0010	0.23
Angry	-0.07 (0.060)	-0.19	0.051
Model 3			
Gender	0.09 (0.056)	-0.022	0.20
Target Affect			
Happy	0.11 (0.058)	-0.0020	0.22
Angry	0.008 (0.071)	-0.13	0.15
Psychopathy			
IPM	-0.03 (0.063)	-0.15	0.092
CA	-0.19 (0.067)	-0.33	-0.059
ELS	0.04 (0.059)	-0.081	0.15

ASB	-0.10 (0.071)	-0.23	0.045
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Model 4			
<hr/>			
Gender	0.08 (0.056)	-0.033	0.19
Target Affect			
Happy	0.10 (0.056)	-0.010	0.21
Angry	0.02 (0.072)	-0.12	0.16
Psychopathy			
IPM	-0.08 (0.070)	-0.21	0.062
CA	-0.22 (0.069)	-0.35	-0.073
ELS	0.03 (0.059)	-0.084	0.15
ASB	-0.09 (0.071)	-0.23	0.046
Mach IV	0.007 (0.0050)	-0.0020	0.016
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<i>Note.</i> Bootstrapping based on 5000 resamples			

Footnotes

ⁱ Following the feedback of an anonymous reviewer, we collected data from a pilot sample using a scale alternatively anchored at 1 “Is not a threat to me” and 5 “Is a threat to me.” The average ratings given to the faces were highly correlated between the two scales with all disattenuated correlations greater than .79 across the three conditions.

ⁱⁱ Similar effects were found when Machiavellianism was entered as a fourth step in the model using the total SRP-III score instead of the individual subscales: overall model fit, $F(5, 421) = 6.68, p = .0000050, R^2 = .074$; improvement over step 3, $\Delta F(1, 421) = 1.30, p = .25, \Delta R^2 = .0029$; effect of overall psychopathy, bootstrapped 95% CI [-0.50, -0.14]; and effect of Machiavellianism, 95% CI [-0.0034, 0.013].

ⁱⁱⁱ Notably, adding the interactions between psychopathy and Machiavellianism with participant gender and target affect condition does not result in significant improvements in model fit: all $\Delta R^2 < .014$, all $\Delta F < 2.95$, all $p > .054$.