Seeing but Not Feeling: Machiavellian Traits in Relation to Physiological Empathetic Responding and Life Experiences

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Abstract Machiavellian personality traits are often associated with low levels of empathy and lack of interpersonal closeness. However, some individuals high on Machiavellian traits have been shown to be skilled at affective-perspective taking and thereby may *appear* to exhibit an empathic response. The current study examined reported empathetic response as well as physiological empathetic response (through skin conductance levels) in relationship to Machiavellian personality traits. Physiological responses were examined while participants watched emotion eliciting videos. In addition, life history traits and social strategies were examined in relation to the development of Machiavellian personality traits. The results of the current study reveal that individuals high on Machiavellian personality traits had lower levels of physiological empathic responding (skin conductance levels), although they did not report less empathy. Additionally, Machiavellian personality traits were associated with the use of bi-strategic social strategies and having a childhood environment with a harsh or inconsistent father. More specifically, a relationship with a harsh or inconsistent father was found to moderate the relationship between Machiavellian personality scores and skin conductance levels, such that those high in Machiavellian traits appeared to be more resistant to the impact of harsh fathering on responses to others' distress. These results suggest that personality characteristics, social styles, and father's parenting styles are linked to particular physiological profiles in response to highly charged emotional situations.

Keywords Machiavellian · Empathy · Skin conductance levels · Father · Social strategies

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Research has shown that personality traits and life experiences can result in individual differences in physiological and empathetic responding (Bremner and Vermetten 2001). False emotions associated with empathy can be displayed without the individuals actually feeling an emotional response. This can be beneficial in social situations where certain emotional responses are expected. However, this behavioral profile in extreme instances is often seen as pathological, such as Machiavellian personality traits. Although this may be viewed as a negative phenotype, it is highly correlated with social dominance. The theoretical perspective of Resource Control Theory provides a framework in which to understand trade-offs associated with dominance related behaviors, describing variations in strategy usage in order to control and manipulate social resources within the hierarchy (Hawley 2014). Under this framework, aggression in the service of resource control are often effective, and may be appealing to the social group, such that peers gravitate towards the effective resource controller. This type of control and leadership is often observed through the use of a mix of prosocial and coercive social strategies, a term referred to as bi-strategic controller (Hawley 2003a, b). In addition, the Life History Theory indicates that Machiavellian personality traits may be beneficial to individuals pursuing a fast life strategy (Buss 2009; Jonason et al. 2012).

The purpose of this study is to determine how social strategies, personality traits, life experiences, and attachment are related to skin conductance levels when watching an emotion producing video. Physiological reactivity and electro-dermal response (as indexed by Skin Conductance Level, SCL) are used to measure the emotional response of participants watching a video. The aim is to determine which personality characteristics and life history traits would be associated with social strategies (e.g., prosocial and coercive acts), and response to emotional situations.

Resource Control Theory

Resource Control Theory describes strategy usage in order to control and manipulate social resources within the hierarchy (Hawley 2014). We can examine this perspective further through the Social Centrality Hypothesis which states, aggression in the service of effective resource control can not only be effective but also appealing to the social group, such that peers gravitate towards the effective resource controller. A subset of aggressors can be socially skilled and socially appealing. The benefits of associating with these individuals may outweigh the costs (Hawley 2003a, b). Resource Control Theory examines the function of social dominance over the form. For example, which social strategy is more beneficial in a given context? In some instances it is adaptive to use aggression and in other instances cooperation is more beneficial (Hawley 2014). So, two very different behaviors can have the same goal (attainment of social resources), and be used by the same individual, with the variation attributed to context.

Hawley and colleagues have defined five resource control strategy types based on social strategy usage: noncontrollers, typical controllers, prosocial controllers, coercive controllers, and bi-strategic controllers (Hawley 2003a, b). Hawley defines these groups based on self-reported, peer-reported, or parent/teacher-reported use of prosocial and coercive strategies for resource obtainment. Directly competitive behaviors, such as coercive strategies (making others or forcing others to follow plans) begins early and is

followed at 4 to 5 years of age with indirectly competitive behaviors, such as prosocial strategies (helping, cooperation, and reciprocation (Hawley 2003a, b). Noncontrollers score lower than 33% on prosocial and coercive strategies. Typical controllers score less than 66% on both but, only in the lower 33% of one. Prosocial controllers score 66% or above on prosocial strategies but lower on coercive. Coercive controllers score 66% or above on coercive strategies but lower on prosocial strategies. Finally, bi-strategic controllers score 66% or above on both coercive and prosocial strategies.

Socially dominant individuals often use both coercive and prosocial strategies (bi-strategic controllers) in order to gain and maintain resources (Hawley 2003a, b). Resources may be anything from money, time, support, or assistance. For example, often individuals that are bi-strategic will both assist others and control others in order to gain and maintain the resources they are interested in. This bi-strategic behavior often leads to the individual not necessarily being liked by most, but being perceived as socially prominent or dominant. Bi-strategic individuals are rated by peers as being high on intimacy and fun, but also high on conflict and aggression (Hawley et al. 2007). It is, perhaps, this social strategy that might be most interesting in terms of effective control of social resources and associated physiological correlates due to their social focus, flexible strategy use, and ability to effectively wield social power (Hawley et al. 2002). With a focus on control of resources, social resources in particular, bi-strategic individuals may represent an overlapping phenotype with Machiavellian personality traits.

Machiavellianism

The term Machiavellian comes from the Italian Renaissance diplomat and writer Niccolò Machiavelli who deployed strategies through deceit, brutality, and manipulation in order to gain status and power (Christie and Geis 1968). Today this term refers to an individual who is motivated by self-interest, lacks interpersonal closeness, endorses unethical behavior, and desires control (Fehr et al. 1992; McHoskey 1999; Ramanaiah et al. 1994). Machiavellianism is one of the three components of the dark triad, which represents the most prominent and socially aversive personalities (psychopathy, narcissism, and Machiavellianism) (Wai and Tiliopoulos 2012). The three traits are moderately intercorrelated in disagreeableness, dishonesty, aggressiveness, and deficits in empathy (Jonason et al. 2012; Wai and Tiliopoulos 2012).

Those high on Machiavellian personality traits are consistently found to possess low levels of empathy (Ali and Chamorro-Premuzic 2010; Barnett and Thompson 1985; Wai and Tiliopoulos 2012). However, recent research has differentiated affective empathy from cognitive empathy, and it appears for those high on Machiavellian personality traits, the deficit may not be in overall empathy, but rather limited to emotional contagion and affective empathy (Wai and Tiliopoulos 2012). Affective empathy generally refers to emotional contagion and the appropriate emotional reaction in response to others emotions (Feshbach 1987). Cognitive empathy is the ability to discern emotional states from others without emotional contagion (Harari et al. 2010). Research has shown that individuals high on Machiavellian personality traits can display a high level of affective-perspective-taking and a low level of empathy (Barnett and Thompson 1985). Therefore, they are able to identify the feelings of others and may

understand their victim's experiences on a situational level but, not emotionally. This may allow individuals high on Machiavellian personality traits to assess sensitive information from others and formulate strategies, while overlooking or ignoring the harm inflicted in the process. This is similar to the concept of a "successful psychopath" (McHoskey et al. 1998).

All research has not shown that individuals high on Machiavellian personality traits are successful at interpreting others' emotions. Several studies found that individuals with high scores of Machiavellian personality traits had a poor ability to identify facial emotions and often had inappropriate empathic responses to the emotions displayed on facial imagery (Ali et al. 2009; Wai and Tiliopoulos 2012). However, these studies both state that individuals scoring high in Machiavellian personality traits may be better attuned at micro-expression changes and not simply reading static faces. For example, Ali et al. (2009) found that individuals high in Machiavellian personality traits scored well on the reading the mind in the eyes task. Research has also shown that traits of Machiavellianism may be related to decreased levels of Theory of Mind (ToM; the ability to impute the mental states of others and to appreciate what another will think, feel or believe) and emotional intelligence (EI) (Barlow et al. 2010). However, this appears more the case for young girls than boys. For girls (8 to 11), low levels of ToM and low levels of EI (the ability to perceive, use, understand, and regulate emotions) was related to increases in Machiavellian personality scores (Barlow et al. 2010). Similarly, low levels of self-reported and performance EI was related to increased Machiavellian scores in college males and females (Austin et al. 2007). Interestingly, Machiavellian personality traits may not only be related to the level of theory of mind and emotional intelligence, but also how well an individual trusts their bodily sensations. Research has shown high levels of Machiavellian traits were related to decreased levels of trusting body sensations (Lyons and Hughes 2015). Therefore, individuals high in Machiavellian traits may feel typical bodily sensations associated with social contexts but, not trust or interpret them incorrectly. The combination of the above may lead to lack of empathetic responding in studies.

Individuals high in Machiavellian traits have been shown to be resistant to influence by others, cognitively orientated, disinterested in interpersonal closeness, and motivated by self-interest (Fehr et al. 1992; McHoskey 1999; Wastell and Booth 2003). These traits are often viewed as deficits with empathy and social cohesiveness being highly desired in many social contexts. However, the motive to empathize and be included socially can come at a price in certain circumstances. For example, one study found that counseling psychology graduate students scored higher than their academic peers in Machiavellian Tactics. It is believed that Machiavellian tactics allow for more improvisation as well as less emotional involvement, which allows for better overall treatment and care (Chrisite and Geis 1970).

Additionally, Machiavellian traits can be useful in instances where competition for resources is required. In many circumstances, prosocial behavior is a useful tool in obtaining salient resources, particularly as a long-term strategy. However, when those resources are scarce, or believed to be scarce, explicit competition is often required (Sapolsky 2005). Strategies associated with resource competition can involve coercive tactics used to force others to follow plans or make others give or obtain resources. These behaviors may be better suited for individuals with Machiavellian Traits. Hawley (2003a, b) states that the most effective resource strategy is the balance of prosociality

and coercion, which she labels “bi-strategic resource controller.” This type of behavior has been observed in many age groups (Hawley 2003a, b; Hawley et al. 2002; Massey-Abernathy and Byrd-Craven under review).

Life history theory suggests that traits for the Dark Triad (in particularly Machiavellianism) may hold a positive fitness benefit (Mealey 1995). More specifically, Machiavellian traits could be useful to a fast life strategy based on immediate rewards and gratifications. Television shows have often displayed figures such as Gregory House, M.D., Batman (a.k.a. the Dark Knight), and James Bond as possessing high levels of Machiavellian traits while being successful and dominant in at least one primary area of their lives (Jonason et al. 2012). What is seen as maladaptive personality marked by increased levels of self-interest can be conceptualized within life-history theory as adaptive within a fast life history strategy (Buss 2009).

Machiavellianism and Physiology

Although the link between lack of empathy and Machiavellian personality traits has been repeatedly found, the underlying physiological mechanisms associated with this personality profile have not been well documented. One study did find that psychopathology (tested using Lilienfeld’s Psychopathic Personality Inventory) was related to a reduction in skin conductance levels during the anticipatory period before an aversive noise. Increased skin conductance levels were reported related to psychopathology and a presentation of a speech about one’s faults. More specifically, those individuals scoring higher on Machiavellian Egocentricity had a larger increase in skin conductance levels during the presentation of the speech (Dindo and Fowles 2011). Taken together, it appears that individuals high in Machiavellian personality traits may be more sensitive to reporting their own shortcomings but, do not have a significant response to anticipatory stressors. This study included only male participants and sex differences were not addressed.

Similarly, studies have found a link between Machiavellian Egocentricity and a blunted cortisol awakening response (CAR). In addition, the blunted CAR was related to low levels of affective empathy but, not cognitive empathy (Johnson et al. 2014). Cortisol awakening response can reflect an individual’s biological preparedness to handle social challenges throughout the day. The CAR is highly heritable (Bartels et al. 2003; Wüst et al. 2000). However, the hypothalamic-pituitary-adrenal (HPA) axis and associated stress response systems are also highly sensitive to social context and plastic throughout much of development (Flinn et al. 2007).

Parenting and Machiavellianism

Familial relationships have been shown to be related to the activity of the stress response systems, specifically the HPA axis, its primary glucocorticoid product, cortisol, and response to psychosocial events (Muehlenbein and Flinn 2011). The HPA axis is particularly attuned to social dynamics, and is particularly modifiable during infancy and early childhood (Flinn 2006). The presence of chronic psychosocial stress, such as family conflict, father absence, or insensitive or harsh

parenting has the potential to influence endocrine activity within the HPA axis. In naturalistic settings, family conflict and disruptions are associated with altered diurnal cortisol patterns (often elevated cortisol levels for several days) in children and with withdrawal from peer relationships, demonstrating a relationship beyond the family and later relationships (Flinn 2006; Flinn et al. 2011). The HPA axis interacts with the autonomic nervous system (ANS) to influence and coordinate responses to environmental demands, and both systems have been shown to be reactive to social stressors (Byrd-Craven et al. 2011; Sapolsky et al. 2000). Additionally, studies have shown that responses to stress and arousal can be measured by the HPA axis as well as through skin conductance and the ANS (Dieleman et al. 2015).

Machiavellianism appear to be the susceptible to low quality or irregular parental care and attachment (Jonason et al. 2013). Decreased maternal care and father overprotection have been associated with increased Machiavellian traits (Abell et al. 2014; Jonason et al. 2013). In addition, decreased paternal care has been associated with secondary psychopathy (Jonason et al. 2013). Machiavellian traits have a modest heritability factor of .31, making it difficult to separate genetic contributions from parenting environment. We do know that maternal and paternal support and responsiveness are associated with phenotypic differences. Mothers and father contribute differently, with mothers helping to regulate internal aspects of the child's psychology, whereas fathers may act as moral guides to the external world (Jonason et al. 2013).

Fathers are thought to play a unique role in determining the family climate through support of the mother and through parenting behaviors that have developmental consequences. In addition, paternal investment and behavior is more variable than that of mothers (Geary and Flinn 2001), making the father-child relationship an excellent candidate for the study of calibrating physiology to social interactions. It is possible that father-child interactions moderate reactivity of emotion regulation mechanisms, preparing them for later social interactions. In infancy and toddlerhood, father negativity was associated with stronger cortisol responses to an emotion challenge task and to overall cortisol levels (Mills-Koonce et al. 2011). In adult women, more negative father-daughter relationships were associated with higher baseline cortisol levels and higher cortisol responses to peer interactions (Byrd-Craven et al. 2012).

In addition to differences in stress response reactivity, variability in the quality of fathering has been shown to be associated with children's Machiavellian beliefs. More specifically, fathers' Machiavellianism was positively related to their children's Machiavellian beliefs (Kraut and Price 1976). When fathers are absent or when their investment is of low-quality, developmental markers reflect this. Girls in father-absent homes are more likely to have internalizing disorders, while boys in father-absent homes are more likely to have externalizing disorders and to be less popular (Parke et al. 2002). Variability in fathering has also been shown to be related to emotion regulation (Pellegrini 1988) and social cognition (Paquette 2004). This suggests the nature and quality of father-child interactions could have a long-lasting impacts not only on response to psychosocial stressors but, to overall social outcomes as well. However, the link between Machiavellian traits, social strategies, physiological response, reported emotional response, stress levels and parenting, has not, to our knowledge, been studied.

The Current Study

The current study examines the relationship between self-reported empathic response and physiological measures of empathic response. In addition, Machiavellian personality traits are examined in relation to parenting relationships, and social strategies.

Specific hypotheses include the following:

1. Self-reported empathy ratings would be higher than physiological responses (skin conductance levels) of individuals high in Machiavellian traits.
2. Individuals that scored higher on Machiavellian personality scores would have lower skin conductance levels in response viewing a video of others' distress. Parenting, in particular fathers' harsh or inconsistent parenting styles, would be related to Machiavellian personality scores. More specifically, father's harsh or inconsistent parenting style would moderate the relationship between Machiavellian personality scores and skin conductance levels in response viewing a video of others' distress.
3. Machiavellian personality scores would be positively associated with bi-strategic controllers (the combination of prosocial and coercive social strategies).

Methods

Participants

One hundred and twenty undergraduates participated in the study and were recruited through a subject pool website and given partial course credit for participating (males $n=30$, females $n=90$, age range 18–26).

Measures

Demographic Questionnaire – This questionnaire assessed age, sex, and a variety of questions relating to perceived social status and wellbeing. Questions pertaining to perceived social status and wellbeing included: coercive, prosocial, empathetic, and perceived stress levels. All questions were on a five point scale from not at all to very much. Scores for self-reported stress and self-reported empathy were obtained from this questionnaire.

Resource Control Strategies Inventory (RCSI) – This was used to assess characteristics of resource control through prosocial, coercive, and bi-strategic strategies. Prosocial behaviors were assessed based on two questions (*i.e. I have good ideas or suggestions that others like to follow; I am chosen by others to lead the group*). Coercive reported behaviors were also assessed based on two questions (*i.e. I make others do what I want; I force others to follow my plans*). Scores were based on a 5 point Likert scale of strongly disagree, tend to disagree, neither agree nor disagree, tend to agree, and strongly agree. The scores for bi-strategic controllers were configured using the sum of prosocial questions and coercive questions. This method is a deviation from previous work by Hawley (2003a, b) in which percentiles were used. Due to the small sample size, summed scores from participants' use

of both strategies was used for this study. All questionnaires were completed based on the participant average behavior. The resource control strategy assessment has a reliability of .78 to .88 (Hawley et al. 2007).

Machiavellianism Personality Scale (MPS) - The MPS is a 16-item self-report measure designed to assess the personality facets of Machiavellianism. Participants rate each item on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The MPS has a total Machiavellianism score and four subscales: Distrust of Others, Desire for control, Amorality, and Desire for status. The MPS has a total score with an internal consistency coefficient of .84 and good convergent, discriminant, and criterion-related validity (Dahling et al. 2009).

Six Dimensions of Parenting - Skinner et al. (2005) created a motivational model based on the six dimensions of parenting. The questionnaire used for this study was based on their model and modified for this study in order to reflect the relationship of the participant with their father and mother. Instructions were given to participants to answer based on their overall relationship with their father and mother (separately), which included perceptions of the relationship while growing up as well as current relationship. Participants were asked to identify if their primary male caregiver growing up was their father, step-father, adopted father, male relative, or other. Similarly, they were asked if their primary female caregiver growing up was their mother, step-mother, adopted mother, female relative, or other. Answers were then based on their primary male and female caregivers. The questionnaire includes six major factors. Warmth (e.g., “My father and I do special things together.”) ($\alpha = .77$), Structure (e.g., “My father’s expectations for me are clear.”) ($\alpha = .66$), and Autonomy Support (e.g., “My father expects me to say what I really think.”) ($\alpha = .73$) are the three warm/positive dimensions. Rejection (e.g., “Sometimes I feel like my father thinks I’m difficult to like”) ($\alpha = .69$), Chaos (e.g., “My father changes the rules a lot at home.”) ($\alpha = .67$), and Coercion (e.g., “I often get into power struggles with my father.”) ($\alpha = .74$) are the three negative dimensions. In order to create parsimonious discussion of questionnaire dimensions and for ease of analysis, Warmth, Structure, and Autonomy Support were combined into a single composite “Perceived Warm Father/Mother” variable ($\alpha = .84$). Rejection, Chaos and Coercion factors were combined into a single composite “Perceived Negative Father/Mother” variable ($\alpha = .83$).

Procedures

All procedures took place in the psychophysiology laboratory with one research assistant and the participant present. After consenting to the study, participants were then asked to complete a series of questionnaires using Qualtrics online software. Next, skin conductance (9 mm electrodes) were attached to the middle and ring finger of the non-dominant hand. A layer of an isotonic electrolyte gel was placed on the electrodes to increase conduction. Skin conductance was registered and digitized using a BIOPAC Student Lab system that was controlled by a Windows computer that contains data acquisition hardware. All procedures for recording skin conductance levels were obtained from the BIOPAC manual (BIOPAC Systems, Inc., Goleta, California). Baseline physiological activity (skin conductance level) was assessed during a 5-min period of rest. During this period, participants were instructed to sit quietly and relax.

They were then, randomly assigned to watch one of three five minute videos used to measure physiological response, free from social desirability. The three videos are clips from “Odd Girl Out”, “Legends of the Fall”, and multiple clips of babies crying eliciting psychological pain, relational aggression, and caregiving empathy. The video was started after the 5 minute base reading was obtained. Again, participants were instructed to sit quietly and watch the video with little to no movement. Once the video was complete, the electrodes were removed from the participants’ fingers and all participants were debriefed.

Plan of Analysis

Hypotheses were investigated using correlations and a series of linear regression equations conducted through IBM SPSS Statistics Software 22.

Results

Descriptive statistics can be found in Table 1. Skin conductance levels were obtained by subtracting the average of the baseline readings from the average of the readings while participants watched the video. No differences were observed based on the video watched. Therefore, data below is based on all three videos. Also, no sex differences were found regarding any of the analyses.

Table 1 Descriptive statistics and correlational analyses for variables of interest

	Means (SD)	1	2	3	4	5	6	7	8
1. Coercive	M = 2.88 (SD = 1.12)								
2. Prosocial	M = 4.45 (SD = .72)	.18							
3. Empathetic	M = 4.12 (SD = .95)	-.13	.25**						
4. Stressed	M = 3.66 (SD = 1.09)	.22*	-.03	.11					
5. Machiavellian Personality Scores (MPS)	M = 37.14 (SD = 10.55)	.57**	.08	-.13	.29**				
6. Negative Father	M = 24.25 (SD = 12.62)	.12	-.18	-.21*	.17	.26**			
7. Bi-Strategic	M = 10.97 (SD = 2.35)	.80**	.73**	.06	.14	.44**	-.02		
8. Skin Conductance Level (during task minus pre-task)	M = .00 (SD = .07)	-.11	-.05	.08	.04	-.21*	.18	-.10	
9. MPS * Negative Father (Interaction)	M = 921 (SD = 625.25)	.23*	.25**	-.06	.07	.19*	.13	.31**	-.21*

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

To test the first hypothesis, that self-reported empathy ratings would not be associated with higher skin conductance levels, a correlation was conducted with self-reported empathy rating and skin conductance levels. Results revealed that self-reported empathy ratings were not significantly related to skin conductance levels ($r = -.08$, $p = .40$) and self-reported responses were higher.

To test the second hypothesis that skin conductance levels are a function of multiple risk factors, and more specifically whether negative fathers moderate the relationship between Machiavellian personality scores and skin conductance levels, a hierarchical multiple regression analysis was conducted (See Fig. 1). The overall model was significant, $R^2 = .12$, $F(3, 106) = 6.72$, $p < .001$. Variables that were predicted to have problematically high multicollinearity were centered (i.e., Machiavellian personality scores, negative father; Aiken and West 1991). In the first step, two variables were included: Machiavellian personality scores and negative father. These variables accounted for a significant amount of variance in total skin conductance levels, $R^2 = .12$, $F(2, 107) = 7.19$, $p = .001$. Machiavellian personality scores, $b = -.28$, $t(109) = -2.97$, $p = .004$, and negative father, $b = 0.28$, $t(109) = 3.02$, $p = .003$, were significant predictors of skin conductance levels. In the final step of the regression analysis, an interaction term between Machiavellian personality scores and negative father was created, which accounted for a significant proportion of the variance in skin conductance levels, $\Delta R^2 = .04$, $\Delta F(1, 106) = 5.22$, $p = .02$, $b = -0.21$, $t(109) = -2.29$, $p = .02$. Additionally, Machiavellian personality scores were found to be related to negative father ($F(1, 116) = 8.57$, $p = .00$, $\beta = .26$) and self-reported stress ($F(1, 116) = 10.32$, $p = .00$, $\beta = .29$).

Results did not reveal a relationship between Perceived Positive Father Parenting Dimensions and Machiavellian personality scores ($F(1, 114) = .13$, $p = .72$, $\beta = .03$), Perceived Negative Mother Parenting Dimensions and Machiavellian personality

Fig. 1 Moderation by negative father

scores ($F(1,117)=3.77, p=.06, \beta=.18$), or between Perceived Positive Mother Parenting Dimensions and Machiavellian personality scores ($F(1,115)=.15, p=.70, \beta=-.04$). Primary female caregivers were primarily mothers and all mother parenting scores were based on all participants' responses about their primary female caregiver.

To test the third hypothesis, that individuals using a combination of prosocial and coercive social strategies (bi-strategic controllers) would have higher Machiavellian personality scores, participants' scores on the two prosocial questions from the RCSI were summed and scores on the two coercive questions from the RCSI were summed. A linear regression was conducted with Machiavellian personality scores and bi-strategic strategy usage. Machiavellian personality scores predicted bi-strategic strategy use ($F(1,118)=28.63, p=.00, \beta=.44$).

Discussion

The results of the current study suggest that personality characteristics, social styles, and perceived father's parenting styles are linked to particular physiological profiles in response to highly charged emotional situations. Individuals high on Machiavellian personality traits displayed less of a sympathetic nervous systems response, but did not report less empathy. Similar findings have been reported in individuals with borderline personality disorder (Kuo and Linehan 2009). However, this is the first study to our knowledge to find this in relation to high levels of Machiavellian Personality Traits.

Further, it appears that negative or inconsistent developmental experiences are associated with lack of empathetic physiological responding by moderating the relationship between Machiavellian personality scores and skin conductance levels. Individuals scoring higher on Machiavellian personality traits who also reported increased instances of negative or harsh experiences with their father show a physiological profile that suggests that they are less sensitive to social stressors, particularly when compared to those lower on Machiavellian personality traits who experienced harsh fathering. This is consistent with previous research, which has shown that developmental stressors are negatively related to empathetic responding (Boyce and Ellis 2005; Gunnar and Vazquez 2001), and this may be particularly true for those with a Machiavellian phenotype. Genotype X environment effects have been found in other domains for social rejection sensitivity, oxytocin receptor (OXTR) polymorphisms, and stress response (Auer et al. 2015), suggesting that some genotypes predispose individuals to react to psychosocial cues. Our results show that individuals low in Machiavellian traits were highly sensitive to harsh or inconsistent experiences with their fathers, showing *more* reactivity to others' distress. For those high on Machiavellian traits, on the other hand, negative fathering appeared to have no impact on their physiological responses, as they showed little response to viewing others' distress, and were not significantly different from those high in Machiavellian traits with fewer negative experiences with their father. This finding appears to differ from previous research that shows Machiavellianism susceptible to low quality or irregular parental care and attachment (Jonason et al. 2013). However, previous research has also shown that regardless of age, Machiavellianism is negatively related to self-reported importance of friendship (Lyons and Aitken 2010). Machiavellian individuals may have an emotionally detached social style which may translate into a smaller

impact of some social interactions. Taken together, it appears that some levels of Machiavellian traits may be highly susceptible to parental attachment characteristics while those individuals in the highest level of Machiavellian traits may be less influenced by any social relationships.

A useful interpretation of these results examines the costs and benefits of developmental adjustments to harsh or inconsistent parenting. While lower empathy is generally seen as a negative outcome, in the context of harsh parenting, it may serve an adaptive function in fine-tuning social attentional systems away from emotional contagion and empathetic responding toward a more self-preservation and opportunistic social cognitive style. In some contexts, this suite of traits may lead to increased social dominance, particularly in relatively harsh contexts (Jonason et al. 2013).

Fathers, because of the variable and facultative nature of their investment, may serve as reliable cues and moral guides that reveal the nature of the social climate and successful strategies for gaining social resources (Geary and Flinn 2001; Jonason et al. 2013). Being more resistant to the impacts of harsh and/or inconsistent fathering may lead to a social cognitive style that facilitates social resource acquisition by reducing empathetic responding in some individuals, thereby allowing for more flexible strategy use (e.g., coercion or pro-social acts) in a context-specific manner. It is important to point out that parenting effects on Machiavellian traits (in this instance) appear to be limited to fathers, as maternal effects were non-significant. This pattern of results lends further support to the idea that the social climate fathers provide (or fail to provide) significantly impacts social cognition. Furthermore, it should be noted that increased reports of negative fathering may be indicative of harsh childhood environments overall, and associated adjustment of the stress response system, resulting in lower levels of empathetic arousal. This may be less likely given that the same findings were not found related to reports of the maternal relationship. However, further research is needed to tease out the impact of harsh or inconsistent fathering from other associated developmental experiences that may have led to the down regulation of the stress response in reaction to others' distress.

Machiavellian traits were also related to bi-strategic social strategy usage. In previous studies, bi-strategic usage was related to self-reported popularity (Hawley 2003a, b; Massey et al. 2015). These findings suggest that lower physiological arousal to distress of others may facilitate social dominance. Individuals may be able to more effectively use both prosocial and coercive strategies if they are not experiencing an empathetic response. Similarly, individuals high on Machiavellian traits have been observed to be better psychiatric counselors through quick responding and less emotional attachment (Chrisite and Geis 1970), although these findings have been disputed (Abramson 1973). This may demonstrate an adaptive trade-off for those high on Machiavellian traits consistent with a fast life strategy, demonstrating a focus on social opportunities at the expense of empathy, particularly when finite resources (such as energy and time) are in short supply (Buss 2009).

Limitations

This study serves as an exploratory look into Machiavellian traits, social strategies, parental involvement, and physiological empathetic responding. One limitation of the current study is the lack of assessment of potential genetic contributions. For

example, negative fathers might be high on Machiavellian traits and therefore, the transmission might be genetic rather than experiential. Additionally, this study used videos in order to elicit an empathic response. A more naturalistic stressor would help clarify the results.

Future Directions

The current study provides a better understanding of how Machiavellian traits are used in daily social interactions. It also yields a better picture of specific social-environmental factors that may contribute to Machiavellian traits. Future studies are needed to examine the relative contributions of cognitive and affective empathy, and associated physiological profiles for individuals who may be high on one but not the other. In addition, it is important to determine the relative contribution of fathers and mothers (as well as their combined influence) and other developmental experiences lead to social-cognitive styles. The combination of these studies would help us better understand the relative costs and benefits of Machiavellian traits in relation to empathetic responding.

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