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Psychopaths: cheaters or warrior-hawks?

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Abstract

From a life history perspective, psychopaths can be thought to pursue both social cheating and warrior-hawk strategies. The Cheater Hypothesis suggests that psychopaths would exhibit more indignation, and less empathy and altruism than nonpsychopaths. According to the Warrior-Hawk Hypothesis, psychopaths should also be more aggressive. Questionnaires measuring empathy, altruism, indignation, anti-sociality, aggression, and behavioral activation and inhibition were administered to 37 psychopathic inmates, 40 nonpsychopathic inmates, 42 community recruited volunteers, and 38 undergraduate students. Both hypotheses received some support: psychopathic participants scored significantly higher than other participants on measures of indignation and aggression. Consistent with both hypotheses, psychopaths also had a lower ratio of behavioral inhibition to activation than other participants. Contrary to expectations, psychopaths did not score lower on measures of empathy or altruism.

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1. Introduction

Although psychopathy is usually viewed as a disorder (reviewed in Mealey, 1995; cf. Wakefield, 1992; 1999), some investigators have conceptualized it as a life history strategy because a number of psychopathic traits could well have contributed to reproductive and survival success in ancestral environments (Harris, Rice, & Quinsey, 1994; Mealey, 1995; Seto, Khattar, Lalumière, & Quinsey, 1997). More specifically, psychopathy has been characterized as a frequency-dependent life history strategy (Frank, 1988; Mealey, 1995) in which the relative fitness of psychopathy as a strategy depends on the relative frequency of other genotypes (i.e. nonpsychopaths) in the population. This view receives some support from the finding that psychopaths exhibit relatively few developmental

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instabilities, such as minor physical anomalies, that are associated with a variety of neurodevelopmental pathologies (Lalumière, Harris, & Rice, 2001).

The prevalence of antisociality in general is necessarily low when the relative gain from behaving antisocially toward a cooperator is much smaller than the relative loss to the cooperator (Colman & Wilson, 1997). The estimated incidence of psychopathy in the general population is consistent with the hypothesis of frequency-dependent selection (Hare, 1993; Skilling, Quinsey, & Craig, 2001). Colman and Wilson (1997) suggest that heritability should be high if frequency dependent selection is responsible. Consistent with this hypothesis, Schulsinger (1972) found that 14% of the biological relatives of clinically diagnosed psychopaths were also psychopathic, compared with 5–8% in other groups (such as adoptive relatives).

At least two evolutionary hypotheses predict psychopathy to confer a frequency-dependent fitness benefit: the Cheater Hypothesis and the Warrior-Hawk Hypothesis. Both hypotheses yield specific predictions with regards to psychopathy, and each is discussed in turn.

1.1. *The Cheater Hypothesis*

For psychopathy to be considered to be a life history strategy, it must plausibly have conferred a fitness advantage in ancestral environments. Mealey (1995) has noted that game theory, as exemplified in the iterated “Prisoner’s Dilemma” game, illustrates that a cheating or defecting strategy can provide benefits under certain conditions (e.g. where the benefits of cheating outweigh the costs and there are fewer cheaters than cooperators). Psychopaths do appear to have a propensity to exploit the cooperation of others (Mealey, 1995) and Seto et al. (1997) found psychopathy to be related to deception across social domains. This propensity to cheat others is in direct contrast to altruistic, or cooperative behavior.

Frank (1988) has described the evolution of cheating as an alternative to cooperation in social interactions in which emotions have a central role as “commitment devices”. By displaying certain emotions, individuals signal their intentions to others. Feeling (and displaying) certain emotions commits an individual to act in certain ways. This has implications in the evolution of cheating, because cheaters who displayed the intention to cheat would obviously be selected against (Dugatkin, 1992). Cooperators who were adept at reading the signs of cheating would then be selected. More skillful cheaters would then be selected, and so on. In the end, cooperators would have evolved to use reliable cues of trustworthiness and cheaters to conceal the intention to cheat, thus appearing to be cooperators. Trivers (1971) labeled this subtle cheating, and stated that selection would favor individuals who were able to mimic the traits of cooperators in order to influence cooperators’ behavior.

Two displays that may be used by subtle cheaters are indignation and empathy (Frank, 1988). These can both be conceptualized as reactions to being wronged. In the case of indignation, one reacts with anger to having been treated unfairly. For example, if an individual is wronged in some way, he/she may show anger or even attempt to get revenge. When an individual reacts to such a situation visibly, it signals to other people that he or she understands the concept of fairness and may be fair in future interactions with others (Frank, 1988). Empathy, on the other hand, involves reacting to *another person being wronged*. In other words, these two reactions are very similar, except for the subject of the feeling. Empathy is defined as “an affective response more appropriate to someone else’s situation than to one’s own” (Blair, 1995). When an individual

shows empathy towards another who is being slighted in some way, it may signal to the people around him or her that fairness is a concern to this person. More importantly, it may indicate that the individual is likely to be fair or supportive in future interactions. Frank's theory (1988) provides a useful framework for the present study, because both of these social emotions may be an important mechanism in the evolution of psychopathy as an alternative life history strategy.

Because humans are adaptation executors, not fitness maximizers, the feelings/emotions discussed above are unlikely to be voluntarily turned on and off in a strategic manner (Wright, 1995). It is difficult for people to display an unfeared emotion; emotional expression is to a considerable degree an honest signal. For example, posed facial expressions are more muted than spontaneous ones (Landau, 1989). One of the symptoms making up the syndrome of psychopathy is an inability to feel or exhibit empathy (Hare, 1993; Patrick, Cuthbert, & Lang, 1994). If this is the case and empathy is a signal of trustworthiness, it would be difficult for psychopaths to elicit interactions with others. It is possible, however, that psychopaths compensate for a deficit in empathy by exhibiting strong displays of indignation when they are wronged or appear to have been wronged in some way.

1.2. Warrior-Hawk Hypothesis

Although the Cheater Hypothesis adequately explains the manipulateness and duplicity of psychopaths, it does not address their impulsivity and aggressiveness (Colman & Wilson, 1997). The tendency toward indignation in cheaters covers some of the aggression seen in psychopaths, but a second hypothesis is required to explain impulsive aggression typical of psychopaths. The Warrior-Hawk hypothesis is best described using the Hawk–Dove Game (Dawkins, 1976). In this game, there are two basic strategies: “hawk” and “dove”: hawks will always fight very hard and are persistently aggressive. Doves, on the other hand, will threaten, but run if attacked. Clearly, the hawks will always win such contests. With constant selection of hawks over doves, the population of doves would dwindle. These two strategies are not evolutionarily stable according to computer simulations (Dawkins, 1976).

Dawkins (1976) discussed an interesting “retaliator” strategy that may be more stable. Retaliators start off like doves, but retaliate if attacked. In other words, they are conditional strategists. This strategy is similar to the Tit for Tat strategy in the Prisoner's dilemma game, in that the retaliator starts off by being “nice” and only attacks if he/she is attacked first. Another possible strategy is used by “prober-retaliators”. This strategy is essentially the same as the retaliator strategy, with a brief experimental escalation. Psychopaths could be thought of as prober-retaliators because they are impulsively aggressive in situations where most people would not consider it to be appropriate. Not only does it account for the psychopath's reactivity to slights (Hare, 1993), it also accounts for their use of intimidation.

1.3. Proximal mechanism

Risk is associated with both cheating and aggressive strategies due to the increased likelihood of costly retaliation. It would be expected, therefore, that individuals following these strategies would be less risk averse than others. This is consistent with psychopaths' apparent fearlessness and taste for risk (Hare, 1993).

Fowles (1980) proposed a physiological mechanism that may help to explain the lack of fear and risk taking associated with psychopathy. He applied Gray's theory of arousal to psychopathy. Fowles suggests that psychopathy involves a weak Behavioral Inhibition System (BIS) resulting in a lack of anxiety, the inability to inhibit behavior, the inability to learn from past punishments, and a lack of empathy and guilt.

Psychopaths do show less behavioral inhibition (usually operationalized as a response to fear), in comparison to controls (Newman, Wallace, Schmitt, & Arnett, 1997) and painful punishments do not appear to inhibit psychopaths (Newman, 1987). Psychopaths also seem to lack the empathic and guilt responses that normally follow cheating and/or aggressive behavior. Empathic and guilt responses, however, would interfere with a deceptive or aggressive strategy, although an ability to recognize these emotions and to appear to have empathy would be useful. On the other hand, it has been shown that psychopaths do not show this deficit in inhibition when fines are used as punishments instead of aversive events like shocks (Schmauk, 1970), suggesting that psychopaths may be more motivated by tangible punishments and/or rewards.

1.4. Predictions

The present study sought to evaluate the merits of the Cheater and Warrior-Hawk Hypotheses in explaining psychopathy. The combination of cheating and intimidation could have conferred fitness advantages. Some support for this idea was found by Quinsey, Book, and Lalumière (2001) in a factor analytic study of male non-offenders. An Aggressiveness factor (reflecting the Warrior-Hawk Hypothesis) was correlated with an Antisociality factor (reflecting the Cheater Hypothesis). It was, thus, expected that psychopaths use both warrior-hawk and cheater strategies.

Three predictions stem from the Cheater Hypothesis of the origin of psychopathy. First, psychopathic offenders will have higher scores on measures of indignation than nonpsychopaths. Second, psychopaths will exhibit deficits in empathy. Third, psychopaths will report being less altruistic than nonpsychopaths. The Warrior-Hawk Hypothesis predicts that psychopaths should show higher levels of aggression than nonpsychopaths. Finally, both hypotheses would predict that psychopaths would exhibit a lower ratio of behavioral inhibition to activation.

Because the BAS is associated with aggression, and indignation often results in aggressive or threatening displays, it was predicted that higher levels of indignation would be related to a relatively strong BAS. Empathy, an emotional reaction to the plight of others, should, however, tend to inhibit such behaviors. Thus, empathy should be positively correlated with behavioral inhibition.

2. Method

2.1. Participants

2.1.1. Specificity design

When research is conducted with institutional and clinical populations, researchers often employ an institutionalized comparison group. This is definitely the case in the literature on

psychopathy. Most studies examine institutional (imprisoned) populations, namely nonpsychopathic offenders, as their “control” group. The problem with this type of design is the tendency to attribute differences to something unique about the group of interest, ignoring the possibility that the comparison group is the one with the unique trait. Keeping this in mind, the authors decided to use a specificity design to make sure that differences were, in fact, attributable to the psychopaths, and not the other way around. Four groups were recruited; psychopathic inmates, nonpsychopathic inmates, a community sample, undergraduate students.

2.1.2. Institutional sample

Seventy-seven men serving federal prison sentences of 2 years or more were recruited from prison populations in the Kingston area: 40 nonpsychopaths and 37 psychopaths. In the first step of data collection, file data were used to determine which inmates met the criteria on the PCL-R (25 or higher for the Psychopathic group, 20 or lower for the Nonpsychopathic group). This criterion was based on the probability of taxon membership found by Harris et al. (1994). All who met this criterion were called down to the institutional Psychology department. The mean age of the nonpsychopaths was 35.28 years (S.D. = 9.95) and that of the psychopaths 33.43 years (S.D. = 9.25).

2.1.3. Community sample

A comparison group of men from the Kingston community was recruited through a newspaper advertisement in June 1999 and January 2000. The advertisement offered \$10 for participation. Participants filled out the package in groups (2–12 people per session) and were paid \$10 for their participation. The mean age of the community participants was 33.35 (S.D. = 11.87).

2.1.4. Undergraduate sample

Previous research has shown that groups recruited from the Kingston community in this manner were likely to have significant criminal histories (Belmore & Quinsey, 1994). Thirty-eight undergraduates were recruited through the Introductory Psychology Subject Pool at Queen’s University. In exchange for participation, students received academic credit. The mean age in this sample was 19.16 years (S.D. = 0.72).

2.2. Materials

2.2.1. Measures of psychopathy and antisociality

Psychopathy Checklist-Revised scores (PCL-R; Appendix B; Hare, 1991) were retrieved from institutional files to determine group membership for the institutional participants. The self-report version of the Child and Adolescent Taxon scale (CAT-SR; Harris et al., 1994) was also administered in order to make appropriate comparisons between prison and community samples. The CAT-SR includes questions relating to problems in school, violence, and running away from home, among other things. Scores range from 0 to 16, and are significantly correlated with the interview measure of the same items $r=0.87$; Seto et al., 1997). Skilling, Harris, Rice, and Quinsey (in press) found large positive correlations between the CAT-SR and PCL-R total, Factor 1 and Factor 2 scores. Lalumière and Quinsey (1996) found a negative correlation between Childhood and Adolescent Taxon Self Report scores and

Gough's measure of socialization $r = -0.49$). They also obtained significant correlations with Levenson's psychopathy scale, sensation seeking, different measures of mating effort, and self-reported sexual aggression.

2.2.2. *Social desirability and faking*

The Balanced Inventory of Desirable Responding (Paulhus, 1998) was chosen because one of its subscales measures "Impression Management" and there is evidence that the scale has "utility in the measurement of socially desirable responding with offenders" (p. 323). Alpha coefficients range from 0.58 to 0.84 (Kroner & Weekes, 1996). However, it has also been found that scores on Impression Management are significantly negatively correlated with measures of deviant behavior (Paulhus & John, 1998), so a second measure of socially desirable responding, the Holden Psychological Screening Inventory (HPSI), was employed. Lower total HPSI scores indicate socially desirable responding and very high total scores indicate an effort to portray oneself in a negative light (Holden & Grigoriadis, 1995).

2.2.3. *Cheater Hypothesis*

2.2.3.1. *Altruism*. The Self-Report Altruism Scale (Rushton, Chrisjohn, & Fekken, 1981) was used to measure altruism. Internal consistency ranges from 0.78 to 0.87 and the scale total correlates with peer ratings of altruism ($r = 0.51$).

2.2.3.2. *Empathy*. The Interpersonal Reactivity Index (Davis, 1983) has 28 items assigned equally to four subscales: Perspective Taking, Fantasy, Empathic Concern, and Personal Distress. The first two are cognitive measures of empathy, while the last two deal with emotional empathy. Measures of internal consistency for the subscales range from 0.76 to 0.82.

2.2.3.3. *Indignation*. Indignation is defined in the present study as anger in response to mis/maltreatment. The Hostility subscale of the Aggression Questionnaire (Buss & Perry, 1992) has been found to predict such anger (Felsten & Hill, 1999). The Hostility subscale was, therefore, included as a measure of indignation. Interestingly, the Anger subscale is not predictive of such a reaction, and was excluded on that basis.

The Vengeance Scale (Stuckless & Goranson, 1992) was also employed to measure the indignation construct. Vengeance can be thought of as the desire for retribution in response to perceived mis/maltreatment. It should be noted that this scale includes items relating to aggression, and as such, is not a pure measure of indignation. Correctional inmates score more highly than non-inmates on the Vengeance Scale and its internal consistency is high ($\alpha = 0.92$). Example items include "If someone causes me trouble, I'll find a way to make them regret it" and "I find it easy to forgive those who have hurt me".

2.2.4. *Warrior-Hawk Hypothesis*

2.2.4.1. *Aggression*. Aggression was measured using the Aggression Questionnaire (Buss & Perry, 1992). The Physical Aggression and Verbal Aggression subscales were used as measures of aggression in the present study. Alpha coefficients range from 0.72 to 0.85 for the Physical Aggression, Verbal Aggression, Anger, and Hostility subscales of the Aggression Questionnaire.

2.2.5. Proximal mechanism

2.2.5.1. *Inhibition/activation.* The BIS/BAS scale was developed by Carver and White (1994) to measure the two motivational systems posited to underlie behavior. It contains four subscales; BIS, BAS Drive, BAS Fun seeking, and BAS Reward Responsiveness. The internal consistency of these scales ranges from 0.66 to 0.74.

3. Results

3.1. Descriptive statistics

Most of the scales used in the study had alpha coefficients over 0.70, and all but the Verbal Aggression subscale ($\alpha=0.58$) were over 0.60;. Means and standard deviations for all variables are given in Table 1. Empathic Concern was both negatively skewed and leptokurtic ($z_{skew}=3.72$; $z_{kurt}=3.53$), and Self-Report Altruism scores were positively skewed ($z_{skew}=3.44$). None of the variables violated the assumption of homogeneity of variance, according to Levene's test ($P>0.01$). Because MANOVA is robust to modest violations, none of the variables were transformed (Tabachnick & Fidell, 1996).

3.2. Psychopathy/antisociality

Significant differences were found between groups on the CAT-SR, as was expected. Psychopathic inmates scored significantly higher than all other groups, $P<0.001$. Because the CAT-SR was able to differentiate between the groups in a manner that is consistent with theoretical expectations, because of previous research finding significant correlations between the CAT-SR and personality and behavioral aspects of psychopathy (Lalumière & Quinsey, 1996), and because the PCL-R was non available for the non-offenders, correlational analyses were done with the CAT-SR as a measure of psychopathy.

3.3. Correlations between CAT-SR and study variables

Consistent with the hypothesis that psychopathic individuals are cheaters, Childhood and Adolescent Taxon-SR scores were significantly positively correlated with Hostility and Vengeance scores, $r(158)=0.34$, $P<0.01$ and $r(158)=0.22$, $P<0.01$, respectively. However, there were no significant relationships between the CAT-SR and self-reported altruism or empathy. As expected from the Warrior-Hawk Hypothesis, the CAT-SR was positively correlated with Physical Aggression, $r(158)=0.33$, $P<0.01$, Verbal Aggression, $r(158)=0.33$, $P<0.01$, and Anger, $r(158)=0.19$, $P<0.05$. Consistent with both hypotheses, CAT-SR scores were significantly negatively correlated with the ratio of inhibition to activation, $r(156)=-0.19$, $P<0.05$.

3.4. Multivariate analysis of variance

A multivariate analysis of variance was performed on all dependent variables: Perspective Taking, Empathic Concern, Fantasy, Personal Distress, Physical Aggression, Verbal Aggression,

Table 1
Means, standard deviations, and MANOVA results for all dependent variables

Variable	Psychopathic offenders	Nonpsychopathic offenders	Community	Undergraduate	<i>P</i> -value for contrast ^a
<i>Antisociality</i>					
CAT-SR	3.27 (0.58)	2.41 (1.18)	2.56 (0.88)	1.43 (0.99)	N/A
<i>Socially desirable responding</i>					
Impression Management	4.55 (3.04)	6.76 (3.91)	5.10 (3.32)	4.82 (3.63)	N/A
HPSI	49.31 (11.83)	39.90 (14.40)	46.58 (14.64)	40.24 (9.80)	N/A
<i>Indignation/vengeance</i>					
Vengeance Scale	72.00 (28.42)	48.10 (20.30)	67.77 (25.37)	68.14 (17.24)	<0.01
<i>Behavioral inhibition/activation</i>					
BIS	17.67 (3.24)	18.95 (3.74)	19.17 (3.65)	20.42 (2.56)	0.006
BAS	39.91 (5.62)	36.77 (5.88)	40.98 (4.84)	41.88 (4.85)	>0.05
BIS/BAS	0.45 (0.12)	0.52 (0.11)	0.47 (0.09)	0.49 (0.08)	0.012
<i>Aggression</i>					
Physical Aggression	26.46 (4.13)	24.16 (4.25)	26.35 (4.34)	25.08 (4.35)	0.04
Verbal Aggression	15.83 (3.95)	12.82 (2.82)	14.67 (3.65)	15.28 (2.98)	<.01
Anger	20.69 (4.11)	19.17 (3.56)	21.01 (4.22)	21.00 (4.01)	>0.05
Hostility	22.12 (5.80)	18.03 (4.84)	21.58 (6.49)	21.08 (4.64)	<.01
<i>Empathy/altruism</i>					
Self Report Altruism Scale	58.50 (16.79)	58.80 (15.16)	61.56 (12.26)	54.96 (9.10)	>0.05
Perspective Taking	18.06 (5.27)	18.75 (5.50)	15.69 (4.92)	17.81 (4.70)	>0.05
Empathic Concern	17.81 (5.50)	18.76 (5.36)	18.19 (4.63)	19.00 (3.71)	>0.05
Fantasy	13.44 (3.39)	11.99 (3.94)	14.29 (4.52)	15.67 (4.44)	>0.05
Distress	9.92 (5.16)	9.32 (4.42)	9.86 (4.76)	10.03 (4.58)	>0.05

Sample sizes are 36, 37, 43, and 36 for each group, respectively.

^a This column refers to the *P*-value associated with *F*-contrast, using coefficients of 3, −1, −1, and −1 for each group, respectively.

Anger, Hostility, the ratio of inhibition to activation, Vengeance scores, and Self-Report Altruism scores. The independent variable was Group (psychopathic, nonpsychopathic, community, and undergraduate). Because the undergraduate sample was so much younger, on average, than the other groups, age was included in the analysis as a covariate. As well, total HPSI scores were covaried to account for social desirability. All multivariate assumptions were evaluated at the 0.001 level, as is suggested by [Tabachnick and Fidell \(1996\)](#). While this is liberal, MANOVA tends to be fairly robust to modest violations of assumptions, as long as group sizes are relatively equal, as is true in this case.

Mahalanobis' distances indicated one multivariate outlier who was removed from the analysis. Once that outlier was removed, Mahalanobis' distances were within the normal range when evaluated with a χ^2 with 13 df at the 0.001 level. As well, all Cook's distance values were lower than 1, indicating that there were no individual participants who had undue influence on the

outcome. Box's M shows that the data also meets the assumption of homogeneity of the variance-covariance matrices [$M(273, 45044) = 402.91, P = 0.004$]. An examination of scatterplots gave no indication of nonlinear relationships between the dependent variables.

Contrast coefficients were set so that psychopathic participants were compared with a combination of the other three groups (coefficients were 3, -1, -1, -1 so that the three comparison groups were weighted equally). Multivariate tests were significant for age [Wilk's $\lambda = 0.81, F(13, 134) = 2.45, P < 0.01$] and total HPSI score [Wilk's $\lambda = 0.53, F(13, 134) = 9.31, P < 0.01$] indicating that these covariates did account for some of the variance in group membership. The overall test for group was also significant [Wilk's $\lambda = 0.63, F(39, 397.55) = 1.71, P < 0.01$], indicating that there were group differences on some combination of the dependent variables. Because the multivariate test was significant, it was possible to then interpret differences on the individual variables, using univariate F -tests.

3.4.1. Cheater Hypothesis

Univariate analyses revealed group differences on Hostility [$F(3, 146) = 5.03, P < 0.05, \eta^2 = 0.094$], Vengeance [$F(3, 146) = 7.37, P < 0.001, \eta^2 = 0.132$] and Perspective Taking scores [$F(3, 146) = 2.799, P < 0.05, \eta^2 = 0.054$]. While psychopathic inmates scored significantly higher than the other three groups on hostility and vengeance [$F(1, 146) = 9.10, P < 0.01, \eta^2 = 0.059$ and $F(1, 146) = 14.15, P < 0.001, \eta^2 = 0.088$], they did not on Perspective Taking [$F(1, 146) = 0.06, P > 0.05, \eta^2 < 0.001$].

3.4.2. Warrior-Hawk Hypothesis

Under the Warrior-Hawk Hypothesis, higher levels of aggression were predicted for psychopaths. Groups were found to differ on Verbal Aggression and Physical Aggression, $F(3, 146) = 2.92, P < 0.05, \eta^2 = 0.057$; $F(3, 146) = 5.28, P < 0.01, \eta^2 = 0.098$, respectively. More specifically, contrasts comparing psychopathic inmates to the other three groups all showed that psychopaths scored significantly higher on both measures of aggression [$F(1, 146) = 4.29, P < 0.05, \eta^2 = 0.029$; $F(1, 146) = 13.48, P < 0.01, \eta^2 = 0.085$].

3.4.3. Proximal mechanism

As expected, the ratio between Behavioral Inhibition and Behavioral Activation differed between groups, $F(3, 146) = 3.05, P < 0.05, \eta^2 = 0.059$, with psychopaths scoring significantly lower than the other participants, $F(1, 146) = 6.49, p = 0.01, \eta^2 = 0.043$. It was predicted that Vengeance scores and Hostility would be positively correlated with behavioral activation. As expected, all four variables exhibited strong, positive relationships with BAS scores $r(156) = 0.34, P < 0.01, r(156) = 0.30, P < 0.01$, respectively). Also as predicted, empathy scores were significantly related to inhibition [BIS: $r(154) = 0.34, P < 0.01$].

4. Discussion

The present study sought to evaluate the utility of the Cheater and Warrior-Hawk hypotheses in explaining the origins of psychopathy. As expected from the Cheater Hypothesis, psychopathic offenders scored higher than the other participants on the Hostility subscale of the Aggression

Questionnaire and the Vengeance Scale. Hostility and Vengeance Scale scores were also significantly positively correlated with the CAT-SR, further supporting the relationship between antisociality and indignation. However, psychopathic inmates did not show a deficit in empathy or altruism when compared to the other three groups. This result is contrary to previous research showing empathy deficits associated with psychopathy (Hare, 1993). It is possible that the use of self-report measures for such variables is extremely sensitive to social desirability. This is especially important for variables that are supposed to be related to cheating. According to Trivers (1971) and Frank (1988), the survival of cheating as a strategy requires the concealing of one's intention to cheat. For the survival of the Warrior-Hawk strategy, however, one would want to be seen as aggressive and impulsive. This may introduce a self-report bias that is unique to measures associated with cheating, especially those with face validity. The use of behavioral measures of empathy and altruism may remove that bias. It is of interest that a recent meta-analysis, in contradiction to our hypothesis, has shown that altruism and antisocial behavior are unrelated traits (Krueger, Hicks, & McGue, 2001).

Psychopathic offenders scored higher than the other groups on verbal and physical aggression in accord with the Warrior-Hawk Hypothesis. These findings are consistent with previous research showing that psychopaths tend to be aggressive (Carver & White, 1994; Hare, 1993). Further, while the difference between psychopathic participants and others on Anger was not significant, there was a significant positive relationship between Anger scores and CAT-SR scores. While this may seem inconsistent, this is simply an issue of statistical power. There is more variance associated with CAT-SR scores, which are continuous in their distribution, than with the grouping variable, which is nominal in nature. Simply stated, it is easier to find an existing effect using continuous data than nominal data.

The final prediction involved the suggested proximal mechanism for Cheater and Warrior-Hawk behavior: As expected, psychopathic participants scored significantly lower than other participants on the ratio of inhibition to activation, providing additional support for the Cheater and Warrior-Hawk Hypotheses.

5. Conclusions

Both hypotheses appear necessary to explain the pattern of group differences, supporting a composite "Cheater-Hawk Hypothesis". While cheating is a part of the psychopathic repertoire, the Cheater Hypothesis does not explain psychopaths' tendency to rely on violence to get what they want. Similarly, the Warrior-Hawk hypothesis does a good job of dealing with the latter, but ignores cheating and manipulative tendencies. The combined theory is consistent with a recent factor analysis of traits and behaviors associated with psychopathy in a community sample, finding two main domains: aggression, consistent with the Warrior-Hawk Hypothesis, and antisociality, consistent with the Cheater Hypothesis (Quinsey et al., 2001). It should be noted that these factors were positively correlated with one another. Psychopathic individuals should be, then, not only prone to cheat, but also to use intimidation to achieve their ends. This is supported by the findings of higher scores on the hostility, vengeance, and on measures of aggression. One or the other of the evolutionary explanations of psychopathy, then, would not be sufficient in explaining the full range of behaviors. Not only are psychopaths

cheaters, they tend to use aggression (physical or otherwise) to get what they want. In future research, it would be useful to examine the conditions under which psychopathic individuals would use cheating and aggression.

5.1. Limitations

In contrast to the Cheater Hypothesis, the present study found that psychopaths did not report less altruism and empathy than their nonpsychopathic counterparts. This mirrors the findings of Skilling, Harris, Rice, and Quinsey (in press) who found a positive but nonsignificant correlation between the behavioral or lifestyle factor of the PCL-R and self-report deception scales. This points to the possible lack of validity of self-report measures of cheating-related behavior, especially among prison inmates. It is not surprising that the empathy and altruism measures may have been weak because of their self-report nature, given the need for cheaters to hide the intention to cheat. More objective measures of cheating, including behavioral measures and ratings from others, appear to be necessary for a strong test.

A second limitation was that there was some overlap between the dependent measures, creating some construct contamination. The indignation construct, for example, was measured by the Hostility subscale of the Aggression Questionnaire and the Vengeance Scale. While the Hostility subscale excludes items related to aggression, the Vengeance Scale includes such items, and was strongly related to total aggression scores, showing that it was not a pure representation of indignation. At some level, many of the items on the Vengeance Scale are related to physical or other types of aggression. In fact, revenge is defined as the intention to harm another for a perceived wrong. Thus, the fact that psychopathy is positively correlated with vengeance also supports the Warrior-Hawk Hypothesis. However, the relationship between psychopathy and hostility is not affected by such construct contamination.

A final issue is that there may have been some circularity between the independent measures (CAT-SR and PCL-R) and the dependent measures (specifically, the Aggression Questionnaire and Behavioral Inhibition). One of the CAT-SR items concerns aggressive behaviors before age 16, possibly inflating the relationship with subscales of the Aggression Questionnaire, although the latter deals with adult behavior. The PCL-R does not contain aggression items, although some of the items, such as the one measuring impulsivity, may be indirectly related. Given that similar results were found using both of these measures of antisociality, that the number of possibly contaminating items were very few, and that none of the items dealt specifically with aggression in adulthood, redundancy is likely to be a minor problem. To make sure that this redundancy was not inflating the relationship, the item pertaining to aggression on the CAT-SR was removed, and correlations were run again, resulting in significant positive correlations with Physical and Verbal Aggression [$r(154)=0.15$, $P=0.05$, $r(155)=0.17$, $P<0.05$]. Similarly, the PCL-R includes two items that may inflate the relationship between psychopathy and the ratio of behavioral inhibition to behavioral activation: namely “has poor behavioral controls” and “impulsivity”. While this inflation is very likely small, because similar results were found with the CAT-SR which has no items pertaining to impulsivity, these two items were removed from the total, and the relationship was reevaluated. As expected, there was a significant negative relationship between psychopathy and the ratio of inhibition to activation [$r(48)=-0.38$, $P<0.01$].

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