EYSENCK AND ANTISOCIAL BEHAVIOR: AN ANALYSIS OF THE ASSOCIATIONS BETWEEN PERSONALITY STYLES AND PROBLEMS WITH CONDUCT

DISSERTATION

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By

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ABSTRACT

Antisocial behavior is an occupying interest in the social-psychological literature. One interesting way to examine antisocial behavior is to explore the relationships between personality styles and the manifestation of antisocial behavior. H. Eysenck proposed three primary dimensions of personality on which people can be characterized: extraversion, neuroticism, and psychoticism. Although psychoticism has been reliably linked with antisocial behaviors in a number of research variables, it has yet to be systematically associated in the research with psychopathy. In addition, the results regarding extraversion and antisocial behavior have been inconsistent.

The present study examined the predictive power of the Eysenck personality dimensions for self-reported, parent-reported, and teacher-reported antisocial behavior in a community sample of children from local schools. Parents, children, and teachers filled out relevant questionnaires in the context of a larger study. Important dependent variables in the analyses included delinquent acts, reactive aggression, proactive aggression, hyperactivity, and general externalizing behavior problems.

The results supported the relationship between psychoticism and antisocial behavior, across reporters. In addition, there was a significant interaction between psychoticism and extraversion in the prediction of proactive aggression, suggesting that extraversion may play a protective role in the presence of high levels of psychoticism. However, there was a significant difference in the predictive strength of the personality variables. These findings are discussed within the context of their predictive relationships and suggestions for future research are made.

Dedicated to my grandmother, June Battles

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CHAPTER 1

INTRODUCTION

Antisocial behavior is an occupying interest in the social-psychological literature. Vast numbers of studies are published each year attempting to explore why some people behave in ways that harm others and some people refrain from such behavior. One vantage point from which to examine this problem is to explore personality variables that may influence the development or manifestation of antisocial behavior. The present study was intended as an exploration of the interaction between one model of personality, Hans Eysenck's dimensional model, and variables related to aggression, delinquency, and antisocial behavior.

Hans Eysenck's original model of personality outlined two major orthogonal dimensions: extraversion and neuroticism (see Brand, 1997 for a brief history). In 1952 (see Eysenck, S., 1997 for a review), the psychoticism scale was introduced. According to the theory, psychoticism is associated with being aggressive, cold, egocentric, impersonal, impulsive, antisocial, unempathic, creative, and tough-minded (e.g., Eysenck, H., 1998). Gudjonsson (1997) also described people with high psychoticism as being aggressive, dominant, and tough-minded. In children, S. Eysenck (1997) noted that high psychoticism is associated with learning difficulties, truancy, behavior problems, crime, and being

disliked by peers and adults. H. Eysenck (1998) theorized that a low level of arousability, making conditioning to social cues more difficult, may explain some of the behavioral characteristics of high psychoticism. When children with this characteristic are exposed to similar social conditioning trials as other children without it, they will demonstrate less resistance to naturally occurring antisocial impulses, and subsequently more antisocial behavior.

There are a number of studies that support the link between psychoticism and antisocial behavior in both children and adults. For example, Rigby and Slee (1987) found that psychoticism was negatively related to pro-authority attitudes and behavior in children, suggesting that children who are high in psychoticism are likely to behave in ways reflecting their anti-authority beliefs. Lane (1987) found positive associations between psychoticism, hostility, and peer maladaptiveness in children. In this same study, Lane found that psychoticism was a significant predictor of number of criminal convictions, as well as correlating with severity, persistence, and violence of offenses. Several studies examining the construct of Machiavellianism, a trait characterized by emotional detachment from others and thought by a number of researchers to reflect a sub-clinical variation of psychopathy, have found a positive correlation between psychoticism and Machiavellianism (e.g., Allsopp, Eysenck, & Eysenck, 1991; Sutton & Keogh, 2001). In terms of aggressive behavior, Slee and Rigby (1993) found that bullies were higher in psychoticism than children who did not bully others. Delinquent children have also been shown to be higher in psychoticism than other children (e.g., Furnham & Barratt, 1988; Gabrys, 1983; Romero,

Luengo, & Sobral, 2001), as have children who were high on teacher ratings of antisocial behavior (Powell & Stewart, 1983). Two studies exploring the relationships between Eysenck dimensions and features of personality disorders in non-referred adults found that psychoticism was positively associated with characteristics of Antisocial Personality Disorder, conduct problems, substance abuse, violent behavior, and disregard for social norms (Deary, Peter, Austin, & Gibson, 1998; Jang, Livesley, & Vernon, 1999).

H. Eysenck (e.g., 1998) described the extraversion dimension as being associated with sociability, liveliness, activity, assertiveness, sensation seeking, dominance, and venturesomeness. As with children high in psychoticism, Eysenck believed that children high in extraversion exhibit low levels of arousal, putting them at risk for impulsive, antisocial behavior. However, S. Eysenck (1997) argued that, unlike children high in psychoticism, who she described as misbehaving out of spite or mean-spiritedness, children high in extraversion are mischievous "lovable rogues," who are forgiven more readily by adults for their misbehavior. She distinguished between the "impulsivity" of children high in psychoticism and the "venturesomeness" of children high in extraversion, suggesting that the antisocial behavior of those high in extraversion may be more a result of the child seeking to increase his low tonic arousal, rather than having a disregard for social norms or others' feelings, as in the case of children with high psychoticism. She used an illustrative example of two people driving around a blind bend in the road, one high in psychoticism and the other high in extraversion. The person high in psychoticism, she posited, will continue to drive

fast because it never occurs to him that someone might be coming the other way and that he may cause harm or death to that person. Conversely, the person high in extraversion understands the risk involved and will continue to drive fast for the sensation seeking arousal that a close call will cause.

These theoretical viewpoints suggest that people high in extraversion and high in psychoticism may behave similarly in broad terms, but that different processes will drive the behavior. Specifically, people high in extraversion may engage in behavior outside social norms in a "venturesome," sensation-seeking way, while people high in psychoticism are more likely to indulge their egocentric impulses in a cold, dominating, unempathic, antisocial manner. Thus, if S. Eysenck's example is extended, perhaps both the high psychoticism and the high extraversion person would engage in mildly antisocial behaviors, such as driving fast around the blind curve, or even shoplifting. However, because of their high regard for their own needs and desires, and disregard for others' rights, individuals high in psychoticism would be more likely to engage in severe antisocial behavior, such as rape or "cold-blooded" murder. If this conceptualization is accurate, then samples using varying levels of severity in antisocial behavior should find consistent results in relation to psychoticism but variability in the results for extraversion. For example, studies using community samples of children, who have not been identified as having antisocial behavior problems, should find that extraversion and psychoticism are both related to antisocial behavior. However, studies using children already identified as having

antisocial behavior problems (e.g., children in institutions for violent youth), should find that psychoticism alone predicts antisocial behavior, and that extraversion is unrelated.

When the literature is reviewed on antisocial behavior and the Eysenck dimensions, there is support for this hypothesis. As reviewed above, studies have consistently yielded a positive relationship between psychoticism and antisocial behavior. However, the picture regarding extraversion and antisocial behavior is less clear-cut. A number of studies have found extraversion to be predictive of delinquency, psychopathic tendencies, and other antisocial behavior (e.g., Allsopp et al., 1991; Furnham & Barratt, 1988; Slee & Rigby, 1993), while others have found no relationship between extraversion and these constructs (e.g., Rigby & Slee, 1987; Sutton & Keogh, 2001); still others have shown mixed or opposite-direction results (e.g., Borduin, Henggeler, & Pruitt, 1985; Fonseca & Yule, 1995; Lane, 1987; Powell & Stewart, 1983). However, if these studies are examined by sample characteristics, a different pattern emerges.

There are a number of studies using non-referred samples of children or adults that have found extraversion to be positively related to antisocial characteristics. For example, Allsopp et al. (1991) found Machiavellianism to be positively correlated to extraversion in a sample of normal adults. In Lane's (1987) sample of non-referred children, a group identified by teachers and parents as having more severe behavior problems was higher in extraversion than a group identified as having no behavior problems. Similarly, in a group of non-referred children with a family history of alcoholism, high extraversion was

associated with earlier onset of drinking. Jang, Livesley, and Vernon (1999) found a positive correlation between extraversion and features of Antisocial Personality Disorder (ASPD) in a community sample of adults. In another study using non-referred undergraduate college students, Deary, Peter, Austin, and Gibson (1998) found psychoticism to be positively correlated with features of ASPD, but extraversion to be positively correlated with features of Histrionic Personality Disorder and unrelated to ASPD.

Conversely, a shift in the pattern emerges when studies using participants with identified problems are examined. For example, Lane's (1987) study of delinquent youths found extraversion to be unrelated to criminal convictions, severity, or violence of offenses. Borduin, Henggeler, and Pruitt (1985) found lower levels of extraversion in delinquent children when compared to non-delinquent children. In a study of adult male pedophiles, Wilson and Cox (1983) found pedophiles to be higher on psychoticism and lower on extraversion than control subjects. Finally, Romero, Luengo, and Sobral (2001) found that levels of extraversion in a group of institutionalized boys were similar to those demonstrated by non-institutionalized boys, while levels of psychoticism were higher in the institutionalized boys.

If these studies are taken as a whole, there is support for the view that extraversion is related to behavior problems having to do with exuberant, under-controlled behavior, while psychoticism is related to antisocial behavior at all levels of severity. Thus, in a sample of non-referred boys and girls, both extraversion and psychoticism should be positively associated with antisocial

characteristics and behavior. However, where a distinction is available, psychoticism was expected to be a better predictor of behaviors that directly violate the rights of others, such as bullying or cruelty to animals, whereas extraversion was expected to better predict problems of an under-controlled nature (e.g., hyperactivity).

In addition, examination of the interaction of psychoticism and extraversion may be useful in the prediction of antisocial behavior. Lane (1987) argued that high extraversion is associated with "overreactive" behavior problems (pg. 803), but that the level of psychoticism influences the form these behaviors take. He found that children with teacher-rated behavior problems at school who were high in extraversion but low in psychoticism could be characterized as having "impulsive, distractible, attention-seeking" problem behaviors (pg. 803), while children with high extraversion and high psychoticism had "peer-maladaptive" (pg. 803) (e.g., proactive aggression or bullying) behavior problems. Thus, it might be expected that extraversion and psychoticism interact such that at low levels of psychoticism, extraversion would be associated with such problematic behaviors as hyperactivity or reactive aggressive responses to provocation. However, at high levels of psychoticism, extraversion would be associated with more premeditated reactions to provocation, and delinquent acts, such as stealing, or cruelty to animals.

According to Eysenck's (1998) theory, the neuroticism–stability dimension reflects emotionality, or response to emotional stimuli. That is, individuals high in neuroticism will be highly reactive to emotional stimuli, whereas individuals low in

neuroticism (stable) are expected to be less reactive to such stimuli. Highly neurotic people are described as anxious, depressed, feeling guilty, tense, irrational, shy, moody, emotional, and having low self-esteem (e.g., Eysenck, H., 1998). In addition, highly neurotic people have been shown to demonstrate high levels of negative affect, making them more likely to be frequently distressed in a variety of situations, regardless of the level of environmental stress (e.g., Watson & Clark, 1984). In support of this, Jang, Livesley, and Vernon, (1999) found that neuroticism was indicative of generalized psychological distress in a sample of community adults. In addition, Gudjonsson, (1997) argued that the emotional instability and strong autonomic arousal in people with high neuroticism could lead to impulsive and antisocial behavior. There are some studies in adults and children to support the link between high neuroticism and antisocial behavior, although the relationship is not as consistent as psychoticism's association with these behaviors. Indeed, H. Eysenck (1998) described psychoticism as being consistently able to distinguish criminals from non-criminals, and that extraversion was helpful in this distinction in younger people, while neuroticism was more helpful in this distinction in adults. However, there are some studies using children that have found an effect for neuroticism. For example, Sutton and Keogh (2001) found overall Machiavellianism scores to be positively correlated with neuroticism. Fonseca and Yule (1995) found higher neuroticism scores in conduct disordered children, as did Gabrys (1983), who found pro-social children to be significantly lower in neuroticism than antisocial children. In another study, children with behavior problems demonstrated higher levels of

neuroticism than control groups (Furnham & Barratt, 1988). Romero, Luengo, and Sobral (2001) found higher levels of neuroticism in non-referred boys characterized as having severely delinquent behaviors than in boys and girls with fewer antisocial behavior problems. However, Lane (1987) found effects in the opposite direction for neuroticism, in that children identified as having severe behavior problems were lower in neuroticism than children with no problems. He also found that low levels of neuroticism were predictive of convictions in delinquent youth.

One possible explanation for the mixed results regarding the role of neuroticism is the differential correlation between anxiety-related constructs and two-empirically supported distinctions in the dimension of psychopathy, a personality construct hypothesized to be one causal factor for antisocial behaviors and conduct problems. In his book on the subject, Lykken (1995) defines psychopaths as "individual[s] in whom the normal process of socialization have failed to produce the mechanisms of conscience and habits of law-abidingness that normally constrain antisocial impulses" (page 6). There is no implication that all individuals who engage in antisocial behavior are psychopathic, rather that some individuals who engage in antisocial behavior will exhibit the qualities of psychopathy, while others will not. In addition, there is growing evidence that the construct of psychopathy can be broken into two distinct factors: callous-unemotional characteristics (also called emotional detachment) and impulsivity-conduct problems (also called antisocial lifestyle),

with true psychopaths being marked by high levels of callous-unemotional traits (e.g., Frick & Ellis, 1999; Harpur, Hare, & Hakstian, 1989; Patrick, Zempolich, & Levenston, 1997).

Although the present study did not directly assess psychopathy, it is useful to examine some of the empirically-supported correlates of this construct in order to understand some of the disparate results discussed above, especially as related to neuroticism. According to researchers, traits such as egocentricity, shallowness of emotions, lack of empathy, inability to form or maintain close relationships, and an absence of remorse, shame, or anxiety are highly associated with the callous-unemotional factor of psychopathy. In addition, Frick and Ellis (1999) report that children with high levels of callous-unemotional traits show significantly lower levels of anxiety than children without these traits.

Studies have generally found significant positive correlations between antisocial behavior and trait anxiety (e.g., Russo & Beidel, 1994; Zoccolillo, 1992), but few have split the antisocial groups into people high in callous-unemotional traits and people low in these characteristics to examine the relationship between anxiety and these constructs. In one study that did, Frick, Lilienfeld, Ellis, Loney, and Silverthorn (1999) found a significant negative relationship between callous-unemotional traits and trait anxiety when conduct problems were controlled for, and a positive relationship between conduct problems and trait anxiety when callous-unemotional traits were controlled for. Harpur, Hare, and Hakstian (1989) found that the core psychopathic personality factor (i.e., callous-unemotional traits) on the Psychopathy Checklist (PCL) was

negatively associated with both state and trait anxiety in adults, but the unstable and antisocial lifestyle factor was not. Similarly, Frick, O'Brien, Wootton, and McBurnett (1994) found trait anxiety to be negatively related to the callous-unemotional factor but positively related to the conduct problems factor of the Psychopathy Screening Device (PSD), a measure of psychopathy in children. In addition, researchers have found that antisocial children with higher rates of anxiety tend to have better adjustment and lower recidivism, as well as less conflict with authority than antisocial children with low anxiety (e.g., Quay, 1987; Walker, et al., 1991).

Harpur, Hare, and Hakstian (1989) examined the relationships between neuroticism and the two factors of psychopathy. Similar to their results with trait and state anxiety (discussed above), they found neuroticism to be negatively associated with the callous-unemotional factor, but positively associated with the impulsive-conduct problems factor, although these correlations were quite low. Unfortunately, these results suggest that if the constructs of callous-unemotional style and impulsivity-conduct problems are not distinguished in studies exploring the relationship between antisocial behavior and neuroticism (or anxiety), the results may be washed out. Thus, in the present study, neuroticism was expected to be significantly positively related to measures of trait anxiety, and general externalizing problems. However, to the extent that reports of delinquent behaviors, such as not feeling guilty about wrongdoing or cheating, are indicative of higher levels of callous-unemotional traits, it was expected that neuroticism would be negatively associated with such reports.

Another construct that has generated copious literature in the area of social-cognition and is intuitively linked to antisocial tendencies is aggression. There are two dominant views concerning the etiology and expression of aggressive behavior: frustration-aggression hypothesis and social-learning theory.

Early proponents of the frustration-aggression hypothesis, (e.g., Dollard et al., 1939) concentrated on aggression as an angry, hostile attempt to harm someone in response to a frustration (Berkowitz, 1988; Dodge, 1991). Berkowitz's (1988) more recent conceptualization of this model posits that there is an important distinction between *instrumental* and *hostile* aggression, with instrumental aggression being aggression oriented toward the attainment of a social goal or desired object and hostile aggression being primarily motivated to hurt. He further argues that the frustration-aggression hypothesis best explains hostile aggression. According to Berkowitz, unfulfilled expectations can lead to frustration, which results in an "inclination to hostile (or angry) and not instrumental aggression" (page 3).

Hostile (or reactive) aggression, as it is defined in the current psychological literature, is aggression motivated by anger and characterized by impulsive "hot" behavior (Berkowitz, 1988; Dodge, 1991). The goal of reactive aggression is to defend oneself or to inflict harm on the source of the frustration (Berkowitz, 1988; Dodge, 1991), rather than to gain a desired goal. A number of studies have supported the distinction between reactive aggression and instrumental aggression (also called proactive aggression) in both adults and

children (e.g., e,g., Atkins, Osborne, Bennett, Hess, & Halperin, 2001; Berkowitz, 1988; Dodge, Price, Bachorowski, & Newman, 1990; Hartman, & Stage, 2000; Pellegrini, Bartini, & Brooks, 1999).

Proactive aggression is commonly explained by social learning theory (e.g., Bandura, 1973, 1983; Patterson, 1982), which argues that aggression is a result of conditioning experiences in which external rewards reinforce the expression of aggressive behaviors. This type of aggression is not motivated by emotion (e.g., anger), is often characterized as "cold blooded, " and is designed to gain a desired goal, such as money, an attractive object, or the humiliation of another person. A number of studies have supported this conceptualization of proactive aggression in children and adults (e.g., Atkins, Osborne, Bennett, Hess, & Halperin, 2001; Dodge, Price, Bachorowski, & Newman, 1990; Pellegrini, Bartini, & Brooks, 1999).

Research on the distinction between reactive aggression and proactive aggression has identified a number of social-cognitive and behavioral differences between these constructs. For example, Dodge and his colleagues (e.g., Dodge & Coie, 1987; Dodge, Price, Bachorowski, & Newman, 1990; Schwartz, et al., 1998) have examined the relationship between hostile attributional biases and aggression in children. They have consistently found that reactively aggressive children tend to believe that other people have hostile intent toward them, despite ambiguous social cues, but that this bias is not present in proactively aggressive children. In addition, children high in reactive aggression tend to experience significantly more social rejection from their same-age peers than children high in

proactive aggression (Pellegrini, Bartini, & Brooks, 1999; Poulin & Boivin, 2000; Price & Dodge, 1989). In fact, some studies show that proactive aggression is associated with positive social qualities, such as leadership, high peer status, and having a sense of humor (Dodge & Coie, 1987; Poulin & Boivin, 2000; Price & Dodge, 1989).

Children high in proactive aggression tend to have significantly more positive outcome expectancies than other children (Crick & Dodge, 1996; Schwartz, et al., 1998), supporting the social learning hypothesis that instrumental aggression is motivated by external contingencies. In addition, there is some indication that the subtypes of aggression are mediated by different neurocognitive factors (Blair, 2001). Dodge (1991) reports that some studies have linked reactive aggression to brain regions responsible for hyperactivity and aversiveness, but proactive aggression to regions responsible for appetitive functioning and reward centers. Behaviorally, reactive aggression (but not proactive aggression) has been found to predict number of in-school suspensions (Hartman & Stage, 2000), dating violence in adolescence (Brendgen, Vitaro, Tremblay, & Lavoie, 2001), and men's angry interactions with their wives (Chase, O'Leary, & Heyman, 2001). Conversely, proactive aggression (but not reactive aggression) has been shown to be uniquely associated with callous-unemotional traits (Ugueto & Vasey, 2001), to predict delinquency and symptoms of conduct disorder in adolescence (Vitaro, Gendreau, Tremblay, & Oligny, 1998), delinquent violence (Brendgen, et al., 2001), and higher scores on dimensions such as aggressive-sadism,

antisociality, and dominance (Chase, O'Leary, & Heyman, 2001). These studies suggest that reactive aggression should be uniquely related to problems within the impulsive-conduct spectrum and that proactive aggression will be uniquely related to callous-unemotional traits and behavioral correlates. Thus, to the extent that neuroticism is differentially related to the factors of psychopathy, is should also be related differentially to proactive and reactive aggression. That is, neuroticism should be negatively associated with proactive aggression and positively associated with reactive aggression.

The literature is not conclusive on the relationship of psychoticism and extraversion to proactive and reactive aggression, or to the factors of psychopathy. Harpur, Hare, and Hakstian (1989) examined the relationships among the Eysenck variables and the two factors of psychopathy and found no relationship with extraversion. They also found that psychoticism was positively related to the impulsive-conduct problems dimension, but unrelated to the callous-unemotional dimension. In a review of this issue, Harpur, Hart, and Hare (2002) conclude that psychoticism is reflective of general antisocial tendencies, rather than being related in a systematic way to the construct of psychopathy. However, given the lack of extensive literature in this area, particularly with children, the present study sought to explore the relationships between psychoticism and extraversion and the two domains of aggression, as well as attempting to determine if a relationship could be delineated with constructs related to callous-unemotional traits. Specifically, psychoticism and the interaction between psychoticism and extraversion should account for significant

variance in proactive aggression, given these variables' theoretical relationship to premeditated, callous behavior. In contrast, given the impulsive nature of people with high extraversion, and the potentially magnifying effect of neuroticism on this trait, it is likely that reactive aggression will be related to a combination of these variables. That is, the emotional reactivity of neuroticism was expected to magnify the effects of high extraversion's impulsive responses, leading to higher levels of reactive aggression among high extraversion, high neuroticism children, while the absence (or very low level) of neuroticism was expected to significantly decrease the likelihood of reactive aggression.

Specific Hypotheses

1. Psychoticism, extraversion, and neuroticism will significantly predict general externalizing behavior, both self- and other-reported. The beta weights in these models for all three variables will be positive, suggesting that higher levels of these traits correspond to higher levels of antisocial behaviors. In addition, the interaction of psychoticism and extraversion is predicted to be significant, such that extraversion will magnify the antisocial tendencies of psychoticism.
2. Psychoticism and neuroticism will predict delinquency scores on a self- and parent-reported questionnaire, when reactive aggression is partialled out of the model. Any relationship between extraversion and delinquency will be mediated by psychoticism. Neuroticism will have negative beta weights in this model.

3. Extraversion will uniquely predict problems with hyperactivity, whereas psychoticism will not once extraversion is partialled out of the model. That is, any relationship between psychoticism and hyperactivity will be mediated by extraversion.
4. The correlation between neuroticism and reactive aggression, when proactive aggression is partialled out will be positive, while the correlation between neuroticism and proactive aggression, when reactive aggression is partialled will be negative.
5. The main effect for psychoticism and the interaction between psychoticism and extraversion will be significant in regression analyses predicting proactive aggression, even when reactive aggression and neuroticism are controlled for.
6. The linear combination of neuroticism, extraversion, and their interaction is expected to account for significant variance in reactive aggression, even when proactive aggression is controlled for.

CHAPTER 2

METHODS

Participants

Study personnel recruited participants from local elementary schools in Columbus, Ohio. To introduce the study, investigators spoke in classrooms and passed out letters of introduction to be taken home by interested students. Children's parents who were interested in having their child participate contacted the research lab to set up an appointment for data collection.

During the design process, an *a priori* power analysis was conducted to determine the optimum number of subjects, using the procedure recommended by Cohen and Cohen (1983). Assuming moderate effect sizes in the population ($r \approx .30$), it was determined that a sample of 84 children was needed to have adequate power for the originally proposed analyses.

A total of 89 children from 6th, 7th and 8th grade classrooms (male = 46, female = 43) participated in the study. Thirty-eight students were from the sixth grade, 29 from the seventh, and 22 from the eighth. A chi-square analysis shows that these frequencies are not significantly different from each other ($p > .10$). Ages of participants ranged from 11 to 16.5 years old ($M = 12.8$, $SD = 1.01$), with a majority (92%) of the participants being Caucasian.

All data collection took place in the children's homes. An undergraduate research assistant was responsible for setting up appointments with families for this home-based data collection. At the time of scheduling, parents were informed that the experimenters would need a table to put a full-size desktop computer on and were informed that the study would take about an hour to an hour and a half. In addition, parents were told that their participation (i.e., filling out questionnaires) would take approximately 20 minutes. Parents with further questions were referred to one of the two graduate students whose project this was.

Only children whose primary language is English were considered for participation. Additionally, the reading level of the child was briefly assessed over the phone. Any child read at or below a 2nd grade level was not considered for participation. All children who participated in the study were paid $10 upon completion of their participation.

Measures

Parent Questionnaire Measures:

Demographic Questionnaire

One parent for each participant completed a demographic questionnaire for the family, which gathered data concerning parental levels of education, SES, parents' occupations, and racial information.

Child Behavior Checklist (CBCL)

One parent also completed the CBCL, which is an instrument designed to assess several dimensions of problem behaviors in children. The individual

scales include Aggression, Anxiety/Depression, Attention Problems, Delinquency, Sex Problems, Social Problems, Somatic Complaints, Thought Problems, and Withdrawal. These individual scales can be combined to form three global scales: Externalizing, Internalizing, and Total Problem.

The CBCL asks the parent to rate the child on 112 problem items, and gives the parent an opportunity to define any other problems not covered by the scale and rate those. The parent circles a zero if the item does not describe the child within the past 6 months, a one if the item is somewhat true of the child, and a two if the item is very true or often true of the child.

Achenbach (1991a) reports test-retest reliability coefficients ranging from .89 to .93 for the three global scales across a 1-week interval, indicating adequate test-retest reliability. In addition, Achenbach reports correlations between the CBCL global scales and similar scales on the Connor's Parent Questionnaire, and on the Quay-Peterson Scales as ranging between .52 and .88. These coefficients indicate adequate support for the construct validity of the CBCL as an instrument of parent-reported child behavior problems. Achenbach (1991a) also reports that the items on the CBCL were able to consistently discriminate between referred and nonreferred children, indicating support for the content validity of the measure.

Child Questionnaire measures:

Eysenck Personality Questionnaire (EPQ-J)

Children completed a short form of the junior version of the Eysenck Personality Questionnaire (Corulla, 1990). This questionnaire contains four

scales: Neuroticism (N), Extraversion (E), Psychoticism (P), and Lie. The internal consistencies of these scales for the age range of the validation sample (approximately 11-13) ranged from .58 to .81 (Corulla, 1990), which indicates adequate internal consistency. This version of the questionnaire shows similar interrelations between the scales to the long version (Corulla, 1990). In addition, Corulla (1990) reports that the means for the short version are reasonable approximations to the long version. He notes that the Lie scale reliability is fairly low for 14-15 year olds, but was low on the long form as well.

The EPQ-J contains 48 items, each phrased in question form (e.g., "Would you rather sit and watch than play at parties?") and the child is asked to circle 'yes' or 'no' for each. The EPQ-J is scored by assigning a point for a yes response in some cases and for a no response in others (Corulla, 1990). Each item falls on one scale only, and all items are used in scoring.

State-Trait Anxiety Inventory for Children (STAIC)

Participant children completed the STAIC (Spielberger, 1973). The STAIC is a 40-item measure designed to assess both state and trait anxiety in children. On the trait form, the items are statements (e.g., "I worry about making mistakes") to which the child is asked to answer "hardly ever," "sometimes," or "often." On the state form, the child is asked to mark a box next to the statement that best describes their current feeling state (e.g., "I feel… very calm/calm/not calm").

Spielberger (1973) reports adequate internal consistency coefficients for the state form (.82 for males, .87 for females) and for the trait form (.78 for males,

.81 for females). The trait form also showed good test-retest reliability (.65 for males, .71 for females) across a six-week period. These values indicate that the STAIC trait and state forms show adequate reliability. In addition, Spielberger (1973) reports that the trait form correlated highly (.75) with the Childhood Manifest Anxiety Scale, supporting the notion that the trait form has reasonable validity.

Youth Self Report (YSR)

Children completed the problem behavior section of the Youth Self Report (YSR; Achenbach, 1991b). The YSR is a 112-item self-report measure designed for children 11 to 18 years of age. This measure is intended to measure several dimensions of problem behaviors. The individual scales include Aggressive, Anxious/Depressed, Attention Problems, Delinquent, Self-Destructive-Identity Problems, Social Problems, Somatic Complaints, Thought Problems, and Withdrawn. These individual scales can be combined to form three global scales: Externalizing, Internalizing, and Total Problem. Like the CBCL, YSR items are statements for which the child circles a zero if the statement is not true now or within the past 6 months, a one if the statement is somewhat or sometimes true, and a two if the statement is very true or often true.

Achenbach (1991b) reports test-retest reliability for the three global scales over a one-week interval ranging from .83 to .87 and over an eight-month interval from .64 to .67, both indicating good test-retest reliability. In addition, Achenbach (1991b) reports that referred adolescents score themselves significantly higher on the problem items than nonreferred adolescents, indicating support for the

content validity of the measure. The author did find an age difference in the reliability of the measure, such that younger respondents (i.e., 11-14 year olds) were somewhat less reliable (median r = .77) than the older respondents (i.e., 15-18 year olds, median r = .89). However, even this lower coefficient for the younger respondents indicates adequate reliability.

Teacher Questionnaire Measures

Aggression Measure

One teacher for each participant completed a 28-item teacher-rating scale developed by Brown, Atkins, Osborne, & Milnamow (1996) to assess the two subtypes of aggression. Brown, et al. (1996) found evidence for two independent factors comprised of the 21 antisocial items on this questionnaire: a Proactive Aggression and a Reactive Aggression factor. The remaining items measure prosocial behaviors. The two antisocial factors demonstrated high internal consistency (alpha coefficients of .94 for proactive and .92 for reactive), and were significantly correlated with each other (r=.70).

Connor's Teacher Rating Scales (CTRS)

Teachers also completed the Conners' Teacher Rating Scales – 28 (CTRS; Conners, 1989), which is a 28-item behavior-rating instrument for children aged 3 to 17 years. Classroom teachers completed the measure by rating the extent to which each item describes the child in question on a scale of 0 ("not at all") to 3 ("very much"). The CTRS yields scores on three behavioral dimensions: Hyperactivity, Conduct Problem, and Inattentive-Passive. Conners (1989) reported adequate psychometric properties for the CTRS-28.

Other Measures

As this study was part of a larger study, there were a number of other measures completed by participants and their parents that are not relevant for the purposes of the current analysis.

Procedure

Two experimenters traveled to the participants' homes to collect data, usually visiting two homes in one evening. Each data collection team consisted of a graduate student in child-clinical psychology or a post-baccalaureate student and a trained undergraduate research assistant. Once in the home, one investigator read a brief study/procedure description to the family, informed them of their right to withdraw from the study without penalty, outlined procedures protecting their confidentiality, and answered questions. Parents and children signed an informed consent form and were given one copy to keep. Following this procedure, data was collected from the child and parent with each data collection visit lasting between 50 and 90 minutes.

CHAPTER 3

RESULTS

Preliminary Analyses

Validity Checks

The constructs of neuroticism and Trait Anxiety should overlap to a significant degree. Therefore, the Pearson Product Moment correlation coefficient between these two variables was calculated. The result, as expected, was positive and significant ($r_{trait \cdot neur}$=.642, p<.001).

Previous studies have found PA and RA to be highly correlated. In order to determine if this sample resembled other samples of children in that respect, the Pearson Product Moment correlation coefficient was calculated between these variables. The result was positive and significant ($r_{pa \cdot ra}$=.549, p<.001), suggesting a moderate sized relationship between the two variables. Due to this relationship, all regression analyses predicting RA controlled for PA, and all analyses predicting PA controlled for RA.

Calculation of Product Terms

In order to decrease problems arising from multicollinearity of the interaction terms with the main effects of which they are comprised, all predictors were standardized for the regression analyses. Interaction terms were calculated

using the two standardized variables to create a product term. As outlined in Cohen and Cohen (1983, page 305), the linear transformation of variables has no effect on the correlations of the interactions with the dependent variable. Therefore all resulting correlations have been interpreted in terms of the variables themselves.

Primary Analyses

In all regression analyses, the effects of SES, gender, and age were controlled for by entering these variables first. In order to more easily examine interaction effects, these control variables were standardized prior to their inclusion in the regression models.

In addition, for all regression analyses, several diagnostic tests were performed. First, the normal-probability plots were examined to determine if the normality of errors assumption was violated. Next, the plots of the standardized residuals against the standardized predicted values were examined to determine if the assumptions of homoscedasticity or linearity were violated. Finally, leverage statistics were examined for the presence of outliers and Cook's distance was calculated for all regression analyses to determine the presence of influential data points. The results of these diagnostic evaluations are presented with the analyses for each individual hypothesis.

Hypothesis 1

Self-reported externalizing behavior

Diagnostic tests of the regression analyses predicting YSR Externalizing Problems indicated that the assumptions of normality of errors, homoscedasticity, and linearity were not violated. There was no evidence of outliers or influential data points.

In order to test for linear relationships between psychoticism, extraversion, and neuroticism in the prediction of general externalizing behavior, hierarchical multiple regression models were used. As can be seen in Table 1, the model predicting self-reported general externalizing behavior on the YSR from psychoticism, extraversion, and neuroticism, as well as the interaction of psychoticism and extraversion yielded a significant overall model ($p<.001$). However, it is clear from Table 2 that only the main effects for psychoticism, extraversion, and neuroticism added significantly to the prediction of self-reported externalizing behavior; the interaction did not account for significant variance above and beyond the main effects. Additionally, it can be seen that the model with psychoticism accounted for 25% of the variance in self-reported externalizing behavior, extraversion added another 7.8% of the variance, and neuroticism accounted for an additional 11.4% of variance. Together, these three variables accounted for 43.1% of the variance in self-reported externalizing behavior. As predicted, the beta weights in these models for psychoticism, extraversion, and neuroticism were positive, suggesting that higher levels of these traits correspond to higher levels of antisocial behaviors.

Parent-reported externalizing behavior

Diagnostic tests of the regression analyses using the CBCL Externalizing Problems scale indicated no violations of the assumptions, and no evidence of outliers or influential data points.

Table 3 presents the results of the regression equation predicting parent-reported externalizing behavior from psychoticism, extraversion, neuroticism, and the interaction of extraversion and psychoticism. Only the model containing psychoticism and the control variables was significant; the addition of the other main effects and the interaction resulted in a non-significant overall model. With psychoticism in the model, 7.1% of the variance in parent-reported externalizing behaviors was accounted for. As predicted, the beta weight for psychoticism was positive, suggesting that increased levels of self-reported psychoticism are associated with increased levels of parent-reported problems with externalizing behaviors.

Teacher-reported externalizing problems

In order to measure teacher-reported externalizing behaviors, the Conduct Problems scale of the Conners Teacher Rating Scale (CTRS), and the overall aggression score on the Brown et al (1996) measure were used as dependent variables. Diagnostic tests indicated no violations of the assumptions of normality of errors, homoscedasticity, or linearity. Examination of the studentized residuals revealed that there were some outliers on the CTRS (i.e., the maximum studentized residual was greater than 3). However, as the maximum Cook's Distance value was quite low (.114), these outliers did not influence the

regression equation. As suggested by Cohen and Cohen (1983, pg. 128), these outliers were included in the analyses, as there was no evidence of error, the points comprised only a small percentage of the total sample size, and they were not influential.

The overall regression model for the CTRS was nonsignificant ($F=1.503$, $p>.10$). However, when the partial correlation coefficient between psychoticism and CTRS conduct problems (controlling for age, gender, SES, neuroticism, extraversion, and the interaction between extraversion and psychoticism) was calculated, the result was significant ($pr_{CTRScp \cdot P}=.2803$, $p<.05$). When squared, this coefficient demonstrates that almost 8% of the variance in teacher-reported conduct problems was accounted for by psychoticism when age, gender, SES, neuroticism, extraversion, and the interaction between extraversion and psychoticism were controlled for.

As can be seen in Table 4, the overall model for the aggression measure was significant. In addition, Table 5 demonstrates that the main effects for psychoticism and extraversion were significant, but were qualified by a significant interaction between these two variables. The interaction was examined by graphing the simple regression lines for each variable and calculating the slopes of these lines, following Aiken and West's (1991) recommended procedure.

As can be seen in Figure 1, at low levels (i.e., 2 standard deviations below the mean) of extraversion, the slope of the regression line for psychoticism was considerably steeper than at high levels (i.e., 2 standard deviations above the mean) of extraversion, where the slope was near zero. In fact, the slope of the

line at low levels of extraversion was calculated to be .813, which was significantly different from zero (t=4.081, p<.001). The slope of the line at high levels of extraversion was .044, which was not significantly different from zero (t=.262, p>.10). Thus, children with high levels of extraversion had similar levels of aggressive behavior problems (as rated by their teachers), regardless of their level of psychoticism. However, in children with low levels of extraversion, high psychoticism is associated with greater aggression.

Hypothesis 2

In order to test whether psychoticism uniquely predicted delinquent behaviors, multiple linear regression models were calculated entering the control variables of gender, age, and SES first. In the next step, Reactive Aggression was entered to remove any variance in delinquent behaviors due to this variable. Finally, psychoticism, extraversion, then neuroticism were entered in separate steps. This analysis was completed for both self-reported and parent-reported delinquent behaviors.

Selt-reported Delinquent Behaviors

The Delinquency subscale of the YSR was used as the dependent variable in this analysis. Diagnostic tests indicated no violations of assumptions, but examination of the Cook's Distance scores revealed one data point above the cutoff of 1.0. Further exploration revealed that this subject had a raw YSR score of 18, considerably higher than any other child in the study, the nearest of whom scored 7. Because the extreme value indicated a likely error, this data point was dropped from the regression analysis for this hypothesis.

The overall model predicting self-reported delinquent behavior was significant, although the model with the control variables and reactive aggression was not (see Table 6). As can be seen from Table 7, the hypotheses regarding psychoticism and neuroticism were partially supported. Psychoticism and neuroticism did add significantly to the prediction of self-reported delinquent behavior, however, the beta weight for neuroticism was not negative, as predicted. Overall, the model accounted for 24.3% of the variance in self-reported delinquent behavior.

Parent-reported Delinquent Behaviors

For this analysis, the Delinquency subscale of the CBCL was used as the dependent variable. Diagnostic tests indicated no violations of assumptions and there were no influential data points. Although Table 8 indicates that the model predicting parent-reported delinquent behaviors was significant with reactive aggression and psychoticism in the model ($p<.05$), only reactive aggression accounted for a significant increment in variance in parent-reported delinquent behaviors. In addition, together, Reactive Aggression and psychoticism only accounted for 8.6% of the variance in the dependent variable.

Hypothesis 3

To test the hypothesis that extraversion would uniquely predict hyperactivity, this analysis used the CTRS Hyperactivity scale as a measure of hyperactive behavior problems. There were no comparable analogs in the self-report or parent-report data, so no analyses were calculated for these reporters.

Diagnostic tests indicated no serious violations of assumptions. Examination of the studentized residuals indicated the presence of 2 outliers (i.e., residual scores>3). However, these data points were not influential, as examination of the Cook's Distance scores revealed no scores above .275, well below the cutoff of 1.0. As discussed above, these data points were left in the analysis, lacking good reason to remove them.

As can be seen in Table 9, the overall model with both extraversion and psychoticism was significant. However, as predicted, Table 10 shows that only extraversion accounted for a significant increment in variance, psychoticism did not. With extraversion but not psychoticism, in the model, 7.5% of the variance in hyperactive behavior is accounted for.

Hypothesis 4

In order to calculate the correlation between neuroticism and reactive aggression with proactive aggression partialled out, and between neuroticism and proactive aggression with reactive aggression partialled out, partial correlation coefficients were calculated between these variables. Neither hypothesis was supported; the partial correlation between neuroticism and reactive aggression was nonsignificant ($pr_{N \cdot ra}$=.0144, p>.05), as was the partial correlation between neuroticism and proactive aggression ($pr_{N \cdot pa}$=-.0606, p>.05).

Hypothesis 5

To test whether the main effect for psychoticism and the interaction between psychoticism and extraversion were significant in regression analyses predicting proactive aggression, even when reactive aggression and neuroticism

were controlled for, this analysis was performed using proactive aggression as the dependent variable. The control variables of age, gender, and SES were entered in the first step, reactive aggression in the second, and neuroticism in the third. Following this, psychoticism, then extraversion, and then the interaction were entered. Diagnostic tests revealed no serious violations of assumptions. Examination of the studentized residuals indicated the presence of outliers, but no Cook's Distance score exceeded the cutoff of 1.0, meaning no data point was influential. Therefore, as with the previous analyses, all data points were kept in the analyses.

The overall model was significant (Table 11), accounting for a total of 40.5% of the variance in proactive aggression. However, it is clear from Table 12, that only 4 variables accounted for a significant increment in variance in the dependent variable: reactive aggression, psychoticism, extraversion, and the interaction between psychoticism and extraversion. These results directly supported the hypothesized relationships.

As with the model predicting overall aggression, the main effects for psychoticism and extraversion were qualified by the presence of a significant interaction between these two variables. Therefore, further analysis of this interaction was conducted, using the same technique as with overall aggression in hypothesis 1. The interaction is graphed in Figure 2. As with overall aggression, the slope of the regression line for psychoticism at low levels of extraversion was significantly different from zero (slope=.862, t=4.467, p<.001) whereas, at high levels of extraversion the slope was not significantly different

from zero (slope=.065, t=.395, p>.10). Thus, children with high levels of extraversion had similar levels of proactive aggressive behavior (as rated by their teachers), regardless of their level of psychoticism. However, in children with low levels of extraversion, high psychoticism was associated with greater levels of proactive aggression.

To explore the similarity between the two significant interactions (i.e. predicting overall aggression and predicting proactive aggression), the same regression analysis predicting overall aggression was performed (i.e., using psychoticism, extraversion, neuroticism, and the interaction between extraversion and psychoticism as independent variables), but proactive aggression was first partialled out of the model. In this case, the overall model was significant, but only proactive aggression accounted for significant variance in overall aggression, all other main effects were nonsignificant, as was the interaction.

Hypothesis 6

In order to test the prediction that the linear combination of neuroticism, extraversion, and their interaction would account for significant variance in reactive aggression, even with proactive aggression controlled for, another hierarchical regression analysis was performed. In the first step, the control variables of age, gender, and SES were entered, then proactive aggression, then psychoticism, then extraversion, then neuroticism, and finally the interaction between extraversion and neuroticism. Diagnostics revealed no serious

violations of assumptions. Examination of the studentized residuals gave an indication of two outliers, but there were no influential data points, so all data points were included in this analysis.

Although the overall model was significant ($F_{8,82}$=4.305, p<.001), it is clear from Table 13 that this was due entirely to the presence of proactive aggression in the model, which was the only variable that accounted for a significant increment in variance in reactive aggression.

Exploratory Analyses

In order to explore the discrepancies between self-reported and other-reported antisocial behaviors, correlation coefficients were calculated between several of the dependent variables. These results appear in Table 14 and indicate that the correlations between self-reported and other-reported behaviors were significant, but small.

Due to the null findings in the analyses predicting reactive aggression, two additional regression analyses were performed. The first predicted self-reported aggression from extraversion, neuroticism, and their interaction. The second predicted parent-reported aggression from extraversion, neuroticism, and their interaction. Both analyses controlled for the Aggression subscale's overlap with Delinquency by entering this variable first.

The overall model predicting self-reported aggression was significant, as shown in Table 15. Delinquency, extraversion, and neuroticism all accounted for significant increments in variance, while the interaction was nonsignificant (Table 16). Although the overall model predicting parent-reported aggression was also

significant (Table 17), only delinquency accounted for a significant increment in variance, all other main effects were non-significant, as was the interaction. These results are presented in Table 18.

CHAPTER 4

DISCUSSION

This study explored the relationships between Eysenck personality variables and a number of antisocial behaviors reported by school-aged children, their parents, and their teachers; in general, the analyses supported a number of study hypotheses. People high in psychoticism, as described by H. Eysenck and other theorists, are predicted to be cold, dominating, impersonal, and unempathic (e.g., H. Eysenck, 1998, S. Eysenck, 1997, Gudjonsson, 1997). Given the amount of previous research that has supported this conceptualization of psychoticism in children and adolescents (e.g., Furnham & Barratt, 1988; Gabrys, 1983; Romero, Luengo, & Sobral, 2001), it was hypothesized that psychoticism would be a significant predictor of antisocial behavior.

As predicted, this relationship held true and psychoticism was a significant predictor of conduct problems and aggression, although the strength of that effect varied depending both on reporter and the specific aspects of conduct problem behavior being considered. Specifically, psychoticism significantly predicted self-reported externalizing and delinquency problems, parent-reported externalizing problems, and teacher-rated proactive aggression. The presence of the main effect for psychoticism in the prediction of proactive aggression was qualified by a significant interaction between psychoticism and extraversion. As

this interaction was quite interesting in and of itself, full discussion of it and its implications will appear later in this section. Finally, although the predicted relationship between psychoticism and teacher-reported general conduct problems was not supported by the regression equation, a significant partial correlation was found between psychoticism and teacher-reported conduct problems. These results together support the hypothesis that psychoticism is closely related to antisocial behaviors, including behaviors that impinge upon or disregard the rights of others.

From these results, it is clear that psychoticism is a robust predictor of antisocial behaviors. According to S. Eysenck (1997), children with high levels of psychoticism misbehave out of spite and are at risk for a number of maladaptive behaviors, such as truancy, low peer status, and criminality. This study found partial support for this position, in that children high in psychoticism tended to engage in higher levels of general externalizing behaviors, such as arguing, being mean, screaming, lying, attacking others, aggression, and swearing, as well as in delinquent behaviors, such as stealing, setting fires, skipping school, or using drugs/alcohol than their peers who were lower in psychoticism. These results hold true across raters, albeit with less strength than when the antisocial behavior is self-rated.

H. Eysenck's (1998) theory links extraversion to behavior problems, however, theorists argue that the misbehavior of highly extraverted children is of a different nature than that of children high in psychoticism (e.g., S. Eysenck, 1997). People high in extraversion are frequently described as sociable, lively,

active, and venturesome, rather than spiteful or mean, as with people high in psychoticism. There is some evidence in the literature that extraversion may be significantly predictive of antisocial behavior in non-referred samples of subjects, whereas this relationship may not be present in referred populations (i.e., populations with identified conduct problems). In addition, H. Eysenck (1998) suggests that people high in extraversion will have difficulty following social norms and will be at risk for impulsive behavior problems. In this study, extraversion was expected to be a significant predictor of externalizing behavior, hyperactivity, and aggression, regardless of reporter. However, due to its sociable nature, extraversion was expected to be unrelated to delinquent behaviors, that is, the distinction between psychoticism and extraversion would be clear concerning behaviors that disregard the rights of others.

These relationships were partially supported by the data. Extraversion was indeed a significant predictor for self-reported externalizing, teacher-reported aggression, and teacher-reported hyperactivity. This finding is in direct support of previous studies that have also found a relationship between extraversion and behavior problems such as hyperactivity, arguing, bragging or disobeying adults (e.g., Jang, Livesley, & Vernon, 1999; Romero, Luengo, & Sobral, 2001). It is notable that extraversion, a self-reported variable, was able to significantly predict teacher-reported hyperactivity, particularly given the persistent discrepancies between teacher and child reports of problematic behaviors that have appeared in the literature. In addition, as predicted, extraversion was not a significant predictor of delinquent behaviors, while psychoticism was, suggesting

that extraversion may put children at risk for impulsive, under-controlled behavior problems, but that such children are not more likely to violate the rights of others in a more instrumental way. In addition, such children would not be expected to endorse items indicating a lack of remorse for wrongdoing or a lack of empathy for others. Finally, extraversion was a significant predictor of teacher-reported proactive aggression, although this main effect was qualified by a significant interaction between extraversion and psychoticism. Because this interaction is quite interesting in its own right, it will be discussed later in this section.

Although a number of the hypotheses concerning extraversion were supported, some were not. For example, extraversion was not a significant predictor of parent-reported externalizing problems, or teacher-rated general conduct problems, as was predicted. One hypothesis about the null effect for the teacher-rated variable was that it was due to a restriction of range. Of the 83 subjects, only 49 had a score above 1 on the teacher-reported measure of conduct problems, and only 11 scores were more than one standard deviation away from the mean. Given this decreased range of possible scores, prediction of this variable may be quite difficult.

However, there was not a restriction of range with the parent-reported externalizing scores that might explain the null effect. It is important to consider, however, the way the general externalizing score on the CBCL is computed. That is, it is an aggregate of the Delinquency and Aggression subscales. Thus, parents who rate their children as having very few problems with either of these areas will also, as a result, have lower externalizing scores. As discussed above,

extraversion was not related to delinquency, thus making it more likely that these children will have lower scores on the externalizing scale. In addition, S. Eysenck (1997) argues that children high in extraversion are seen as "loveable rogues," rather than mean and spiteful, and are more likely to be forgiven for transgressions in behavior. It may be that the very traits that characterize a child as highly extraverted may also protect the child from negative evaluations by their parents.

In addition, extraversion was not a significant predictor of reactive aggression as predicted. Once again, this variable may have been difficult to successfully predict, given its restriction in range. That is, of the 83 subjects, only 43 children had a score above zero, and only 14 were more that one standard deviation away from the mean. This restriction in range severely reduces the power of the test to detect effects, which may have resulted in the present null findings. In addition, it is possible that teachers also view these children as "loveable rogues," in S. Eysenck's (1997) terms, and thus are not viewed as having problems with reactive aggression until such behaviors become extreme (e.g., considerably more than the average). Teachers clearly rate children high in extraversion as higher in hyperactivity, but may not associate such overactive behavior with aggression toward others. Conversely, the mixed findings in this study regarding extraversion may indicate that extraversion is not a coherent construct. That is, there may be a number of ways to be highly extraverted that do not all have similar outcomes. For example, children who are highly sociable, active, and gregarious would be rated as highly

extraverted, but according to H. Eysenck's (1998) definition of the construct, so would children who are sensation-seeking and dominant. Although both sets of children would be classified as high extraverts, it is easy to imagine that the behavioral correlates of each type would be quite different. Indeed, the mixed findings in the literature regarding the relationship between extraversion and antisocial behavior may be a result of different types of extraverts being considered in the same sample under one rubric.

As indicated earlier, there was some support in the literature for pursuing analysis of the interaction between psychoticism and extraversion. That is, some researchers have argued that the impulsive, under-controlled aspects of extraversion may exacerbate the tendencies toward antisocial behavior of psychoticism (e.g., Lane, 1987). Thus, the interaction between psychoticism and extraversion was expected to significantly add to the prediction of general externalizing problems, as well as aggression.

These predictions were partially supported. In particular, the interaction between psychoticism and extraversion was a significant predictor of teacher-reported overall aggression. However, the effect of the interaction between extraversion and psychoticism on general aggression was mediated by proactive aggression. That is, the interaction significantly predicted general aggression and proactive aggression, but did not continue to be a significant predictor of general aggression once proactive aggression was entered into the model. Thus, it is clear that this interaction was particular to proactive, and not reactive, aggression. This finding is interesting, given the theoretical link between

psychoticism and psychopathy that several researchers have attempted to make. That is, people high in psychoticism might be expected to also be high in psychopathy. This association, however, has been weak in the literature, when it has been found at all. For example, Hare (1982) found a very small, but significant relationship between psychoticism and psychopathy, that disappeared when the positive skew in psychopathy was corrected. In addition, proactive aggression is theoretically related to psychopathy, thus, if a link can be established between psychoticism and proactive aggression, one may exist between psychoticism and psychopathy. The fact that the present interaction is uniquely related to proactive aggression, as is the callous-unemotional factor of psychopathy, is therefore significant.

Closer examination of the interaction between extraversion and psychoticism suggested that children high in extraversion are rated by their teachers as having similar levels of proactive aggression, regardless of their level of psychoticism. However, in children with low levels of extraversion, psychoticism was highly related to the level of proactive aggression. That is, children with high psychoticism had high levels of proactive aggression, and children with low psychoticism had very low levels of proactive aggression. In addition, closer examination of Figure 2 suggests that highly extraverted children have predicted levels of proactive aggression at or only slightly above the mean, regardless of level of psychoticism, while, in the low extraversion group, children with high psychoticism have predicted levels of proactive aggression well above the mean, and children low in psychoticism were predicted to be considerably

below the mean in their level of proactive aggression. The close-to-zero slope for high extraversion contrasted with the very steep slope for low extraversion suggests that some component of extraversion seems to serve in a protective role, even in the presence of high levels of psychoticism, particularly in the case of proactive aggressive behavior. Children with high extraversion tend to be rated as more sociable and gregarious than those with low extraversion, and it may be this basic connectedness to people that insulates such children from higher levels of premeditated aggression toward others.

In addition, as stated above, the connection between psychoticism and proactive aggression is important, given the few research studies that have been able to systematically support this relationship. Given the relationship between proactive aggression and psychopathy, the presence of a significant relationship between proactive aggression and psychoticism in these data is supportive of the position that psychoticism should also be related to psychopathy. However, it is important to note that this relationship is a modest one, that is, psychoticism only accounted for a 5.3% increment in variance accounted for in proactive aggression. This result is consistent with some previous research connecting psychoticism with psychopathy, albeit at low levels (e.g., Harpur, Hare, & Hakstian, 1989). These authors found a small, but significant, correlation between the callous-unemotional factor of the Revised Psychopathy Checklist and psychoticism. Clearly, more research is needed in this area to clarify the relationships between variables, but it is crucial that such research does not ignore the interaction between psychoticism and extraversion because the

present study implies that the presence of high extraversion may serve as a protective factor, whereas children high in psychoticism but low in extraversion may actually be at higher risk for instrumental aggression. Ignoring the interaction in research concerning these variables may lead to false patterns, such as obtaining main effects for both extraversion and psychoticism that do not take into account the relationship between them. For example, in the present study, it might have been concluded that both high extraversion and high psychoticism put children at risk for increased proactive aggression, and the protective function of extraversion would have been missed completely.

Given the implication that high extraversion may be protective, rather than a risk factor, for instrumental aggression, it is also not surprising that the prediction that this interaction would be a significant predictor of general externalizing behavior was not supported. If anything, the effect predicting proactive aggression would imply that, instead of magnifying the effects of high psychoticism, extraversion may dampen such antisocial tendencies. This effect may not be robust enough, however, to overcome the influence of the delinquency and aggressive items that comprise the externalizing subscales used in this study, especially given the null relationship between extraversion and delinquency.

Conversely, it is important to consider, as stated above, that extraversion may not be one consistent construct for all children. In this sample of children, it is clear that extraversion served a protective role against the effects of high psychoticism, but it is certainly possible that another study with a slightly different

sample of extraverted traits might find no effect at all, or a large effect for extraversion when predicting antisocial behavior. Such an explanation is parsimonious with the mixed findings in the literature regarding this variable.

Some theorists argue that the emotional instability and strong autonomic arousal in people with high neuroticism could lead to impulsive and antisocial behavior (e.g., Gudjonsson, 1997). Given this theoretical position, as well as the research findings that neuroticism (or anxiety) is related to antisocial behavior problems (e.g., Fonseca and Yule, 1995; Furnham & Barratt, 1988; Gabrys, 1983), neuroticism was expected to be a significant predictor of general externalizing behavior in this study. As predicted, neuroticism was found to be a significant predictor of self-reported externalizing behavior, but not of parent-reported externalizing behavior, nor of teacher-reported conduct problems. As discussed above, one explanation for the lack of effect for the teacher-rated conduct problems was the restriction in range, making prediction difficult. In addition, given the consistent lack of findings with the parent-reported data, it is possible that another factor entirely is responsible for the null findings concerning parents' reports. This issue, being relevant to all variables will be discussed later in this section.

Given the research findings that antisocial children with higher anxiety have better outcomes (e.g., Lane, 1987) and the negative relationship between trait anxiety and psychopathy (e.g., Frick & Ellis, 1999; Harpur, Hare, & Hakstian, 1989), it was expected that neuroticism would be negatively associated with behaviors indicative of higher levels of callous-unemotional traits, insofar as they

could be measured by the YSR and CBCL (i.e., the delinquency subscale). Neuroticism was indeed a significant predictor of self-reported delinquency in this study, but its beta weight was not negative as predicted. This finding may reflect the relatively inadequate fit between the delinquency subscales and the construct of callous-unemotional traits. In addition, neuroticism did not significantly predict parent-reported delinquent behaviors, nor was it a significant predictor of any teacher-reported antisocial behaviors. Again, possible reasons for the null finding using parent data are considered later in this section.

Because high levels of neuroticism are presumed to index emotional lability or reactivity (as opposed to stability), it was expected that neuroticism would be positively correlated with reactive aggression, which is characterized by impulsive, "hot" responses to provocation. Conversely, neuroticism was expected to be negatively related to the more premeditated, "cold-blooded" type of aggression (i.e., proactive aggression). These hypotheses, however, were not supported. Research on the constructs of proactive and reactive aggression have shown that the two types of aggression are quite difficult to differentiate. That is, people frequently manifest both types of aggression, rather than being purely reactively or purely proactively aggressive (e.g., Bushman & Anderson, 2001). Thus, the effect of neuroticism would have to be quite large to be able to overcome the significant overlap between the constructs, particularly in a moderately-sized sample, such as the present data set.

Neuroticism, because of its presumed reactivity to emotional stimuli was hypothesized to be a significant predictor of reactive aggression. In addition, the interaction between neuroticism and extraversion was expected to significantly predict reactive aggression. That is, the emotional reactivity of neuroticism was expected to magnify the effects of high extraversion's impulsive responses, leading to higher levels of reactive aggression among high extraversion, high neuroticism children, while the absence (or very low level) of neuroticism was expected to significantly decrease the likelihood of reactive aggression. These hypotheses were also not supported. As discussed above, it is important to remember that there was a restriction in range of reactive aggression, which may have led to the null findings, particularly if the effect of neuroticism is not a large one in the population.

In general, it is clear from these results that the role of neuroticism in predicting antisocial behavior is not yet fully known. On the one hand, children with high levels of neuroticism were more at risk for externalizing and delinquent behaviors, but only when these behaviors were self-rated. When other reporters, such as teachers and parents judged, neuroticism was unrelated to any antisocial variable. As previously stated, it is clear that parent reports differ significantly from self-reports and that this discrepancy had a large effect on the results obtained in this study. As this issue is a pervasive one in this study, it will be discussed later in this section.

As stated above, a number of hypotheses were borne out, but there were also some problems and questions raised by the results that warrant further consideration. First, it was clear that the strength of the relationship between predictors and outcome was dependent upon the reporter. For example, it was possible to account for almost half of the variance in self-reported externalizing behavior with the linear combination of psychoticism, extraversion, and neuroticism, but this same combination accounted for less than 10% of the variance in parent-reported externalizing behavior. Psychoticism and neuroticism in linear combination accounted for 31% of the variance in self-reported delinquent behaviors, but only 8.6% of the variance in parent-reported delinquent behaviors. The discrepancy between parent and child reports was not limited to reports of antisocial traits or behaviors. Neuroticism, though significantly related to trait anxiety and to self-reported anxiety and depression, was unrelated to parent-reported anxiety and depression. Indeed, self-reported trait anxiety was unrelated to parent-reported anxiety and depression.

One possible explanation for this discrepancy is that all items in the study assessing personality were self-report in nature. Thus, to the extent that items assessing personality were similar to items assessing behavior, the relationship between the two would be expected to be high. On the other hand, this discrepancy may indicate a significant difference in either the level of knowledge or the level of willingness to report about antisocial behaviors, and other psychological symptomatology, between the two reporters. That is, it may be that parents know their children are behaving in antisocial ways, but social

desirability prevents them from being honest in their reports. Conversely, it may be that parents are, to a great extent, unaware of the extent to which their children are engaging in antisocial behaviors. There is some indication that the latter may be true, particularly for parents of adolescents. For example, findings from the investigation of the Columbine High School killers suggest that they maintained a "hate website," ordered ammunition from a local shop, made extensive video tape and kept written journals about their plans, and set off homemade pipe bombs in their neighborhood without gaining the attention of their parents. Empirical literature on this issue is sparse, but in one study on the sexual behavior of adolescents, Jaccard, Dittus, and Gordon (1998) found that mothers of adolescents underestimated the level of sexual activity of their children, regardless of the gender or age (above 14) of the adolescent.

Conversely, it is also true that the personality measures used in this study were entirely self-report, with a number of items on the psychoticism dimension of the Eysenck instrument closely mirroring the externalizing items on the YSR. Given such a correspondence between items, it is not at all surprising that the relationship between such measures is strong. However, this issue does not resolve the fact that discrepancies remain between what adults report as children's level of antisocial behavior and what the children themselves report. Relationships between measures of the same constructs, but using different reporters (e.g., self-reported delinquency vs. parent-reported delinquency) had, at best, moderate correlations. For example the largest correlation found between reporters was between self-reported delinquency and parent-reported

delinquency (r=.504), whereas the rest of the correlations between related constructs by different reporters were between .20 and .38. However, even the largest relationship indicates that only a quarter of the variance in one variable can be accounted for by its relationship with the other, suggesting a low level of overlap between reporters' accounts. In addition, although the overlap between items on the self-report measures may have inflated the size of the effects in those analyses, this issue cannot account for the significant relationships found between self-reported personality styles (i.e., psychoticism and extraversion) and teacher reports of proactive aggression and hyperactivity.

Although there were significant and important relationships between teacher reports and self-reported personality data, it was also clear that teacher-reported behaviors differed in some cases from self-reports. Particularly when using teacher-reported conduct problems (as measured by the Conners Scales) as a measure of general externalizing behaviors, no significant effects were found. However, even given the problem of restricted range, teacher-report data seems to have underestimated the level of antisocial behavior in which children in this sample were engaging. For example, psychoticism accounted for about 8% of the variance in teacher-reported conduct problems, similar to the 7% it accounted for in parent-reported externalizing problems. These values are vastly lower than the 25% of the variance in self-reported externalizing behavior that psychoticism alone accounted for. Thus, teachers, also seem not to be privy to information about a large percentage of the antisocial behavior in which children

engage. Future studies should certainly continue to address the discrepancies between reporters, as well as the similarities between adult and child reporters, perhaps using peer-ratings as another source about children's behavior.

There were some limitations to this study that should be addressed and corrected for future research in this area. For example, in order to better study agreement between reporters, as well as the predictive power of the personality variables, it would be preferable to have measures of personality from all three sets of reporters. Also, adding a specific measure of psychopathy in children and adolescents, such as the Psychopathy Screening Device, would make it possible to directly test the relationships between proactive aggression, psychoticism, and psychopathy. In addition, a low percentage of the total possible participants (i.e., the number of children who were present when the study was introduced) actually participated. Although this is a common problem in psychological research using child participants, it is nevertheless a limitation to the study to the extent that it may have resulted in the restriction in range observed in several of the variables.

In addition, it is clear that the Eysenck variables in this study were insufficient for the prediction of reactive aggression. Although it is tempting to predict that extraversion is highly related to impulsivity, and therefore to reactive aggression, this relationship did not hold true in these data. In addition, although there is a consistent positive correlation in the literature between trait anxiety and impulsive conduct problems, in the present data set, trait anxiety and neuroticism were both unrelated to reactive aggression, even when proactive aggression was

controlled for. Exploratory analyses predicting self-reported and parent-reported aggression from neuroticism, extraversion, and their interaction were also performed to determine if the personality variables would demonstrate any predictive power for other aggression variables in the data set. Just as proactive aggression was partialled out of analyses predicting reactive aggression, in these analyses, delinquency was controlled for. For self-reported aggression, there were significant main effects for extraversion and neuroticism, while the interaction was not significant. Both beta weights were positive, as expected, indicating that higher levels of these variables are associated with higher levels of predicted self-reported aggression. This finding is supportive of the hypothesis that both extraversion and neuroticism put a child at risk for increased aggression, and is in-line with our original hypothesis concerning reactive aggression.

The exploratory analyses predicting parent-reported aggression from neuroticism and extraversion yielded a significant overall model, however, this was entirely due to the variance accounted for in aggression by delinquency. The main effects for neuroticism and extraversion were not significant, nor was the interaction. Once again, as discussed above, the parent data does not agree with the self-reported data. It is important to consider the overlap between items comprising the personality scale and the aggression scale as possibly inflating the effect size, however, it is equally important to consider that parents may be poor reporters of their children's level of aggression.

Although a significant effect for self-reported aggression was found, the construct of reactive aggression warrants further exploration and investigation to determine not only the best way to predict this variable, but also the best way to measure it. For example, a number of studies use the original 6-question measure for proactive and reactive aggression, originated by Dodge and Coie (1987). This study, however, used the longer measure developed by Brown et al (1996) for these constructs. It remains to be seen which, if either, is a better measure, or if an entirely new measure should be developed. In addition, as Bushman and Anderson (2001) note, the distinction between a proactively aggressive person and a reactively aggressive person is often difficult to make, due to so many people manifesting traits of both types of aggression. Future research should continue to assess and address this issue.

In general, it is possible to make several important conclusions from the present study. First, Eysenck's variables seem to be useful in the prediction of general antisocial behavior and particular subsets are able to distinguish delinquent behaviors from other types of externalizing behaviors. The three factors of psychoticism, extraversion, and neuroticism are clearly replicable phenomena that do describe behavioral responses or personality styles. In addition, the interaction of psychoticism and extraversion appears to be an important link in the taxonomic chain between Eysenck's variables, proactive aggression, and psychopathy. In particular, it appears that extraversion may play a protective role against the antisocial, unempathic, cold tendencies of the

person high in psychoticism. Few studies have addressed this interaction in either theory or analysis and its presence warrants further exploration. If indeed, high extraversion can be protective, knowing children's personality styles would be an aid in the diagnosis and treatment of antisocial behaviors, as well as in making assessments of prognosis.

However, the controversy about whether psychoticism (or the interaction of psychoticism and extraversion) can be systematically related to psychopathy in future studies remains very much unresolved. For example, Harpur, Hart, and Hare (2002) argue that Eysenck's variables, particularly in the three-factor form, are insufficient for the distinction of psychopaths from other antisocial individuals. It is important to consider, however, that these authors only considered one data set in their argument, and did not analyze or discuss the possible interaction between psychoticism and extraversion. The presence of a significant interaction effect predicting a variable so closely related to psychopathy contradicts their conclusions. Clearly more research using both the interactions in predictions and analysis is needed to determine what the true relationship is. It is also important to consider, however, that three factors may be insufficient to capture all the important traits of psychopathy (Harpur, Hart, & Hare, 2002), or indeed to relate the personality factors to particular problem behaviors (e.g., reactive aggression). It is also clear that the broadness of these three factors may lead to effects washing out in particular populations. To best describe such traits, it may be necessary to consider other theories, such as the Big 5, in which the presence of more dimensions makes the characterization of psychopaths somewhat easier.

Harpur, Hart, and Hare (2002) have outlined a taxonomy for classifying personality disorders, including psychopathy, using the Big 5 traits. In particular, psychoticism in this model would be best characterized with two domains, instead of one (i.e., agreeableness and conscientiousness). It is also important to consider that extraversion, as discussed above, may not be best suited for a single domain either. For example, Lynam (2002) describes extraversion as comprised of warmth, gregariousness, and positive emotions, which can be considered to characterize considerable similarity. However, extraversion is also described as assertiveness, activity, and excitement seeking. It is easy to imagine certain types of individuals who are high on these three traits and how they would differ considerably from those high on the first set, but both be characterized as highly extraverted. In fact, it may be that even 5 factors is insufficient to capture some of the subtle characteristics comprising psychopathy and other personality styles, and that both extraversion and neuroticism may have to be split.

Finally, the relationship between what children are reporting and what adults know about these behaviors is as yet unclear. Very little research to date addresses this issue, but what empirical and anecdotal literature there is suggests a discrepancy between what children are doing and what the adults in their lives know about their behavior. Clearly future research must focus on this discrepancy, as well as how the differences in reporting may be affecting the community and social relationships. With the world's alarm rising at the increased incidence of violence perpetrated by seemingly "normal" adolescents,

the research literature will need to explore the factors contributing to parental ignorance of antisocial acts as well as the point at which this ignorance by adults ceases to be part of the average experience.

APPENDIX A

TABLES

Variables Entered		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Controls	Regression	1.875	3	.625	.616	.606
	Residual	80.125	79	1.014		
	Total	82.000	82			
Psychoticism	Regression	23.552	4	5.888	7.858	.000
	Residual	58.448	78	.749		
	Total	82.000	82			
Extraversion	Regression	29.913	5	5.983	8.844	.000
	Residual	52.087	77	.676		
	Total	82.000	82			
Neuroticism	Regression	39.249	6	6.542	11.629	.000
	Residual	42.751	76	.563		
	Total	82.000	82			
ExP Interaction	Regression	39.293	7	5.613	9.858	.000
	Residual	42.707	75	.569		
	Total	82.000	82			

Table 1. Hierarchical linear regression predicting self-reported externalizing behavior from Eysenck's variables.

Model	*R*	R^2	*Adjusted* R^2	R^2 *Change*	*F Change*
Controls	.151	.023	-.014	.023	.616
Psychoticism	.536	.287	.251	.264	28.928***
Extraversion	.604	.365	.324	.078	9.403**
Neuroticism	.692	.479	.437	.114	16.598***
ExP Interaction	.692	.479	.431	.001	.078

*p<.05; **p<.01; ***p<.001

Table 2. Amount of variance each variable accounts for in self-reported externalizing behavior.

Variables Entered		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Controls	Regression	5.181	3	1.727	1.776	.159
	Residual	76.819	79	.972		
	Total	82.000	82			
Psychoticism	Regression	9.513	4	2.378	2.559	.045
	Residual	72.487	78	.929		
	Total	82.000	82			
Extraversion	Regression	9.851	5	1.970	2.103	.074
	Residual	72.149	77	.937		
	Total	82.000	82			
Neuroticism	Regression	11.047	6	1.841	1.972	.080
	Residual	70.953	76	.934		
	Total	82.000	82			
ExP Interaction	Regression	11.047	7	1.578	1.668	.130
	Residual	70.953	75	.946		
	Total	82.000	82			

Table 3. Hierarchical linear regression predicting parent-reported externalizing behavior from Eysenck's variables.

Variables Entered		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Controls	Regression	6.509	3	2.170	2.271	.087
	Residual	75.491	79	.956		
	Total	82.000	82			
Psychoticism	Regression	13.720	4	3.430	3.918	.006
	Residual	68.280	78	.875		
	Total	82.000	82			
Extraversion	Regression	17.981	5	3.596	4.325	.002
	Residual	64.019	77	.831		
	Total	82.000	82			
Neuroticism	Regression	18.093	6	3.016	3.586	.003
	Residual	63.907	76	.841		
	Total	82.000	82			
ExP Interaction	Regression	22.847	7	3.264	4.138	.001
	Residual	59.153	75	.789		
	Total	82.000	82			

Table 4. Hierarchical linear regression predicting teacher-reported overall aggression from Eysenck's variables.

Model	*R*	R^2	*Adjusted* R^2	R^2 *Change*	*F Change*
Controls	.282	.079	.044	.079	2.271
Psychoticism	.409	.167	.125	.088	8.237**
Extraversion	.468	.219	.169	.052	5.125*
Neuroticism	.470	.221	.159	.001	0.133
ExP Interaction	.528	.279	.211	.058	6.027*

*p<.05; **p<.01; **p<.001

Table 5. Amount of accounted for in teacher-reported aggression.

Variables Entered		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Age, Gender, SES	Regression	4.287	3	1.429	2.616	.057
	Residual	42.618	78	.546		
	Total	46.905	81			
Reactive Aggression	Regression	4.614	4	1.153	2.100	.089
	Residual	42.291	77	.549		
	Total	46.905	81			
Psychoticism	Regression	11.808	5	2.362	5.114	.000
	Residual	35.098	76	.462		
	Total	46.905	81			
Extraversion	Regression	11.972	6	1.995	4.284	.001
	Residual	34.933	75	.466		
	Total	46.905	81			
Neuroticism	Regression	14.466	7	2.067	4.714	.000
	Residual	32.439	74	.438		
	Total	46.905	81			

Table 6. Hierarchical linear regression predicting self-reported delinquent behaviors from reactive aggression and Eysenck's variables.

Model	*R*	R^2	*Adjusted* R^2	R^2 *Change*	*F Change*
Controls	.302	.091	.056	.091	2.616
Reactive Aggression	.314	.098	.052	.007	0.595
Psychoticism	.502	.252	.203	.153	15.577***
Extraversion	.505	.255	.196	.004	0.353
Neuroticism	.555	.308	.243	.053	5.690*

*p<.05; **p<.001; ***p<.001

Table 7. Amount of variance each variable accounts for in self-reported delinquent behavior.

Variables Entered		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Age, Gender, SES	Regression	4.720	3	1.573	1.608	.194
	Residual	77.280	79	.978		
	Total	82.000	82			
Reactive Aggression	Regression	9.069	4	2.267	2.425	.055
	Residual	72.931	78	.935		
	Total	82.000	82			
Psychoticism	Regression	11.614	5	2.323	2.541	.035
	Residual	70.386	77	.914		
	Total	82.000	82			
Extraversion	Regression	11.637	6	1.940	2.095	.064
	Residual	70.363	76	.926		
	Total	82.000	82			
Neuroticism	Regression	11.867	7	1.695	1.813	.097
	Residual	70.133	75	.935		
	Total	82.000	82			

Table 8. Hierarchical linear regression predicting parent-reported delinquency from Eysenck's variables.

Variables Entered		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Controls	Regression	4.134	3	1.378	1.398	.250
	Residual	77.866	79	.986		
	Total	82.000	82			
Extraversion	Regression	9.852	4	2.463	2.663	.039
	Residual	72.148	78	.925		
	Total	82.000	82			
Psychoticism	Regression	12.486	5	2.497	2.766	.024
	Residual	69.514	77	.903		
	Total	82.000	82			

Table 9. Hierarchical linear regression predicting teacher-rated hyperactivity from psychoticism and extraversion.

Model	*R*	R^2	*Adjusted* R^2	R^2 *Change*	*F Change*
Controls	.225	.050	.014	.050	1.398
Extraversion	.347	.120	.075	.070	6.183*
Psychoticism	.390	.152	.097	.032	2.917

*p<.05; **p<.01; ***P,.001

Table 10. Amount of variance each variable accounts for in teacher-reported hyperactivity.

Variables Entered		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Age, Gender, SES	Regression	6.374	3	2.125	2.219	.092
	Residual	75.626	79	.957		
	Total	82.000	82			
Reactive Agg'n	Regression	27.054	4	6.763	9.601	.000
	Residual	54.946	78	.704		
	Total	82.000	82			
Neuroticism	Regression	27.118	5	5.424	7.609	.000
	Residual	54.882	77	.713		
	Total	82.000	82			
Psychoticism	Regression	31.440	6	5.240	7.877	.000
	Residual	50.560	76	.665		
Extraversion	Total	82.000	82			
	Regression	35.451	7	5.064	8.160	.000
	Residual	46.549	75	.621		
	Total	82.000	82			
ExP Interaction	Regression	38.006	8	4.751	7.991	.000
	Residual	43.994	74	.595		
	Total	82.000	82			

Table 11. Hierarchical linear regression predicting proactive aggression from reactive aggression and Eysenck's variables.

Model	*R*	R^2	*Adjusted* R^2	R^2 *Change*	*F Change*
Age, Gender, SES	.279	.078	.043	.078	2.219
Reactive Aggression	.574	.330	.296	.252	29.357***
Neuroticism	.575	.331	.287	.001	.090
Psychoticism	.619	.383	.335	.053	6.497*
Extraversion	.658	.432	.379	.049	6.462*
ExP Interaction	.681	.463	.405	.031	4.298*

*p<.05; **p<.01; ***p<.001

Table 12. Amount of variance each variable accounts for in proactive aggression.

Model	*R*	R^2	*Adjusted* R^2	R^2 *Change*	*F Change*
Age, Gender, SES	.210	.044	.008	.044	1.217
Proactive Aggression	.553	.306	.270	.261	29.357***
Psychoticism	.554	.307	.262	.002	.207
Extraversion	.557	.310	.256	.003	.286
Neuroticism	.557	.310	.246	.000	.003
ExN Interaction	.564	.318	.244	.008	.820

*p<.05; **p<.01; ***p<.001

Table 13. Amount of variance accounted for by each variable in reactive aggression.

	CBCL Delinquency	CBCL Aggression	CBCL Externalizing	CTRS Conduct Problems	Teacher-rated Agg'n
YSR Delinquency	.504**				
YSR Aggression		.287**			.356**
YSR Externalizing			.361**	.378**	
CTRS Conduct Problems			.307**		
Teacher-rated Aggression		.247*			

*p<.05; **p<.01; ***p<.001

Table 14. Correlations between self-reported and other-reported dependent variables.

Variables Entered		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Age, Gender, SES	Regression	.343	3	.114	.110	.954
	Residual	81.657	79	1.034		
	Total	82.000	82			
Delinquency	Regression	18.075	4	4.519	5.514	.001
	Residual	63.925	78	.820		
	Total	82.00	82			
Extraversion	Regression	25.169	5	5.034	6.820	.000
	Residual	56.831	77	.738		
	Total	82.000	82			
Neuroticism	Regression	34.515	6	5.752	9.207	.000
	Residual	47.485	76	.625		
	Total	82.000	82			
ExN Interaction	Regression	35.219	7	5.031	8.066	.000
	Residual	46.781	75	.624		
	Total	82.000	82			

Table 15. Hierarchical linear regression predicting self-reported aggression from Eysenck's variables.

Model	*R*	R^2	*Adjusted* R^2	R^2 *Change*	*F Change*
Age, Gender, SES	.065	.004	-.034	.004	.110
Delinquency	.470	.220	.180	.216	21.637***
Extraversion	.554	.307	.262	.087	9.611**
Neuroticism	.649	.421	.375	.114	14.958***
ExN Interaction	.655	.430	.376	.009	1.129

*p<.05; **p<.01; ***p<.001

Table 16. Amount of variance accounted for by each variable in self-reported aggression.

Variables Entered		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Age, Gender, SES	Regression	4.893	3	1.631	1.671	.180
	Residual	77.107	79	.976		
	Total	82.000	82			
Delinquency	Regression	22.643	4	5.661	7.439	.000
	Residual	59.357	78	.761		
	Total	82.000	82			
Extraversion	Regression	23.120	5	4.624	6.047	.000
	Residual	58.880	77	.765		
	Total	82.000	82			
Neuroticism	Regression	24.211	6	4.035	5.307	.000
	Residual	57.789	76	.760		
	Total	82.000	82			
ExN Interaction	Regression	24.896	7	3.557	4.671	.000
	Residual	57.104	75	.761		
	Total	82.000	82			

Table 17. Hierarchical linear regression predicting parent-reported aggression from Eysenck's variables.

Model	*R*	R^2	*Adjusted* R^2	R^2 *Change*	*F Change*
Age, Gender, SES	.244	.060	.024	.060	1.671
Delinquency	.525	.276	.239	.216	23.325***
Extraversion	.531	.282	.235	.006	.623
Neuroticism	.543	.295	.240	.013	1.436
ExN Interaction	.551	.304	.239	.008	.899

*p<.05; **p<.01; ***p<.001

Table 18. Amount of variance accounted for by each variable in parent-reported aggression.

APPENDIX B

FIGURES

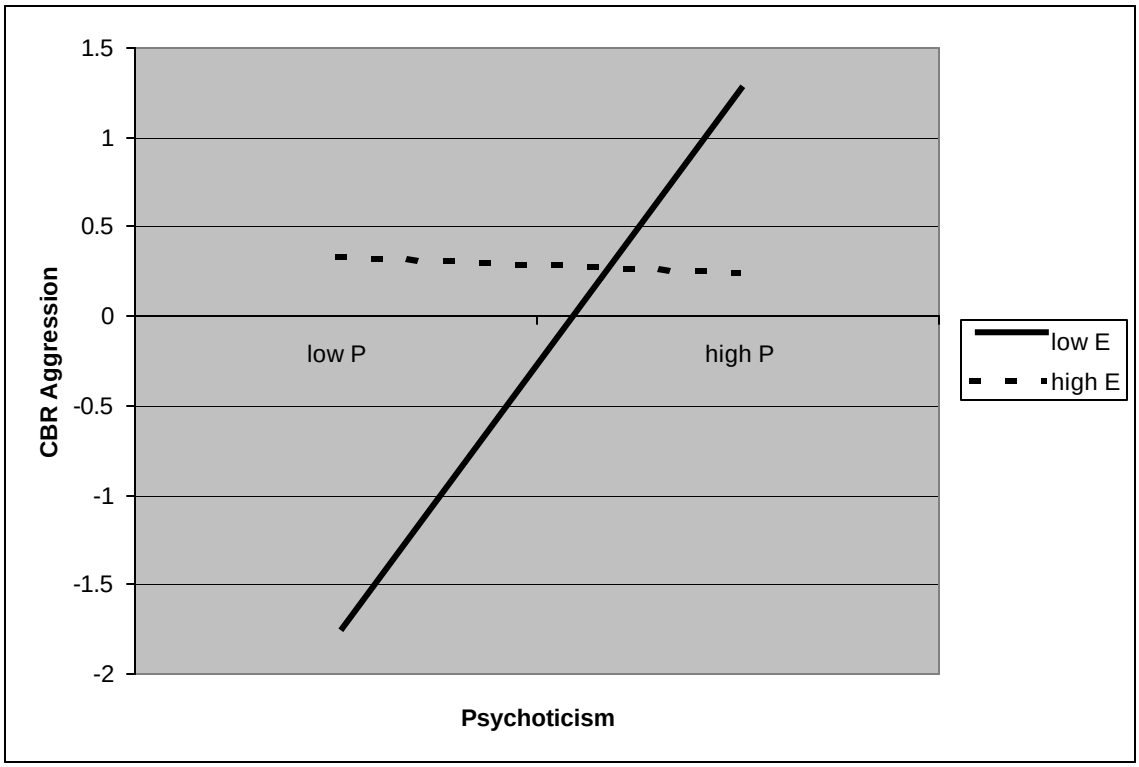

Figure 1. The interaction of psychoticism and extraversion in the prediction of teacher-reported aggressive behavior.

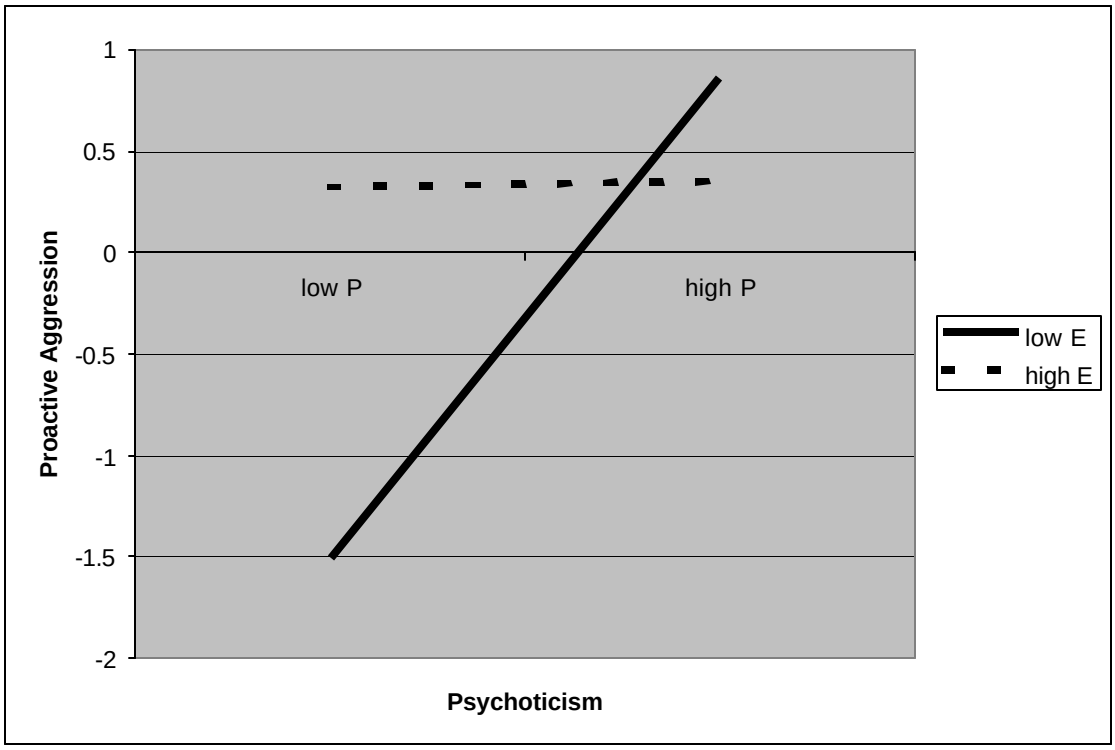

Figure 2. The interaction between psychoticism and extraversion when predicting proactive aggression.

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