

# Antisocial Behaviour in Children and Eysenck's Theory of Personality: an evaluation

DAVID B. CENTER\*

*Department of Educational Psychology and Special Education, Georgia State University, University Plaza, Atlanta, GA 30303, USA*

DAWN E. KEMP

*Rome, Georgia Public Schools*

**ABSTRACT** *Antisocial behaviour in children and youth was examined in relation to the biosocial personality theory of Hans Eysenck. Eysenck's theory is based on three independent personality traits that reflect hypothesised temperament source traits affecting behavioural predisposition. The theory holds that the interaction of the three temperament traits Psychoticism (P), Extroversion (E), and Neuroticism (N) with socialisation experiences produce personality. Eysenck's measurement instruments also contain a Lie (L) scale that has been shown to function as an index of socialisation or social conformity. Eysenck's antisocial behaviour (ASB) hypothesis predicts that individuals at risk for developing ASB have above average P scale scores. Further, individuals who are also high on the E and N scales and below average on the L scale are at the greatest risk. The current article provides an overview of the theory and an evaluation of the research support for the ASB hypothesis in children and youth. The evaluation supported the role of P and L in ASB. Implications of the findings are discussed.*

## **Background**

The difficulties posed for public school programs by children and adolescents with conduct problems have been widely debated (Maag & Howell, 1991; Nelson, Center, Rutherford, & Walker, 1991; Nelson, Rutherford, Center, & Walker, 1991). Many students with conduct problems have been described as "repetitive and persistent" violators of rules and of the rights of others and as exhibiting "... a recurrent pattern of negativistic, defiant, disobedient, and hostile behavior ..." (American Psychiatric Association, 1994, p. 91). Such students when given psychiatric diagnoses are often diagnosed as having a Conduct Disorder, Oppositional

\* dcenter@gsu.edu

Defiant Disorder, or Attention Deficit Hyperactivity Disorder. The problem of antisocial behaviour (ASB) is a complex one with no certain solution in sight. There are many factors that contribute to the development of conduct problems (McMahon & Wells, 1998; Sprague & Walker, 2000), including a number of biological factors (Chess & Thomas, 1987; Niehoff, 1999). One well-developed position that addresses biological factors in ASB is the biosocial theory of Eysenck (1997).

### Eysenck's Personality Theory

Eysenck's temperament-based theory is sometimes referred to as a *three-factor model of personality* in which the three factors are Extroversion (E), Neuroticism (N), and Psychoticism (P). Eysenck (1991a) pointed out that nearly all large-scale studies of personality find the equivalent of the three traits he proposed. Further, the traits are found across cultures worldwide (Barrett & Eysenck, 1984). Assessments of an individual on the traits are also relatively stable across time (H. Eysenck & M. Eysenck, 1985). Finally, research on the genetics of personality supports the three traits (Eaves, Eysenck, & Martin, 1988). The development of the theory and related research has given considerable attention to measurement. The Eysenck Personality Questionnaire (EPQ) developed for research on the model includes both adult and child versions (H. Eysenck & S. Eysenck, 1975, 1994). The EPQ is not a measure of psychopathology, but rather is a measure of temperament-based personality traits.

In recent years, a great deal of attention has been given to a personality trait model referred to as the Five-Factor Model (FFM), also called the Big Five (McCrae & John, 1992). The five traits represented in this model are Extroversion, Emotional Instability, Agreeableness, Conscientiousness, and Openness. Robinson (2001) criticises the FFM on the grounds that it is atheoretical and provides no structure for the integration of existing knowledge, or for the systematic development of hypotheses to guide research. Cattell (1995) has also been highly critical of the FFM and research studies employing the model for failure to employ state-of-the-art multivariate methods. Eysenck (1991a) has argued that two of the factors in the FFM, Agreeableness and Conscientiousness, are part of a higher-order factor he labeled Psychoticism. Eysenck's theoretical model is clearly an alternative trait model and is sometimes referred to as the Even Bigger Three or EB3 (Revelle, 1995) or as the Agigantic three  $\cong$  (Eysenck, 1991b).

The Extroversion (E) trait is measured on a bipolar scale that is anchored at the high end by sociability and stimulation-seeking and at the low end by social reticence and stimulation avoidance. Extroversion is hypothesised to be dependent upon the basal arousal level in an individual's neocortex, which is mediated through the ascending reticular activating system (ARAS) (Eysenck, 1967, 1976, 1977, 1997). Extroverts (high E) are less responsive than introverts (low E) to the conditioning of operant and respondent responses. Eysenck stated that a person high on the E trait has a low basal arousal level in the neocortex and does not condition or acquire anxiety-based constraints on behaviour as easily as a person with a high basal level of arousal in the neocortex (low E). The difference in basal arousal

between introverts and extroverts is evident in research on their differential response to stimulant and sedative drugs (Claridge, 1995).

The Neuroticism (N) trait is measured on a bipolar scale anchored at the high end by emotional instability and spontaneity and by reflection and deliberateness at the low end. Individuals high on the N trait are susceptible to anxiety-based problems. Neuroticism is hypothesised to be dependent upon an individual's emotional arousability due to differences in ease of visceral brain activation, which is mediated by the hypothalamus and limbic system (Eysenck, 1977, 1997). A person low on the N trait reacts slowly and moderately to most emotional stimuli and ceases reacting when the stimuli are withdrawn. Conversely, a person high on the N trait is quickly and easily aroused emotionally and the arousal is more persistent.

Eysenck (1976) hypothesised that individuals who are low to average on both the E and N traits will be more likely to acquire an effective system of inhibitions on their behaviour. Conversely, individuals who are high on both traits will be less susceptible to acquiring conditioned inhibitions on their behaviour and are thus at greater risk of exhibiting ASB. The positive interaction of the E and N traits was offered by Eysenck as a possible explanation of what is referred to by many as moral behaviour. This moral hypothesis when combined interactively with the P trait can be characterised as Eysenck's ASB hypothesis.

The Psychoticism (P) trait is a bipolar scale anchored at the high end by aggressiveness and divergent thinking and at the low end by empathy and caution. The label for this trait is based on the susceptibility of a significant sub-group of individuals high on the P trait to psychotic disorders (H. Eysenck & S. Eysenck, 1976). Psychoticism is hypothesised to be a polygenic trait (Eysenck, 1997) that depends on contributions from a large number of genes each of whose individual effect is small. Each of these "small effect" genes is additive, so that the total number inherited determines the degree of the P trait in the personality. When "large effect" genes that predispose for psychosis occur in combination with the P trait, one is at the greatest risk for developing a psychotic illness.

The P trait is the trait with the most direct link to the problem of Conduct Disorder (CD). Research indicates a relationship between high P and diagnoses such as Antisocial Personality Disorders, Schizotypal Personalities, Borderline Personalities, and Schizophrenia (Claridge, 1995; H. Eysenck & S. Eysenck, 1976; Monte, 1995). Psychotic tendencies in high P individuals are indirectly supported by the follow-up research of Robins (1979). Robins found that approximately 25% of individuals with a diagnosis of CD in childhood developed psychotic conditions in adulthood. One common misconception about the P scale is that it is diagnostic for psychosis. The EPQ is not a diagnostic instrument. While appropriateness of the label "Psychoticism" for the trait has been debated, it has nevertheless been retained.

Eysenck predicted that individuals high on the P trait would be predisposed to developing ASB (Eysenck, 1997). Further, an individual high on both the P and E traits would be predisposed to developing antisocial, aggressive behaviour. Aggressive behaviour is associated with low cortical arousal (high E) because a person with a relatively under reactive nervous system does not learn restraints on behaviour or

learn rule-governed behaviour as readily as do individuals with a higher basal level of cortical arousal. Further, when such an individual is high on the N trait as well, this will add an emotional and irrational character to behaviour under some circumstances. Thus, the ASB hypothesis requires the elevation and interaction of all three personality traits.

Finally, antisocial individuals typically score lower than others on the Eysenck Personality Questionnaire's Lie (L) scale (Eysenck & Gudjonsson, 1989). The L scale is a measure of the degree to which one is disposed to give socially expected responses to certain types of questions. A high score on this scale suggests that the respondent is engaging in impression management by consistently giving "yes" responses to items reflecting socially desirable behaviours (H. Eysenck & S. Eysenck, 1994). A low score suggests indifference to social expectations and is usually interpreted as an indication of weak socialisation. The strongest form of Eysenck's ASB hypothesis would be high P, E, and N with low L.

### **Method**

This paper evaluates the research on Eysenck's ASB hypothesis that higher than average levels of the P, E, and N traits and lower scores on the L scale will be associated with ASB. A literature search was conducted using the PSYCHLIT database and covered the period 1975 through 2000. The computerised search employed several key terms (e.g., personality, temperament, Eysenck, antisocial, delinquent, aggressive, children, and adolescents). An evaluation of 60 published articles yielded 10 reports to which one recent report (Kemp & Center, in press) was added making 11 reports, inclusive of 18 tests for P trait differences, 14 tests for E and N trait differences, and 12 tests for L scale differences. The studies selected for review met the following criteria:

1. The study used child or adolescent participants.
2. The study tested for differences between a group with ASB and a contrast group on one or more of the components in Eysenck's ASB hypothesis.
3. The study included the data needed to compute effect sizes.
4. The research used the Eysenck Personality Questionnaire (EPQ) (H. Eysenck & S. Eysenck, 1975), Eysenck Personality Questionnaire-Revised (EPQ-R) (H. Eysenck & S. Eysenck, 1994), or the Junior Eysenck Personality Questionnaire (JEPQ) (H. Eysenck & S. Eysenck, 1975).

The review was limited to studies employing the EPQ, EPQ-R, or JEPQ for several reasons. First, these instruments are directly tied to the theoretical model. Second, good reliability and validity have been reported for the instruments (H. Eysenck & S. Eysenck, 1975, 1994). Third, there is good comparability across the instruments. All three instruments measure the same set of traits and they provide measures suitable for children, adolescents, and adults. Finally, they are the most widely used of the various instruments that have been developed from Eysenck's theory.

Support for the temperament components of the ASB hypothesis were evaluated

TABLE I. A summary of child and adolescent studies related to Eysenck's ASB hypothesis

Study Source	Study Group	Contrast Group	Psychoticism	Extraversion	Neuroticism	Lie Scale	Comment
Berman & Paisey, 1984	30 assaultive delinquents	30 non-assaultive delinquents	$F = 24.7$ $p < .05$	$F = 4.24$ $p < .05$	$F = 4.47$ $p < .05$	$F = 6.76$ $p < .05$	all Ss were male
Chico & Ferrando, 1995	181 violent (V) & 119 non-violent (NV) delinquents	300 young soldiers (S)	$F = 56.9$ $p < .001$ V > NV & S	not reported	not reported	not reported	Ss matched for age, SES, & IQ
Fonseca & Yule, 1995, Study 1	44 delinquents: 22 aggressive 22 non-aggressive	20 normal Ss	not significant	not significant	not significant	not reported	all male Ss
Fonseca & Yule, 1995, Study 2	24 conduct disordered Ss	26 normal Ss	not significant	not significant	$F = 5.35$ $p < .05$	not significant	all male Ss
Gabrys, 1983	116 Ss referred for antisocial behaviour	116 Ss referred for other problems	no $t$ value given male $p < .001$ female $p < .001$	no $t$ value given male $p$ , n.s. female $p$ , n.s.	no $t$ value given male $p < .001$ female $p < .001$	no $t$ value given male $p < .001$ female $p < .001$	2.5:1 male to female ratio
Gabrys et al., 1988	330 conduct disorder Ss	354 non-conduct disorder Ss	$t = 21.76$ $p < .001$	$t = 1.96$ $p < .05$	$t = 8.72$ $p < .001$	$t = 15.76$ $p < .001$	contrast group
Kemp & Center, in press	40 moderate (M) and 33 severe (S) problem students	77 average (A) problem students	S vs M vs A $p < .05$	not significant  S & M > A	S vs M vs A $p < .05$	S vs M vs A $p < .05$ S > M > A	116 males 34 females A > S
Lane, S4, 1987	60 convicted juvenile Ss evaluated on severity (S), persistence (P), and violence (V)	60 matched normal Ss	$T = 7.1$ $p < .001$ S, $r = .34$ , $p < .004$ P, $r = .24$ , $p < .032$ V, $r = .23$ , $p < .037$	not significant	contrary to prediction V, $r = -.35$ ,	$T = -2.9$ $p < .005$ $p < .003$	Ss initially assessed prior to convictions
Putnins, 1982, Study 1 <sup>a</sup>	10 delinquents	62 non-offenders	$t$ not reported $p < .05$	not reported	not reported	not reported	all male Ss 13-15 yrs
Putnins, 1982, Study 2 <sup>a</sup>	45 delinquent recidivist	23 delinquent non-recidivist	$t$ not reported $p < .01$	not significant	not significant	not reported	based on a 12 month follow-up
Saklofske & Eysenck, 1980	45 badly behaved (BB) and 30 delinquent (D) Ss	72 well behaved (WB) Ss	D vs WB $t = 3.57$ , $p < .001$ BB vs WB $t = 2.41$ , $p < .05$	BB vs WB $t = 3.26$ , $p < .01$	not significant $t = -.296$ ,	BB vs WB $p < .01$	all male Ss
Silva et al., 1986	42 incarcerated delinquents	103 normal Ss	$t = 3.57$ $p < .001$	contrary to prediction	$t = 2.66$ $p < .01$	$t = 2.13$ $p = .05$	all male Ss matched for age
Slee & Rigby, 1993	29 bullies (B) and 29 victims (V) Ss	29 normal (N) Ss	B vs V vs N $p < .05$ B > V & N	B vs V vs N $p < .05$ B & N > V	not significant	B vs V $p < .05$ B < V	all male Ss ANOVA with Scheffe post hoc

<sup>a</sup> Only P was statistically tested. However, the data needed to compute ES values for all four scales was available and the ES for each scale is reported in the tables that follow.

TABLE II. Effect sizes for comparisons between antisocial and contrast participants on the P scale

Sources for P scale	Antisocial			Contrast			Effect size
	Mean	N	STD	Mean	N	STD	
Berman & Paisey (1984) <sup>a</sup>	9.03	30	3.77	4.9	30	2.55	1.28
Chico & Ferrando (1995) <sup>b</sup>	10.42	181	3.79	6.76	119	3.01	1.05
Chico & Ferrando (1995) <sup>c</sup>	10.4	181	3.79	7.22	300	3.55	0.87
Chico & Ferrando (1995) <sup>d</sup>	6.76	119	3.01	7.22	300	3.55	-0.14
Fonseca & Yule (1995) <sup>e</sup>	5.5	22	3.11	5.36	22	2.79	0.05
Fonseca & Yule (1995) <sup>f</sup>	5.5	22	3.11	5.15	20	3.45	0.11
Fonseca & Yule (1995) <sup>g</sup>	5.91	24	3.06	4.65	26	3.24	0.4
Gabrys (1983) <sup>h</sup>	7.41	116	2.9	2.49	116	1.84	2.03
Gabrys et al. (1988) <sup>i</sup>	7.79	330	3.48	2.81	354	2.35	1.69
Kemp & Center (in press) <sup>j</sup>	6.88	33	2.71	3.13	77	2.56	1.44
Kemp & Center (in press) <sup>k</sup>	5.4	40	2.42	3.13	77	2.56	0.9
Lane (1987) <sup>l</sup>	6.03	60	2.8	2.92	60	2.08	1.26
Putnins (1982) <sup>m</sup>	7.9	10	4.36	4.11	162	3.0	1.23
Putnins (1982) <sup>n</sup>	9.58	45	4.12	6.52	23	4.89	0.7
Saklofske & Eysenck (1980) <sup>o</sup>	7.96	45	3.57	6.36	72	3.45	0.46
Saklofske & Eysenck (1980) <sup>p</sup>	8.93	30	2.95	6.36	72	3.45	0.78
Silva et al. (1986) <sup>q</sup>	6.6	42	2.97	4.56	103	3.46	0.61
Slee & Rigby (1993) <sup>r</sup>	5.72	29	3.44	2.72	29	2.12	1.05
Slee & Rigby (1993) <sup>s</sup>	5.72	29	3.44	3.41	29	3.82	0.64
<b>Mean for P scale</b>							<b>.86</b>

*Note.*<sup>a</sup>30 assaultive delinquents contrasted with 30 non-assaultive delinquents.<sup>b</sup>181 violent delinquents contrasted with 119 non-violent delinquents.<sup>c</sup>181 violent delinquents contrasted with 300 young soldiers.<sup>d</sup>119 non-violent delinquents contrasted with 300 young soldiers.<sup>e</sup>22 aggressive delinquents contrasted with 22 non-aggressive delinquents.<sup>f</sup>22 aggressive delinquents contrasted with 20 control participants.<sup>g</sup>24 conduct disordered participants contrasted with 26 control participants.<sup>h</sup>116 antisocial participants contrasted with 116 prosocial participants.<sup>i</sup>330 conduct disordered participants contrasted with 354 control participants.<sup>j</sup>33 participants with severe problem behaviours contrasted with 77 control participants.<sup>k</sup>40 participants with moderate problem behaviours contrasted with 77 control participants.<sup>l</sup>60 convicted juveniles contrasted with 60 matched and normal control participants.<sup>m</sup>10 delinquents contrasted with 162 control participants.<sup>n</sup>45 recidivists contrasted with 23 non-recidivists.<sup>o</sup>45 badly behaved participants with 72 well-behaved participants.<sup>p</sup>30 delinquents contrasted with 72 well-behaved participants.<sup>q</sup>42 incarcerated delinquents contrasted with 103 normal control participants.<sup>r</sup>29 bullies contrasted with 29 victims.<sup>s</sup>29 bullies contrasted with 29 controls.

on an individual basis. While not the most desirable approach, no studies were found that tested the strong form of the hypothesis. Thus, any study that had a supportive finding for one or more of the components in the hypothesis was considered to support the hypothesis to some degree. Theoretically speaking,

TABLE III. Effect sizes for comparisons between antisocial and contrast participants on the E scale

Sources for E scale	Antisocial			Contrast			Effect size
	Mean	N	STD	Mean	N	STD	
Berman & Paisey (1984) <sup>a</sup>	14.03	30	3.11	12.1	30	4.10	0.9
Fonseca & Yule (1995) <sup>b</sup>	18.72	22	3.7	18.86	22	4.89	-0.03
Fonseca & Yule (1995) <sup>c</sup>	18.72	22	3.7	18.05	20	4.83	0.16
Fonseca & Yule (1995) <sup>d</sup>	18.54	24	3.45	17.92	26	3.74	0.17
Gabrys (1983) <sup>e</sup>	17.4	116	3.9	16.67	116	4.24	0.18
Gabrys et al. (1988) <sup>f</sup>	17.41	330	4.12	16.76	354	4.52	0.15
Kemp & Center (in press) <sup>g</sup>	18.06	33	3.87	18.01	77	4.18	0.01
Kemp & Center (in press) <sup>h</sup>	18.7	40	3.57	18.01	77	4.18	0.17
Lane (1987) <sup>i</sup>	17.73	60	3.95	17.15	60	3.89	0.15
Putnins (1982) <sup>j</sup>	18.9	10	3.14	19.21	162	3.25	-0.1
Putnins (1982) <sup>k</sup>	13.47	45	4.18	13.74	23	3.73	-0.07
Saklofske & Eysenck (1980) <sup>l</sup>	20.11	45	2.89	17.75	72	4.27	0.62
Saklofske & Eysenck (1980) <sup>m</sup>	19.07	30	3.65	17.75	72	4.27	0.32
Silva et al. (1986) <sup>n</sup>	16.86	42	3.2	18.22	103	3.41	-0.41
Slee & Rigby (1993) <sup>o</sup>	20.93	29	2.46	17.52	29	5.51	0.8
Slee & Rigby (1993) <sup>p</sup>	20.93	29	2.46	20.31	29	3.3	0.21
<b>Mean for E scale</b>							<b>0.2</b>

*Note.*<sup>a</sup>30 assaultive delinquents contrasted with 30 non-assaultive delinquents.<sup>b</sup>22 aggressive delinquents contrasted with 22 non-aggressive delinquents.<sup>c</sup>22 aggressive delinquents contrasted with 20 control participants.<sup>d</sup>24 conduct disordered participants contrasted with 26 control participants.<sup>e</sup>116 antisocial participants contrasted with 116 prosocial participants.<sup>f</sup>330 conduct disordered participants contrasted with 354 control participants.<sup>g</sup>33 participants with severe problem behaviours contrasted with 77 control participants.<sup>h</sup>40 participants with moderate problem behaviours contrasted with 77 control participants.<sup>i</sup>60 convicted juveniles contrasted with 60 matched and normal control participants.<sup>j</sup>10 delinquents contrasted with 162 control participants.<sup>k</sup>45 recidivists contrasted with 23 non-recidivists.<sup>l</sup>45 badly behaved participants with 72 well-behaved participants.<sup>m</sup>30 delinquents contrasted with 72 well-behaved participants.<sup>n</sup>42 incarcerated delinquents contrasted with 103 normal control participants.<sup>o</sup>29 bullies contrasted with 29 victims.<sup>p</sup>29 bullies contrasted with 29 controls.

support for the P trait is particularly important because it is the primary predisposing trait for the development of ASB (Eysenck & Gudjonsson, 1989).

## Results

Antisocial behaviour across the studies was variously defined by diagnostic status (e.g., Conduct Disorder), by legal status (e.g., delinquent), by offense (e.g., assault), by school discipline records, by teacher ratings, and by self-ratings. There were 18 comparisons between groups of subjects with ASB and a contrast group on the P

TABLE IV. Effect sizes for comparisons between antisocial and contrast participants on the N scale

Sources for N scale	Antisocial			Contrast			Effect size
	Mean	N	STD	Mean	N	STD	
Berman & Paisey (1984) <sup>a</sup>	13.47	30	2.98	11.47	30	4.24	0.55
Fonseca & Yule (1995) <sup>b</sup>	11.72	22	4.86	12.27	22	3.56	-0.13
Fonseca & Yule (1995) <sup>c</sup>	11.72	22	4.86	11.4	20	3.77	0.07
Fonseca & Yule (1995) <sup>d</sup>	13.39	24	3.79	10.88	26	3.8	0.66
Gabrys (1983) <sup>e</sup>	12.8	116	4.13	10.16	116	5.41	0.55
Gabrys et al. (1988) <sup>f</sup>	13.24	330	4.44	10.18	354	4.72	0.67
Kemp & Center (in press) <sup>g</sup>	14.12	33	3.41	8.31	77	4.1	1.49
Kemp & Center (in press) <sup>h</sup>	11.45	40	4.32	8.31	77	4.1	0.75
Lane (1987) <sup>i</sup>	10.07	60	4.32	12.83	60	4.18	-0.65
Putnins (1982) <sup>j</sup>	11.5	10	2.64	10.71	162	4.31	0.19
Putnins (1982) <sup>k</sup>	12.13	45	4.47	12.96	23	6.17	-0.16
Saklofske & Eysenck (1980) <sup>l</sup>	13.44	45	3.65	12.15	72	4.46	0.31
Saklofske & Eysenck (1980) <sup>m</sup>	13.9	30	4.6	12.15	72	4.46	0.39
Silva et al. (1986) <sup>n</sup>	12.4	42	3.54	10.5	103	4.67	0.43
Slee & Rigby (1993) <sup>o</sup>	11	29	4.25	10.66	29	4.91	0.07
Slee & Rigby (1993) <sup>p</sup>	11	29	4.25	9.17	29	4.5	0.42
<b>Mean for N scale</b>							<b>0.43</b>

*Note.*<sup>a</sup>assaultive delinquents contrasted with 30 non-assaultive delinquents.<sup>b</sup>22 aggressive delinquents contrasted with 22 non-aggressive delinquents.<sup>c</sup>22 aggressive delinquents contrasted with 20 controls.<sup>d</sup>24 conduct disordered participants contrasted with 26 controls.<sup>e</sup>116 antisocial participants contrasted with 116 prosocial participants.<sup>f</sup>330 conduct disordered participants contrasted with 354 controls.<sup>g</sup>33 participants with severe problem behaviours contrasted with 77 controls.<sup>h</sup>40 participants with moderate problem behaviours contrasted with 77 controls.<sup>i</sup>60 convicted juveniles contrasted with 60 matched and normal control participants.<sup>j</sup>10 delinquents contrasted with 162 controls.<sup>k</sup>45 recidivists contrasted with 23 non-recidivists.<sup>l</sup>45 badly behaved participants with 72 well-behaved participants.<sup>m</sup>30 delinquents contrasted with 72 well-behaved participants.<sup>n</sup>42 incarcerated delinquents contrasted with 103 normal control participants.<sup>o</sup>29 bullies contrasted with 29 victims.<sup>p</sup>29 bullies contrasted with 29 controls.

trait. Fifteen out of 18 of these comparisons (83.3%) were statistically significant and the significant differences were in the predicted direction (see Table I). There were 14 comparisons on the E trait of which six were statistically significant. One test resulted in a significant finding counter to prediction and five (37.5%) in significant findings in the predicted direction (see Table I). There were 14 comparisons on the N trait of which eight were statistically significant. One test resulted in a significant finding counter to prediction and seven (50%) in significant findings in the predicted direction (see Table I). There were 12 comparisons on the L scale of



TABLE V. Effect sizes for comparisons between antisocial and contrast participants on the L scale

Sources for L scale	Antisocial			Contrast			Effect size
	Mean	N	STD	Mean	N	STD	
Berman & Paisey (1984) <sup>a</sup>	7.67	30	3.86	10.17	30	3.58	-0.67
Fonseca & Yule (1995) <sup>b</sup>	5	22	3.51	6.59	20	4.86	-0.38
Fonseca & Yule (1995) <sup>c</sup>	5	22	3.51	6.8	20	4.9	-0.43
Fonseca & Yule (1995) <sup>d</sup>	10.25	24	5.39	10.57	26	3.54	-0.07
Gabrys (1983) <sup>e</sup>	4.41	116	3.1	7.34	116	5.01	-0.7
Gabrys et al. (1988) <sup>f</sup>	4.67	330	3.31	9.53	354	4.67	-1.19
Kemp & Center (in press) <sup>g</sup>	4.85	33	3.22	8.53	77	3.98	-0.98
Kemp & Center (in press) <sup>h</sup>	6.93	40	3.74	8.53	77	3.98	-0.41
Lane (1987) <sup>i</sup>	5.58	60	3.56	7.63	60	3.78	-0.56
Putnins (1982) <sup>j</sup>	5.2	10	2.78	6.2	162	3.9	-0.26
Putnins (1982) <sup>k</sup>	7.69	45	5.5	7.65	23	4.03	0.01
Saklofske & Eysenck (1980) <sup>l</sup>	1.44	45	1.64	2.69	72	2.51	-0.56
Saklofske & Eysenck (1980) <sup>m</sup>	2.73	30	2.77	2.69	72	2.51	0.02
Slee & Rigby (1993) <sup>n</sup>	6.27	29	4.3	10.58	29	3.99	-1.04
Slee & Rigby (1993) <sup>o</sup>	6.27	29	4.3	8.31	29	4.35	-0.47
<b>Mean for L scale</b>							<b>-0.51</b>

Note.

- <sup>a</sup>30 assaultive delinquents contrasted with 30 non-assaultive delinquents.
- <sup>b</sup>22 aggressive delinquents contrasted with 22 non-aggressive delinquents.
- <sup>c</sup>22 aggressive delinquents contrasted with 20 controls.
- <sup>d</sup>24 conduct disordered participants contrasted with 26 controls.
- <sup>e</sup>116 antisocial participants contrasted with 116 prosocial participants.
- <sup>f</sup>330 conduct disordered participants contrasted with 354 controls.
- <sup>g</sup>33 participants with severe problem behaviours contrasted with 77 controls.
- <sup>h</sup>40 participants with moderate problem behaviours contrasted with 77 controls.
- <sup>i</sup>60 convicted juveniles contrasted with 60 matched and normal control participants.
- <sup>j</sup>10 delinquents contrasted with 162 controls.
- <sup>k</sup>45 recidivists contrasted with 23 non-recidivists.
- <sup>l</sup>45 badly behaved participants with 72 well-behaved participants.
- <sup>m</sup>30 delinquents contrasted with 72 well-behaved participants.
- <sup>n</sup>29 bullies contrasted with 29 victims.
- <sup>o</sup>29 bullies contrasted with 29 controls.

which eight (66.6%) were statistically significant and the significant differences were in the predicted direction (see Table I).

Effect sizes (ES) were computed for the group comparisons on the P trait. The ESs ranged from a low of -.14, which was a contrast between non-violent delinquents and young soldiers (Chico & Ferrando, 1995) to a high of 2.03, which was a contrast between antisocial participants and prosocial participants (Gabrys, 1983) (see Table II). The mean ES for P was .86, which is considered to be a high ES (Cohen, 1988). The ESs for the E trait ranged from a low of -.41, which was a contrast between incarcerated delinquents and normal adolescents (Silva, Martorell, & Clemente, 1986) to a high of .9, which was a contrast between assaultive delinquents and non-assaultive delinquents (Berman & Paisey, 1984) (see Table

III). The mean ES for E was .2, which is a low ES. The ESs for the N trait ranged from a low of  $-.65$ , which was a contrast between delinquents and normal adolescents (Lane, 1987) to a high of 1.49, which was a contrast between students with severe behaviour problems and normal controls (Kemp & Center, in press) (see Table IV). The mean ES for N was .43, which is a low to moderate ES. Finally, the ESs for the L scale ranged from a low of  $-1.19$ , which was a contrast between participants with Conduct Disorder and normal controls (Gabrys et al., 1988) to a high of .02, which was a contrast between delinquents and normal controls (Saklofske & Eysenck, 1980) (see Table V). Recall that the predicted relationship between ASB and the L scale is that the L score will be lower in individuals with ASB. The mean ES for L was .51, which is a moderate ES.

The findings for significant differences and the ESs compliment one another. The relative rank of each scale, whether for percentage of significant tests or for strength of ES, was the same.

### **Discussion**

Strong support was found for the P scale, which is the component in the ASB hypothesis with the most direct link to ASB (Eysenck, 1977). The importance of the P trait is particularly evident in two of the studies that addressed the predictive validity of the ASB hypothesis. Putnins' (1982) second study showed that P scores predicted recidivism in delinquents at a one-year follow-up. Further, Lane's (1987) fourth study showed that P scores predicted delinquency five years later. Lane also found a strong association between the severity, persistence and violence of convictions, and P scores. Moderate support was also found for the L scale. The L scale plays a confirmation role in the ASB hypothesis; whereby a low score on this scale suggests that an individual's socialisation has probably not been adequate to constrain his or her predisposition for developing ASB.

This evaluation found little support for elevated E and N scale scores in participants with ASB. If these two scales play a role in a predisposition for the development of ASB, it remains to be demonstrated. The interaction of the E and N traits is of particular interest because of the hypothesised role they play in the strength of behavioural inhibitions established through conditioning (Eysenck, 1976).

Recent research (Robinson, 2001) on the relationship of neurological arousal to the E and N traits reported clear and significant differences in neurological activity between participants with different strength combinations of these traits. These findings strongly reinforce the need for researchers to contrast participants who are high with those who are low on the traits making up Eysenck's morality hypothesis and his ASB hypothesis. One recent study (Jackson & Center, 2002) tested Eysenck's morality hypothesis. The study used two small samples of children who were either above the mean on both the E and N traits or below the mean on both traits and found a significant difference between them on a measure of ASB. The finding indirectly supports the presence of weaker inhibition of behaviour in the high E and N participants. There is also an indication that the E trait measures both impulsiveness and sociability and that the impulsiveness component has the closer

association with ASB (S. Eysenck, 1981). It may be that the predicted relationship between E and ASB would be found more frequently if the E scale were broken into sub-traits scores.

Eysenck's ASB hypothesis is a complex hypothesis, which goes beyond simply suggesting that ASB is a direct result of temperamental predisposition reflected by P, E, N, and L scale scores. Eysenck suggested that other factors interact with temperament, including general intelligence (*g*) and environmental factors (Eysenck & Gudjonsson, 1989), to produce personality and behavioural styles. For example, Eysenck indicated that above average *g* provides a degree of protection from the negative aspects of P and increases the likelihood that positive aspects of this predisposition (e.g., creativity) will be facilitated (Eysenck, 1995). In particular, it is suggested that below average *g* leads to academic difficulties and that these difficulties in interaction with high P increase the probability that such an individual will make antisocial adaptations to the educational environment and subsequently to the broader social environment. Fonseca and Yule (1995) did attempt to control for *g* but found no effect associated with intelligence. Kemp and Center (2000) also failed to find any effect associated with *g* in a sample of young adult offenders. In spite of these two studies, future studies should control for intellectual ability and school success when examining the effects of P on the development of ASB.

Another major influence on the development of ASB that needs to be better controlled in future studies is the role of socialisation. Eysenck proposed that elevated E in combination with elevated N reduces susceptibility to conditioning and makes it more difficult to establish conditioned restraints on behaviour (Eysenck, 1976). Further, elevated P is associated with diminished responsiveness to punitive stimuli, which would make even more difficult the establishment of behavioural inhibitions. These traits in children would clearly interact with parenting skill and affect the success of socialisation efforts. Kemp and Center (2000, in press; Center & Kemp, in press) used a retrospective measure of their participants' socialisation. They found that their antisocial and aggressive participants were high on Eysenck's traits and reported weak socialisation experiences. In addition, Raine and Venables (1981) discussed some potential socialisation problems associated with low E (e.g., greater susceptibility to inappropriate socialisation experiences).

In conclusion, Eysenck's ASB hypothesis clearly appears to have sufficient support in children and youth to warrant further investigation. The P trait and L scale components of the ASB hypothesis seems to have considerable potential for identifying at-risk children during the early school years. However, there is a need for studies that examine the strong form of the ASB hypothesis, which requires consideration of the interaction of the traits where participants are either high or low on all three traits. In the authors' view, future research should use personality profile as the independent variable rather than behaviour, which should be the dependent variable. All the studies reviewed herein used behaviour as the independent variable and each personality trait as a separate dependent variable. Such a design cannot adequately test the strong form of the ASB hypothesis, which depends on the interaction of the three traits when they are high or low together. There is also a need for longitudinal data to determine how accurately the hypothesis can predict

maladaptive outcomes in children. If such prediction proves feasible, preventive programs targeting children at-risk for developing ASB because of temperamental predispositions might be an efficient way of directing prevention efforts. Finally, information about temperament-based personality traits may be useful for better individualising interventions for students already identified with emotional or behaviour disorders (Center & Kemp, in press; Wakefield, 1976).

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