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Longitudinal examination of the impact of Eysenck's psychoticism dimension on emotional well-being in teenagers

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Abstract

Using a two-wave longitudinal design with a 12-month interval, we assessed the impact of Eysenckian psychoticism on the emotional well-being of teenagers ($N = 660$). The mean age of the participants was 12 years at Time 1. At both times, participants completed the Eysenck psychoticism measure as well as a number of measures of positive and negative affect derived from the PANAS-X, namely, hostility, fear, sadness, and joy [Watson, D. & Clark, L. A. (1994). *The PANAS-X: manual for the positive and negative affect schedule – expanded form*. Department of Psychology, University of Iowa]. Structural equation modeling (SEM) indicated structural differences in psychoticism between boys and girls. Further SEM analyses revealed that amongst girls, P was associated with increases in hostility, sadness, and fear, whereas amongst boys it was associated with decreases in joy. These results are discussed with reference to the nature of Eysenckian psychoticism, its links to emotional states, and their implications for behaviour in young people.

Keywords: Psychoticism; Adolescence; Emotional well-being; Longitudinal

1. Introduction

When considering the dimensions of major contemporary personality schemes such as the Big Five and the Gigantic Three, none has generated as much debate and conjecture as Eysenck's

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psychoticism (P) dimension.[1] Also referred to as "toughmindedness" (Eysenck & Eysenck, 1975), the P dimension is viewed as an "unspecific vulnerability" in which individuals are predisposed to varying degrees of psychosis (Eysenck & Eysenck, 1985, p. 64) or a continuum, ranging from altruistic and empathic tendencies at one end to impulsive, aggressive and other "near-psychotic" states at the other (Eysenck, 1997, p. 111).

From the outset this proposal generated vigorous debate. The major discussions have centered on the extent to which P is distinguishable from agreeableness and conscientiousness (Costa & McCrae, 1995; Eysenck & Eysenck, 1985) and whether or not this personality dimension predicts psychotic behaviour. Questions have also been raised regarding the exact nature of the P scale itself (e.g. Bishop, 1977; Block, 1977; Claridge & Birchall, 1978; Davis, 1974; Eysenck, 1977, 1992; Howarth, 1986; Van Kampen, 1993). Most scholars, it now seems, are agreed that the P scale does not predict psychosis. Indeed, following a 10-year longitudinal study, Chapman, Chapman, and Kwapil (1994) concluded that the P scale best predicts personality disorders (e.g. schizotypy and paranoia), and psychotic-like experiences (e.g. aberrant beliefs and aberrant visual experiences), rather than psychosis. Claridge (1997) concluded that the "traits associated with psychoticism . . . cannot be considered as uniquely, or importantly, 'psychotic' as is claimed (but) the P dimension is clearly relevant to our understanding of serious mental illness" (pp. 377–378).

Despite the arguments that P is essential to understanding mental health and well-being, relatively little research has investigated the extent to which P actually predicts aspects of emotional well-being, especially in adolescents. Emotional or affective states are worthy of study because of their known links to subjective well-being, and because of their significant influences on cognitions and self-evaluations (Watson, Clark, & Carey, 1988). Still less research has investigated whether P is likely to be a mere correlate of well-being, or even a consequence of poor well-being. Thus, we utilized a two-wave longitudinal design to investigate the extent to which P predicts changes in emotional well-being, and the extent to which emotional well-being predicts changes in P.

2. Psychoticism and maladjustment in adolescents

Longitudinal studies into the effects of psychoticism on young people are extremely limited and largely confined to studies of anti-social behaviours rather than emotional well-being. Thus, Heaven (1996) found that the P factor predicted self-reported delinquency two years later. Lane (1987) demonstrated that high P scale scores among youth significantly predicted convictions five years later and that, the higher the original P score, the more likely it was that the subsequent misbehaviour was severe, persistent, and violent. More recently, P scores at Time 1 among boys, but not girls, predicted antisocial behaviour 12 months later (Romero, Luengo, & Sobral, 2001).

Psychoticism has also been found to predict a range of other behaviours in teenagers including health-related behaviours (Brayne, Do, Green, & Green, 1998), drug-taking behaviours (Kirkcaldy, Siefen, Surall, & Bischoff, 2004), and peer-crowd affiliations (Mak, Heaven, & Rummery, 2003).

[1] In all, the Eysencks proposed three major personality dimensions, namely, extraversion–introversion, emotional stability-neuroticism, and psychoticism-impulse control (e.g. Eysenck & Eysenck, 1985; Eysenck & Eysenck, 1976).

3. Aims and rationale of study

Past research has established strong links between P and behavioural and interpersonal problems. Thus, we made two predictions with regard to P and emotional well-being.

Hypothesis 1. We argue that part of the reason why people high in P have interpersonal and behavioural problems is because of the association between P and traits such as hostility and aggression (e.g. Davis, 1974; Eysenck & Eysenck, 1976, p. 192). We therefore predicted that P would lead to increases in hostile affect over time.

Hypothesis 2. We predicted that high P would be a precursor to decreases in positive affective states. Research suggests that positive social relationships are highly rewarding and a critical determinant of positive affect (Lucas & Diener, 2001). We assume that adolescents high in P tend to alienate others via their antisocial and aggressive behaviours, restricting their social circle and leading to reduced opportunities for social reward and reduced experience of positive affect.

We also had two exploratory questions: First, in addition to hostility, we were interested in whether there was a significant relationship between higher P and other indices of negative affect (e.g. sadness and fear) one year later. Second, given the substantial gender differences in P scores (e.g. Corulla, 1990), and Eysenck's view that "maleness" is associated with P by virtue of various hormones such as testosterone (Eysenck & Eysenck, 1976), we explored the possibility that the link between P and emotional well-being may vary according to the individual's gender. This has not been a focus of previous research using the P scale.

Our criterion variables were positive and negative affect as they have been shown to underpin the dimensions of emotional experience (e.g. Clark, Watson, & Mineka, 1994). These dimensions tend to be moderately independent of each other, and to relate uniquely to depression, social activity and social closeness (Watson, 1988; Watson & Walker, 1996).

4. Method

4.1. Participants

Participants, part of the Wollongong Youth Study, attended five high schools in a Catholic Diocese of New South Wales, Australia. In Australia 33% of all students now attend non-government (including Catholic) schools, a rapidly growing proportion (Australian Bureau of Statistics, 2004). Our sample represents key demographic indicators and closely resembles national distributions with respect to number of intact families and language other than English in the home (e.g. Australian Bureau of Statistics, 2006). The Diocese is centered on the city of Wollongong, but also reaches into south-western Sydney thereby ensuring that the socio-economic and cultural mix of the participants is diverse. Students were surveyed in the middle of their first year of high school and again twelve months later. At Time 1, 785 students (mean age = 12.28 yr, SD = 0.49) completed the questionnaire (males = 377, females = 389; 19 did not indicate gender). At Time 2, 891 students completed the survey (males = 457, females = 430; 4 did not indicate gender).

The discrepancy between Time 1 and 2 completions was due to an administrative error that occurred at Time 1 in one of the schools resulting in three classes of the year group not being available for testing on that day. Taking this into account, plus normal student transfers into and out

of schools, we were able to match the Time 1 and Time 2 data of 660 students (males = 322; females = 332; 6 did not indicate gender). This is a 84.1% follow-up rate. Participants who provided data at both times did not differ significantly on the self-reported P scale from those who provided Time 1 data only, $t(779) = 0.24$, ns.

4.2. Materials

On both occasions, students were provided with a test booklet containing the following measures:

1. *Psychoticism* (Eysenck & Eysenck, 1975). We used Corulla's (1990) revision of the junior psychoticism scale with improved psychometric properties. This 12-item scale yielded alpha coefficients of .68 (Time 1) and .73 (Time 2) which compare favourably with coefficients reported by Corulla (1990) for 12 and 13 year olds using the short questionnaire (alphas ranging from .62 to .73). This scale has also been found to distinguish high from low self-reported delinquents in Australia (e.g. Heaven & Virgen, 2001).
2. *Positive and negative affect (PANAS-X)* (Watson & Clark, 1994). We assessed a broad range of affective states including hostility, fear, sadness, and joy. Students were asked to describe their feelings and emotions over the past month. Evidence shows strong convergence between trait and state indices of affect when using the PANAS-X (Watson & Clark, 1994). Respectively, the following Time 1 and Time 2 internal consistency coefficients were obtained on the measures: hostility (.83, .82), fear (.87, .85), sadness (.90, .91), joy (.93, .94). These are similar to, and in some cases higher than those reported in Watson and Clark (1994).

4.3. Procedure

After obtaining consent from schools and parents, students were invited to participate in a study on "Youth Issues". At both times, administration of the questionnaires took place during regular classes under the supervision of one of the authors. Students completed the questionnaires anonymously and without any discussion. At the conclusion of the sessions students were thanked for their participation and debriefed.

5. Results

5.1. Preliminary analyses

Table 1 shows the mean scores at both times on the measures for boys and girls. In order to determine gender differences on the variables, a repeated measures MANOVA was conducted, with gender and time as the explanatory variables, and psychoticism, fear, sadness, hostility, and joy as the dependent variables. A significant multivariate effect was found for gender, Wilks' Lamba = .74, $F(5, 617) = 44.08$, $p < .001$.

Table 1
Mean scores (and standard deviations) on variables for boys and girls

Variables	Time 1				Time 2			
	Boys	Girls	F value	η^2	Boys	Girls	F value	η^2
Psychoticism	2.42 (1.99)	1.09 (1.47)	94.27***	.127	3.21 (2.39)	1.55 (1.79)	97.84***	.135
Fear	11.13 (4.64)	12.70 (5.91)	14.23***	.021	9.20 (3.45)	10.64 (4.12)	22.32***	.034
Hostility	12.41 (4.87)	11.56 (5.00)	4.83*	.007	10.69 (4.06)	10.27 (4.13)	1.67	.003
Sadness	8.83 (4.57)	10.12 (5.36)	10.84**	.016	7.64 (3.63)	9.66 (5.01)	33.47***	.051
Joviality	34.39 (6.52)	35.73 (5.89)	7.56**	.012	32.61 (7.10)	34.01 (6.52)	6.64**	.010

* $p < .05$.
** $p < .01$.
*** $p < .001$.

The univariate F values are listed in Table 1. Boys were significantly higher than girls on psychoticism (large effect sizes; $\eta^2 > .12$) and fear (small effect size) at both times. Girls were significantly more hostile, sad, and joyous than boys (all small effect sizes).

5.2. Gender and the structure of psychoticism

We examined whether the structure of the P scale was invariant across gender at Times 1 and 2. Structural equation modeling was used to compare two measurement models. The first assumed that the twelve psychoticism items loaded on a single latent variable (psychoticism) and that the loadings where the same for boys and girls. The second model was the same as the first, but assumed that the loadings where different for boys and girls. The analysis at Time 1 indicated that the model that assumed a different structure for boys and girls ($\chi^2 = 374.7$, df = 108) fitted the data significantly better than the model that assumed the same structure, $\chi^2 = 408.5$, df = 119, $p < .0001$. This result was replicated at Time 2, with the different structure model ($\chi^2 = 392.7$, df = 108) fitting the data better than the "same structure" model ($\chi^2 = 459.5$, df = 119), $p < .001$. As can be seen in Table 2, the items that index fighting (such as "Do you seem to get into more disagreements/fights than other kids your age?") load relatively more strongly for girls than boys. These results suggest that separate analyses need to be conducted for boys and girls.

5.3. Correlations

Psychoticism was stable across time with large effect sizes; for boys, $r = .53$; for girls, $r = .63$ (both ps $< .001$). Table 3 presents the intercorrelations for boys and girls. Among boys, psychoticism at Time 1 was significantly positively related to hostility 2 and significantly negatively related to joy 2 (both small effect sizes). Among girls, psychoticism at Time 1 was significantly related to fear 2 (small effect size), hostility 2 (medium effect size), and sadness 2 (small effect size).

5.4. Predicting positive and negative affect

We utilized structural equation modeling to assess the impact of psychoticism at Time 1 on fear, hostility, joy, and sadness at Time 2. We ran separate analyses for boys and girls. The core model

Table 2
Loadings on psychoticism items amongst boys and girls

Psychoticism Item	Boys		Girls	
	Time 1	Time 2	Time 1	Time 2
Do you seem to get into a lot of fights?	.53	.34	.72	.65
Do you seem to get into more disagreements/fights than other kids your age?	.43	.56	.62	.73
Do you enjoy hurting people you like?	.32	.43	.23	.24
Would you enjoy practical jokes that could sometimes hurt people?	.40	.43	.35	.44
Is it important to have good manners?	−.15	−.31	−.15	−.14
Should people always try not to be rude?	−.19	−.33	−.17	−.27
Do you get into more trouble at school than most other kids?	.51	.68	.31	.43
Do you get picked on by your teachers more than other kids at school?	.32	.57	.38	.40
Would it upset you a lot to see a dog or cat that has just been run over?	−.07	−.14	.00	−.11
Do you like playing pranks (tricks) on others?	.41	.39	.30	.31
Do you sometimes bully and tease other kids?	.55	.40	.52	.43
Do you sometimes like teasing animals?	.29	.39	.03	.27

Table 3
Correlations between psychoticism at both times and criterion variables for boys and girls

	Boys		Girls	
	Psychoticism 1	Psychoticism 2	Psychoticism 1	Psychoticism 2
Fear 1	−.06	−.00	.10	.02
Hostility 1	.26**	.23**	.26**	.18**
Sadness 1	.05	.03	.19**	.08
Joy 1	−.20**	−.14*	−.15**	−.08
Fear 2	.07	.03	.11*	.23**
Hostility 2	.13*	.23**	.31**	.41**
Sadness 2	.03	.17**	.18**	.28**
Joy 2	−.19**	−.23**	−.09	−.15**

* $p < .05$.
** $p < .01$.

involved utilizing psychoticism and each affect (e.g., anger, fear) at Time 1 to predict psychoticism and affect at Time 2, while controlling for the covariation between affect and P at Time 1. We also represented measurement error in the model by utilizing three item parcels as indicators of each latent variable (affect and psychoticism) at each time point. Items were placed into parcels in order to reduce the parameters estimated and thereby ensure sufficient power in the modeling and especially in estimating correlated errors.

Model 2 assumed correlated measurement error between repeated variables and correlated disturbances. Model 1 did not make these assumptions. In every case, Model 2 fitted the data significantly better than model 1, differences in $\chi^2 > 30$, all $ps < .001$. Table 4 (girls) and 5 (boys) present the fit indices for the two models for each affect. As suggested by Kline (1998), several different goodness of fit measures were used to assess the models. The measures of fit suggest that model 2 provides adequate fit, in that the χ^2/df is less than 2.5, NFI are well above .90, and the RMSEA is at or below .05 (Bentler & Bonett, 1980; Browne & Cudeck, 1993; Kline, 1998).

Table 4
Structural equation models for girls with Eysenckian psychoticism and different affective states at Time 1 (T1) predicting the same variables at Time 2

Model	χ^2	χ^2/df	NFI	RMSEA	Psychoticism Time 1 → Affect Time 2	Affect Time1→ Psychoticism Time 2
Joy						
Model 1	118.429	2.417	.941	.066	−.06	.03
Model 2	54.309	1.293	.973	.030	−.02	.02
Hostility						
Model 1	114.952	2.346	.916	.064	.45***	−.07
Model 2	48.052	1.144	.965	.021	.36***	−.05
Sadness						
Model 1	134.154	2.738	.934	.073	.25***	−.09
Model 2	59.808	1.424	.970	.036	.17**	-.07
Fear						
Model 1	152.396	3.110	.903	.080	.16*	−.08
Model 2	80.726	1.922	.948	.053	.13*	−.09

Note: Model 1 involved no correlated measurement errors or disturbances; Model 2 involved correlated errors of the repeated measurements and correlated disturbances.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

We examined the path coefficients (last two columns in Tables 4,5) to evaluate whether P predicted changes in affect, or vice versa. Affect did not influence future levels of psychoticism. In contrast, Psychoticism was associated with decreasing emotional well-being in boys and girls, but the longitudinal effects differed by gender. P was associated with increases in negative affect for girls, and especially increases in hostility. In contrast, P was associated with decreases in joy for boys. These effects were consistent across the two models. Due to space limitations, only the results for hostility and sadness are illustrated (see Fig. 1).

Amongst girls, after controlling for Time 1 measures of affect, psychoticism predicted 9.9% of the variance in Time 2 hostility, 1.2% of the variance in Time 2 fear, and 2.8% of the variance in Time 2 sadness. Amongst boys, psychoticism predicted 3.4% of the variance in Time 2 joy.

6. Discussion

We assessed the extent to which scores on Eysenck's psychoticism dimension predict later emotional well-being in teenagers. Previous research into the P scale has tended to focus on anti-social and delinquent behaviours, rather than on emotional well-being. Our large sample allowed us to represent measurement and correlated error in statistical models, providing us with the power to examine gender differences in the trajectory of change. Using two waves of data, our results suggest that P has an impact on the affective states of young people. Among girls, P predicted increases in hostility, sadness, and fear one year later. Among boys, P predicted decreases in joy

Table 5
Structural equation models for boys with Eysenckian psychoticism and different affective states at Time 1 (T1) predicting the same variables at Time 2

Model	χ^2	χ^2/df	NFI	RMSEA	Psychoticism Time 1 → Affect Time 2	Affect Time 1 → Psychoticism Time 2
Joy						
Model 1	168.383	3.436	.917	.086	−.23**	.01
Model 2	75.476	1.797	.963	.049	−.20**	−.02
Hostility						
Model 1	130.781	2.669	.893	.071	.11	.09
Model 2	55.938	1.332	.954	.032	.08	.12
Sadness						
Model 1	147.240	3.005	.913	.078	.10	−.05
Model 2	62.428	1.486	.963	.038	.032	−.03
Fear						
Model 1	121.105	2.472	.907	.067	−.001	.06
Model 2	49.195	1.171	.962	.023	−.036	.05

* $p < .05$.
** $p < .01$.
*** $p < .001$.

one year later. Thus, Eysenckian psychoticism at age 12 appears to lead to decreases in emotional well-being at age 13.

There were important structural differences in psychoticism for boys and girls. Amongst high P girls, fighting was highly indicative of psychoticism, whereas amongst high P boys, such behaviours are no more indicative of psychoticism than other deviant behaviours. We speculate that fighting is more culturally normal for boys, and consequently this does not stand out as an indicator of P. In contrast, girls are probably less likely to engage in physical fights; it is highly distinctive if they do and, as our data suggest, indicative of high psychoticism.

6.1. Psychoticism and negative affect

Although many previous studies have found males to score higher than females on the P scale (as we also did), research into the differential impact of P on later adjustment in the two gender groups has largely been ignored. Although P was found to be equally stable across time in boys and girls, our data suggest gender differences in the impact of P on emotional states. Specifically, P was associated with increases in hostility and other negative affective states in girls but not boys.

Many previous studies using the P scale have tended to focus on the relationships between P and a range of different anti-social and disruptive behaviors. The present results extend this literature by suggesting the possibility that these negative behaviours are driven by negative emotional states. An emotional state such as hostility or sadness "readies the individual for action" and primes the individual to display a wide range of anti-social or generally disruptive behaviours (Frijda, 2004, p. 159). Thus, high P scorers might engage in these behaviours *because of* their negative affect. Empirical evidence supports such a view. For instance, Hart (1991) suggested that

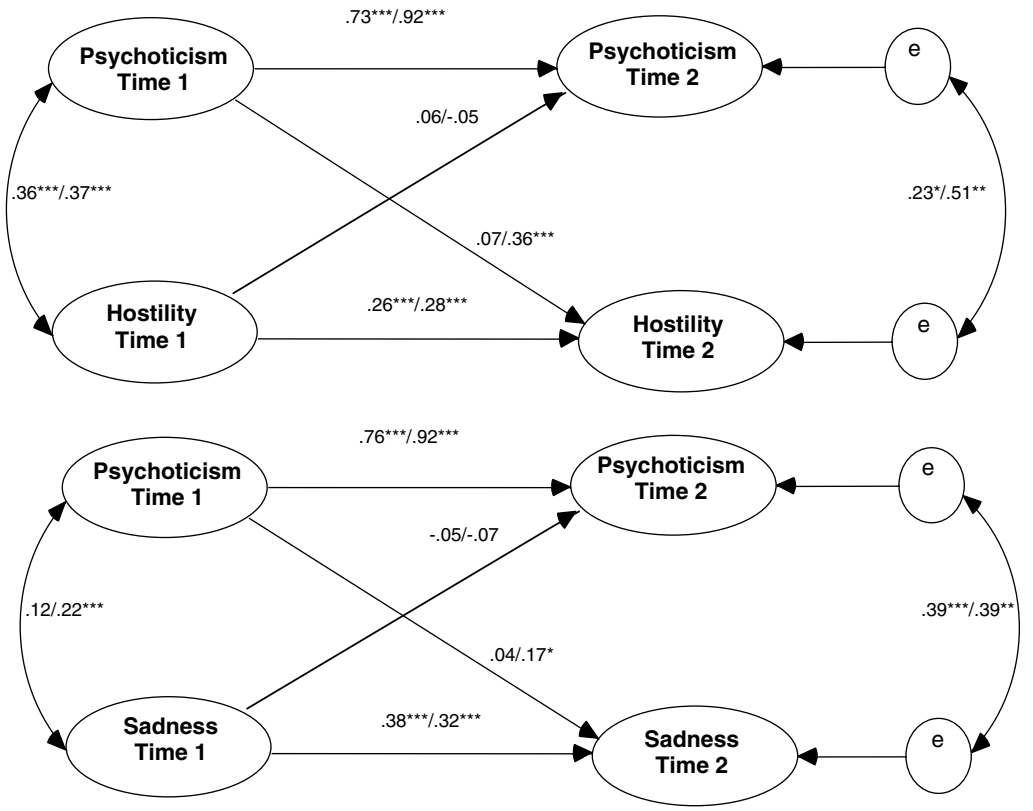

Fig. 1. Final models showing relationships between psychoticism and hostility and sadness for boys and girls.

negative emotions such as hostility can lead to deviant behaviours in young people because of disrupted information processing which, in turn, leads to low levels of positive appraisals of the situation. Other work with youth has clearly shown that negative emotions such as hostility and depression lead to various externalizing behaviours (Cooper, Shaver, & Collins, 1998).

It is quite likely that the negative emotional states of high P scorers have wide-ranging deleterious effects on their social world. Indeed, such a view would be in line with previous research in which high P scorers were found to obtain negative behavioural ratings by teachers (Powell & Stewart, 1983), and to associate with more deviant groups (Mak et al., 2003). This would suggest that, for high P children, the nature and quality of their engagement with the environment (Watson, 1988) is generally poor and unconstructive.

6.2. Psychoticism and positive affect

P predicted decreases in joy over time, but the effect was significant only for boys. Many individuals who are high in P tend to engage in antisocial behaviour which might serve to alienate others, reduce their social circle, and reduce their social rewards (e.g. Powell & Stewart, 1983). We propose that people high in P experience a "downward positive spiral" in which their

unacceptable behaviours lead to fewer rewarding social interactions and less positive affect which, in turn, leads to less positive social interactions (see also Raine & Allbutt, 1989).

Past research provides evidence for the link between positive affect and social engagement. Positive social interactions are associated with positive affect (Lucas & Diener, 2001). Positive emotions have been shown to predict positive behaviours toward others (Argyle, 2001) and increased sensitivity to rewarding social situations (Lucas & Diener, 2001). In field and laboratory experiments, Berry and Hansen (1996) concluded that positive affect was associated with a greater frequency of social interactions, greater duration of contact, and higher quality of contact. In laboratory studies those high in positive mood were more inclined to perform helping and altruistic behaviours (Isen, 1987). These sorts of behaviours are not typically found in individuals with high P scores; rather, the opposite seems to be the case.

6.3. Limitations and future directions

P at age 12 was associated with decreasing joy amongst boys, and increasing hostility, sadness, and fear amongst girls at age 13, trends likely to lead to social problems. High P boys may be increasingly likely to perceive their social worlds as unrewarding and to withdraw from social contacts; high P girls may be increasingly likely to find their social worlds to be dangerous and unfair and to engage in destructive externalizing behaviors, such as fighting.

Future research should directly evaluate these possibilities. Longitudinal studies are needed to assess P, affect, and dimensions of the social world (e.g. social support; quality of interpersonal relationships) at repeated time points. One could then evaluate a number of important mediational questions: Do changes in social network mediate the relationship between P and decreasing positive affect? Does affect mediate the relationship between P and anti-social behaviour?

In conclusion, our results support the view that Eysenckian psychoticism is a significant predictor of later emotional states in young people. Our results are commensurate with the views of others (e.g. Chapman et al., 1994; Claridge, 1997) regarding P and maladjustment. Future work is needed to examine the impact of P over longer periods of time, and to evaluate the reasons for the gender differences.

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