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Personality development at school: Assessing a reciprocal influence model of teachers' evaluations and students' personality

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ABSTRACT

We examined, over 4 years, the interrelationships between changes in teachers' ratings of student behavior and changes in students' self-reports of their personality. Participants were Australian high school students in Grades 8–11 (Ns were 891, 763, 778, and 571, respectively). Teachers evaluated students' behavioral problems and overall adjustment, whereas students reported on their levels of Eysenckian psychoticism (P), a personality trait relevant in the school setting. We found some evidence of bidirectional influences between P and evaluations of adjustment and behavioral problems. These results are discussed with reference to transactional models of personality change.

1. Introduction

The adolescent years are filled not only with enormous promise and new opportunities, but also with many challenges. As young people leave their childhood years and make the transition to high school, they confront a radically different, but exciting world. They forge their identity across several domains including the academic and interpersonal and their levels of success in each domain help determine the trajectory of their development. The personality development of adolescents coincides with major transitions (e.g. biological changes) and occurs within a number of social contexts (Elliott et al., 2006; Montemayor, Adams, & Gullotta, 1990). The reciprocal interplay between these contexts and the individual will help shape and mould the teenager's personality. As Lerner and Galambos (1998, p. 415) succinctly put it, teenagers are shaped by diverse forces and "...no single influence acts either alone or as the 'prime mover' of change".

This study seeks to assess the impact the social context has on adolescent personality development. More specifically, it will examine the bidirectional influences between students' personality and teachers' evaluations of students' behavior. To what extent do teachers' evaluations help shape the development of their students' personalities? And to what extent do students' personalities influence teachers' evaluations? In particular, we were interested in the development of a personality construct that has been consistently linked to anti-social behavior, namely, Eysenck's psychoticism (P) dimension (Eysenck & Eysenck, 1976). We examined the extent to which change and stability in this personality trait is driven by teenagers' relationships with salient others, namely, school teachers. Thus, we sought to examine the extent of reciprocal links between teachers' evaluations of their students and the personality development of these students. Our research extends previous work by using self- as well as observer reports of behavioral tendencies and by using multiple observations of behavior. An advantage of using teacher ratings of behavior is that they are not confounded with genetic variation, as is the case with parental ratings (Plomin & Bergeman, 1991).

1.1. Personality change

Although the study of personality development has a long history going back to Freud (Mroczek & Little, 2006), it is only much more recently that research has begun to examine personality stability and change in a concerted way (see, for example, Caspi & Roberts, 2001; Donnellan, Conger, & Burzette, 2007; Fraley & Roberts, 2005; McCrae et al., 2002; Roberts & DelVecchio, 2000; Trzesniewski, Donnellan, & Robins, 2003).

Most of the research has focused on explicating the extent to which various aspects of personality (such as conscientiousness or agreeableness, for example) change over the life course. For instance, it has been established that personality stability in adulthood is substantially greater than during the adolescent years (Roberts & DelVecchio, 2000) and that some components of personality such as trait hope and global self-esteem decline during the adolescent years (Heaven & Ciarrochi, 2008) before rising again during adulthood (Trzesniewski et al., 2003). It has also been shown that, as adolescents move into adulthood, the personality change that does occur is in the direction of greater

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maturity: women tend to show increases in constraint and social closeness, whilst men show increases in agency and achievement, and decreases in aggression and alienation (Lönnqvist, Mäkinen, Paunonen, Henriksson, & Verkasalo, 2008; Roberts, Caspi, & Moffitt, 2001).

Research into aspects of the social world that may underpin personality development has been relatively rare. One reason might be due to the belief that personality is immune to environmental influences (McCrae et al., 2000). However, a number of studies have highlighted that person–environment interchanges do play an important role in shaping personality (Anderson, Lytton, & Romney, 1986; Bell, 1968; Caspi & Roberts, 2001; Fraley & Roberts, 2005; Ge et al., 1996; Lang, Reschke, & Neyer, 2006; Lerner & Galambos, 1998). According to these authors, there is continual change and transition between individual and context which has a significant effect on personality development.

An important social context in which the development of adolescent personality occurs is the school setting. Attendance at school is a normative life task for the teenager and is compulsory until the mid-teen years, at least in most Western societies. According to Caspi and Roberts (2001), a number of environmental forces have the ability to exact personality change, including teacher expectations. Teachers' expectations and demands on their students are powerful socialization agents and teachers' expectations – as manifest through their observations and feedback regarding a student's behavior – have the ability to create a strong environmental push that will shape the trajectory of a student's personality development. Indeed, Skinner and Belmont (1993) found that teachers' perceptions of the emotional and behavioral engagement of their students in class predicted teachers' interactions with their students across the length of the academic year. Through these interactions teachers help shape the behaviors of their students.

1.2. The importance of psychoticism in the school setting

We focused on P because it is an important correlate of school adjustment. Eysenck's P dimension is one of three personality dimensions in his taxonomy, the others being neuroticism and extraversion (Eysenck & Eysenck, 1985). There has been considerable debate and controversy as to the nature of the P dimension (e.g. Bishop, 1977; Block, 1977; Costa & McCrae, 1995; Eysenck, 1977, 1992, 1995; Howarth, 1986; Van Kampen, 1993), although there appears to be general agreement that P is an indicator of low constraint or self-control (Tellegen & Waller, 2008; Zuckerman, 2003, 2005; Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993).

Zuckerman (2003; Zuckerman, Kuhlman, & Camac, 1988) views P as being aligned to tendencies that can best be described as reflecting "...sensation-seeking, impulsivity, nonconformity, and an ...(un)willingness to live by society's rules and mores..." (p. 104). Costa and McCrae (1995, p. 316) described P as a fusion of agreeableness and conscientiousness and as indicating "...a lack of conventional socialization". Rawlings and Dawe (2008) concluded that the P dimension is reflective of impulsive and anti-social behaviors. In addition to predicting deteriorating emotional well-being in adolescents (Ciarrochi & Heaven, 2007), P is predictive of anti-social and delinquent behaviors (Furnham & Thompson, 1991), later criminal convictions (Lane, 1987) and drug-taking behavior (Kirkcaldy, Siefen, Surall, & Bischoff, 2004).

High P students therefore have the potential to be disruptive at school by disturbing the learning environment of more agreeable and conscientious students. Such disruptive behavior has a negative effect not only on the perpetrator's grades (Johnson, McCue, & Iacona, 2005), but also on class-room dynamics and social networks (Estell, Farmer, Pearl, Van Acker, & Rodkin, 2008), and teachers' levels of distress (Lopez et al., 2008). It is therefore important to articulate to what extent the interactions between students and teachers affect the development of students' levels of P.

1.2.1. Bidirectional influences on personality

It is now generally accepted that personality development is the product of bidirectional influences and that person–environment transactions drive the trajectory of one's life course (Anderson et al., 1986; Bell, 1968; Caspi & Roberts, 2001; Fraley & Roberts, 2005; Ge et al., 1996; Lang et al., 2006; Lerner & Galambos, 1998; Lytton, 2000; Scarr & McCartney, 1983). A large proportion of this literature has tended to focus on parent–child relationships (e.g. Hipwell et al., 2007; Lytton, 2000; Pardini, 2008) whilst tending to ignore the influence of other socialising agents such as teachers. Our study is the first to examine bidirectional influences between teachers and students.

Bidirectional influences can occur in a number of ways (see Caspi & Roberts, 2001; Fraley & Roberts, 2005). One way is through reactive person–environment transactions, that is, individuals reassess who they are on the basis of their unique experience with their environment. As self-views are often resistant to change and because one attends to information selectively, these person–environment transactions may lead to minimal personality change. Bidirectional influences can also occur through evocative person–environment transactions. According to this view, the behavior of an individual evokes a response from others which, in turn, leads to further responses from the individual. This gives rise to reciprocal interchanges or, as Caspi and Roberts (2001, p. 58) put it, a system of "mutually interlocking evocative transactions". Thus, it is quite likely that a student's behavior may evoke an evaluation from teachers ("your behavior in unacceptable"; "you are being anti-social") which will lead to the teacher or school authorities exacting a verbal rebuke or other form of punishment (or reinforcers in the case of acceptable behavior). This, in turn, will elicit a further behavioral response from the student. These transactions with the social environment are therefore thought to lead to personality and behavioral change (Caspi & Roberts, 2001; Fraley & Roberts, 2005; Roberts, Walton, & Viechtbauer, 2006; Skinner & Belmont, 1993).

Support for this transactional model is mixed. Recent support was obtained by Ciarrochi and Heaven (2008) who found that self-reported positive attributional style and perceptions of social support were mutually influencing across multiple observations. Pessimistic attributional style in Grade 7 predicted decreases in reported social support in Grade 8 which predicted an increase in pessimistic attributional style in Grade 9 after controlling for baseline attributional style. Asendorpf and Van Aken (2003) found evidence for bidirectional support with respect to traits such as self-esteem, but not with respect to the Big Five personality dimensions. A weakness of both studies, however, is that they relied on self-reported measures only. Additionally, Asendorpf and Van Aken (2003) made use of only two waves of data thereby limiting their ability to detect changes over time. In the present study we relied on four observations of self- and observer reports across a 4-year period.

1.3. The present study

The main aim of this study was to examine the extent to which the development of P in teenagers reflects bidirectional influences between teachers and adolescents. We present data from a 4-year longitudinal study in which data were collected annually. Following Caspi and Roberts (2001), we tested a mutually evocative model in which adolescents' self-reported P and teachers' ratings of students would show reciprocal influences.

2. Method

2.1. Participants

Our participants attended five high schools in a Catholic Diocese of New South Wales, Australia. The Diocese is centered on the city of Wollongong (population approximately 250,000), but also reaches into south-western metropolitan Sydney. This ensures that our participants represent a diverse socio-economic and cultural mix.

All respondents were participants in the longitudinal *Wollongong Youth Study* which commenced when students entered high school (Grade 7) and is still on-going. At Time 1 (Grade 7) the spread of some occupations of the fathers of our participants closely resembled national distributions. For details of the demographic characteristics of our sample see our previous publications (e.g. Heaven & Ciarrochi, 2008, 2007).

The data on which we have based this report cover Grades 8–11. The mean age of our respondents in Grade 8 was 13.63 years (SD = .51); in Grade 11 it was 16.18 years. (SD = .46). Sample size for each year of data collection was as follows: Grade 8 (N = 891; 457m, 434f); Grade 9 (N = 763; 386m, 377f); Grade 10 (N = 778; 390m, 388f); Grade 11 (N = 571; 269m, 302f). The reduction in sample size in Grade 11 is attributable to the fact that the end of Grade 10 is an exit point for those students who wish to enrol in technical college, embark on training for a trade, or move to another school. Those students who provided data in Grade 10 but not in Grade 11 exhibited significantly higher P scores than students who provided data in Grades 10 and 11, M = 3.38 versus 2.45; t (774) = −5.04, p < .001, d = .36. The criterion for inclusion in the analyses presented below was that students had to have provided at least 2 years of data. A total of 866 students were therefore included in subsequent analyses.

2.2. Materials

Our participants were provided with test booklets containing a variety of measures at each time of data collection. The following measures are of interest to this report.

2.2.1. Psychoticism

We used the junior measure of the P dimension (Corulla, 1990) as an index of anti-social behaviors. This is a revision of the original P measure (Eysenck & Eysenck, 1976) and has improved psychometric properties. Research has found the P measure to predict drug-taking behavior in adolescents (Kirkcaldy et al., 2004), an increased likelihood of alcohol consumption in youth (Francis & Fearn, 2005), self-reported delinquency (Furnham & Thompson, 1991), risky health-related behaviors (Brayne, Do, Green, & Green, 1998), deviant sexual preferences (Barnes, Malamuth, & Check, 1984), and a preference for watching violent films (Bruggemann & Barry, 2002). On the present occasion alpha coefficients were .72 (Grade 8), .74 (Grade 9), .71 (Grade 10), and .73 (Grade 11).

2.2.2. Teacher ratings of behavior

We used the 34-item multidimensional nomination inventory for teachers (Pulkkinen, Kaprio, & Rose, 1999). It assesses three broad domains, namely, behavioral problems (including hyperactivity–impulsivity, aggression, and inattention), emotional problems (including depression and social anxiety), and adjustment (comprising constructiveness, compliance, and social activity). This measure has demonstrated reliability and discriminative validity. For instance, boys scored higher than girls on behavioral problems, whereas girls scored higher on adjustment problems. Correlations on the items between peer nominations and teacher ratings were larger than correlations between teacher ratings and parental ratings (Pulkkinen et al., 1999). We asked teachers to indicate to what extent a description (e.g. "teases smaller and weaker students") is characteristic of the student. Responses were indicated on a 4-point scale from not observed in this student (0) to this characteristic fits the student very well (3).

Each student's "home room" teacher was asked to rate the student. Home room teachers, who meet with their students every day, are assigned responsibility for monitoring the general welfare and academic progress of students and are well informed regarding the overall behavior of the student and his/her standing amongst other students. These teachers are therefore well placed to make judgements of their students' behavior and well-being. The present study focuses on reports of behavioral problems and adjustment. Alpha coefficients for ratings of behavioral problems across the 4 years, respectively, were .93, .91, .91, and .88. For adjustment they were .89, .90, .91, and .89.

2.3. Procedure

This longitudinal study received annual approval from our university ethics committee and Diocesan authorities. Additionally, parents and students also provided consent on an annual basis. Students who provided consent were invited to participate in a survey on "Youth issues". Questionnaires were completed during class time in the presence of one of the authors or a school teacher. Students were fully debriefed at the end of each testing session.

3. Results

3.1. Correlations

Table 1 shows the Pearson correlations between the measures across the 4 years of the study. Correlations for P across time show moderate levels of rank-order stability. For instance, the correlation between P at Grades 8 and 11 was .56, whilst the mean correlation for P across all years was .64. The mean rank-order stability for ratings of behavioral problems was .40, whereas for ratings of adjustment it was .46.

3.2. Structural equation modelling

We conducted a series of structural equation models to identify the most parsimonious and best fitting model for the data. We represented measurement error in the variables by utilizing a minimum of three item parcels per latent variable, the number needed to avoid certain statistical problems. Items were placed into parcels in order to reduce the parameters estimated and thereby ensure sufficient power in the modelling and especially in estimating correlated errors. Three parcels where utilized for each year of P. There were three parcels/subscales for teacher-rated behavior problems, and four parcels/subscales for teacher-rated adjustment.

Amos 7.0 was used to analyse the raw data and estimation was made using the maximum likelihood method. As suggested by Kline (1998), several goodness of fit measures were used to assess the models. We considered a model to provide reasonable fit if the χ^2/df was approximately three or less, NFI was above .90, and the RMSEA was below .08.

We conducted two types of analyses to ensure our findings were robust. First, we conducted typical parametric analyses. Second, to deal with multivariate normality issues we conducted non-parametric bootstrap analyses utilizing 1000 samples and the bias-corrected percentile method. We did not declare an effect to be significant unless it was significant in both analyses.

Table 1
Correlations between psychoticism and teacher ratings across 4 years.

Variable (and Grade level)	1	2	3	4	5	6	7	8	9	10	11	12
1. Psychoticism 8	–											
2. Behavioral problems 8	39***	–										
3. Adjustment 8	−27***	−45***	–									
4. Psychoticism 9	65***	27***	−22***	–								
5. Behavioral problems 9	35***	44***	−37***	27***	–							
6. Adjustment 9	−32***	−33***	47***	−28***	−40***	–						
7. Psychoticism 10	63***	32***	−24***	69***	28***	−28***	–					
8. Behavioral problems 10	32***	41***	−28***	23***	36***	−30***	29***	–				
9. Adjustment 10	−24***	−34***	38***	−21***	−33***	52***	−23***	−38***	–			
10. Psychoticism 11	56***	35***	−22***	59***	22***	−26***	72***	29***	−22***	–		
11. Behavioral problems 11	23***	36***	−16***	21***	23***	−15***	26***	57***	−18***	23***	–	
12. Adjustment 11	−20***	−23***	38***	−21***	−31***	46***	−22***	−15***	56***	−21***	−33***	–

* $p < .05$. ** $p < .01$. Note that *Ns* vary from 469 to 782. Decimal points have been omitted.
*** $p < .001$.

We evaluated models in order of complexity, starting with the most complex "full" model which included all cross-lagged effects, all autocorrelations, all correlations between disturbances in Grades 8 and 11, and all correlated errors between contiguous years. As can be seen in Table 2, this model fitted the data adequately in all analyses. We next conducted an omnibus test of cross-lagged effects, by comparing the full model to a model that assumed no cross-lagged effects. This model significantly worsened the fit of every model. The final model assumed no 2- or 3-year cross-lagged effects, and did not deteriorate the fit of the model. Thus, it appears that where there are significant cross-lagged effects, these occurred across only 1 year.

We tested a series of simpler models (e.g. assuming no correlated errors) to those presented in Table 2, and in every case the simpler model resulted in a significantly worse fit to the data. Our theoretical model is shown in Fig. 1. This model tests the extent that teacher ratings and self-reported personality predict each other when controlling for baseline levels of each variable. For example, it is expected that teacher ratings will predict self-reported personality after controlling for baseline levels of ratings and personality. Likewise, it is predicted that self-reported personality will predict teacher ratings of participants once baseline levels of ratings and personality have been taken into account.

We observed reliable cross-lagged effects involving P. As depicted in Fig. 2, high P consistently predicted increases in teacher-rated behavioral problems, relative to those with low P and the same baseline level of behavioral problems. There was one instance of teacher's negative evaluations (Grade 10) predicting future levels of P (Grade 11), providing some evidence for reciprocal effects. A somewhat similar pattern was observed for teacher rated adjustment (Fig. 3). P predicted increases in adjustment problems in Grades 9 and 11, when controlling for baseline levels of adjustment, and teacher evaluations of adjustment predicted decreasing P in Grade 11 after controlling for prior levels of P.

Thus far our analyses were averaged across five schools in order to improve the accuracy of the estimates. We next sought to determine whether the cross-lagged effects were consistent within schools. We did not have sufficient sample size to estimate the full, correlated-error models within schools. Consequently, we analysed a simpler model that did not assume correlated errors. We compared two models, one that assumed that the cross-lagged effects were the same across schools (similarity model) and one that did not make this assumption (difference model). For behavioral problems the similarity model (χ^2/df = 2.39, NFI = .77, CFI = .85, RMSEA = .037) showed similar levels of fit as the difference model (χ^2/df = 2.38, NFI = .71, CFI = .85, RMSEA = .036). For adjustment, the similarity (χ^2/df = 2.38, NFI = .73, CFI = .82, RMSEA = .037) and difference models (χ^2/df = 2.40, NFI = .73, CFI = .82, RMSEA = .037) also showed similar levels of fit, suggesting that it was reasonable to assume equal cross-lagged effects across schools.

4. Discussion

The aim of this study was to assess the extent to which change and stability in students' personalities are predicated upon their interactions with salient others, namely, school teachers. We assumed that teachers' perceptions and evaluations of their students would play a significant role in shaping students' personality (Skinner & Belmont, 1993). We tested a transactional model in which we expected bidirectional influences. A strength of our study is its reliance on four waves of data spread across 4 years and its use of self- and observer reports. We found evidence of rank-order stability across all of our measures as evidenced by test–retest correlations.

We found limited evidence of bidirectional influences between teachers and students between Grades 8 and 11. All of the significant paths during this time period point to adolescent personality evoking future responses from teachers, rather than vice versa.

Table 2
Model fit indices for structural equation models evaluating the extent of reciprocal influence between Grade 8–11 psychoticism and Grade 8–11 teacher-rated adjustment and behavior problems.

	χ^2	DF	χ^2_{diff}	χ^2/df	NFI	CFI	RMSEA
P and adjustment							
Full path model	1235.3	301	–	4.10	.90	.92	.06
No cross lags	1279.9	313	44.6**	4.09	.89	.92	.06
No two to three year cross lags	1236.2	307	.85	4.03	.90	.92	.06
P and behavior							
Full path model	596.4	206	–	2.90	.94	.96	.05
No cross lags	651.0	218	54.56**	2.99	.93	.96	.05

** $p < .01$.

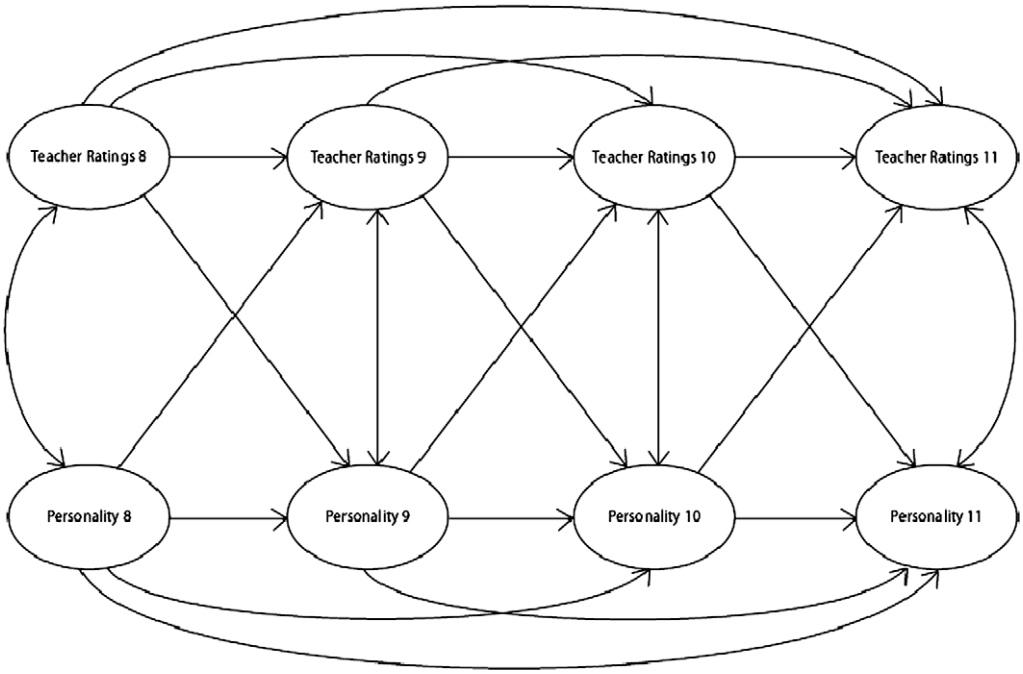

Fig. 1. Theoretical model showing bidirectional influences between teachers' evaluations of students and students' personality.

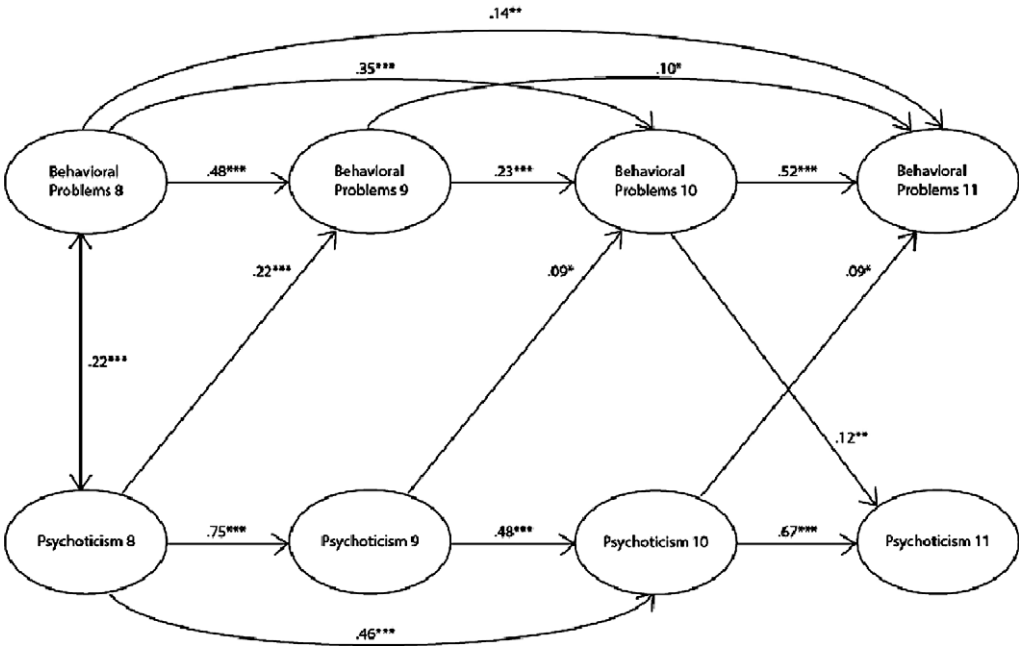

Fig. 2. Bidirectional influences between students' levels of P and teacher evaluations of behavioral problems.

Where bidirectionality was evident, this occurred late in the 4-year cycle and was replicated for both behavioral problems and adjustment. These results are consistent with previous findings that argue for significant person–environment interchanges influencing personality development (e.g. Anderson et al., 1986; Bell, 1968; Caspi & Roberts, 2001; Fraley & Roberts, 2005; Ge et al., 1996; Lang et al., 2006). Self-reported P was related to higher teacher ratings of behavioral problems and to teacher ratings of low adjustment. Additionally, increases in self-reported P were related to increases in teacher evaluations of problems. For instance, self-reported increases in P between Grades 9 and 10 were related to increases in teachers' evaluations of behavioral problems in Grade 11 (Fig. 2).

Our results suggest that there were three importance sources of variance in the ratings of antisocial behavior. There was student variance, teacher variance, and shared variance between student and teacher. The shared variance was quite modest, and our structural equation modelling controlled for this variance and focused on the unique component of students' and teachers' ratings. We found that student self-ratings of P uniquely predicted changes in teacher ratings and teacher ratings were antecedent to changes in student ratings.

One limitation of the longitudinal panel design is that a third unmeasured variable could account for our findings. For example, the evaluations that teachers make concerning these students

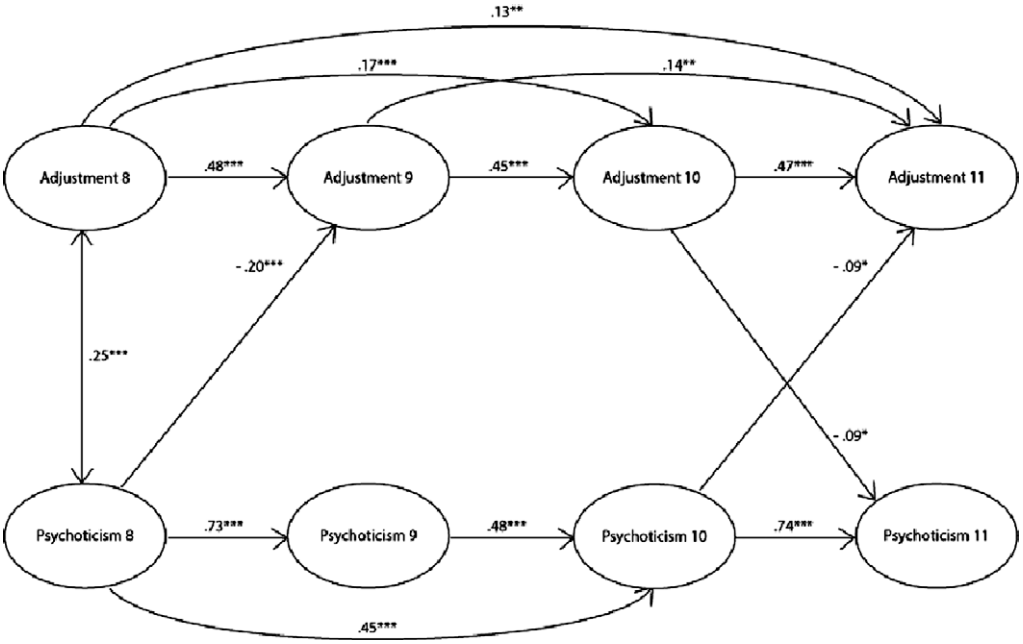

Fig. 3. Bidirectional influences between students' levels of P and teacher evaluations of adjustment.

may not be unique, but shared by other figures (parents, peers, etc.) with whom the students interact. Thus, the true effect may be that parents are influencing student behavior, and teachers are an indirect proxy for parental influences.

Another possibility is that students and teachers had no causal influence on each other. Perhaps teachers, rather than acting as socialising agents, were detached observers reporting on student behavior and that these evaluations did not, in turn, evoke responses from their students. That is, adolescents may behave in an antisocial way (consistent with P) and this observable behavior, not teachers' evaluations, could lead to increases in P over the year.

The only way to rule out competing explanations for the reciprocal influence model is via experimental design. One could manipulate the level of antisocial behavior in the classroom and observe the effects on changing teacher ratings. Alternatively, one could manipulate teacher evaluations of students and observe the effects (see Rosenthal & Jacobson, 1968, and their research into self-fulfilling prophecies; see also Smith, Jussim, & Eccles, 1999). The experimental evidence to date is consistent with the reciprocal influence interpretation examined here.

In conclusion, our research suggests that personality is not static and that meaningful change and development occurs during adolescence. Further research is needed to specify the causes of change. A better understanding of those causes will help guide early intervention programs.

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