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Self-efficacy and academic achievement in Australian high school students: The mediating effects of academic aspirations and delinquency

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Abstract

Studies have shown that self-efficacy, aspirational, and other psychosocial influences account for considerable variance in academic achievement through a range of mediational pathways, although no research to date has tested the mediational relationships identified. The present research investigated the structural relations among self-efficacy, academic aspirations, and delinquency, on the academic achievement of 935 students aged 11–18 years from ten schools in two Australian cities. The *Children's Self-Efficacy Scale*, *Adapted Self-Report Delinquency Scale (Revised)*, and *Children's Academic Aspirations Scale* were administered to participants prior to academic achievement being assessed using mid-year school grades. Structural equation modeling was employed to test three alternative models for the relationships from academic, social, and self-regulatory efficacy on academic achievement. A partial mediation model showed the best overall fit to the data. Academic and self-regulatory efficacy had an indirect negative

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effect through delinquency and a direct positive effect on academic achievement. Academic and social self-efficacy had positive and negative relationships, respectively, with academic aspiration and academic achievement; however, the relationship between academic aspiration and academic achievement was not significant in the final model.

Keywords: self-efficacy; delinquency; academic aspirations; academic achievement; high school students

Research indicates that students who develop strong academic and self-regulatory self-efficacy beliefs are better able to manage their learning and to resist the temptations and social pressures to engage in behaviors, such as delinquency, that can undermine their academic achievements. As a result, students with strong self-efficacy beliefs are more likely to successfully complete their education and be better equipped for a range of occupational options in today's competitive society (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Zimmerman, 1990).

Conversely, it has been found that students who have a low sense of self-regulatory and academic self-efficacy are more likely to engage in problem behaviors such as delinquency, dropping out of school, and school failure (Bandura, 1997; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Bandura, Barbaranelli, et al., 2001; Bandura, Caprara, Barbaranelli, Pastorelli, & Regali, 2001), jeopardizing their chances at academic success and subsequent employment prospects.

Bandura and colleagues (Bandura, Caprara, et al., 2001; Bandura et al., 1996) analyzed the network of psychosocial influences through which efficacy beliefs affect academic achievement. More specifically, direct and mediated paths of influence of children's self-efficacy beliefs to academic achievement were analyzed with a range of factors including socio-economic (status), familial (parental self-efficacy, parental academic aspirations), peer (peer preference) and self (academic aspirations, problem behavior, depression, prosocial behavior, moral disengagement) variables hypothesized to affect academic achievement. The results indicated that the full set of self-efficacy, aspirational, and psychosocial influences accounted for a large amount of variance in academic achievement, although the mediational effect of academic aspirations was not tested in their model (see Bandura et al., 1996 for a full discussion).

By examining the predicted relationships between self-efficacy, academic aspirations, delinquency, and academic achievement, the present research replicates and extends the work of Bandura et al. (1996) in three ways. First, while Bandura et al. analyzed problem behavior in their model, the present research extends this work by examining hard-core delinquent activities (e.g., property offences, physical aggression, motor theft). Second, the present study examines the mediating roles of academic aspirations and delinquency in the relationships between self-efficacy and academic achievement. In particular, we hypothesize that academic aspirations mediates the relationships between academic and social self-efficacy and academic achievement, and that delinquency mediates the relationship between academic and self-regulatory efficacy and academic achievement. Finally, rather than using path analysis, the full hypothesized model will be tested using structural equation modeling. This will allow not only for all relationships to be tested at

once, eliminating problems of shared variance, but also for the proposed model to be statistically compared to two alternatives (a partially-mediated model and a non-mediated model; see Kelloway, 1998).

Self-efficacy and academic achievement

Self-efficacy is best conceived as a differentiated set of self-beliefs specific to different areas of functioning (e.g., social self-efficacy, academic self-efficacy); and is therefore considered a domain-specific concept as no person can feel competent at all tasks (Bandura, 1997; Maddux, 1995; Valentine, DuBois, & Cooper, 2004). The concept of self-efficacy as domain- or task-specific has been proven to be a better predictor of actual behavior (Bandura, 1986, 1997; Multon, Brown, & Lent, 1991; Valentine et al., 2004) than a general self-efficacy concept. Across these different domains of functioning, self-efficacy beliefs influence the courses of action people choose to pursue, how much effort they put into given endeavors, how long they will persevere in the face of obstacles and failures, their resilience to adversity, whether their thought patterns are self-hindering or self-aiding, how much stress and depression they experience in coping with taxing environmental demands, and the level of accomplishments they realise (Bandura, 1991, 1997; Bandura, Barbaranelli, et al., 2001; Bandura, Caprara, et al., 2001).

Fig. 1 summarizes the model to be tested in the current research using structural equation modeling (SEM). The arguments and support for the hypothesized relationships which follow draw from research on self-efficacy.

Academic self-efficacy has been defined "as personal judgments of one's capabilities to organize and execute courses of action to attain designated types of educational performances" (Zimmerman, 1995, p. 203). Academic self-efficacy has been reported to promote academic achievement directly and also indirectly by increasing academic aspirations and prosocial behavior (Bandura et al., 1996). In a meta-analysis by Multon et al. (1991), self-efficacy was found to be related to academic performance ($r = .38$). Many researchers have reported a direct positive relationship between academic self-efficacy and academic achievement (e.g., Bandura et al., 1996; Caprara, Barbaranelli, & Pastorelli, 1998; Chemers, Hu, & Garcia, 2001; Greene, Miller, Crowson, Duke, & Akey, 2004; Pintrich & DeGroot, 1990; Schunk, 1994; Sharma & Silbereisen,

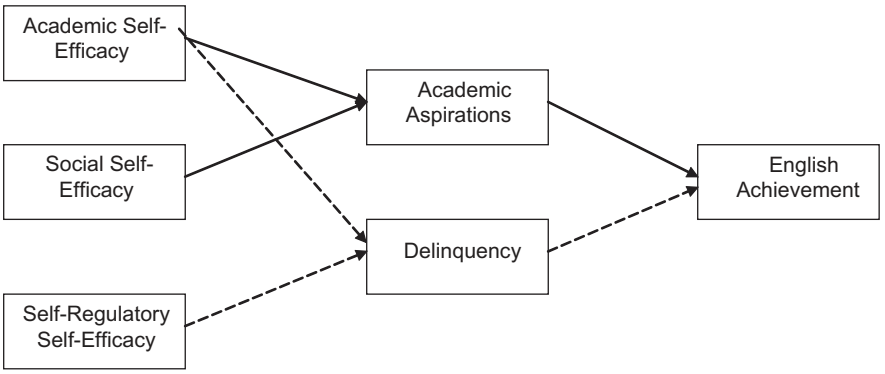

Fig. 1. Hypothesized mediating model. Controlling for the effects of age, gender, and socio-economic status. Solid lines represent positive relationships, dashed lines represent negative relationships.

2007; Zimmerman & Bandura, 1994). For example, Greene et al. tested a model explaining the impact of 220 high school students' perceptions of classroom structures on their academic self-efficacy, instrumentality, and academic achievement. Self-efficacy had a direct positive relationship demonstrating the importance of self-efficacy for successful learning.

Although some researchers have found that prior grade point average is a better predictor of achievement than academic self-efficacy (Roeser, Midgley, & Urdan, 1996), others (e.g., Brown, Lent, & Larkin, 1989; Saunders, Davis, Williams, & Williams, 2004), have found self-efficacy to have a small positive effect on end of year results especially for high achieving students, above and beyond the variance explained by prior academic achievement. It is argued by Bandura (1977) that perceived self-efficacy is often a better predictor under variable conditions than past performance, because "efficacy judgment encompasses more information than just the executed action" (p. 81).

Self-efficacy beliefs not only involve the exercise of control over action but also the self-regulation of various personal determinants of learning, such as thought processes and motivation (Bandura, 1997). According to Caprara, Barbaranelli, Pastorelli, and Cervone (2004), *self-regulatory self-efficacy* concerns peoples' perceptions for relating their actions in accord with personal norms when they are faced with peer pressure for engaging in antisocial conduct. It has been found that good self-regulators do better academically than poor self-regulators (Zimmerman & Schunk, 1989), and that those students who are considered good self-regulators use their own performances as a guide for assessing their self-efficacy (Schunk, 1995). Bandura, Caprara, Barbaranelli, Gerbino, and Pastorelli (2003) found that high self-regulatory efficacy was related to the ability to effectively manage one's academic development. Moreover, Caprara et al. (2008) investigated the central role played by perceived self-regulatory efficacy of 412 Italian students in their academic development and functioning over three time periods. Longitudinal findings indicated that there was a decline in self-regulatory efficacy from junior to senior high school but those who experienced the lowest decline in self-regulatory efficacy had the higher grades and the greater chance of remaining in school. In sum, high perceived self-regulatory efficacy contributed positively to junior high grades.

Social self-efficacy refers to a willingness to initiate behavior in social situations (Sherer & Adams, 1983). The abilities to establish friendships, form sustainable peer relationships, receive positive peer praise, be socially acceptable, and behave in a prosocial manner at school are all important tasks for success at school and have been found to be directly related to academic achievement (Patrick, Hicks, & Ryan, 1997). Children's beliefs that they have the social efficacy to form and sustain satisfying peer relationships also enable them to have academic success (Bandura et al., 1996). In reviewing the findings of previous research then, hypothesis one suggests that academic, social, and self-regulatory self-efficacy will be positively related to academic achievement.

The mediating role of academic aspirations

The first proposed mediator in the conceptual model is academic aspirations. Academic aspirations are derived from a combination of educational goals, vocational and career endeavors, and people's sense of self as it relates to what they feel are important elements to success in the lifestyles of their choosing (Quaglia, 1989). Hypothesis two proposes that the effects of academic and social self-efficacy on academic achievement will be mediated by academic aspirations.

Although some research has indicated that self-efficacy beliefs have no determinative effects (e.g., Vancouver, Thompson, Tischner, & Putka, 2002), overall, large-scale meta-analyses have examined how personal efficacy contributes to diverse domains of human functioning (Bandura & Locke, 2003). Specifically, these domains have included academic achievement and persistence (Multon et al., 1991) with evidence consistently showing that academic and social efficacy beliefs contribute significantly to levels of motivation and performance and that academic aspirations may mediate the relationships among these constructs (see Schunk, 1982; Schunk & Rice, 1993).

Generally speaking, self-efficacy influences academic aspirations and the strength of commitment to the aspirations, in that the stronger the perceived self-efficacy, the higher the aspirations that are adopted (Bandura, Barbaranelli, et al., 2001; Bandura & Locke, 2003; Locke & Latham, 1990; Multon et al., 1991). It has been suggested that a high sense of academic self-efficacy (i.e., high efficacy for self-regulated learning and mastery of academic work) fosters both academic aspirations and academic achievement (Bandura, Barbaranelli, et al., 2001; Caprara, Barbaranelli, & Pastorelli, 1998; Zimmerman & Bandura, 1994; Zimmerman, Bandura, & Martinez-Pons, 1992). However, it is likely that aspirations are also influenced by interests and values.

In their study on career trajectories, Bandura et al. (2001) measured the perceived occupational self-efficacy, academic aspirations, academic achievement, and occupational choices of 272 adolescents ranging in age from 11 to 15 years. They found that children's perceived academic self-efficacy influenced the types of occupational activities for which they judged themselves to be efficacious both directly and through their academic aspirations.

Moreover, Bandura, Barbaranelli, et al. (2001) and Bandura, Caprara, et al. (2001) found that occupational trajectories were shaped indirectly in terms of their social self-efficacy through academic aspirations in that the aspirations raised the perceived social self-efficacy for occupational pursuits. High social self-efficacy of students through beliefs in their sociableness, then, has also been found to promote academic aspirations and reduce vulnerability to depression (Bandura, Barbaranelli, et al., 2001; Bandura, Caprara, et al., 2001; Bandura et al., 1996). As stated previously, social self-efficacy has been found to be directly related to academic achievement (Patrick et al., 1997) and there is also evidence as suggested by Bandura, Barbaranelli, et al. (2001) and Bandura, Caprara, et al. (2001) that there is an indirect relationship with social self-efficacy affecting academic aspirations affecting academic achievement.

Zimmerman et al. (1992) examined students' beliefs in their efficacy for self-regulated learning and their academic achievement. They surveyed 116 high school students pertaining to their academic self-efficacy and educational goals. The findings indicated that personal goals and aspirations play an important role in academic achievement in that setting specific goals committed the students to attain certain academic levels. In addition, the higher the self-efficacy the higher the aspirations students set for themselves and as such self-efficacy influences academic achievement as well as academic aspirations.

The mediating role of delinquency

The second proposed mediator in the conceptual model is that of delinquency. Previous research suggests that delinquency may mediate the relationship between self-efficacy, specifically

academic and self-regulatory self-efficacy and academic achievement. For example, Bandura et al. (1996) found that minor problem behavior indeed mediated these relationships. However, we believe that more 'hard-core' delinquent behavior may also act as a mediator.

To begin, many researchers have shown a negative relationship between self-efficacy and delinquency. Caprara, Pastorelli, and Bandura (1992) measured children's perceived self-efficacy across a number of domains (self-regulatory, academic and social self-efficacy) and found that children who had a high sense of academic and self-regulatory efficacies behaved more prosocially, were more popular, and were less rejected by their peers than were children who believed they lacked these forms of efficacies. Self-regulatory efficacy has been shown to have a negative correlation with engagement in delinquent conduct and substance abuse (Bandura et al., 2003; Caprara, Scabini, et al., 1998). It has also been demonstrated to predict transgressive conduct over time (Bandura, 1997), with it being reported that students who have a high sense of self-regulatory efficacy are better equipped to resist peer pressures to engage in risky or antisocial conduct (Bandura, 1997; Bandura, Caprara, et al., 2001). In addition, Caprara et al. (1992) found that a low sense of academic and self-regulatory efficacy was associated with emotional irascibility, physical and verbal aggression, and moral disengagement, with the impact of children's disbelief in their academic efficacy on socially discordant behavior becoming stronger as they grew older.

Similarly, the negative relationship between juvenile delinquency and academic achievement has been documented in several studies although direct causal pathways have been more difficult to establish (Katsiyannis, Ryan, Zhang, & Spann, 2008). Many theories have been developed to explain the association between academic achievement and delinquency, for example, differential association theory (Matsueda, 1988) and social control theory (Gottfredson & Hirschi, 1990), with a strong inverse relationship found between delinquency and academic performance in several empirical studies (Farrington, 1987; Glueck & Glueck, 1940; Lynam, Moffitt, & Stouthamer-Loeber, 1993; Silberberg & Silberberg, 1971). Meltzer, Levine, Karniski, Palfrey, and Clarke (1984) conducted a study comparing the academic achievement of delinquent and non-delinquent youths and found poorer performance across all subject areas for delinquent youths. A meta-analysis conducted by Maguin and Loeber (1996) revealed that children with lower academic achievement levels committed delinquent acts more often which were of a more serious and violent nature and often persisted in their offending behaviors.

These studies indicate that, similar to minor problem behavior (Bandura et al., 1996), perceived self-regulatory inefficacy increases delinquency and involvement in activities that conflict with academic pursuits. This is in line with previous research which has demonstrated that young people who achieve lower academic grades, experience higher levels of delinquency (Bandura, Barbaranelli, et al., 2001; Bandura, Caprara, et al., 2001; Caprara et al., 2004). Thus, hypothesis three suggests that the effects of academic and self-regulatory self-efficacy on academic achievement will be mediated by delinquency, such that self-efficacy will be negatively related to delinquency and delinquency will be negatively related to academic achievement.

Control variables

Three demographic variables have been noted within the literature as potential confounds of the relationships in the proposed model. First, while age has generally been associated with

increasing levels of self-efficacy (Multon et al., 1991; Zimmerman & Martinez-Pons, 1990), with development, students are better able to gauge their capabilities and these more realistic assessments may actually be lower than those of younger students. Thus, as some research has shown, with age, self-efficacy declines (Bandura & Schunk, 1981; Caprara et al., 2008). Age has also been found to be associated with differential relationships between self-efficacy and behavior (Caprara et al., 1992). Second, it appears that there are gender differences in the self-efficacy, delinquency and academic achievement of school children. For instance, Caprara, Barbaranelli, and Pastorelli (1998) found that girls had a stronger sense of self-regulatory efficacy than boys, and that boys engaged more in substance abuse and delinquent conduct than did girls. Similarly, Bandura et al. (1996) found that girls were more prosocial, had higher academic aspirations, and were less prone to moral disengagement than boys. Third, it has been demonstrated that socio-economic status has effects on risk (Corcoran & Parsley, 2003), violence and poor health (Conrath, 2001; Seccombe, 2002), cognitive, emotional and social development, and academic achievement (Demosthenous, Bouhours, & Demosthenous, 2002). Therefore, age, gender, and socio-economic status were controlled in all analyses.

In accordance with the model, we posit the following structural relations among the factors. First, academic, social, and self-regulatory self-efficacy will be positively related to academic achievement. Second, academic aspirations will positively mediate the relationships between academic and social self-efficacy and academic achievement. Third, delinquency will negatively mediate the relationship between academic and self-regulatory efficacy and academic achievement.

Method

Participants

A total of 935, Years 8–12 students (454 males, 481 females) aged from 11 to 18 years ($M = 14.35$ years) were randomly selected from 10 secondary state schools in the capital cities of Perth, Western Australia, and Brisbane, Queensland to participate in the study. The high school youths in the present study comprised a representative sample of Australian high school students from schools in the low to high socio-economic status regions as determined by an index defined at the postcode level from the Australian Bureau of Statistics (1998). Four schools were located in low socio-economic status areas, three were in middle socio-economic areas, and three were in high socio-economic areas. In the present study, school locations were used as a proxy for socio-economic status because individual data were not available. In the Australian public school system, however, young people attend local schools and as such, the location of the school provides a close representation of the general social standing of children and their families attending the school. Brisbane and Perth were specifically chosen because we wished to capture a representative sample of Australian high school students, and by selecting two cities we increased the generalizability of our findings to make judgments about the adolescent population. With Queensland being the third largest state by population and Western Australia being the fifth largest state by population, the capital cities of these two states provided us with a reasonable representation of social and contextual milieus of Australian cities and provided an east–west dichotomy.

Measures

Three scales were administered to all participants.

The Children's Perceived Self-Efficacy Scale (Bandura, 1990; Bandura et al., 1996) comprises 37 items representing seven domains of functioning that form three basic efficacy factors – academic, self-regulatory, and social self-efficacy. For each item, participants rated their belief in their level of capability to execute the designated activities using a 6-point response format ranging from not at all to extremely well (1 = Not at all, 2 = Not too well, 3 = Okay, 4 = Pretty well, 5 = Very well, 6 = Extremely well).

Perceived academic self-efficacy measures children's perceived capability to judge their own learning, master academic subjects, and fulfill personal, parental, and teacher's academic expectations. Examples of items include "How well can you concentrate on school subjects?; and How well can you study when there are other interesting things to do?" Perceived self-regulatory efficacy measures children's perceived capability to resist peer pressure, and to resist pressure to engage in high risk activities. Item examples include "How well can you resist peer pressure to do things in school that get you in trouble?; and How well can you stop yourself from skipping school when you feel bored or upset?" Perceived social self-efficacy measures children's capability for peer relationships, self-assertiveness, and leisure time activities. Examples of items include "How well can you make and keep friends of the opposite sex?; and How well can you participate in class discussions?" Bandura et al. (1996) established the three factors to be highly reliable (.87 for academic self-efficacy, .75 for social self-efficacy, and .80 for self-regulatory efficacy) constituting 15.7%, 8.3%, and 7.1% of the variance, respectively. In the present research, 11 of the 37 original items were not included due to low factor loadings in the initial analysis by Bandura et al. (1996); however, internal reliabilities were still shown to be high for all three scales (.89 for academic self-efficacy, .81 for social self-efficacy, and .82 for self-regulatory self-efficacy).

The Adapted Self-Report Delinquency Scale – Revised (Carroll, Durkin, Houghton, & Hattie, 1996) comprises 46 items covering a wide range of frequently occurring delinquent acts in Australia with wording consistent with adolescent usage. Responses relate to the number of times delinquent acts were engaged in during the last 12 months, using a 6-point scale with the following anchor points: never, 1–3 times, 4–6 times, once a month, more than once a month, and more than once a week. Factor analysis of the 46 items revealed seven internally homogenous subscales from the scale. In the present study, the reliability coefficients, and an item example for each subscale are: School Misdemeanors, $\alpha = .86$ (e.g., not done your classwork or homework); Soft Drug Use, $\alpha = .88$ (e.g., used beer, wine, spirits or other kinds of alcohol); Vehicle-Related Offences, $\alpha = .94$ (e.g., driven a car at high speeds); Stealing Offences, $\alpha = .90$ (e.g., shoplifted from supermarkets, department stores, or shops); Property Offences, $\alpha = .91$ (e.g., deliberately damaged things in public places); Physical Aggression, $\alpha = .88$ (e.g., deliberately hurt or beat up someone); and, Hard Drug Use, $\alpha = .89$ (e.g., used amphetamines such as speed or ecstasy).

The *Children's Academic Aspirations Scale* (Bandura et al., 1996) measures academic aspirations and valuation of academic pursuits in a set of five items using a 6-point Likert scale (1 being strongly disagree to 6 being strongly agree). Participants rate the importance placed on academic attainments by themselves, their parents, and their friends, and the level of academic performance expectations their parents have for them and they have for themselves. The alpha coefficient has

been reported as .78. These items are identical to those used by Bandura et al. (1996) and, as such, we found a similar internal reliability coefficient of .78.

Academic achievement

The students were graded by their teachers for their level of academic achievement in English at mid-year (English Achievement). The English Achievement score was taken as the actual grade, with 1 being the lowest score and 7 being the highest score. This score was determined subsequent to participants completing the other measures. Teacher rating of English academic achievement was chosen over other potential measures because it is a core academic subject undertaken by all students.

Procedure

The principals of each of the 10 high schools were approached for permission to undertake the research. All principals agreed and a consent form and information sheet pertaining to the purpose and nature of the study were given to all students in each class (approximately 30) in each of the schools. The students and their parents were required to give written consent to participate. There was a response rate of approximately 75 percent. The scales were administered to students in groups of approximately 20 during class time in a room specifically set aside for the purpose of the research. Students were informed about the nature of the study and assured of confidentiality and anonymity by the researcher, prior to the dissemination of the scales. Participants completed the scales in approximately 30 min in the presence of at least one researcher and one school staff member. Those students who were identified by school personnel as experiencing literacy difficulties were administered the scales in small groups, where the researcher read the scales aloud, verbatim. The timing of the study occurred prior to mid-year exams and awarding of grades, Therefore, all measures were completed by participants prior to them being awarded their mid-term English Achievement grade.

Data analysis

Structural equation modeling (SEM) via LISREL was used to compare the models outlined in the introduction. As suggested by Anderson and Gerbing (1988), the measurement model (without paths between latent constructs) was assessed separately to the structural models. This measurement model contains items loading on to their respective latent constructs with correlations between the constructs. However, unlike the structural models, no paths between latent constructs are specified. In this case, a second-order confirmatory factor analysis was used to examine the relationship between the subscales and their respective items as outlined in the measures section and the second-order factors with the subscales (delinquency on to hard drug use, soft drug use, stealing offences, school misdemeanors, vehicle-related offences, property offences, and physical aggression; academic self-efficacy on to learning, processes and academic expectations; social self-efficacy on to friends, sport, dealing with others, and social expectations; aspirations and self-regulatory self-efficacy were first-order factors).

Following testing of the measurement model, the fit of the hypothesized structural model was assessed, and then compared to the fit of the alternative models. Chi-square difference tests were

used to compare the incremental predictive power of the nested models. It was expected that the proposed model would fit the data significantly better than the more parsimonious model (non-mediated), but that it would not differ significantly from the partially-mediated model.

Results

Confirmatory factor analyses

The first analysis of the measurement model assessed the second-order structure of the measures. To begin, assessment of the delinquency and self-efficacy measures was undertaken. Three of the subscales were not clearly separate from the remaining subscales – school misdemeanors, vehicle-related offences, and soft drug use. Items from these subscales did not factor cleanly as they represented "softer" misdemeanors that perhaps occurred alongside the "harder" delinquency behaviors. These three subscales were omitted from future analyses such that delinquency was operationalized by hard drug use, property offences, physical aggression, and stealing offences. The initial analysis of the self-efficacy measures also produced conceptual overlaps amongst the scales. Although the model fitted the data adequately ($c^2 = 2641.35$; RMSEA = .08; CFI = .86; NFI = .84), examination of the findings revealed cross-loadings. It was decided, therefore, to identify the most optimal items to form a subscale for the self-efficacy measures. Three subscales were identified from the academic self-efficacy scale: Learning (4 items; e.g., "Learn social studies", "Learn English"); Process (6 items; e.g., "Organise school-work"; "Take class notes"); and Academic Expectations (2 items; "Live up to teacher expectations" and "Live up to parent expectations"). Four subscales were identified from the social self-efficacy scale: Friends (3 items: e.g., "Make friends with other sex"; "Make friends with same sex"); Social Expectations (2 items; "Live up to peer expectations" and "Live up to own expectations"); Dealing with Social Issues (2 items; "Stand up for self" and "Dealing with annoying things"); and Sport (2 items; "Learn sport skills" and "Learn team sports"). This model produced a significantly better fit to the data ($c^2 = 1558.97$; RMSEA = .05; CFI = .93; NFI = .93) and so was used in the subsequent analyses.

The tested measurement model assessed the fit of the latent scale scores (delinquency, academic self-efficacy, self-regulatory self-efficacy, social self-efficacy, and academic aspirations) on their respective latent subscales which loaded on to the individual items. This model had an acceptable fit to the data ($c^2 = 5160.87$, df = 1066, $p < .001$; RMSEA = .06; CFI = .96; NFI = .95). The loadings of the items, and the second-order factor loadings of the subscales on to the scales are presented in Fig. 2. Bivariate correlations between constructs are presented in Table 1.

Structural model

The hypothesized mediated model was tested and the fit was compared to a partially-mediated model. These models used a simplified first-order structure of the measures by computing scale scores for the subscales loading on to the latent scales (delinquency, academic self-efficacy, and social self-efficacy). These composites were calculated using the factor score regression weights from one-factor congeneric models (Bagozzi & Heatherton, 1994). Maximised reliability

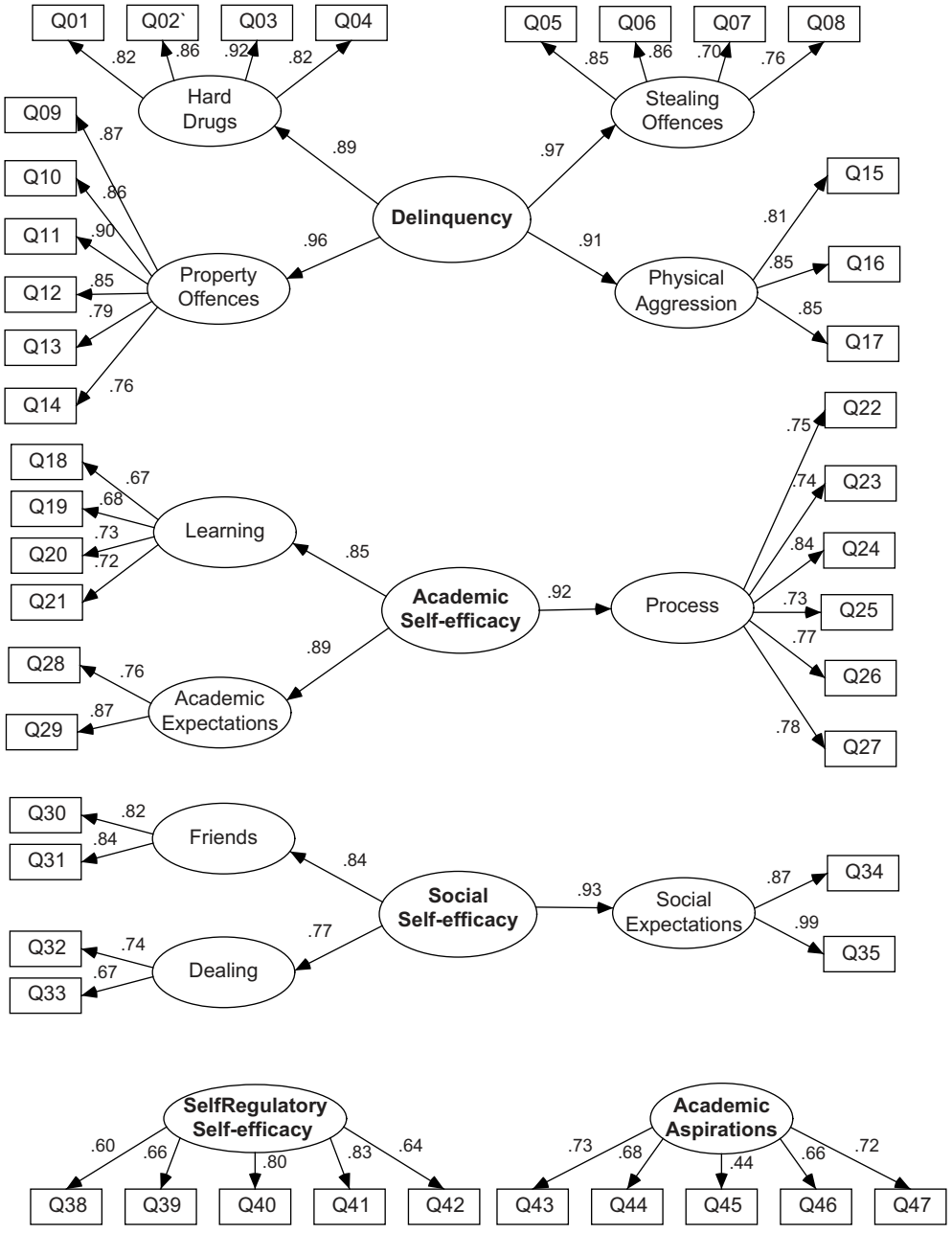

Fig. 2. Factor loadings for the items on the first- and latent-variables on the second-order factors.

Table 1
Correlations of study variables.

	Mean	Standard deviation	Age	Sex	School SES	Academic self-efficacy	Social self-efficacy	Self-regulatory self-efficacy	Academic aspirations	Delinquency	English Achievement
AGE	14.40	1.43									
SEX			.01								
School SES			.04	.03							
Academic self-efficacy	4.08	.95	−.19[a]	.01	.06						
Social self-efficacy	4.45	.90	−.05	.03	.03	.54[a]					
Self-regulatory self-efficacy	4.77	1.15	−.05	.04	−.01	.50[a]	.34[a]				
Academic aspirations	4.67	.91	−.11[a]	.02	.04	.54[a]	.30[a]	.32[a]			
Delinquency	1.67	.81	.06	−.18[a]	−.06	−.27[a]	−.12[b]	−.39[a]	−.25[a]		
English Achievement	4.47	.97	−.09[a]	.27[a]	−.16[a]	.25[a]	.03	.25[a]	.14[a]	−.24[a]	

[a] Correlation is significant at the .01 level (2-tailed).
[b] Correlation is significant at the .05 level (2-tailed).

coefficients were also calculated; all except stealing ($r_c = .64$) were found to have acceptable levels above .70. The other constructs (academic aspirations, self-regulatory self-efficacy) remained as first-order factors with item-level data.

The hypothesized mediated model showed good fit to the data ($c^2 = 2247.43$, df = 241, $p < .001$; RMSEA = .08; NFI = .84; CFI = .85). However, the partially-mediated model showed a significantly better fit to the data ($c^2 = 2181.86$, df = 238, $p < .001$; RMSEA = .07; NFI = .84; CFI = .86) than the fully mediated model ($Dc^2 = 65.57$, df = 3, $p < .05$). When non-significant paths were removed, the final model fit was satisfactory ($c^2 = 1994.89$, df = 219, $p < .001$; RMSEA = .07; NFI = .85; CFI = .87). Thus, the partially-mediated model without non-significant paths was accepted over the hypothesized mediated model. The final model is presented in Fig. 3.

As expected, academic self-efficacy was related to both academic aspirations and delinquency, and directly related to academic achievement. The indirect effect of academic self-efficacy on achievement via delinquency was significant (Sobel $z = 2.02$, $p < .05$) Self-regulatory self-efficacy, also as expected, was negatively related to delinquency and positively related to academic achievement. Delinquency was negatively related to academic achievement. Again, the

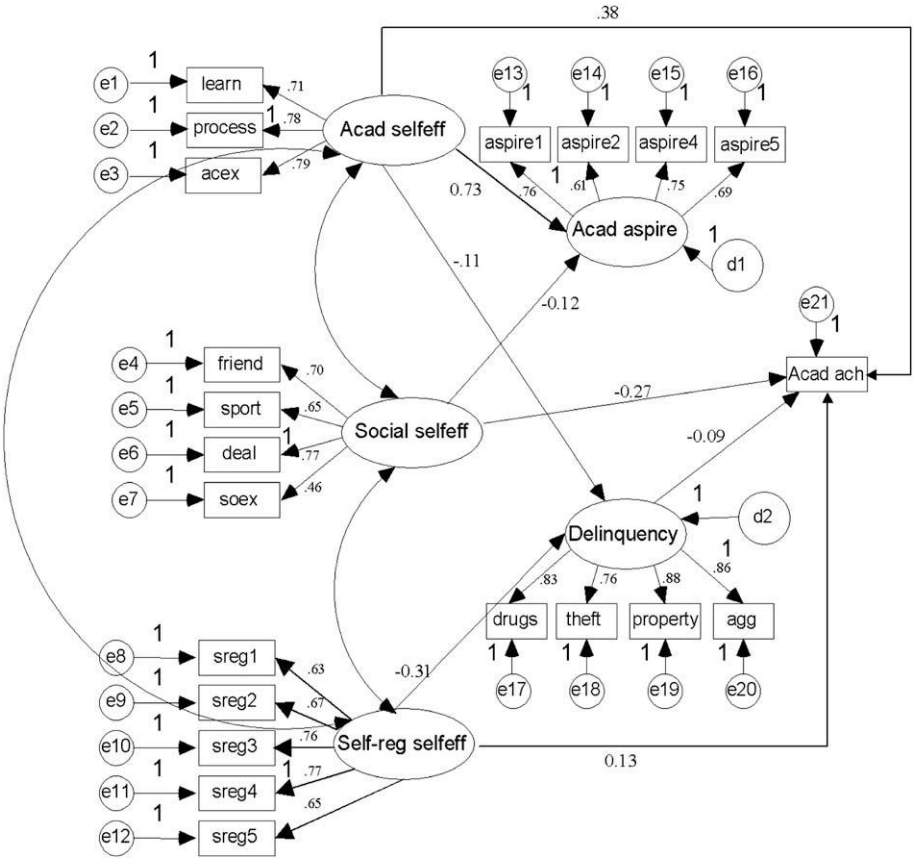

Fig. 3. Structural estimates of final model controlling for sex and school socio-economic status.

indirect effect of self-regulatory self-efficacy on achievement via delinquency was significant (Sobel $z = 2.48$, $p < .05$). Of the control variables, gender was significantly associated with delinquency (loading $= -.21$, $p < .05$), indicating that females were less likely to report delinquent behavior than males, and with academic achievement (loading $= .23$, $p < .05$), indicating that females were more likely to do better in academic achievement than males. School socio-economic status was also significantly related to academic achievement (loading $= -.17$, $p < .05$).

However, examination of the results showed some statistically non-significant paths. Age was not significantly related to either delinquency (loading $= -.03$, n.s.) or academic achievement (loading $= -.02$, n.s.), and school socio-economic status was not significantly related to delinquency (loading $= -.02$, n.s.). More importantly, academic aspirations was not significantly related to academic achievement as hypothesized. This path was significant in the fully mediated model, thus the direct relationship between academic self-efficacy and academic achievement appears to be stronger than that between academic aspirations and academic achievement. Our findings, therefore, suggest that academic aspirations does not mediate the effect of academic self-efficacy on academic achievement.

The second unexpected finding was the negative relationship between social self-efficacy and academic achievement. Given that the bivariate correlation between the two was non-significant, it is likely that this negative relationship was due to controlling for the strong positive effects of academic self-efficacy and self-regulatory self-efficacy on academic achievement.

Discussion

The structural equation modeling confirmed the diverse paths of influence and patterns of relationships that exist between self-efficacy beliefs, delinquency, academic aspirations, and academic achievement. More specifically, the research showed that academic self-efficacy has a strong, direct relationship with academic achievement and an indirect relationship via delinquency; that self-regulatory self-efficacy has direct and indirect relationships with academic achievement via delinquency behaviors; and that social self-efficacy has a direct relationship with academic achievement although this relationship was found to be negative. Age and school SES were not related to delinquency and age and academic aspirations were not related to academic achievement, after controlling for academic self-efficacy.

As expected, academic self-efficacy had a strong relationship with academic achievement. This is in line with previous research (e.g., Bandura, Barbaranelli, et al., 2001; Bandura, Caprara, et al., 2001; Bandura et al., 1996; Brown et al., 1989; Chemers et al., 2001; Greene et al., 2004; Multon et al., 1991; Robbins et al., 2004; Wood & Locke, 1987) that has demonstrated that young people who believe in their capabilities to exercise control over their educational performance, achieve higher results academically than counterparts who have less efficacious beliefs in their academic pursuits. Although academic self-efficacy has been shown to affect academic performance indirectly, by fostering academic aspirations (Bandura, 1986; Bandura, Barbaranelli, et al., 2001; Bandura, Caprara, et al., 2001; Bandura et al., 1996) and that academic self-efficacy has an indirect effect on academic achievement through raising academic aspirations (Mau, Domnic, & Ellsworth, 1995; Zimmerman et al., 1992), this was not the case in the present research. Unique to

the present research, was the finding that while academic self-efficacy was directly related to academic aspirations and academic achievement, it was not mediated by academic aspirations. There may be both measurement and theoretical explanations for this finding. Indeed, the strong positive effects of academic self-efficacy on academic aspirations and on academic achievement may have created some redundancy among the measures specifically, academic aspirations. There also appears to be overlap between academic self-efficacy and academic aspirations with a loading of .73 of academic self-efficacy on academic aspirations. Bandura et al. (1996) suggested that aspirations are influenced by self-appraisal of capabilities. Perhaps, there are two facets to aspirations: what an individual wants to achieve and what they are capable of achieving. After "capability" is controlled for (by including academic self-efficacy), then all that remains is what the individual wants to achieve. This is an important issue and one worthy of further examination.

There was also a significant indirect effect of academic self-efficacy on academic achievement via delinquency. While previous studies have confirmed that academic self-beliefs and academic achievement are positively and moderately correlated (Bandura et al., 1996; Greene et al., 2004; Hansford & Hattie, 1982; Zimmerman, 1995), less has been established about the contribution of other variables to the relationship (Valentine et al., 2004). The present study confirmed that delinquency plays an indirect role from perceived academic self-efficacy to disengagement from learning and academic success. With lowered self-efficacy for academic tasks, involvement in deviant activities influences and undermines academic achievement. The present findings investigated delinquency in terms of stealing, property offences, physical aggression, and hard drug use and as such extended the work of Bandura et al. (1996) who determined that problem behaviors detract from academic achievement.

As expected, children with higher self-regulatory self-efficacy reported being involved in fewer delinquency behaviors, and therefore, had higher academic grades. This is in line with previous research which has demonstrated that young people who perceive themselves to be more capable of self-regulating their actions when dealing with peer pressure, achieve higher grades, experience lower levels of problem behavior, and are more popular among their peers (Bandura, Barbaranelli, et al., 2001; Bandura, Caprara, et al., 2001; Caprara et al., 2004; Caprara et al., 2008). It also extends Bandura et al.'s (1996) work by expanding more minor "problem behaviors" into more hard-core delinquency activities. As postulated, self-regulatory efficacy had a direct and negative relationship with delinquency and substance use generally, thereby supporting previous research (Caprara, Barbaranelli, & Pastorelli, 1998; Caprara, Scabini, et al., 1998). In addition, delinquency had a direct negative relationship with academic achievement. Bandura (1997) reported that poor school outcomes often foreshadows negative life outcomes like delinquency and associated high risk behaviors which impair students' prospects of a "productive and satisfying life" (p. 213).

The negative relationship between social self-efficacy and academic achievement was not completely surprising. After controlling for age, gender, school socio-economic status, academic and self-regulatory self-efficacy, those children who reported lower social self-efficacy were those who did well in English Achievement studies. Although previous research has suggested that students' educational performance is related to their motivation to be socially responsible and their beliefs in how they relate to others socially (Bandura et al., 1996; Patrick et al., 1997), this was not the case in the present study. Perhaps "doing well" decreased student' perceptions of their social self-efficacy through the power of peer feedback and teasing, especially in high school where

being smart is often perceived as ''uncool''. The work of Houghton and Carroll (1996) lends support to this proposition whereby feedback from peers for being disruptive enhances a young person's reputation, image, and perception of self in the classroom. Moreover, research by Clark and Wells (1995) has demonstrated that individuals who are highly socially anxious tend to devalue their social performance, even when they are objectively successful, as was the case in the present research with high end of term English Achievement scores. Although issues of psychological adjustment were not tested in the present model, previous research has found expectations pertaining to social self-efficacy to be linked to problems of social anxiety (e.g., Connolly, 1989; Sherer & Adams, 1983) and depression (Anderson & Betz, 2001: Bandura, Pastorelli, Barbaranelli, & Caprara, 1999). Conversely, those with high social self-efficacy may have been more aware that high academic achievement is not a ''cool'' thing to aim towards, than those with low social self-efficacy. A competing explanation may indeed be that students had little time to spend making and being with friends, playing sport, and living up to peer expectations because of the time consuming nature of their school studies.

There was no evidence of age effects with age not being significantly related to academic achievement. Although there was expected to be a relationship between age and self-efficacy, no such relationship was found to exist. This was somewhat unexpected and is contrary to previous findings (Multon et al., 1991; Zimmerman & Martinez-Pons, 1990) which speculated that older students may be better able to assess their academic capabilities due to their greater school experience. Perhaps, however, all students, young and old, are constantly faced with new and harder material that they must overcome, and that one's capabilities are often under question, regardless of age. There was also no significant relationship between age and delinquency. The research of Jessor, Donovan, and Costa (1991) and Kasen, Cohen, and Brook (1998) yielded similar findings, reporting minimal variation in deviancy in their samples with regard to age.

School SES was also not significantly related to delinquency. Previous research has found that the impact of SES is mediated through its influence on parental perceived academic efficacy and educational aspirations (Bandura, Barbaranelli, et al., 2001; Bandura, Caprara, et al., 2001) with ''the higher the family's socio-economic status, the stronger the parents' beliefs in their efficacy to promote their children's academic development and the higher the educational aspirations they have for them'' (p. 197). This may have been the case in the present study and SES effects may have been detected if a measure of parental efficacy and aspirations had been included. As expected, there was a significant relationship between gender and delinquency with females less likely to report delinquent behavior than males. This is in line with previous research (Bandura et al., 2003; Caprara et al., 2004; Kasen et al., 1998). Moreover, gender was significantly associated with academic achievement, with females more likely to do well than males. As reported by Bandura et al. (2003) and Caprara et al. (2004), girls displayed higher levels of agreeableness, conscientiousness, and academic achievement, and lesser externalization and delinquent behaviors than boys.

There are a number of implications for education. For example, in high school, students encounter new subjects and material that becomes increasingly more difficult. To master this, a resilient belief in one's capabilities and the ability to self-regulate one's learning are required. Those who lack the ability to self-regulate fall behind in their schoolwork and are constantly reminded that they are not performing to expectation, whether it be their own, their parents',

or their teachers' expectations. This then establishes a cycle of failure, which encourages the student to pursue 'success' in other domains, including for some school misdemeanors and acts of delinquency (Carroll, Houghton, Hattie, & Durkin, 1999; Houghton & Carroll, 1996).

Another important educational implication concerns the role of self-regulatory influences in educational self-development. With the phenomenal pace of technological changes and advances, it is likely that the gap between good and poor self-directed learners will widen (Bandura et al., 1996). Therefore, working on the assumption that students with high self-regulatory and academic self-efficacies are more likely to experience academic success, educators need to develop an understanding of the methods and practices in how to increase the self-efficacies of students who have previously demonstrated low self-efficacy. Schunk (1995), for example, reported a number of methods that have demonstrated increases in self-efficacy, these employing learning strategies, observing models (teachers and peers, especially similar peers), feedback (attributional and performance), and goal setting. Moreover, as we alluded to above, the present findings that the power of peer feedback regarding the perception that being smart is "uncool" may suggest that a more desirable situation for adolescents is one of moderate levels of both academic and social self-efficacy.

Previous research has shown that self-assessments of one's capability may be critical to our understanding of adolescent at-risk behavior (Bandura, 1986). Therefore, it is envisaged that the results of the current research will have practical significance for school administrators, educators, parents and students alike, in developing their understanding of problem behaviors and self-efficacy and the influence that these have on academic achievement. Many intervention strategies that target delinquency have focused on information pertaining to the risk factors associated with engaging in such behaviors. Other strategies involve teaching assertiveness skills such as "saying no to drugs or crime". This study suggests the need to raise students' levels of academic, social, and self-regulatory self-efficacy to improve academic performance and decrease engagement in serious offending behaviors.

It is noted that limitations of the current study are that it is cross-sectional rather than longitudinal, there is a relatively weak association between delinquency and English Achievement, the study used self-report data, and the fit indices indicate that other factors may also play an important part in the explanation. Further, it is acknowledged that some factors were not able to be integrated in the current research. For example, goal setting has been shown to be an important determinant in the regulation of human actions and performance levels (Bandura et al., 1996; Carroll, Durkin, Hattie, & Houghton, 1997; Latham & Locke, 1991), affecting achievement outcomes and influencing self-efficacy. Moreover, while the English Achievement scores provided an indication of the student's performance levels in these specific subject areas, they may not have adequately reflected whether students were performing to the level of their ability. It has been shown that in students of similar ability levels, those with high self-efficacy perform better than those with low self-efficacy (Collins, 1982). However, without knowing the students' actual ability levels, one cannot determine whether their results are reflective of their ability or of their self-efficacy. Perhaps future research could test self-efficacy theory on students of similar ability levels, as assessed by performance on skill tasks, as suggested by Multon et al. (1991). Students' past histories of achievement may also provide an indication of ability. Finally, the variety of items on the measure of academic aspirations should be acknowledged as a limitation as this seems to be

more indicative of a broad measure of social encouragement or achievement context rather than personal aspirations Perhaps, future research should examine mediators such as school engagement, personal goals, motivation, and values.

In conclusion, this study has provided substantial empirical support for the posited partially-mediated model through which academic, social, and self-regulatory self-efficacy operate in concert to shape children's academic achievement with the mediational effects of academic aspirations and delinquency. The outcomes of the findings suggest the importance of fostering self-efficacy among children at an early age in order to facilitate self-beliefs and involvement in appropriate academic and school-related activities. Failure to do so may increase the likelihood of children seeking more nonconforming alternative pathways to obtain the kudos and success that they strive for, but through engagement in delinquent and disruptive behavior.

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