

Antecedent and consequence of school academic optimism and teachers' academic optimism model

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ABSTRACT

The main purpose of this research was to examine the relationships among school principals' transformational leadership, school academic optimism, teachers' academic optimism and teachers' professional commitment. This study conducted a questionnaire survey on 367 teachers from 20 high schools in Taiwan by random sampling, using principals' transformational leadership scale, a school academic optimism scale, teachers' academic optimism scale, and teachers' professional commitment scale. The results of confirmatory factor analysis showed that there is good fit in the factor structure of school academic optimism and teachers' academic optimism. The results of the Pearson product-moment correlation analysis and path analysis revealed that principals' transformational leadership has a positive effect on school academic optimism and teachers' academic optimism. School academic optimism has a positive effect on teachers' academic optimism. Principals' transformational leadership and teachers' academic optimism have a positive effect on teachers' professional commitment. Finally, this research offers some suggestions based on the results.

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1. Introduction

Hoy, Tarter and Woolfolk Hoy (2006a, 2006b) indicated that school academic optimism, which has a positive effect on students' academic achievements, could be used to predict the differences between schools in terms of students' academic achievements. The three characteristics of school academic optimism are academic emphasis, collective efficiency and faculty trust; when these are present, they have a positive effect on students' achievements (Hoy, Tarter, and Woolfolk Hoy 2006a, pp. 426–427, 2006b, p. 148). Schools with a high level of academic optimism are thought to have potential for improvement because the faculty is professionally effective, the students are highly motivated to study and achieve high grades, and the parents are supportive.

Woolfolk Hoy, Hoy, and Kurz (2008) used the concept of teachers' academic optimism to explain personal teaching characteristics and behaviours. It is not simply about teachers having a generally optimistic disposition; rather, it is about teachers who remain positive, believe in cooperation and strengthen their relationships with the students and parents.

They suggested that teachers' emphasis on academics, their belief in their abilities to overcome difficulties, and dealing with setbacks with resilience and perseverance are key components to academic optimism. Considering the difference between Eastern and Western cultures, this study investigated Taiwanese high school teachers to test the structural fitness of school academic optimism and teachers' academic optimism.

It is important to first differentiate between the concepts of teachers' academic optimism and school academic optimism. Teachers' academic optimism refers to their individual sense of efficacy; it is their own beliefs. Teachers, in their personal capacity, have trust in parents and students, and place an emphasis on academics, which affect their teaching behaviours. School academic optimism, on the other hand, refers to teachers' collective efficacy. Although teachers' academic optimism and school academic optimism are two independent concepts, they are closely related. While teachers' academic optimism is assumed to be a factor of their personal character, school academic optimism is merely assumed to be part of the special culture of the school (Hoy and Miskel 2008; Woolfolk Hoy, Hoy, and Kurz 2008). Woolfolk Hoy et al. suggested that there is a strong relationship between school academic optimism and teachers' academic optimism. However, the question remains as to how and to what extent does school academic optimism influence teachers' academic optimism? As school academic optimism and teachers' academic optimism have the same theoretical basis and there is potentially a close relationship between the two, this study attempts to examine the theoretical concepts and the relationship.

Many recent studies have mentioned the close relationship between a student's academic achievement, school academic optimism and teachers' academic optimism (Hoy, Tarter, and Woolfolk Hoy 2006a, 2006b; Woolfolk Hoy, Hoy, and Kurz 2008). Therefore, it is necessary to explore the factors related to school academic optimism and teachers' academic optimism. Hoy, Tarter, and Woolfolk Hoy (2006a) indicated that, in order to increase school academic optimism, there needs to be an improvement in all of the factors that influence school academic optimism. Barth (1990) argued that the principal is the key factor in a good school. The teaching quality and professional growth of teachers, as well as the school atmosphere, all depend on the school principal. Therefore, the principal may also greatly influence school academic optimism (McGuigan and Hoy 2006). Woolfolk Hoy, Hoy, and Kurz (2008) suggested that teachers' academic optimism, such as school academic optimism, is influenced by variables related to the principal. A principal can strengthen teachers' teaching ability, encourage them to emphasise academic achievement, and engender the support of parents and students, thereby enhancing students' academic achievements.

What are the influences of the concepts of school academic optimism and teachers' academic optimism on teachers' teaching behaviours? Teachers' professional commitment has the same positive effect as teachers' academic optimism. When a commitment is present, there is potential for an improved educational environment in the classroom, and the students' learning effectiveness can thus be enhanced. Previous studies have found a positive relationship between teachers' professional commitment and students' academic commitment (Bryk and Driscoll 1988). When the teachers put forth greater effort on educational activities or spend more time after school to assist the students, the students show better academic achievements (Rosenholtz 1989). As school academic optimism and teachers' academic optimism may influence teachers' teaching behaviours, teachers are thus more active when facing challenges and are willing to spend more time helping students. As a result, parent–teacher cooperation leads to the most effective outcome.

Research has shown that teachers' beliefs directly influence teaching behaviour, encouraging them to persist in their effort (Goddard, Hoy, and Woolfolk Hoy 2004; Woolfolk Hoy, Davis, and Pape 2006). Broadly speaking, teachers' academic optimism, which encompasses their efficacies and beliefs, may influence their professional commitment. However, there lacks related empirical research to support such a supposition. Therefore, this paper aims to establish a model to explore the relationships between these variables. Although many Western studies have supported school academic optimism and teachers' academic optimism in empirical studies, whether these concepts also apply to Eastern educational systems is worthy of further exploration, especially in Taiwan. By establishing a positive educational culture, promoting positive characteristics in teachers, as well as encouraging teachers to conduct a better effort in teaching, schools can create an effective teaching environment and be able to retain good teachers.

2. Literature review

2.1. *Effect of principals' transformational leadership*

As the interaction between school academic optimism and teachers' academic optimism has an important effect on students' learning and teachers' teaching, the role of principals is the key and their leadership has a direct impact on the quality of teaching, the teachers' professional attitudes, and the overall atmosphere of the school. Principals' transformational leadership can enhance teachers' abilities, strengthen the school climate, and receive support from parents and students; all of these can enhance students' academic achievements. Burns (1978) proposed the theory of transformational leadership to support the type of leadership in which individuals forego their personal interest to pursue some collective interest (Bass and Avolio 1991). In the educational field, transformational leadership is regarded as an effective style of leadership (Ogawa and Weaver Hart 1985; Leithwood and Jantzi 1998). Apart from motivating a subordinate to do more work than expected, transformational leadership can satisfy the higher demands of the subordinate, as proposed by Maslow (1954) (Bass 1985). At the same time, such concepts as transformational leadership, teachers' academic optimism, and schools' academic optimism are related to positive psychology, optimism, psychological capital and social capital (Beard, Hoy, and Woolfolk Hoy 2010; Toor and Ofori 2010). According to Bass and Riggio (2008), transformational leaders would encourage the subordinate to achieve excellence; by setting objectives for the subordinate and authorising them, the leaders reflected the demands of the subordinates and helped them seek personal improvement.

The principal-based transformational leadership is mainly based on four dimensions: intellectual excitement, individualised consideration, inspirational motivation and idealised influence. Intellectual excitement means that leaders challenge the current situation and encourage the subordinate to enhance creativity, explore new methods and seek new learning opportunities to finish tasks. Individualised consideration indicates that leaders support and encourage the subordinate; to consolidate the support-based relation, transformational leaders keep an open communication channel so that the subordinate feels free to share their ideas; moreover, leaders recognise the special contribution made by the subordinate. Inspirational motivation means that leaders are clear about visions and share the visions with the subordinate; moreover, they help the subordinate to increase experience, passion,

and motivation to fulfil these visions. Idealised influence indicates that leaders set a model for the subordinate; as subordinates trust and respect leaders, they follow the model and change it into their ideas (Bass and Avolio 1990, 2007). Therefore, this paper discusses the relationships between principals' transformational leadership, school academic optimism and teachers' academic optimism.

2.1.1. Relationship between principals' transformational leadership and school academic optimism

Hoy, Tarter, and Woolfolk Hoy (2006a) suggested that to enhance school academic optimism, there is a need to improve all the factors that contribute to the concept, including academic emphasis, collective efficacy and faculty trust. Empirical research has indicated that principals' leadership, collective efficacy (Goddard 2002a, 2002b; Ross, Hogaboam-Gray, and Gray 2003), academic emphasis (Alig-Mielcarek and Hoy 2005; Hoy, Tarter, and Woolfolk Hoy 2006a), and teachers' trust in colleagues and the principal (Hoy, Tarter, and Witkoskie 1992; Tschannen-Moran and Hoy 1998) all have significant positive relationships. As discussed above, there are close relationships between principals' transformational leadership and academic emphasis, collective efficacy, and the sense of faculty trust. Therefore, a hypothesis is proposed as follows.

H1. There is a positive relationship between principals' transformational leadership and school academic optimism.

2.1.2. Relationship between principals' transformational leadership and teachers' academic optimism

Teachers' academic optimism includes their personal academic emphasis, efficacy and trust in parents and students. School academic optimism refers to an atmosphere in the school where the entire faculty emphasises the importance of the academic aspect, and there is collective efficacy and faculty trust in parents and students. While the components of the concepts are similar, their levels differ. Teachers' academic optimism is at a personal and individual level, while school academic optimism is at a school level. This study refers to Woolfolk Hoy, Hoy, and Kurz (2008) and assumes that principals' transformational leadership has the same predictive effect on teachers' academic optimism. In order to increase teachers' academic optimism, their academic emphasis efficacy, beliefs, and trust in parents and students should be improved first (Hoy, Tarter, and Woolfolk Hoy 2006a). A number of studies have shown that principals with transformational leadership skills have a positive predictive effect on teachers' efficacy and beliefs (Brissie, Hoover-Dempsey, and Bassler 1988; Hipp and Bredeson 1995; Riehl and Sipple 1995) as well as on teachers' trust in the principals (Podsakoff et al. 1990; Pillai, Schriesheim, and Williams 1999; Zeinabadi and Rastegarpour 2010). Therefore, this paper proposes the following hypothesis.

H2. There is a positive relationship between principals' transformational leadership and teachers' academic optimism.

2.2. Shared theoretical underpinnings of school and teachers' academic optimism

The social cognitive theory proposed by Bandura (1997) provides a theoretical structure to explain the relationship between teachers' academic optimism and school academic optimism. The basic assumption of the social cognitive theory is human agency. When an

individual and an organisation make decisions, they exhibit human agency. According to the social cognitive theory, self-efficacy belief is the key in the agency. When individuals believe that they have the ability to accomplish a task independently, such behaviour is more likely to occur. When teachers, either individually or collectively, believe in the importance of students' academic achievements, trust the parents and students, and have faith that they can overcome difficulties, they will exhibit teaching behaviours that can improve students' academic achievements.

Aside from the assumption of agency, the concept of academic optimism applies to both the school and personal levels and includes cognitive, affective and behavioural aspects. Efficacy belief is the cognitive aspect, and the sense of trust is the affective aspect. Academic emphasis is the cognitive emphasis on particular behaviours in school (Woolfolk Hoy, Hoy, and Kurz 2008). Academic optimism at the school level includes three components: academic emphasis, collective efficacy and teachers' trust in parents and students. The relationships between these three components and the effect of their interaction produce a culture of school academic optimism, emphasising that teachers have the ability to create and maintain a positive and productive educational environment. For example, if there is a collective decision between teachers, parents and students that the students have to achieve higher academic success, then a higher academic standard will be set, and the sense of trust is strengthened. When teachers believe that they are capable of executing such behaviours to form a positive effect on students' academic achievements, they will encourage the students to aspire to higher academic achievements. Furthermore, if a school emphasises academic achievements, then teachers' collective self-efficacy will be strengthened (Hoy, Tarter, and Woolfolk Hoy 2006a). The result of the interaction between academic emphasis, collective efficacy and teachers' trust in parents and students will be a school academic optimism culture that influences the school environment to emphasise academic achievement, trust in students and parents, and trust in the professional abilities of the faculty (Woolfolk Hoy, Davis, and Pape 2006).

Bryk and Schneider (2002) suggested that there are at least four kinds of social situations in a school that can improve students' education: (1) the teachers have a "can do" attitude; (2) the school has frequent contacts with the parents; (3) an emphasis on cooperative work and commitment to improving professional commitment; and (4) high expectations. Self-efficacy belief, a sense of trust and an academic emphasis that form the school academic optimism can improve the school environment. A "can do" attitude results from the teachers' sense of self-efficacy. The trust that teachers have in parents and students produces an environment in which students, parents and teachers can cooperate, as well as have close contacts. Finally, an academic emphasis produces high expectations and standards (Beard, Hoy, and Woolfolk Hoy 2010). In this kind of school climate in which teachers can develop collegiality through conversations and observations with each other and share personal teaching experiences, they can filter out unsuitable academic behaviours. This concept of normative behaviour can lead to the honouring of teachers who show appropriate teaching behaviours (Coleman 1990). Therefore, in a school with high academic optimism, teachers will be affected by the positive normative culture, thereby enhancing teachers' academic optimism, trust in parents and students, and the emphasis on higher academic achievements of students. Based on the above, the next hypothesis is proposed as follows.

H3. There is a positive predictive relationship between school academic optimism and teachers' academic optimism.

2.3. Predictive relationships between principals' transformational leadership, academic optimism and teachers' professional commitment

Teachers' professional commitment is defined as their willingness to make more effort to teach the students in order to improve their academic achievements. The teachers may spend more time assisting the students, while parents are willing to cooperate with the teachers, and thus the teaching time can be used more effectively. A transformational leader can stimulate subordinates to change their work expectations, concepts and motives. A leader can encourage workers to perform better than expected (Bass 1985). The workers will be highly committed to, and show solidarity with, the leader's visions (Burns 1978). Ronit (2005) indicated that empowering teachers and including them in decision-making can positively predict their professional commitment. Therefore, principals can have high expectations of subordinates' performances, provide a good model and vision, and indicate approval of teachers who are showing greater professional commitment. A number of studies have shown a relationship between teachers' perceptions of principal's empowering behaviours and teachers' professional commitment (Bogler and Somech 2004; Lee and Nie 2014). Therefore, the hypothesis is proposed as follows.

H4. There is a positive predictive relationship between principals' transformational leadership and teachers' professional commitment.

When school academic optimism is viewed as the intellectual culture of a school, the communication, values and the norms of this culture can influence the members of the organisation. In a school environment with high academic optimism, teachers can emphasise the importance of students' academic achievements, trust in parents and students, and belief in the ability of the faculty, thereby providing more effort to ensure the academic success of the students. Moreover, the school climate can predict teachers' professional commitment (Hoy, Tarter, and Bliss 1990), and teachers' professional commitment is also influenced by other factors (Woolfolk Hoy, Davis, and Pape 2006). When teachers' beliefs affect the situation, there will be pressure on the teachers to identify with the group. Therefore, in an environment that emphasises students' academic achievements, trust in students and parents, as well as a belief in the ability of the faculty, teachers' behaviours regarding their professional commitment will change. This point of view is only an assumption, and thus another hypothesis is proposed.

H5. There is a positive predictive relationship between school academic optimism and teachers' professional commitment.

When teachers believe in their teaching capabilities, have trust in students, and emphasise the importance of education, they will spend more time and energy on advancing their professional careers. As compared with those affected by extraneous motives, such as salary, teachers with academic optimism can more consistently uphold their commitment to their professional careers. Because teachers' academic optimism and professional commitment are resilient beliefs, those with a professional commitment will continuously apply themselves to their careers, so that students can grow and learn effectively. Firestone (1996) suggested that there is a predictive relationship between teachers' professional commitment and students' studying motivation, attitudes, and academic achievements. Teachers' academic optimism and professional commitment may be indirectly linked to students' academic achievement. Therefore, the next hypothesis is proposed as follows.

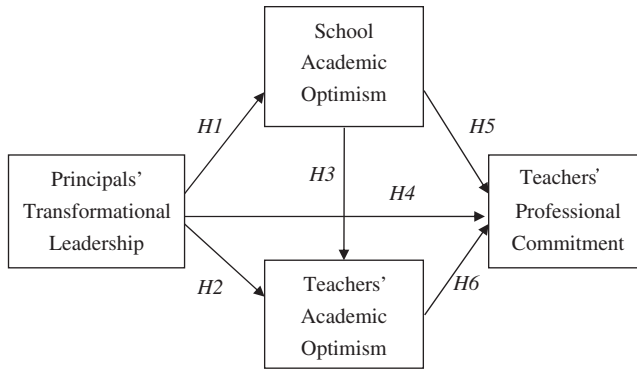


Figure 1. Model of high school teachers' academic optimism hypothesis.

H6. There is a positive predictive relationship between teachers' academic optimism and teachers' professional commitment.

Figure 1 illustrates the research framework of this study.

3. Research method

This study conducted a pre-test on 204 teachers (80 males and 124 females) from 11 high schools in Taiwan by convenience sampling. The official samples of this study were high school teachers in Taiwan randomly selected from 22 high schools among a total of 340. Each of the 22 high schools randomly selected at least 12 and up to 30 teachers to fill the questionnaire. Altogether, there were 367 samples. The formal questionnaire survey was given to 367 teachers from 22 high schools in Taiwan by random sampling. The researcher selected 12–30 teachers from each school. Among the subjects, 171 teachers are from public schools (46.6%) and 196 are from private schools (53.4%); 12 teachers are from schools with 13–24 classes (33%), 173 are from schools with 25–48 classes (47.1%) and 182 teachers from schools with more than 49 classes (49.6%); 129 teachers are male (35.1%), and 238 teachers are female (64.9%); 105 teachers have served less than five years (28.6%), 101 have served for 6 to 10 years (27.5%), 76 have served for 11–15 years (20.7%), 54 have served for 16–20 years (14.7%), and 31 teachers have served more than 21 years (8.4%).

3.1. Measurements

In order to validate the hypotheses proposed in this paper, four scales were developed: the Principals' Transformational Leadership Scale, the School Academic Optimism Scale, the Teachers' Academic Optimism Scale, and the Teachers' Professional Commitment Scale. The descriptions of the scales are defined as follows.

3.1.1. Principals' transformational leadership scale

The Principals' Transformational Leadership Scale is developed by referring to Bass (1985), as well as Nir and Kranot (2006) and Podsakoff et al. (1990). The scale includes nine items and is based on a six-point Likert scale (1 = completely disagree to 6 = completely agree). The Kaiser-Meyer-Olkin measure of sampling adequacy is .832, and the Bartlett ball shape

test $\chi^2(36) = 1493.511$ ($P < .001$). The nine items measure three factors of principals' transformational leadership - namely, intellectual excitement (3 items), good model (3 items), and high performance expectation (3 items), which explain 84.269% of variance. In the context of education, intellectual excitement means that the principal can provide teachers with new ideas and methods for handling affairs. For instance, the principal requires a teacher to consider all things involved before taking any action. A good model indicates that the principal is self-disciplined and sets an example for the subordinate. For instance, the principal sets a good model for a teacher. High performance expectation means that the principal expects good performance from teachers and hopes that they stick to their objectives. For instance, the principal often says that he or she has high expectations on the school's teachers. The alpha coefficient of the scale is .9336, and that of the three factors is .9293, .9711 and .9053, respectively. Therefore, the scale is shown to have high reliability (see Table 1).

3.1.2. School academic optimism scale

School academic optimism includes three factors: academic emphasis, collective efficacy and teachers' trust in parents and students (Hoy, Tarter, and Woolfolk Hoy 2006a, Hoy, Tarter, and Woolfolk Hoy 2006b). The sub-scales are developed by referring to Goddard, Hoy and Woolfolk Hoy. For academic emphasis, this paper modifies the Academic Emphasis Scale developed by Goddard, Hoy, and Woolfolk Hoy (2000) and the Organisational Health Measurement Scale developed by Hoy and Miskel (2008) and Hoy and Tarter (1997). For collective efficacy, this paper modifies the Collective Efficacy Questionnaire (short format) developed by Goddard (2002a), Goddard, Hoy, and Woolfolk Hoy (2004), and Goddard, Sweetland, and Hoy (2000). Teachers' trust in parents and students is modified from Teacher's Trust in Parents and Students Scale developed by Hoy and Tschannen-Moran (2003).

The 11 items in this scale are based on a 6-point Likert scale (1 = completely disagree to 6 = completely agree). The Kaiser-Meyer-Olkin measure of sampling adequacy is .878, and the Bartlett ball shape test $\chi^2(55) = 1776.134$ ($p < .001$). The 11 items measuring the three factors of school academic optimism, including school academic emphasis (4 items), collective efficacy (3 items), and teachers' trust in parents and students (4 items), can explain 66.77% of variance. The alpha coefficient of the School Academic Optimism Scale is .8735, and that of the three sub-scales is .7622, .7034 and .8875, respectively. As can be seen, the reliability of this scale is good (see Table 1).

3.1.3. Teachers' academic optimism scale

Teachers' academic optimism includes three factors: teachers' academic emphasis, teacher efficacy, and teachers' trust in parents and students (Woolfolk Hoy, Hoy, and Kurz 2008). For teachers' academic emphasis, this paper modifies the Academic Emphasis Scale developed by Goddard et al. (2000) and the Organisational Health Measurement Scale developed by referring to Hoy and Miskel (2008) and Hoy and Tarter (1997). For teacher efficacy, this paper modifies the Teacher Efficacy Scale (simple format) developed by Tschannen-Moran, Woolfolk Hoy, and Hoy (1998). For teachers' trust in parents and students, this paper modifies the Trust Questionnaire developed by Hoy and Tschannen-Moran (2003). As the three scales are all related to the internal conditions of the schools, they are modified to allow teachers to provide their personal opinions.

The 11 items in this scale are based on a 6-point Likert scale (1 = completely disagree to 6 = completely agree). The Kaiser-Meyer-Olkin measure of sampling adequacy is .903, and

Table 1. Summary of item mean, standard deviation and factor loading.

	Mean	Standard deviation	Factor loading
<i>Principals' transformational leadership scale</i>			
Intellectual excitement			
Principal wants me to think before execution	4.654	0.963	0.892
Principal wants own points of views to be supported by good theories	4.594	0.923	0.890
Principal wants me to handle things with reason and evidence	4.625	0.954	0.879
Principal can act as a role model to lead the school	4.974	0.860	0.890
Principal is a role model to the teachers	4.940	0.879	0.843
Principal provides a role model which can be followed by teachers	4.943	0.895	0.826
Principal often expresses high expectations of us	5.059	0.876	0.864
Principal emphasises that employees' performances have to be the best	4.971	0.907	0.838
Principal demands the highest level of teaching and administrative work	4.993	0.934	0.826
<i>School academic optimism scale</i>			
Teachers' trust in parents and students			
Teachers of this school all have trust in parents	4.436	0.8335	0.842
Teachers of this school think that students' and parents' commitments can be trusted	4.3978	0.9022	0.831
Teachers of this school think that most of the parents will make efforts to educate their own children	4.1839	0.9777	0.792
Teachers of this school believe that students of this school can be trusted	4.2984	0.9137	0.765
Students of this school will attain the goals set by the school	4.0872	0.9796	0.776
Students may want the assistance of teachers	4.1144	0.9541	0.747
The school may set a high standard for students' academic achievement	4.2956	1.0365	0.733
Students who emphasise academic achievement are generally accepted	4.6839	0.8187	0.583
Teachers of this school can include all students in learning	4.9278	0.832	0.783
Teachers of this school all have the ability to educate students	4.9183	0.7457	0.765
Students in school are in a safe environment for studying	5.2616	0.7184	0.683
<i>Teachers' academic optimism scale</i>			
Teacher efficacy			
When teaching in class, I can apply several teaching strategies	4.9496	0.6802	0.776
I can provide students with a good study environment	4.891	0.6552	0.755
I can ask questions according to student's abilities	4.9373	0.635	0.748
I can give students a tranquil environment in which to study	4.7234	0.6879	0.733
I believe that most parents will make the effort to educate their own children	4.6281	0.7673	0.811
Students' and parents' commitments can be trusted	4.5518	0.8421	0.776
I think that all students have learning capability	4.8583	0.8365	0.754
I believe in students	4.9469	0.7007	0.605
Teachers' trust in parents and students			
Students in my class will achieve the goals that the school has set for them	4.2071	0.908	0.808
The students in my class may want assistance from teachers	4.4087	0.8905	0.782
My classroom is clean and provides a serious environment for the students	4.5613	0.9006	0.732

(Continued)

Table 1. (Continued)

	Mean	Standard deviation	Factor loading
<i>Teachers' professional commitment scale</i>			
Intent to stay			
I am glad that I chose teaching as a career	5.2684	0.7889	0.895
I am satisfied with my work as an educator	5.0967	0.8657	0.842
I will stay in the academic profession although there are other employment opportunities	5.1880	0.8894	0.83
I feel happy when I can solve students problems	5.3678	0.699	0.790
Profession and devotion			
To provide students with better learning, I am willing to communicate more with the parents and find solutions for students.	5.0899	0.7762	0.758
I believe that I, as a teacher, should have the authority of professional judgement like a doctor or a lawyer and be responsible for my own decisions	5.327	0.6831	0.667
I will take work home that is related to teaching in spite of the lack of overtime pay	5.3297	0.7764	0.606

the Bartlett ball shape test $\chi^2(55) = 1809.455$ ($p < .001$). These 11 items, which measure teachers' academic emphasis (3 items), teacher efficacy (4 items), and teachers' trust in parents and students (4 items), can explain 68.46% of variance. The alpha coefficient of teachers' academic optimism is .8899, and that of the three sub-scales is .8164, .8096 and .8376, respectively. As can be seen, the reliability of this scale is good (see Table 1).

3.1.4. Teachers' professional commitment scale

This paper uses the Organisational Citizen Behaviour Scale developed by DiPaola and Tschannen-Moran (2001). The Questionnaire Revision of DiPaola, Tarter, and Hoy (2005), Chiang (1997), and Kuo (1996) is employed to evaluate the subjects' beliefs in organisational levels. The scale is modified to evaluate teachers' beliefs. The seven items in this scale are based on a six-point Likert scale (1 = completely disagree to 6 = completely agree). The Kaiser-Meyer-Olkin measure of sampling adequacy is .824, and the Bartlett ball shape test $\chi^2(21) = 1010.682$ ($p < .001$). These seven items, which measure profession and devotion (4 items) and intent to stay (3 items), can explain 66.289% of variance. The alpha coefficient of the Teacher Professional Commitment Scale is .8357, and that of the two factors is .7318 and .8639, respectively. As can be seen, the reliability of this scale is good (see Table 1).

4. Research results

All normal distribution tests of the variables in this research apply an analysis of skewness and kurtosis, the coefficients of which are between ± 3 . AMOS6.0 Statistics was used to evaluate principals' transformational leadership, school academic optimism, teachers' academic optimism and teachers' professional commitment by confirmatory factor analysis. The fitting indicators used for this study include χ^2 , GFI, CFI, and RMSEA. If the χ^2 value does not exceed 3 (Bagozzi and Yi 1988), then GFI is over .9 (Hu and Bentler 1999), CFI is over .95 (Bentler 1988), and RMSEA is below .08 (Browne and Cudeck 1993), and these can be viewed as ideal values for the goodness of fit.

For principals' transformational leadership, the results of the confirmatory factor analysis on the model fit are: $\chi^2/24$ ($n = 367$) = 1.982, $p = .003$, GFI = .973, CFI = .993, and RMSEA = .052. Therefore, the model fit is ideal. For school academic optimism, the results of the confirmatory factor analysis are: $\chi^2/41$ ($n = 367$) = 2.378, $p = .000$, GFI = .956, CFI = .968, and RMSEA = .061, and so model fitting is ideal. The results of the confirmatory factor analysis on teachers' academic optimism are: $\chi^2/41$ ($n = 367$) = 2.166, $p = .000$, GFI = 0.958, CFI = .973, and RMSEA = .056. Therefore, the model fit is ideal. The results of the confirmatory factor analysis on teachers' professional commitment are $\chi^2/13$ ($n = 367$) = 2.756, $p = .001$, GFI = 0.974, CFI = .977, and RMSEA = .069. Therefore, the model fit is ideal.

4.1. Descriptive analysis

Table 2 shows the variables of the mean, as well as the standard deviation and correlation coefficient of the four scales. As seen, principals' transformational leadership, school academic optimism, teachers' academic optimism and teachers' professional commitment are significantly related. The correlation between the variables is over .4, indicating that there is a relationship between each of the sub-scales. Only "school academic emphasis" and "good

Table 2. The estimation of correlation coefficient ($n = 367$).

Variables	M	SD	I	II	III	IV	M	SD	1	2	3	4	5	6	7	8	9	10	11
I. Principal' transfor	43.753	6.623	-				13.873	2.657	1										
1 Intellectual excitement							14.857	2.562	.621 ^c	1									
2 Good model							15.023	2.492	.597 ^c	.601 ^c	1								
3 High performance leadership expectation							17.181	2.905	.255 ^c	.176 ^c	.275 ^c	1							
4 School academic emphasis	49.605	6.491	.472 ^c	-			15.108	1.823	.439 ^c	.449 ^c	.552 ^c	.430 ^c	1						
5 Collective efficacy							17.316	3.141	.331 ^c	.382 ^c	.314 ^c	.563 ^c	.497 ^c	1					
6 Teachers' trust in parents and students							13.177	2.308	.309 ^c	.265 ^c	.263 ^c	.653 ^c	.436 ^c	.640 ^c	1				
7 Teachers' academic emphasis	51.664	5.917	.415 ^c	.745 ^c	-		19.501	2.122	.287 ^c	.264 ^c	.314 ^c	.403 ^c	.515 ^c	.353 ^c	.497 ^c	1			
8 Teacher efficacy							18.985	2.587	.317 ^c	.356 ^c	.318 ^c	.426 ^c	.455 ^c	.685 ^c	.644 ^c	.540 ^c	1		
9 Teachers' trust in parents and students							21.114	2.188	.358 ^c	.368 ^c	.426 ^c	.259 ^c	.485 ^c	.275 ^c	.298 ^c	.629 ^c	.448 ^c	1	
10 Profession and devotion	36.668	3.904	.483 ^c	.419 ^c	.544 ^c	-	15.553	2.258	.334 ^c	.404 ^c	.300 ^c	.214 ^c	.424 ^c	.281 ^c	.293 ^c	.408 ^c	.363 ^c	.541 ^c	1
11 Intent to stay																			

^c $p < .001$.

model" are correlated below .2, while all of the other scales are correlated above .2. Overall, the path analysis can be made on this research structure.

4.2. Testing the hypotheses

The hypothesis mode proposed in this study was a satiation one, and so the first step was to check the standard errors of the path coefficients and the standardised regression coefficients among the variables. It was found that the standard errors of the path coefficients (ranging from 0.028 to 0.045) were not high and were actually very low compared with the path coefficients. This demonstrates that the parameter estimates of the hypothesis mode were rather stable (See Marsh et al. 2004). Despite the fact that the two potential prediction variables – schools' academic optimism and teachers' academic optimism – were highly correlated, there was no error in the mode estimation caused by multi-collinearity. The hypothesis testing of this study is a saturated mode; thus, this paper first presents the standard regression coefficients between the variables. The standard regression coefficient of school academic optimism with respect to teacher professional commitment is -0.090 , which is an insignificant relationship. Therefore, the path between school academic optimism and teachers' professional commitment is deleted, and the model is revised. The fit of values on the revised model is: $\chi^2/1 (n = 367) = 1.967, p = .161, GFI = .997, CFI = .998, \text{ and } RMSEA = .051$. Therefore, the fit is ideal (see Figure 2).

If two highly correlated potential prediction variables predict a potential criterion variable at the same time, then two path coefficients can be constrained to be equal to obtain an alternative mode. The alternative mode will then be compared with the original mode with unconstrained paths (the initial mode is Mode 1 of this study) to find out which mode is better. At the same time, schools' academic optimism and teachers' academic optimism will be standardised for a comparison of identical equality of path. As suggested by Marsh et al. (2004), this study took a modified mode as the foundation and an equivalence constraint mode as the alternative mode, making the path coefficient of schools' academic optimism for teachers' professional commitment equal to that of teachers' academic optimism for teachers' professional commitment. If schools' academic optimism and teachers' academic optimism are collinear or reflect the same constructional dimension, then such a setting should be more ideal than the modified mode; the goodness-of-fit of the equivalent constraint mode is as follows: $\chi^2(1, n = 367) = 23.078, p = .000, GFI = .970, CFI = .961, \text{ and } RMSEA = .246$. In general, the modified mode was more ideal than the equivalent constraint mode. Therefore, the modified mode proposed in this study does not result in any error caused by multi-collinearity in the mode estimation.

According to Figure 2, in the revised model the predicted main effect of the variables is in the order of: school academic optimism positively influences teachers' academic optimism (0.706), the main effect of principals' transformational leadership on teachers' professional commitment (0.483), the main effect of principals' transformational leadership on school academic optimism (0.472), the main effect of principals' transformational leadership on teachers' academic optimism (0.415), the main effect of teachers' academic optimism on teachers' professional commitment (0.415), and the main effect of school academic optimism on teachers' professional commitment (0.293). The predicted direct effect is in the order of: the direct effect of school academic optimism on teachers' academic optimism (0.706), the direct effect of principals' transformational leadership on school academic optimism (0.472),

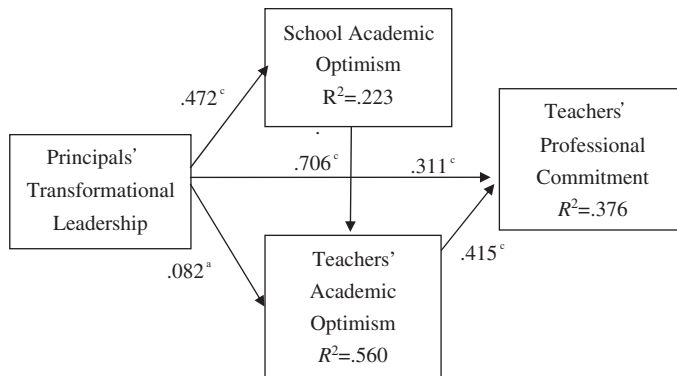


Figure 2. High school and teachers' academic optimism path analysis: revised model ^a $p < .05$. ^c $p < .001$.

the direct effect of teachers' academic optimism on teachers' professional commitment (0.415), the direct effect of principals' transformational leadership on teachers' professional commitment (0.311), and the direct effect of principals' transformational leadership on teachers' academic optimism (0.082). The predicted indirect effect is in the order of: the indirect effect of principals' transformational leadership on teachers' academic optimism (0.333), the indirect effect of school academic optimism on teachers' professional commitment (0.293), and the indirect effect of principals' transformational leadership on teachers' professional commitment (0.172).

A further examination on the relationships between principals' transformational leadership, school academic optimism and teachers' academic optimism reveals a significant relationship between these three variables. Principals' transformational leadership can positively predict school academic optimism ($\gamma = .472, p < .001$) and teachers' academic optimism ($\gamma = .082, p < .05$); school academic optimism can positively predict teachers' academic optimism ($\gamma = .706, p < .001$). All three paths have a direct effect on each other. The mediating effect of school academic optimism on the relationship between principals' transformational leadership and teachers' academic optimism is also significant ($z = 9.249, p < .001$). In other words, there is a partial mediation effect of school academic optimism on the relationship between principals' transformational leadership and teachers' academic optimism. This finding supports the view that principals' transformational leadership can be a positive influence in constructing a culture of school academic optimism, and school academic optimism can further influence teachers' behaviours. Principals' transformational leadership and school academic optimism account for 56% of variance in teachers' academic optimism. Moreover, principals' transformational leadership accounts for 80.25% of the variance in teachers' academic optimism through school academic optimism. This indicates that principals' transformational leadership has a positive effect on teachers' academic optimism, but partially influences teachers' academic optimism by school academic optimism. Therefore, when the school attempts to increase teachers' academic optimism, it must also increase school academic optimism.

A further examination on the relationships between principals' transformational leadership, teachers' academic optimism, and teachers' professional commitment suggests that there is a direct relationship between principals' transformational leadership and teachers' academic optimism ($\gamma = .082, p < .05$), between teachers' academic optimism and teachers'

professional commitment ($\gamma = .415, p < .001$), and between principals' transformational leadership and teachers' professional commitment ($\gamma = .311, p < .001$). There is a significant mediating effect of teachers' academic optimism on the relationship between principals' transformational leadership and teachers' professional commitment ($z = 2.310, p < .05$). These results indicate that there is a partial mediation effect of teachers' academic optimism on the relationship between principals' transformational leadership and teachers' professional commitment. However, principals' transformational leadership accounts for 9.863% of variance in teachers' professional commitment through teacher's academic optimism.

The hypotheses are examined by the regression coefficient of the path analysis model. The results show that principals' transformational leadership has a positive predictive relationship with school academic optimism (H1) and teachers' academic optimism (H2); school academic optimism has a positive predictive relationship with teachers' academic optimism (H3); principals' transformational leadership has a positive predictive relationship with teachers' professional commitment (H4); teachers' academic optimism has a positive predictive relationship with teachers' professional commitment (H6). All of these hypotheses are supported. However, H5, the positive predictive relationship between school academic optimism and teachers' professional commitment, is not supported.

5. Discussion

The difference that sets this research apart from previous studies on academic optimism is that the results of this research support the theory that three factors (i.e. self-efficacy, a sense of trust, and academic emphasis) are constitutive of academic optimism at the school level and teachers' personal level. This study also indicates that the concepts of school academic optimism and teachers' academic optimism fit the sample of high school teachers in Taiwan. Furthermore, this study provides a theoretical basis for the relationship between school academic optimism and teachers' academic optimism, which is practically supported. Based on the above findings, measures to enhance school academic optimism and teachers' academic optimism can be proposed. The influence of school academic optimism and teachers' academic optimism on teaching behaviour is discussed. This study has four main contributions: (1) it supports academic optimism at the school level and the teachers' personal level, strengthened by efficacy belief, a sense of trust, and academic emphasis; (2) it demonstrates that school academic optimism has a strong influence on teachers' academic optimism; (3) it suggests that developing principals' transformational leadership is a feasible approach to enhance school academic optimism and teachers' academic optimism; (4) it explains the reason that some teachers spend more time and energy on teaching and continue to make commitments. These four points are further elaborated below.

First, this study conducts confirmatory factor analysis on school academic optimism and teachers' academic optimism and finds a good fit between the two. In other words, the three measurements – namely, school academic emphasis, collective efficacy and teachers' trust in parents and students – give some indications of the level of optimism in the school. In the same way, the results show that schools with high academic optimism have high academic emphasis, teacher self-efficacy beliefs, and trust in parents and students. Therefore, applying these indicators on the school environments in Taiwan can help explore the culture of the schools. The development of academic optimism also applies to encouraging positive and optimistic teachers to become efficient, cooperative and productive.

Second, with regard to the positive relationship between school academic optimism and teachers' academic optimism, the three factors (i.e. academic emphasis, collective efficacy, and teachers' trust in parents and students) interact with each other to form a culture of school academic optimism, which affects the school atmosphere. The findings support H3. In this kind of school atmosphere, teachers develop better collegiate friendships. By discussing, observing and sharing personal teaching experiences, all teachers can discern correct teaching behaviours and develop academic optimism, thus gaining a higher level of self-efficacy to place a greater emphasis on students' academic achievement and learning to trust parents and students.

Third, principals' transformational leadership has a positive predictive effect on school academic optimism and teachers' academic optimism. The findings support H1 and H2. Hoy, Tarter, and Woolfolk Hoy (2006a) suggested that in order to increase school academic optimism, it is necessary to improve all three factors of academic emphasis, collective efficacy and a sense of trust. Previous research has examined the relationships between the three sub-scales of principals' transformational leadership and school academic optimism. The findings have provided strong support for the results of this study.

Although principals' transformational leadership and teachers' academic optimism are positively related, the standard regression coefficient of the path analysis model is only .082. This indicates that the relationships between principals' transformational leadership, teachers' academic optimism and school academic optimism also play an important part. In other words, when the principals attempt to improve teachers' academic optimism, it is necessary to construct a positive school academic optimism environment, by establishing a high level of teachers' collective efficacy, emphasising on academic achievements and increasing the sense of trust to shape the school environment. Such a school is a collective cultural environment whose effective behaviour norms enable teachers to develop academic optimism.

In practical terms, to increase school academic optimism the principals not only need to exhibit transformational leadership, but also need to improve the school academic optimism climate, increase teaching efficacy, and develop trust in parents and students. To achieve the above, the principals can honour teachers' good performance, set high and achievable aims, demand cleanliness and a serious teaching environment and provide teachers with chances to succeed in promoting a climate. Furthermore, the principals need to assign teaching tasks according to teachers' abilities and needs, honour good teachers to enhance their confidence, and provide interactive communication channels of teaching and class management structures to strengthen collective efficacy. Finally, the principals can enhance teachers' trust in parents and students by organising school activities that could encourage the interaction between teachers and students, communicating to teachers that "students and parents are the main partners in bringing about students' learning and efficient teaching", asking students and parents to participate in the setting of educational policies, and establishing a school and academic department information window for students and parents.

Fourth, this study also examines the factors that can explain the professional commitments made by teachers, such as those who believe in their own educational abilities, who believe in students and place emphasis on educational importance, and who put forth more effort in teaching. It is found that if the principals display transformational leadership, then they are able to motivate the faculty to be loyal and teach effectively, thus enhancing teachers' academic optimism. Principals' transformational leadership is predicatively and positively

related to teachers' professional commitment. This finding supports H4 and is consistent with Bogler and Somech (2004) and Lee and Nie (2014). More importantly, with a high level of academic optimism, teachers may spend more time and energy on teaching, thus developing trust in their teaching ability and in the students. This finding supports H6. When teachers develop such an attitude and strive to achieve professionalism in teaching, they will be stimulated and motivated to continue with a teaching career. Teachers with high academic optimism will help students to mature and attain academic success, which are the rewards for the teachers, whereas salary, social welfare, greater power and other advantages are incomparable. Therefore, when a school wants to enhance teachers' academic optimism, it should encourage teachers, honour them for their effort, set them up as positive examples and facilitate them to learn from each other. Furthermore, through communication, more solutions can be proposed.

This study finds that principals' transformational leadership and school academic optimism indirectly affect the professional commitment of teachers. Principals' transformational leadership has an indirect effect on teachers' professional commitment due to the effect of such leadership on school academic optimism and teachers' academic optimism. Conversely, the hypothesis that school academic optimism and teachers' professional commitment are predicatively positively correlated is not supported. School academic optimism can only increase teachers' professional commitment through teachers' academic optimism. In other words, teachers' academic optimism needs to be increased in order to enhance their professional commitment. By influencing teachers' professional commitment and enhancing their academic optimism, good teachers can develop loyalty and commitment to the school.

6. Limitations

This study has three limitations. First, as principals' transformation leadership is a transformed leadership, group leadership behaviour in other areas, such as education and training, social support, democratic behaviour, positive feedback and avoidance of totalitarian leadership behaviour, does not necessarily show the same results as the analysis of school academic optimism, teachers' academic optimism, teachers' professional commitment and other variables. In the future, an advanced analysis of school academic optimism and teachers' academic optimism can be conducted to cross validate the results of this study.

Because this study is limited by the sample size, school academic optimism at the school level could not be a significantly positive predictor of differences between teachers' academic optimism and teachers' professional commitment. Future studies may consider expanding the sample size to explain the multilevel effect of school academic optimism on teachers' academic optimism and teachers' professional commitment. Furthermore, this study focused on the relationship among principal-based transformational leadership, schools' academic optimism, teachers' academic optimism, and teachers' professional commitment, but it did not control the number of schools, the scale of a school, the seniority of teachers, and the age of teachers in the path mode. It is hoped that future studies will conduct a difference analysis to sort out the possible changes to schools'/teachers' academic optimism caused by the scale of the school, the seniority of teachers, and the age of teachers.

All the scales of this study were based on independent scales. For instance, the scale of teachers' academic optimism was based on the scale of academic emphasis, the scale of teachers' efficacy, and the trust questionnaire, as were the other three scales. Although a

demonstrative factor analysis was made in this study, the constructs that originally existed in the scales might disappear in the making of the scale and the factor analysis, which made it impossible to reflect other dimensional concepts of the variables. It is hoped that future studies will adopt a multi-trait-multi-method to further verify the validity of the scale of this study.

This study overall supports the significant relationships between principals' transformation leadership, school academic optimism, teachers' academic optimism and teachers' professional commitment. However, the model developed herein cannot analyse the causes of principals' transformation leadership, school academic optimism, teachers' academic optimism and teachers' professional commitment. Future research can use experimentation to study the mechanisms through which principals' transformation leadership influences teachers' professional commitment.

7. Directions for future research

This study discussed principals' transformation leadership, school academic optimism, teachers' academic optimism and teachers' professional commitment. Future studies can include teachers' demographic characteristics (e.g. gender, years of teaching) and school attributes (e.g. teaching grades, school size, school characteristics) to verify their influences on school academic optimism and teachers' academic optimism. Moreover, teachers' personal optimism and well-being, which are the same positive variables as school academic optimism, can play an important role in enhancing teachers' academic optimism.

The question remains as to whether school academic optimism also fits students? When students' academic optimism and school academic optimism form a fit, what are the relationships between students and their academic optimism? Do the students' personal characteristics and academic optimism influence their academic achievements, learning motivations, career development or other variables? The above points can be directions for future research.

Disclosure statement

No potential conflict of interest was reported by the author.

Notes on contributor

Hong Fu-Yuan, PhD. is an associate professor in Graduate Institute of Professional Development in Education, based at Da-Yeh University in Taiwan. His research has focused primarily on issues associated with high maintenance behaviour, the use of smart phones, mobile phone addiction, facebook usage and facebook addiction.

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