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ABSTRACT

A study comparing the effects of student self-concept, classroom environment, and socioeconomic status on student aspirations and achievement surveyed 3,397 students in 28 rural and urban high schools in Western Australia over a period of 3 years. Government and nongovernment schools in metropolitan areas and in four categories of rural and remote areas were included. This paper presents findings from data collected during the first year. The classroom learning environment had a strong, positive effect on student self-concept, which in turn had an indirect effect on student ambition and aspirations. Socioeconomic status (SES) had a strong, positive effect on student ambition and aspirations, but did not directly affect self-concept. The effect of SES on ambition was very strong; the effect on achievement was weak, but positive. Overall, SES had an overwhelming impact on these student outcomes. Self-concept had a direct effect on student ambition, aspiration, and achievement. This effect was mitigated by SES, but was still strong. For urban students, there appeared to be little or no relationship between self-esteem and ambition. For rural students, there was a small effect of self-esteem on ambition and a larger effect of ambition on self-esteem. Contains 41 references and 15 tables and figures. (TD)

Self-Esteem in Rural Schools: Dreams and Aspirations

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Overview

The purpose of this study was to compare the effects of the self-concept (self-esteem), the classroom learning environment and socioeconomic status on student aspirations attending rural and urban schools.

There are three aspects of student life which together drive the student's expected future as a successful person: determination to achieve their desired goals, belief in their ability to achieve these goals and the ability which would match these goals. In this study, these three aspects will be referred to respectively as *Ambition*, *Self-Concept* and *Achievement*. The inter-relationships between these three student outcomes are not well known, nor documented in the literature, so this researcher selected the latent variable structural equation model as the model of choice which would adequately account for the measurement error within each of these outcomes, while simultaneously estimating the effect of each outcome. The effect of the classroom upon these student outcomes is investigated here by estimating the effect of the *Classroom Learning Environment*. In this investigation, the student's background was controlled for by including a measure of *Socioeconomic Status*.

Of singular importance is the assertion that rural students are disadvantaged by their location, culture and lack of access to similar facilities as their counterparts living in the city. However, rural/urban differences in student outcomes are not easily understood. That rural schools may be somehow inferior has already been abandoned as a valid claim in understanding these differences. Socioeconomic problems penetrate both the city schools and the country schools, and so socioeconomic measures must be included in any analysis of these differences.

In this study, the relationships between the three student outcomes were examined for both rural and urban schools, with the effects compared using the multi-sample analysis procedure.

Background Literature to Rural Education

Dreams and Aspirations

This discussion is grounded in a theoretical framework developed by Sizer (1996) and Quaglia and Cobb (1996) who have inspired this article and these analyses. While Sizer points to the student with dreams and aspirations - for Sizer it is the teacher who figures out how to stoke a student's little fire. Conceptualisation of aspirations by Quaglia and Cobb is "a student's ability to identify and set goals for the future, while being inspired in the present to work toward those goals" (1996, p. 130).

> This construct of aspirations has two major underpinnings: *inspiration and ambitions*. Inspiration reflects that an activity is exciting and enjoyable to the individual and the awareness of being fully and richly involved in life here and now. It is depicted by an individual who becomes involved in an activity for its intrinsic value and enjoyment. An individual with a high level of inspiration is one who believes an activity is useful and enjoyable. Ambitions represent the perception that an activity is important as a means to future goals. It reflects individuals' perceptions that it is both possible and desirable to think in future terms and to plan for the future. (Quaglia & Cobb, 1996, p. 130)

Quaglia and Cobb asked how the student aspirations interact with their environment, both at school and at home. How does the school climate influence student aspirations? What conditions appear to effect changes in the way students view the work they do in school and the goals they set for their future? The research presented here is posited within this framework. That schools can help foster aspirations, that there remains a student characteristic which drives their goals and aspirations and that both the home and school environments can influence these aspirations will be discussed here.

Before moving on from Quaglia and Cobb, a final note. Aspirations are qualified by experiences of success

and failure and by social pressures to aim high and do well. Social comparison theory points to cultural standards which bear down upon these aspirations, pressuring students to conform and placing a ceiling upon them.

> For a child to dream is such a heralded notion. But how often do we as educators encourage students to dream, yet overlook what it will take in the present to realize those dreams? (Quaglia & Cobb, 1996, p. 131)

More Aspirations

Occupational and educational aspirations of rural young people is of considerable importance to rural Australians. It is not enough to have the right attitude and the top tertiary entrance examination score, if the student faces insurmountable barriers to accessing further education and employment. However, in conducting research with a number of rural Australian teachers previously, many teachers felt that students' aspirations were too high! That is, these students were trying to sit tertiary examinations in Year 12 when the teachers did not feel that these students had any hope of gaining a high enough score to get into a university. Of course, this is anecdotal evidence and little research has been conducted in rural schools to follow student aspirations. Stringfield and Teddlie's exemplar research into 16 paired rural and urban schools suggested that teachers in rural schools had higher expectations for their students (Stringfield & Teddlie, 1991).

The problems faced by Australian rural students are confounded. Firstly, when these students grow from adolescence to mature adulthood, they also must face the reality that there is little for them in their town/farm/rural area. In order for these students to attain their potential in life choices, they must make a choice. Either they can stay with their families in their rural location and enjoy the rural lifestyle they are accustomed to, or they must move to the city to either look for work or further their education in vocational colleges or university. It is obvious to these students that education will expand and fulfil their lives; often parents send their children to boarding schools in the city in order to prepare them for the new changes which lie ahead. Unfortunately, some of these students, who are accepted into higher education courses, become extremely lonely and disheartened and return to their rural home. Of course many others are keen to leave home and become independent. It appears that this is sometimes related to the social network which rural students develop when they arrive in the city. Hektner attempted to disentangle the rural young person's aspiration for social mobility and preferences for residing in rural locations (Hektner, 1995). In his study of midwestern US schools, Hektner found a substantial amount of conflict experienced by rural students in choosing to leave or stay at home. Rural students were more likely to have conflicting aspirations about wanting to live at or near home and wanting to "move out in order to move up".

Stevens' investigation of influences on vocational choices of senior high school students in a rural community demonstrated that rural students have to make career decisions at an earlier age than urban students (Stevens, 1995). This study also found a significant difference between the rural working class and the rural middle class. That is, parents who are able to send their children to boarding schools in order to complete the final two years of high school did so from a superior financial base. In the rural school which Stevens' studied, there was negligible provision for students to complete their high school education, with the result that the working class families were disadvantaged and unlikely/unable to send their children to boarding schools. Further, Stevens' noted a difference in the students' perceptions of the world and their ability to cope in an urban school environment. Many rural students were supplied with inadequate information and counselling in order to choose their school subjects for their chosen occupations and also experienced conflict regarding the superiority of the urban lifestyle which lay before them. These findings are similar to McCracken and Barcinas (1991), whose study of rural schools in Ohio revealed that rural students tended to be more homogeneous, come from larger families and have lower socioeconomic status. Rural parents tended to have a lower educational attainment and were less likely to expect their children to attain an education beyond high school. McCracken maintained that these parental and home influences helped to explain why rural students chose lower educational courses. However, rural youth were also more likely to select vocations which they had been able to observe or experience, such as agricultural college or technical colleges. Students in rural areas had lower income expectations, did not observe many high-income workers and those students who were bright and capable tended to be sent away to complete their education. The discrepancy in educational aspirations between rural and non-rural students seems clear, yet the reasons for it are not. Initiatives to raise students' aspirations in rural settings have had limited research foundations. However, it is the hope of a number of researchers that research can be developed which can make a difference both to the research field and to the student (Walberg, 1989; Quaglia, 1989; Cobb, McIntire & Pratt, 1989; Reid, 1989; McCaul, 1989; Pratt & Skaggs, 1989; Breen, 1989; Hansen & McIntire, 1989; Preble, Phillips & McGinley, 1989; Sherwood, 1989).

There appears to be a distinct relationship between socioeconomic status, occupational aspirations and

educational aspirations and this theme has been the subject of research by Haller and Virkler (1993). These important relationships framed this research study of the psychological, socioeconomic and classroom influences on occupational aspirations and educational aspirations.

Self-Concept/Self-Esteem

In previous research about self-concept (commonly referred to as self-esteem), the multidimensional nature has been well documented (Byrne, 1984; Hattie, 1992; Marsh, 1990, 1993; Marsh & Shavelson, 1985). That is, self-concept consists of a number of facets but it is unclear how these facets aggregate into higher order factors. Marsh's facets include physical abilities and sport, physical appearance, relationship with peers, relationships with parents, reading self-concept, mathematics self-concept and self-concept in all school subjects. The academic components of the model have been the focus of attention in relationship to external constructs, such as academic achievement. We included two components of the Marsh Self Description Questionnaire (SDQII) designed to measure adolescent self-concepts (Marsh, 1992). Hattie's review of the literature and research into Self-Concept is well documented in his monograph (1992).

In the literature, the relationships between Self-Concept, Ambition and the Classroom Learning Environment were not well understood. While it was expected that the Classroom may influence student Self-Concept and student Ambition, causality has not been documented. Further, these relationships have not been investigated in rural school settings. This study sought to address these issues using a path analytic technique which did not assume causality and could cope with measurement error.

Included in this study, were two measures of Self-Concept, namely, General Self-Concept and School Self-Concept. Both of these two measures are presented in Table 1. The General Self-Concept scale describes the student's feelings about himself/herself. There are both negative and positive statements related to success and failure in life. The School Self-Concept scale measures the student's perceptions about their academic ability and potential to be a success at school. In this paper, this scale will be referred to as academic self-concept or school self-concept.

Table 1. Description of Items in the Student Self-Concept Scale

STUDENT SELF-CONCEPT SCALES	
SCALE	*ITEMS*
General Self-Concept Items	Overall, I have a lot to be proud of.
	Overall, I am no good.
	Most things I do, I do well.
	Nothing I do ever seems to turn out right.
	Overall, most things I do turn out well.
	I don't have much to be proud of.
	I can do things as well as most people.
	I feel that my life is not very useful.
	If I really try, I can do almost anything I want to do.
	Overall, I'm a failure.
School Self-Concept Items	People come to me for help in most school subjects.
	I'm too stupid at school to get into a good university.
	If I work really hard I could be one of the best students in my school year.
	I get bad marks in most school subjects.
	I learn things quickly in most school subjects.
	I am stupid at most school subjects.
	I do well in tests in most school subjects.
	I have trouble with most school subjects.
	I'm good at most school subjects.
	Most school subjects are just too hard for me.

Science and Mathematics Achievement

For the purposes of this study, a relatively simple multiple-choice test of mathematics and science was employed. This test had already been validated internationally for use in the Third International Mathematics and Science Study (TIMSS) for 13-14 year old students. The TIMSS tested and questioned students, teachers and schools in 200 schools throughout Australia and in 50 other countries. The results of the TIMSS are available from the Australian Council for Educational Research (Lokan, Ford & Greenwood, 1996) and international findings may be viewed at http://wwwcsteep.bc.edu/timss.

Three different rotated forms of the possible eight tests available were used and the open-ended/free response part of the test was not used due to time constraints. There were 18 mathematics test items and 18 science test items which had to be completed in 45 minutes. There was reading time and example test items provided prior to the commencement of the test.

Analysis of the test items involved a procedure called Rasch Modelling which scores the test items and then estimates the student's ability on that test item as a function of the difficulty of the test item and the student responses to other test items. The result is a score which has a range from approximately -3.10 to +4.10. The final science and mathematics achievement measures were constructed using the Rasch Model.

The Classroom Learning Environment

That classes and schools differ in terms of their learning environments, which in turn influence student achievement has been demonstrated by Hattie (1987) who showed that 20% of students in desirable climates are better off than students in average classrooms. In the last 25 years there have been instruments developed for a range of classroom contexts, such as individualised classrooms (Fraser, 1990) and constructivist classrooms (Taylor, Dawson & Fraser, 1995). These instruments have been employed in a range of studies, with different instruments and scales used in particular studies. Recently, Fraser, Fisher and McRobbie (1996) began the development of a new learning environment instrument which incorporates scales that have been shown in previous studies to be significant predictors of outcomes (Fraser, 1994) and additional scales to accommodate recent developments and concerns in classroom learning, such as equity issues and the promotion of understanding rather than rote memorisation. The first version of the new instrument contained the following 9 scales, each scale containing 10 items: *Student Cohesiveness, Teacher Support, Involvement, Autonomy/Independence, Investigation, Task Orientation, Cooperation, Equity and Understanding*. The new instrument employed the same five-point Likert response scale (Almost Never, Seldom, Sometimes, Often, Almost Always) as used in some previous instruments.

For the purposes of this study, we used 5 of these scales in the student questionnaire, that is, *Student Cohesiveness, Teacher Support, Involvement, Task Orientation* and *Cooperation* (see Table 2). Subsequent analyses by Fraser, Fisher and McRobbie (1996) have demonstrated that the scales *Autonomy/Independence* and *Equity and Understanding* were not reliable.

Table 2. Description of Scales in the CLES and Example Items

CLASSROOM LEARNING ENVIRONMENT	
SCALE	*EXAMPLE ITEM*
Student cohesiveness	Friendships are made among students in this class.
Teacher support	The teacher goes out of his/her way to help students.
Student involvement	Students talk with each other about how to solve problems.
Task orientation	Class assignments are clear so everyone knows what to do.
Cooperation	Students share their books and other resources with each other when doing assignments.

Socioeconomic Status

There were four observed variables which were considered as measures of socioeconomic status: Mother's Occupation, Mother's Education, Father's Occupation and Father's Education. These are typically used as indicators of the student's home background and was important to control for socioeconomic status. The combination of these four variables is dependent upon the loading of each measure and the reliability of the final composite socioeconomic status. The effect of socioeconomic status upon student outcomes has been well documented previously, with the relationship between rurality and socioeconomic status of concern to educational researchers. In previous research, differences in rural/non-rural student outcomes such as achievement may be accounted for by the associated differences in socioeconomic status.

Research Questions

1. What is the effect of the Classroom Learning Environment on student aspirations and achievement?
2. What is the effect of Socioeconomic Status on student aspirations and achievement?
3. What is the effect of Self-Esteem/Self-Concept on student aspirations and achievement?
4. Does a model which explains the relationship between student aspirations, achievement, self-esteem, socioeconomic status and the classroom learning environment, differ for rural and urban schools?

Research Design: Western Australian School Effectiveness Study [WASES]

This research study, the Western Australian School Effectiveness Study [WASES], involves three phases. In the *First Phase*, the survey instruments were developed and piloted in two schools (1995).

In the *Second Phase*, a longitudinal survey is being conducted in 28 Western Australian high schools over a three year period. The purpose of this survey is to evaluate the school and classroom climate and characteristics of effective schools in differential contexts. Because the growth model is particularly useful for measuring change over time in student outcomes, while controlling for other influencing variables which may also change over time, the same students at the same schools will be surveyed over a period of three years (1996 to 1998). This phase is called WASES-II for 1996, WASES-III for 1997 and WASES-IV for 1998 and is being funded in part by the Australian Research Council and the Department of Education, Employment, Training and Youth Affairs (DEETYA). Finally, in the *Third Phase*, a case study approach will be used to examine some exceptionally effective and ineffective schools in the rural and urban locations of Western Australia (1997 to 1999). In this paper, some findings from data collected in the 1996 cohort (Second Phase) are presented.

Sample

Western Australian schools are located in a variety of locations, which have previously been categorized into three groups in other analyses (Tomlinson, 1994; Young, 1994a, 1994b): metropolitan Perth, rural and remote. Unfortunately, these three categories did not account for rural cities and other types of rural locations (similarly for the remote category). Subsequently, these categories have been expanded by the Department of Primary Industries and Energy and the Australian Bureau of Statistics (DPIE, 1994) into seven categories, five of which were then used in this study (Table 3a). The five categories were Metropolitan (Capital City), Small Rural Centres, Other Rural Areas, Remote Centres and Other Remote Areas and these were incorporated into this study. In Western Australia, only five categories were applicable.

Table 3a. Rural location categories.

Classification	Category	Population Size
Metropolitan:	Capital City	
	Other Metropolitan Centre	urban centre pop ≥ 100,000
Rural:	Large Rural Centres	urban centre pop 25,000 - 99,999
	Small Rural Centres	urban centre pop 10,000 - 24,999
	Other Rural Areas	< 10,000
Remote:	Remote Centres	urban centre pop ≥ 5,000
	Other Remote Areas	< 5,000

Sampling techniques used in this study were developed by Kish (1965) and further refined by Ross (1976, 1987). An important feature of this study involves the inclusion of Non-government schools. These included Catholic, Anglican and other types of Non-government schools, although no stratification was used for these school types. There were 3397 students in the achieved sample of students from 28 schools (see Table 3b), with representation from five rural categories: Perth (Metropolitan/Urban/Suburban), Small Rural Centres, Other Rural Areas, Remote Centres and Other Remote Areas.

Table 3b. Sample size by rural location.

Sample Size	Perth	Small Rural Centre	Other Rural Area	Remote Centre	Other Remote Area	Total Students
Students	619	747	1013	633	385	3397
Schools	4	6	9	5	4	28

Methodology: Congeneric Measurement Models and Reliability

Jöreskog (1971) proposed the congeneric measurement model for the formation of latent traits because indicators often contribute differently to the composite. When it is assumed that the contribution of each indicator is equal, then the composite scale is constructed by adding the indicator values. This summing of indicators may result in reduced reliability.

> If the measures being added do not reflect the same generic true score, then the resulting composite scale lacks validity. (Holmes-Smith & Rowe, 1994)

In the congeneric measurement model, each observed indicator contributes to a true score with varying degrees. Each contribution is called Lambda, which is a regression coefficient. Further, the error variances are allowed to vary or differ and these are called Theta Delta. The advantages of fitting the congeneric measurement models to large data sets have been described by Holmes-Smith and Rowe:

- a fitted congeneric model allows large numbers of like, observed variables to be reduced to a single composite scale for use in further analyses such as structural equation models or multilevel models
- fitting a congeneric measurement model allows for differences in the degree to which each individual measure contributes to the overall composite scale (Fleishman & Benson, 1987)

- the fit statistic for the congeneric model is a quasi test of validity; that is the indicator variables must be all of similar kind, represent the same generic true score or a single latent trait

For the purposes of this investigation, a two-factor congeneric measurement model was estimated for Socioeconomic Status and the Classroom Learning Environment. These two composites were measured using more than two observed indicators, making a one-factor model possible to measure. However, a three-factor congeneric measurement model was estimated for the combination of Ambition, Self-Concept and Achievement. Each of these composites were measured with two indicators and a one-factor measurement model was not possible due to the negative degrees of freedom. These models are now described in the following sections of this paper. The coding used for the indicator variables is detailed in Appendix I.

The measurement model for X is described in Jöreskog and Sörbom (1996, p. 123-124) Submodel 1 as:

$$X = \Lambda\xi + \delta$$

where

$X' = (X_1, X_2, \ldots, X_q)$ are the observed or measured variables,

Λ is the matrix Λ_x of the general model,

$\xi' = (\xi_1, \xi_2, \ldots, \xi_n)$ are the latent or unobserved variables, and

$\delta' = (\delta_1, \delta_2, \ldots, \delta_q)$ are error variances.

Jöreskog and Sörbom further explain that this measurement model assumes that the ξ's and δ's are random variables with zero means, the δ's are uncorrelated with the ξ's and all observed variables are measured in deviations from their means. The measurement model represents the regression of **x** on ξ and the element λ_{ij} of Λ is the partial regression coefficient of ξ_j in the regression of x_i on $\xi_1, \xi_2, \ldots, \xi_n$.

The covariance matrix of x is

$$\Sigma = \Lambda\Phi\Lambda' + \Theta$$

where Φ and Θ are the covariance matrices of ξ and δ, respectively.

In the standardized solution, used in these analyses, the ξ-variables have unit variance and Φ is a correlation matrix.

A Three-Factor Congeneric Measurement Model: Ambition, Self-Concept and Achievement

In this analysis, six observed variables were used to estimate the three latent traits. Ambition was a latent trait estimated by two ordinal indicator variables, expected level of education (Ed) and expected occupation (Expocc). Self-Concept was estimated by the continuous observed variables School Self-Concept (Selfsch) and General Self-Concept (Selfgen). Achievement was estimated by the continuous measures Mathematics Achievement (Maths) and Science Achievement (Science).

The measured (observed) variables making up the three latent traits are:

x_1 = expected level of education
x_2 = expected occupation
x_3 = school self-concept
x_4 = general self-concept
x_5 = mathematics achievement
x_6 = science achievement

The path diagram for this three-factor measurement model is given in Figure 1.

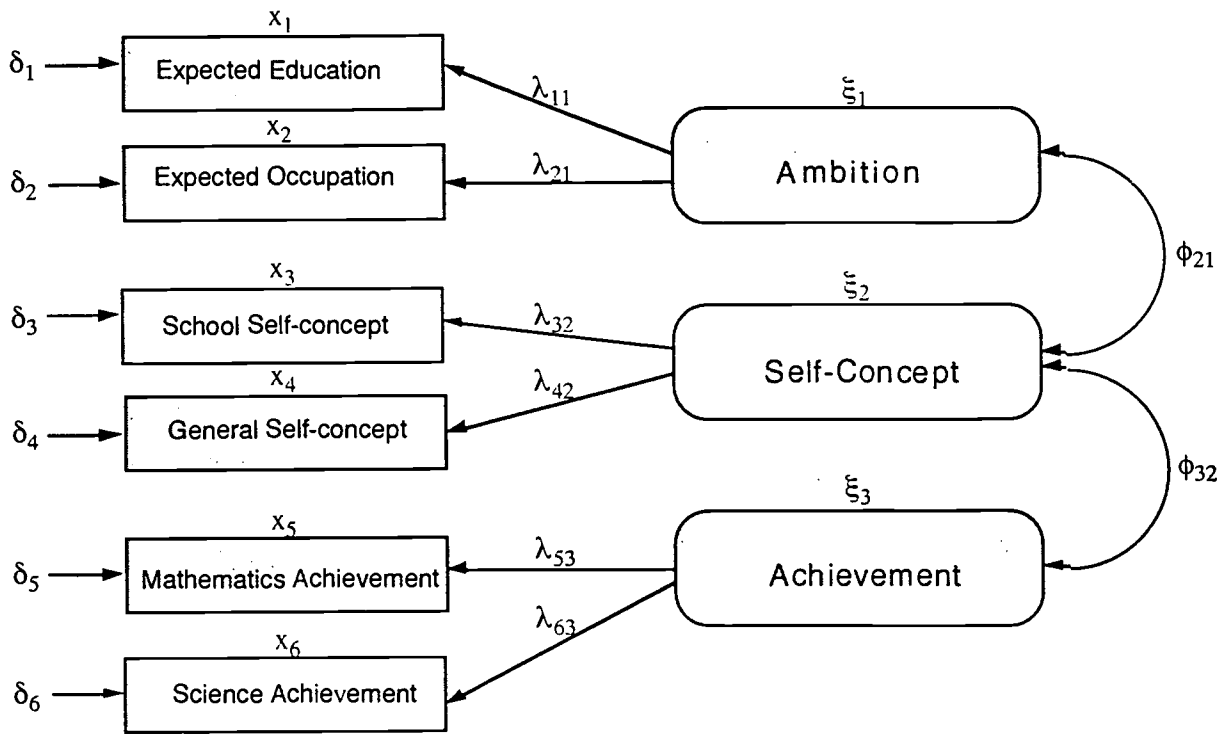

Figure 1. The Three-Factor Measurement Model for Ambition, Self-Concept and Achievement.

This model (Figure 1) included the estimated lambda matrix Λ and phi correlation matrix Φ, where the three latent variables were standardized.

The generalised least squares (GLS) and maximum-likelihood (ML) methods available in LISREL and their chi-square values and standard errors are based upon the assumption that the observed variables have a multivariate normal distribution. However, the weighted least squares (WLS) is asymptotically distribution free and a much preferable method for estimation when the observed variables are ordinal in nature. It should be noted that this method is very time-consuming and demands large amounts of memory when the number of variables is large (Jöreskog & Sörbom, 1996, p. 18-29).

The weighted least squares method was used to estimate this model, with three types of correlations calculated. Where both variables are continuous, the *Pearson product-moment correlation* is calculated. If both variables are ordinal, the *polychoric correlation* is calculated. Finally, if one variable is ordinal and the other is continuous, a *polyserial correlation* is calculated (Jöreskog & Sörbom, 1986). Using weighted least squares (WLS), PRELIS prepared a correlation matrix for the model to be estimated with each type of correlation estimated separately.

The correlations for both ordinal and continuous observed variables are found in Table 4a. There are three pairs of observed variables, with their correlations, which were used to estimate the three-factors Ambition, Self-Concept and Achievement. Expected Education correlated strongly with Expected Occupation; Self-concept (School) correlated strongly with Self-concept (General); and Maths achievement correlated strongly with Science achievement. There was evidence that these variables formed three latent traits which were also correlated with one another.

In Table 4b the parameter estimates (lambda x's), errors (theta delta's) and reliabilities (squared multiple correlations) are shown, along with goodness of fit measures for the combination of the three factors. This three-factor congeneric model had a good fit with a small Chi-square = 2.10 and large p = 0.91. The goodness of fit index of 1.00 indicates that this model was reliable. In this analysis, the three latent variables were standardized so that λ_i are regression coefficients. The lambda x's were strong with good reliabilities, however Expected Occupation had a weak lambda x and reliability.

Finally, the covariance between the three latent traits were estimated (see ϕ's in Table 4b). Of the three phi's, only the covariance between Self-concept and Achievement was significant.

A Two-Factor Congeneric Measurement Model: Socioeconomic Status and Classroom Learning Environment

As noted before, two sets of measurement models were estimated to ensure that they fitted well before combining them into a single measurement model. In the second analysis, eight observed variables were used to estimate two more latent traits. Socioeconomic Status was a latent trait estimated by three ordinal indicator variables, *Father'sEducation* (Fed), *Mother'sOccupation* (Mocc) and *Father's Occupation* (Focc). Classroom Learning Environment was estimated by the five continuous composite variables: *Student Cohesiveness, Teacher Support, Involvement, Task Orientation* and *Cooperation.*

The measured (observed) variables making the two latent traits are:

x_1 = Father's Education
x_2 = Mother's Occupation
x_3 = Father's Occupation
x_4 = Student Cohesiveness
x_5 = Teacher Support
x_6 = Involvement
x_7 = Task Orientation
x_8 = Cooperation

The path diagram for this two-factor measurement model is given in Figure 2.

The correlations for both ordinal and continuous observed variables are found in Table 5a. There were two sets of observed variables, with their correlations, which were used to estimate the two-factors Socioeconomic Status and Classroom Learning Environment. Father's Education correlated weakly with Mother's Occupation and with Father's Occupation. Correlations among the five variables Cohesiveness, Teacher Supportiveness, Involvement, Task Orientation and Cooperation were strong. There was evidence that these variables formed two latent traits which did not correlate with one another.

In Table 5b the parameter estimates (lambda x's), errors (theta delta's) and reliabilities (squared multiple correlations) are shown, along with goodness of fit measures for the combination of the two factors. This two-factor congeneric model had a reasonable fit with a small Chi-square = 32.02 and reasonable p = 0.031. The goodness of fit index of 0.99 indicated that this model was a good fit. In this analysis, the two latent variables were standardized so that λ_i are regression coefficients. The lambda x's were strong with good reliabilities, however Mother's Occupation had a weak lambda x and poor reliability. This probably contributed to the larger chi-square and p.

Finally, the covariance between the two latent traits were estimated and found to be strong and not significant (see ϕ in Table 5b). The standard error of this phi was too large and therefore the phi was likely to be a random effect. That is, there was no covariance between Socioeconomic Status and the Classroom Learning Environment.

Table 4a. Correlation matrix for the three-factor congeneric measurement model.

ObservedVariables	1	2	3	4	5	6
Ambition						
1. Expected Education	1.00					
2. Expected Occupation	.38	1.00				
Self-Concept						
3. Self-concept (School)	.43	.26	1.00			
4. Self-concept (General)	.35	.21	.72	1.00		
Achievement						
5. Mathematics	.33	.22	.36	.27	1.00	
6. Science	.29	.17	.30	.24	.63	1.00

Table 4b. Three-factor congeneric measurement model parameter estimates lambda-x (regression coefficients), theta deltas (error variance of measurement), item reliabilities (squared multiple correlations) and goodness-of-fit measures: Ambition, Self-Concept and Achievement.

ObservedVariables	*Lambda x* λ_i	*Theta Delta* θ_i	*Squared Multiple Correlation (Reliability)* $\rho\xi_i$
Ambition			
1. Expected Education λ_{11}	.95	.10	.90
2. Expected Occupation λ_{21}	.54	.70	.30
Self-Concept			
3. Self-concept (School) λ_{32}	.97	.06	.94
4. Self-concept (General) λ_{42}	.75	.44	.56
Achievement			
5. Mathematics λ_{53}	.87	.25	.75
6. Science λ_{63}	.73	.46	.54
Ambition/Self-concept ϕ_{21}	.45 (ns)		
Ambition/Achievement ϕ_{13}	.43 (ns)		
Self-concept/Achievement ϕ_{32}	.37 (sig)	t=17.93	

Goodness of fit measures:	
Chi-square (χ^2)	2.10
Degrees of freedom (df)	6
Probability (p)	0.91
Goodness of fit index (GFI)	1.00
Adjusted goodness of fit index (AGFI)	1.00
Root mean square residual (RMR)	0.035

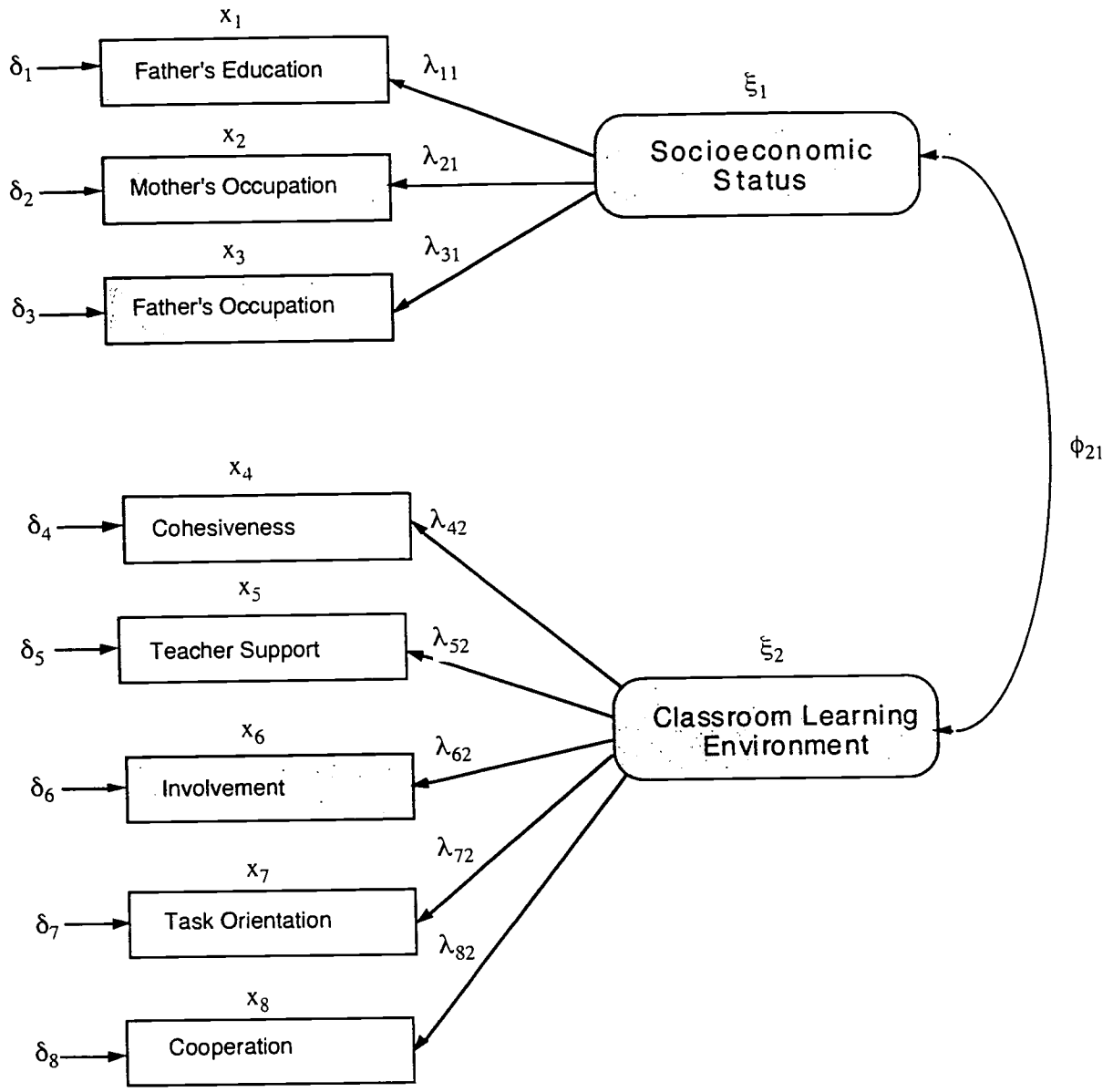

Figure 2. The Two-Factor Measurement Model for Socioeconomic Status and the Classroom Learning Environment

Table 5a. Correlation matrix for the two-factor congeneric measurement model Socioeconomic Status and Classroom Learning Environment.

ObservedVariables	1	2	3	4	5	6	7	8
Socioeconomic Status								
1. Father's Education	1.00							
2. Mother's Occupation	.10	1.00						
3. Father's Occupation	.20	.21	1.00					
Classroom Learning Environment								
4. Cohesiveness	.09	.08	.08	1.00				
5. Teacher Supportiveness	.10	.05	.08	.44	1.00			
6. Involvement	.10	.05	.06	.57	.62	1.00		
7. Task Orientation	.08	.01	.05	.43	.57	.54	1.00	
8. Cooperation	.09	.05	.05	.62	.50	.62	.57	1.00

Table 5b. Two-factor congeneric measurement model parameter lambda-x (regression coefficients), theta deltas (error variance of measurement), item reliabilities (squared multiple correlations) and goodness-of-fit measures: Socioeconomic Status and Classroom Learning Environment.

ObservedVariables	*Lambda x* λ_i	*Theta Delta* θ_i	*Squared Multiple Correlation (Reliability)* $\rho\xi_i$
Socioeconomic Status			
1. Father's Education λ_{11}	.41	.83	.17
2. Mother's Occupation λ_{21}	.20	.96	.04
3. Father's Occupation λ_{31}	.36	.87	.13
Classroom Learning Environment			
4. Cohesiveness λ_{42}	.73	.46	.54
5. Teacher Supportiveness λ_{52}	.76	.43	.57
6. Involvement λ_{62}	.83	.32	.68
7. Task Orientation λ_{72}	.75	.44	.56
8. Cooperation λ_{82}	.84	.29	.71
SES/CLE ϕ_{12}	.40 (ns)		

Goodness of fit measures:	
Chi-square (χ^2)	32.02
Degrees of freedom (df)	19
Probability (p)	0.031
Goodness of fit index (GFI)	0.99
Adjusted goodness of fit index (AGFI)	0.98
Root mean square residual (RMR)	0.055

A Five-Factor Measurement Model: Ambition, Self-Concept, Achievement, Socioeconomic Status, Classroom Learning Environment

Before estimating the complete structural equation model, the previously estimated five latent traits were reestimated simultaneously and, while the chi-square was larger it was of reasonable size for the 106 degrees of freedom (148.33). The goodness of fit index was acceptable (GFI=0.95). When combined, there were three endogenous latent traits (*Ambition, Self-Concept and Achievement*) and two exogenous latent traits (*Socioeconomic Status and Classroom Learning Environment*). Endogenous latent traits are denoted by an eta η and are like the dependent variables in ordinary regression. Exogenous latent traits predict exogenous latent traits (like independent variables in ordinary regression) and are denoted by an epsilon ξ.

In Table 6 the endogenous parameter estimates (lambda x's), errors (theta delta's), reliabilities (squared multiple correlations), the exogenous parameter estimates (lambda y's), errors (theta epsilon's) and reliabilities (squared multiple correlations) are shown, along with goodness of fit measures for the combination of the two factors. In this analysis, the five latent variables were standardized so that the lambdas were regression coefficients.

Table 6. Five-factor congeneric measurement model parameter lambda-x (regression coefficients), theta deltas (error variance of measurement), item reliabilities (squared multiple correlations) and goodness-of-fit measures: Socioeconomic Status and Classroom Learning Environment.

ObservedVariables (Endogenous)	*Lambda y* λ_y	*Squared Multiple Correlation (Reliability)* $\rho\eta_i$	*ObservedVariables (Exogenous)*	*Lambda x* λ_i	*Squared Multiple Correlation (Reliability)* $\rho\xi_i$
Ambition			*Socioeconomic Status*		
1. Expected Education	.99	1.00	1. Father's Education	.97	1.00
2. Expected Occupation	1.04	1.00	2. Mother's Occupation	.99	1.00
Self-Concept			3. Father's Occupation	1.02	1.00
3. Self-concept (School)	.89	.81	*Classroom Learning Environment*		
4. Self-concept (General)	.92	1.00	4. Cohesiveness	.88	1.00
Achievement			5. Teacher Supportiveness	.87	1.00
5. Mathematics	.74	.60	6. Involvement	.90	1.00
6. Science	.91	1.00	7. Task Orientation	.86	1.00
			8. Cooperation	.91	1.00

Goodness of fit measures:	
Chi-square (χ^2)	148.33
Degrees of freedom (df)	106
Probability (p)	0.0042
Goodness of fit index (GFI)	0.95
Adjusted goodness of fit index (AGFI)	0.93
Root mean square residual (RMR)	0.30

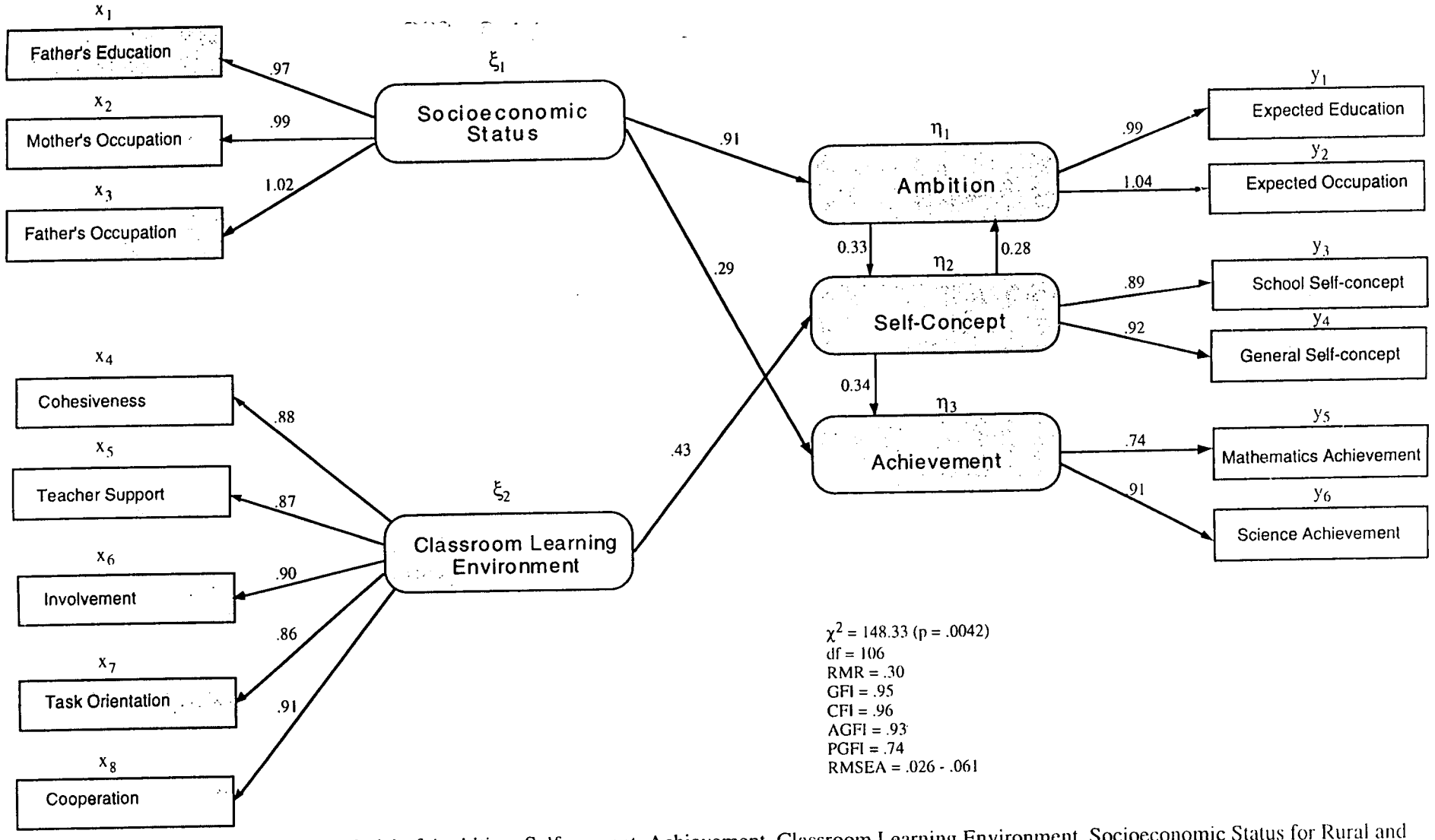

Figure 3. A Structural Equation Model of Ambition, Self-concept, Achievement, Classroom Learning Environment, Socioeconomic Status for Rural and Urban Schools

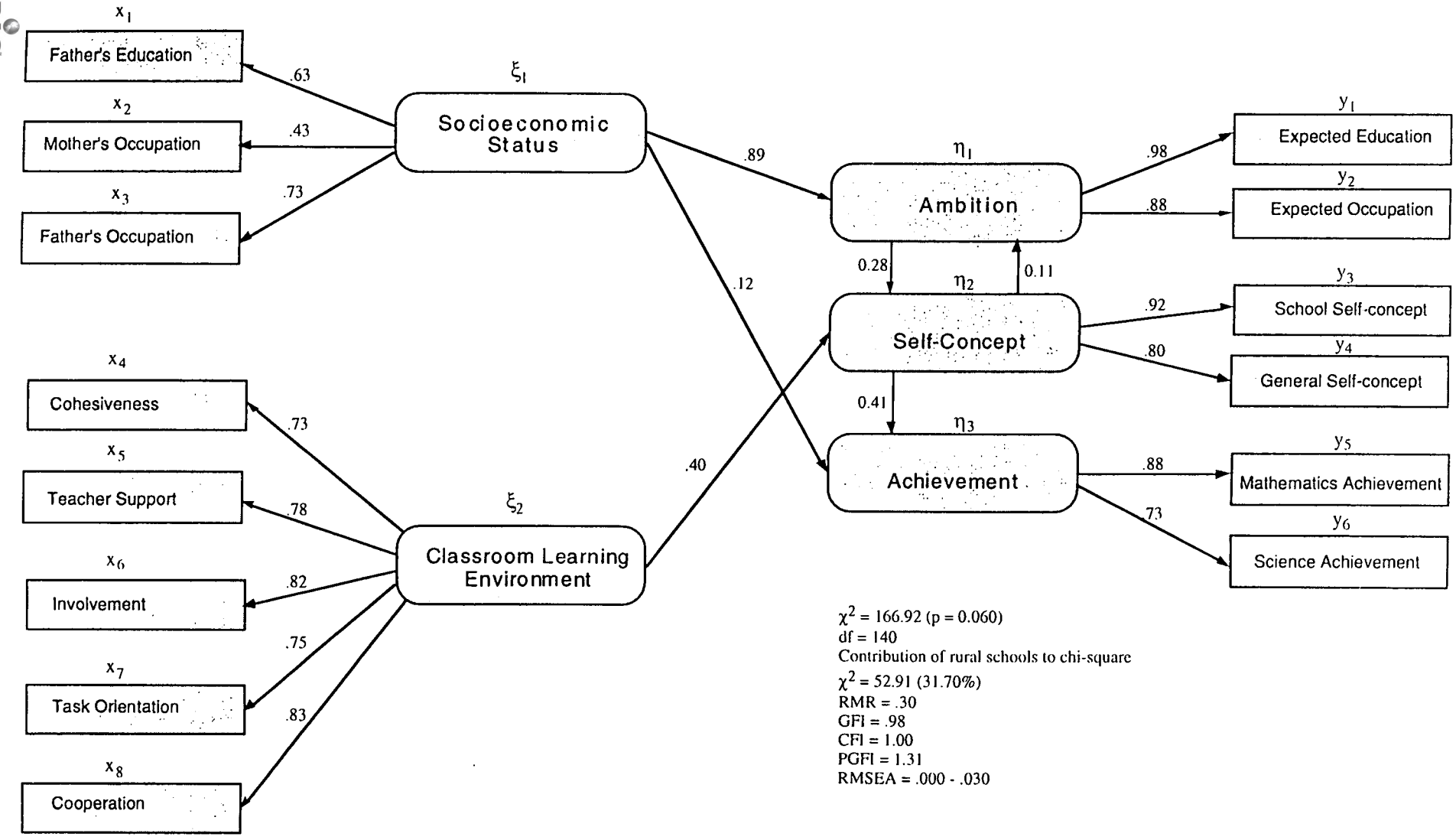

Figure 4. A Structural Equation Model of Ambition, Self-concept, Achievement, Classroom Learning Environment, Socioeconomic Status for Rural Schools

How did these relationships vary between rural and urban schools?

This structural equation model was estimated in identical manner to rural school students (Figure 4) and urban school students (Figure 5). The model fit rural students better, with a smaller contribution to the chi-square (31.70%). Of particular difference was the effect of Self-Concept on Ambition. In general, the model had a strong effect from SES to Ambition to Self-Concept and then to Achievement. However, there was a weak effect back from Self-Concept onto Ambition with rural students. This effect was negligible for urban students. Students from rural schools appeared to be more influenced by their self-concept, when compared with students from urban schools.

Summary of Research Findings

What is the effect of the Classroom Learning Environment on student aspirations and achievement?

The Classroom Learning Environment had a strong, positive effect upon students' Self-Concept and this in turn had an indirect effect upon students' Ambition and Aspirations. So while the effect of the classroom was observed, it was only through Self-Concept that it was able to act.

What is the effect of Socioeconomic Status on student aspirations and achievement?

Socioeconomic Status had a strong, positive effect upon students' Ambitions and Aspirations, but not directly on Self-Concept. The effect on Ambition was very strong. The effect on Achievement was weak, but positive. Overall, Socioeconomic Status had an overwhelming impact upon these student outcomes.

What is the effect of Self-Esteem/Self-Concept on student aspirations and achievement?

Student Self-Concept had a direct effect upon both students' Ambition and Aspirations and Achievement. This effect was mitigated by Socioeconomic Status, yet still strong.

Does a model which explains the relationship between student aspirations, achievement, self-esteem, socioeconomic status and the classroom learning environment, differ for rural and urban students?

When two structural equation models were compared for rural and urban students, there was a small difference in the structures. For students attending urban schools, there appeared to be little or no relationship between self-esteem and ambition. For rural students, there was a small effect of self-esteem on ambition and a larger effect of ambition on self-esteem. The effects were reciprocal for rural students. Otherwise, the structural equation models were similar with the model fitting rural students better than urban students.

Discussion

In the examination of Quaglia and Cobb's (1996) theory of aspirations in this research, a number of internal and external influences on the student which appear to affect the student's level of aspirations were investigated. These included the student's socioeconomic status, the classroom learning environment and the student's own self-concept. Here we have demonstrated the relationships that these variables have on the student's career choice and education choice – called ambition or aspirations in this discussion. These relationships were positive and worked mainly through the student's self-concept; either as a mitigating variable or a direct conduit of the student's self-esteem.

So what are the implications for research? It is certainly difficult to collect large-scale data. This paper shows that the data is representative of high and low socioeconomic areas in Western Australia, as well as rural, remote and urban locations. With so many students providing a rich source of data, it has become difficult to write up all of the research into publishable papers. However, now that this paper has demonstrated the importance of self-concept in motivating students' aspirations, particularly in rural locations, it is useful to now consider what are the characteristics of schools which have high levels of student self-concept. Further, does the teacher's own self-concept make a difference?

In further research, the importance of aspirations in determining life choices of students must be considered in the context of the school environment. The conclusion reached by Quaglia and Cobb that "educators and researchers need to examine and measure key school conditions that affect student aspirations" should become a fundamental part of any school effectiveness research.

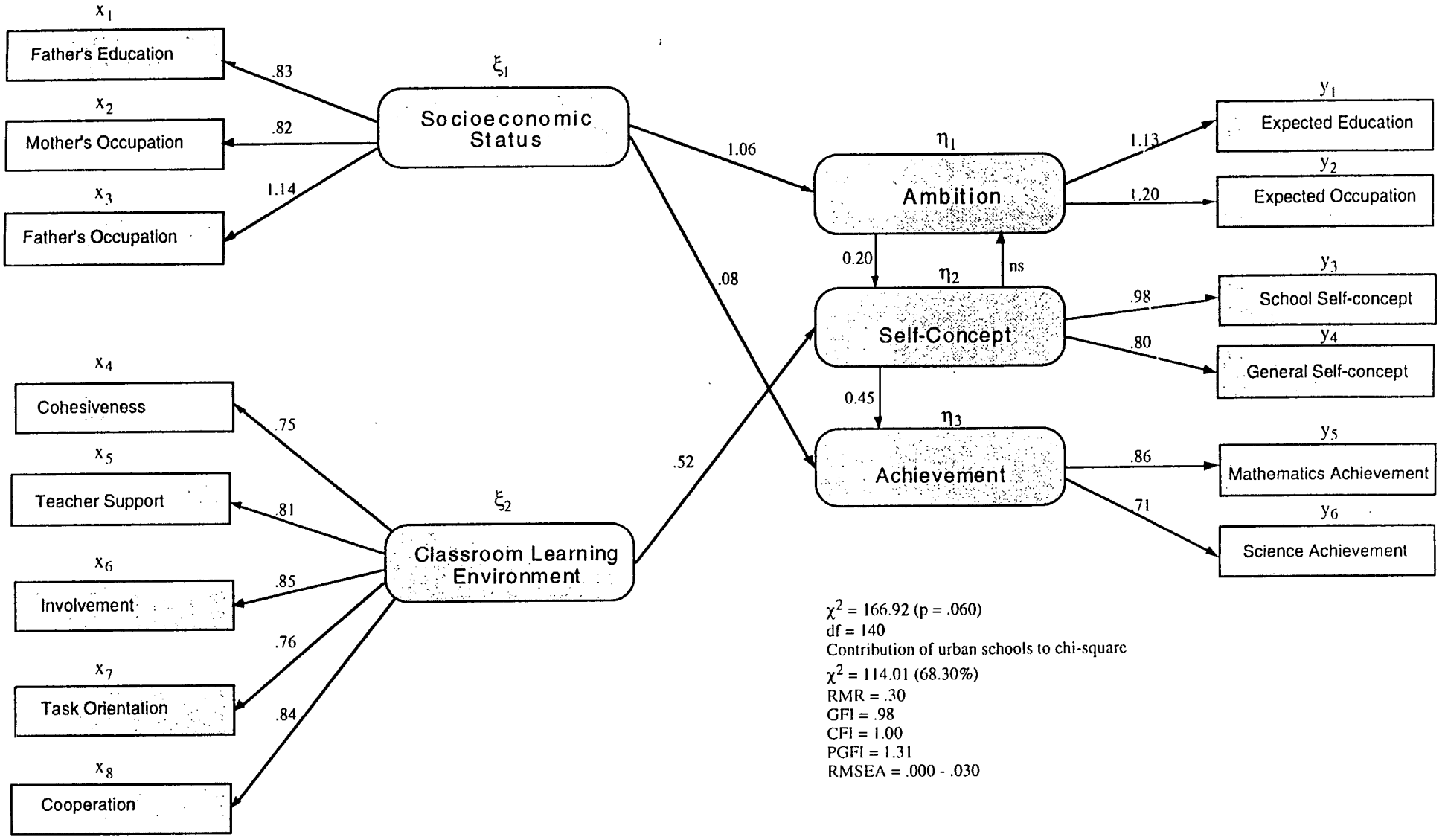

Figure 5. A Structural Equation Model of Ambition, Self-concept, Achievement, Classroom Learning Environment, Socioeconomic Status for Urban Schools

Appendix I

Latent Trait Variables	Observed Indicator Variables	Coding
Ambition	Occupational Aspirations	1 – 10
	Educational Aspirations	1 – 6
Self-Concept	General Self-Concept	1 – 5
	School Self-Concept	1 – 5
Achievement	Mathematics Achievement	-3 – +4
	Science Achievement	-3 – +4
Socioeconomic Status	Father's Occupation	1 – 10
	Mother's Occupation	1 – 10
	Father's Education	1 – 6
	Mother's Education	1 – 6
Classroom Learning Environment	Student Cohesiveness	1 – 5
	Teacher Support	1 – 5
	Involvement	1 – 5
	Task Orientation	1 – 5
	Cooperation	1 – 5
Rural	Rural	Rural = 2, Urban = 1

Results of the Structural Equation Models

A Structural Equation Model for all Schools

How well did the model fit?

The complete structural equation model (SEM) for all schools (rural and urban) is shown in Figure 3, with separate analyses for Rural and Urban schools in Figures 4 and 5 respectively. While the variable Rural was included in this model initially, it did not appear to have any significant effect upon the eta latent traits - Ambition, Self-concept and Achievement. However, the effect of other variables such as Socioeconomic Status and the Classroom Learning Environment were strong and significant on the eta's. Further, the model seemed similar whether the school was rural or urban, at least for this specific model of self-esteem.

The intercorrelations have already been shown in Tables 4a and 5a for the measured variables, with the results of this first SEM shown in Figure 3. These results have standardized coefficients on each arrow from one variable to another; the unstandardized coefficients, standard errors and squared multiple correlations for these SEM's may be obtained from the author by request. The bottom middle section of the figure shows the fit indices used to evaluate the adequacy of this model. With a χ^2 of 148.33 and p=.0042, the probability that this model fits the population is not good. That is, models with a $p > .05$ are more likely to fit the population. This model still did not appear to fit the data well, however χ^2 is a poor measure of fit when the sample is large due to its calculation of $N - 1$ times the minimum value of the fit function.

Further measures of fit were examined including the Goodness of Fit Index (GFI = .95) measuring the relative amount of variances and covariances accounted for by the model (Tanaka & Huba, 1984, 1985); the Comparative Fit Index (CFI = .96) comparing the model with a null model which assumes that the variables are uncorrelated. As the GFI and CFI approach 1.00, the fit improves. This model appeared to fit well enough with the GFI and CFI both greater than .90. The Goodness of Fit index adjusted for degrees of freedom (AGFI = .93) was also an indicator that the model fit well. These Goodness of Fit measures do not depend on sample size and measure how much better the model fits as compared with no model at all. The Parsimony Goodness of Fit Index (PGFI = .74) is an adjusted Goodness of Fit measure for degrees of freedom (similar to AGFI) (Mulaik, et al., 1989).

The Root Mean-square Residual (RMR = .30) should be near zero for a "good" model and measures the model's capacity to predict covariance. The departure of the predicted covariance from the true covariance is a misspecified model. In this case, there is reason to doubt that the model is predicting the covariances or variances of the variables (Bollen, 1989, p. 257-258).

The final fit index is the Root Mean Square Error of Approximation (ε) 90% confidence interval (RMSEA = .026 to .061). This provides a measure of discrepancy per degree of freedom with RMSEAs of .08 representing reasonable errors of approximation in the population (Browne & Cudeck, 1993).

All of these fit statistics indicate that this model did fit the data well, with the result that the lambdas, gammas and betas were estimated and were considered reasonable representation of the model.

What were the relationships between Self-concept Self-esteem and the other variables of interest?

There appeared to be a causal relationship with Ambition driving Self-Concept and Self-Concept driving Achievement (see Figure 3). That is, students with greater career and educational aspirations seemed to have higher Self-Concept and Achievement. Self-Concept was also causing higher aspirations/ambition. These relationships were modified by the student's socioeconomic status, with a strong effect on Ambition and a weaker effect on Achievement. Further, the Classroom Learning Environment had a strong and significant effect upon Self-Concept.

These findings confirmed previous research from the pilot study, that student Self-Concept, or Self-Esteem, was not only influenced by the student's own aspirations and socioeconomic background, but also by the classroom learning environment. That is, there was direct evidence that the school could influence the student's self-esteem and in turn the student's achievement and ambitions.

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