Positive Behaviour for Learning:
Changing Student Behaviours for Sustainable Psychosocial Outcomes

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Abstract

The Positive Behaviours for Learning (PBL) initiative of the NSW Department of Education and Training Western Sydney Region (DET WSR) was derived from the Positive Behaviour Interventions and Supports (PBIS) program developed in the US. Although the major focus of implementation was on student behaviour for both the Australian and US models, PBL in the Australian context has further emphasised the transferability of implementation effects to sustainable learning outcomes. Students from schools implementing PBL (experimental group) and from schools on a wait list for implementation in the next year (control group) responded to survey items on 5 self-concept scales: school competency, school affect, maths, English, and parent self-concepts. Results showed that the experimental group had relatively higher scores for all 5 measures. However, multivariate analysis of variance found between-group differences only in school competency, math self-concept, and parent self-concept. Evidence suggested positive gains in psychosocial outcomes due to PBL implementation. Since these psychosocial determinants of learning success have the potential of leading to long-term tangible gains in learning outcomes, processes of PBL implementation may further strengthen the facilitation of these constructs.

Positive Behaviours for Learning (PBL) is an initiative of the Department of Education and Training Western Sydney Region (DET WSR) that has been progressively introduced into schools across the region from 2005. PBL has been derived from the Positive Behaviour Interventions and Support (PBIS) program developed in the United States. As the name of PBL reflects the emphasis on learning outcomes, the central question for the present investigation was how the cultural transfer of the US model has resulted in improved learning outcomes.

Behaviour Management in NSW Schools

In New South Wales, DET recently revised its discipline policy guidelines to emphasise that 'quality learning environments' should provide 'an environment free from disruption, intimidation, harassment and discrimination. To achieve this, all schools are expected to maintain high standards of discipline' (NSW DET, 2006a). DET WSR has noted disparities across the schools in the region in their capacities to deal effectively with student behaviours. DET WSR has highlighted the need for schools and teachers to employ more effective behaviour management programs through a consistent region-wide professional development program for behaviour management (NSW DET, 2006b). Derived from the Positive Behaviour Interventions and Supports (PBIS) program originated in the US, PBL has become an important initiative of DET WSR. The PBL program has been progressively introduced into schools across the region. However, whether PBL has been able to transfer benefits experienced in the US model of PBIS into academic outcomes is questionable. To examine the possibility of this transfer, the present study compared the self-concepts of students in schools that had implemented PBL (experimental group) with those in schools on a waiting list (control group). According to recent advances in self-concept research that emphasize multidimensionality (e.g., Craven, Marsh, & Burnett, 2003; Yeung, 2005), support for successful transfer of behaviour management effects to academic outcomes requires comparatively stronger self-concepts in academic domains for the experimental group. The results may throw light on new directions to extend behaviour management interventions to academic enhancement effects.

From PBIS to PBL

PBL has been derived from the Positive Behaviour Interventions and Support (PBIS) program developed in the United States. The emphasis on positive behaviour in the PBIS approach is consistent with established, evidence-based methods of behaviour management, which aim to teach and reinforce identified target behaviours and minimise the use of punishment (Sulzer-Azaroff & Mayer, 1994). "Teaching behavioral expectations and rewarding students for following them is a much more positive approach than waiting for misbehavior to occur before responding. The purpose of school-

wide PBIS is to establish a climate in which appropriate behavior is the norm" (OSEP Center on PBIS, 2006). Thus, the PBIS model encourages schools to use data to inform the adoption of systems and practices that apply sound behavioural principles in their approach to managing student behaviour. It aims to equip schools to identify and teach behaviours that they have determined are appropriate for their students.

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The DET WSR valued the positive discipline approach, the adaptability and whole school focus of the PBIS initiative in the U.S. and consequently introduced the model to local principals from primary and secondary schools across the region. The initiative was renamed from PBIS to PBL after the initial group of 13 schools met at the first training conference. As the name of PBL in the Australian model suggests, there was an extension in the Australian approach to an emphasis on positive learning outcomes as a result of positive behaviour enhancement. The change to PBL reflects the region's priority on improving student learning outcomes and therefore explicitly recognized that behaviour support needed to include overt emphasis on learning in order to appeal to WSR schools. The model has been progressively adopted by government schools across the region.

In terms of the association between PBIS and learning, improvements in student academic achievement have been reported in association with PBIS implementation. These are assumed to result from decreased classroom disruption that flows into increased learning time (Luiselli, Putnam, Handler, & Feinberg, 2005; Lassen, Steele, & Sailor, 2006). Although behavioural issues clearly remain an important focus in the PBL initiative (Sugai, 2007), its framing indicates a shift in intent to reinforce the place of learning as paramount. This intent is reflected also in the 'relentless focus on learning' that forms the core of DET WSR's strategic plan 2006-2008, stressing a commitment to continuous improvement in the quality and effectiveness of students' learning and development. There was therefore a need to gauge the effectiveness of PBL as a process for enhancing learning. The investigation involved examining the extent to which the PBL model has been successful in promoting positive student learning outcomes. Research into effects on behaviour, including that undertaken by the US developers of PBIS, indicates that significant behavioural and academic outcomes are typically only achieved after more extended periods of time than the initial 12-month research partnership. However, research into attitudinal dimensions of change has found that this commonly precedes and predicts behavioural and academic outcomes. Accordingly, the present research undertook to measure and compare attitudes and learning through investigating of student self-concept.

Self-concept as a Learning Outcome

Recent research on academic self-concept has shown self-concept to be an important educational outcome in itself, and also an important factor that contributes to other valued educational outcomes (Craven, Marsh, & Burnett, 2003; Marsh, 1993). Numerous studies, for example, have identified strong relations between academic self-concept, adaptive academic behaviours and enhanced academic achievement (e.g., Chapman & Tunmer, 1997; Eccles & Wigfield, 1995; Marsh & Craven, 2006; Marsh & Yeung, 1997a, 1997b; Yeung & Lee, 1999). In recent research, self-concept research has adopted a multidimensional approach to the specification of key constructs (e.g., maths self-concept, parent relations self-concept, etc. that are distinct from each other). Further to the multidimensionality of self-concept, Marsh, Craven, and Debus (1999) have distinguished between self-concepts relating to competency and those relating to affect. Thus, whether students perceive themselves as competent in academic work and whether they perceive themselves as liking schoolwork can be conceptualized as two distinct components of overall self-concept with respect to academic work.

Interestingly, for very young children, high self-concepts in mathematics typically reflect undifferentiated perceptions of mathematical competency and perceptions of a liking for mathematics. However, for older students (such as primary and secondary students in the present study), perceptions of competency in mathematics are not necessarily related in any systematic way to liking mathematics, and vice versa (Yeung, 2005). Hence in an educational milieu that emphasizes lifelong learning (Bragg, 2000; Burkhalter, 2000; Nunley, Shartle-Galotto, & Smith, 2000), there may be an increasing need to separate out the competency and affect components of self-concept when studying learners' self-concepts. In the present investigation, we emphasize both the competency and affect components of academic self-concept.

Students' self-concept regarding school and their schoolwork can significantly influence their academic achievement (Marsh & Yeung, 1997a, 1997b). That is why self-concept is consistently taken as an important educational outcome in policy documents worldwide. To measure multidimensional self-concept, the present study used the Self-Description Questionnaire (SDQ) developed by Marsh and validated in various cultural contexts (Skaalvik & Rankin, 1995; Yeung, Chow, Chow, Luk, & Wong, 2004; Yeung & Lee, 1999). The study assessed those subscales most relevant to school learning and positive behaviours. They included academic self-concepts (maths, verbal and general school self-concept scales), emotional stability self-concept and parent relations self-concept. Based on suggestions by Marsh, Craven, and Debus (1999), the study also evaluated students' perception of their academic competency and affect as measured by the affect component of general school self-concept (Yeung et al., 2004). Whereas the component of competency refers to the students' perceptions of how good or how weak they are in schoolwork, the component of affect refers to the extent to which they like school. It was expected that at least for some students, the effects of PBL may not only improve the

competency aspect, but also the affect component (i.e., they feel like going to school more than before).

The Present Study

The change of nomenclature to PBL was critically important for the adoption of the PBIS model within the region. It not only reflects an adaptation of the PBIS concept of behaviour management from the US to the Australian context, but it also reflects the emphasis of DET WSR on learning outcomes as a result of the school-wide behaviour management strategy. The research question of the present study is: Did PBL make a difference in students' self-concepts that are relevant to learning at school? To answer this question, a survey method was used.

Method

Participants

Participants in the study were 2723 primary and secondary school students in Years 3, 5, 7, 9 and 11. Table 1.1 presents the number and percentage of the male and female participants and their year level. The participants were from 31 randomly selected government schools in the WSR which represented different phases of PBL implementation. For instance Phase 1 schools invited to participate in the research belonged to the first group of schools trained in PBL (November 2005) who had been implementing PBL for 18 months whereas the control group were 10 schools on the waiting list to implement PBL. Table 1.2 presents an overview of the staged implementation of PBL and the relevant Phases from which the schools in this study were invited to participate.

Table 1.1: Student sample (N = 2723*)*

	Year 3		**Year 5**		**Year 7**		**Year 9**		**Year 11**	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
PBL Students										
Number	188	176	193	179	293	305	286	306	133	199
Percentage	52	48	52	48	49	51	48	52	40	60
Total	364		372		598		592		332	
Control Group										
Number	22	21	20	21	79	84	56	61	39	60
Percentage	51.2	48.8	48.8	51.2	48.5	51.5	47.5	51.7	39	60
Total	43		41		163		118		100	

Table 1.2: Phases of PBL schools – training and participation

Schools	**PBL Training**	**Length of participation**
Phase 1 Schools	November 2005	18 months
Phase 3 Schools	September 2006	9 months
Phase 4 Schools	May-June 2007	1 month
Control Group	Not trained	0 months

Material and Procedure

Students' self-concept regarding school and their schoolwork can significantly influence their academic achievement (Marsh & Yeung, 1997a, 1997b). The Self-Description Questionnaire (SDQ), developed by Marsh and validated in various cultural contexts (Skaalvik & Rankin, 1995; Yeung, Chow, Chow, Luk, & Wong, 2004; Yeung & Lee, 1999), assesses multiple dimensions of self-concept. The study assessed those subscales most relevant to school learning and positive behaviours: academic self-concept (including math, verbal and general school self-concept scales), emotional stability self-concept and parent relations self-concept. Table 1.3 provides a sample of these items. Based on suggestions by Marsh, Craven, and Debus (1999), the study also evaluated students' perception of their academic competency and affect as measured by the affect component of general school self-concept (Yeung et al., 2004). Whereas the component of competency refers to the students' perceptions of how good or how weak they are in schoolwork, the component of affect refers to the extent to which they like school. It was expected that at least for some students, the effects of PBL may not only improve the competency aspect, but also the affect component (i.e., they feel like going to school more than before).

Table 1.3: Sample items from the Academic Self-Description Questionnaire

Maths self-concept	
	I get good marks in maths classes.
	I have always done well in maths.
English self-concept	
	I get good marks in English classes
	I have always done well in English.
School self-concept of competency	
	I am good at most school subjects.
	I learn things quickly in most school subjects.
Emotional stability self-concept	
	I am usually pretty calm and relaxed.
	I worry a lot.
Parent self-concept	
	I get along well with my parents.
	My parents treat me fairly.
School self-concept of affect	
	Going to classes is enjoyable.
	I hate school.

Research procedures were conducted according to the approval conditions set by the Research Ethics Committee of the University of Western Sydney. Approval to conduct the research in the WSR schools was requested through the State Education Research Approvals Process (SERAP). On advice of the SERAP office, the application was assessed and approved through the regional research approval process. The schools remain anonymous and are identified as a number in this report.

Statistical Analysis

Construct validity. Before using an instrument to make comparisons between groups so as to test any significant contribution of an intervention to any outcomes, it is important to first validate the instrument such that the results can be trusted to reflect actual differences. There are various ways to validate an instrument. The first step is usually a test of internal consistency of each scale using Cronbach's alpha reliability estimate which has a generally accepted target value of .70 (Garson, 2005; George & Mallery, 1995; Lewicki & Hill, 2006; Nunnally, 1978). In the present study, in addition to traditional reliability tests of internal consistency of each scale, the state-of-the-art confirmatory factor analysis (CFA) approach to construct validation was applied. CFA procedures have been described elsewhere (Bollen, 1989; Byrne, 1994, 2003; Cheung & Rensvold, 2002; Marsh, 1994; Marsh, Hau, Baumert, & Peschar, in press; Jöreskog & Sörbom, 1993; Little, 1997; Steenkamp & Baumgartner, 1998; Vandenberg & Lance, 2000), and they are therefore not detailed here.

In brief, CFAs were conducted with LISREL 8.72 (Jöreskog & Sörbom, 2005) using maximum likelihood estimation. In a CFA study, the parameters typically consist of factor loadings, factor variances and covariances, and measured variable uniquenesses (i.e., measurement errors associated with each item). In accordance with standard practice in multigroup analyses, covariance matrices were used as input (Kline, 1998; Cudeck, 1989; Jöreskog & Sörbom, 1993). The major purpose was to first test the extent to which the proposed model fitted the data from the sample, and then observe whether the relationships between factors were reasonable and logical.

Both absolute fit statistics and incremental fit statistics were utilised to evaluate the model fit (see Hoyle & Painter, 1995; Tanaka, 1993). The absolute fit statistics included the χ^2 test of exact model fit, the root-mean-square error of approximation (RMSEA; Browne & Cudeck, 1993). The incremental fit statistics (Hoyle & Painter, 1995) included the Comparative Fit Index (CFI; Bentler, 1990) and the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), also known as the non-normed fit index (NNFI; Benter & Bonett, 1980). For fit indices, in general, the CFI and TLI vary along a 0-to-1 continuum in which values equal to or greater than .90 and .95 are typically taken to reflect acceptable and excellent fits to the data, respectively. According to Browne and Cudeck (1993), RMSEA values in the vicinity of .05 indicate 'close fit', values near .08 indicate 'fair fit', and values above .10 indicate 'poor fit'. Those scales that passed the CFA validation procedure would be used in subsequent analyses.

Group comparisons. For PBL to be effective in enhancing self-concept, the mean scores for the experimental group should be more favourable than the mean scores for the control group. To test whether PBL had an effect on students' self-concepts the experimental group was compared with the control group. Using the validated scales, multivariate analysis of variance (MANOVA) was conducted to compare the experimental and control groups.

Results

Preliminary analyses involved examining how well items loaded on the hypothesised subscales (Raykov & Marcoulides, 2000). This process involved examining the results from (a) Cronbach's alpha coefficients and (b) the first-order Confirmatory Factor Analysis (CFA) with the Academic Self-Description Questionnaire instrument.

Construct Validity

Reliabilities. The alpha reliability estimate for each scale was acceptable, and was higher than the target reliability of at least .70 (Garson, 2005; George & Mallery, 1995; Lewicki & Hill, 2006; Nunnally, 1978). The alpha estimates are presented in Table 1.4.

CFA. The CFA model tested the ability of the six factors to explain the relationships among the 31 items. We posited a highly restrictive *a priori* model such that each item was allowed to load on one and only one factor (all other factor loadings were constrained to be zero) and the uniqueness term (i.e., measurement error associated with each item) was not allowed to correlate with uniqueness terms for any other item. This model with 31 items positing six self-concept factors provided a good fit to the data (TLI = .93, CFI = .93, RMSEA = .056). See Figure 1.1 for the structure of the model positing six self-concept factors. The solution was fully proper and the factor structure was well defined with all factor loadings being positive and significant, and were larger than .30 (from .38 to .90). The correlations among the six factors were small to moderate (*r*s = .21 to .69), indicating that the factors were clearly distinguishable from one another (see Table 4.2). In sum, there was support for the six-factor model based on the finding of: (a) a reasonable model fit (i.e., TLI = .9 or above), (b) good factor loadings for the model (.3 or above for each item loading on the respective factor), (c) reasonably low correlations among the six factors (< .7). Since the six factors were validated, these factors derived from the CFA were then included in subsequent analysis.

Table 1.4: Alpha reliability and CFA solution of a 6-factor student self-concept model

	Competency	Affect	Maths	English	Parent	Emotions	*Uniqueness*
Alpha	.90	.91	.91	.92	.82	.80	
Items							
Competency 1	.87*	--	--	--	--	--	.25*
Competency 2	.88*	--	--	--	--	--	.23*
Competency 3	.79*	--	--	--	--	--	.38*
Competency 4	.79*	--	--	--	--	--	.38*
Competency 5	.74*	--	--	--	--	--	.46*
Affect 1	--	.83*	--	--	--	--	.31*
Affect 2	--	.87*	--	--	--	--	.24*
Affect 3	--	.85*	--	--	--	--	.28*
Affect 4	--	.87*	--	--	--	--	.25*
Affect 5	--	.76*	--	--	--	--	.42*
Maths 1	--	--	.90*	--	--	--	.19*
Maths 2	--	--	.85*	--	--	--	.28*
Maths 3	--	--	.84*	--	--	--	.29*
Maths 4	--	--	.89*	--	--	--	.21*
Maths 5	--	--	.87*	--	--	--	.24*
Verbal 1	--	--	--	.80*	--	--	.36*
Verbal 2	--	--	--	.82*	--	--	.33*
Verbal 3	--	--	--	.84*	--	--	.30*
Verbal 4	--	--	--	.78*	--	--	.39*
Verbal 5	--	--	--	.82*	--	--	.32*
Parent 1	--	--	--	--	.76*	--	.42*
Parent 2	--	--	--	--	.78*	--	.39*
Parent 3	--	--	--	--	.81*	--	.34*
Parent 4	--	--	--	--	.74*	--	.46*
Parent 5	--	--	--	--	.52*	--	.73*

Emotion 1	--	--	--	--	--	.70*	.51*
Emotion 2	--	--	--	--	--	.42*	.82*
Emotion 3	--	--	--	--	--	.69*	.52*
Emotion 4	--	--	--	--	--	.55*	.70*
Emotion 5	--	--	--	--	--	.55*	.69*
Emotion 6	--	--	--	--	--	.38*	.86*
Factor Correlations							
Competency	--						
Affect	.69*	--					
Maths	.63*	.31*	--				
Verbal	.75*	.42*	.42*	--			
Parent	.35*	.21*	.29*	.41*	--		
Emotion	.50*	.37*	.35*	.47*	.62*	--	

Note: N = 2260. Parameters estimates are completely standardised. *p < .05.

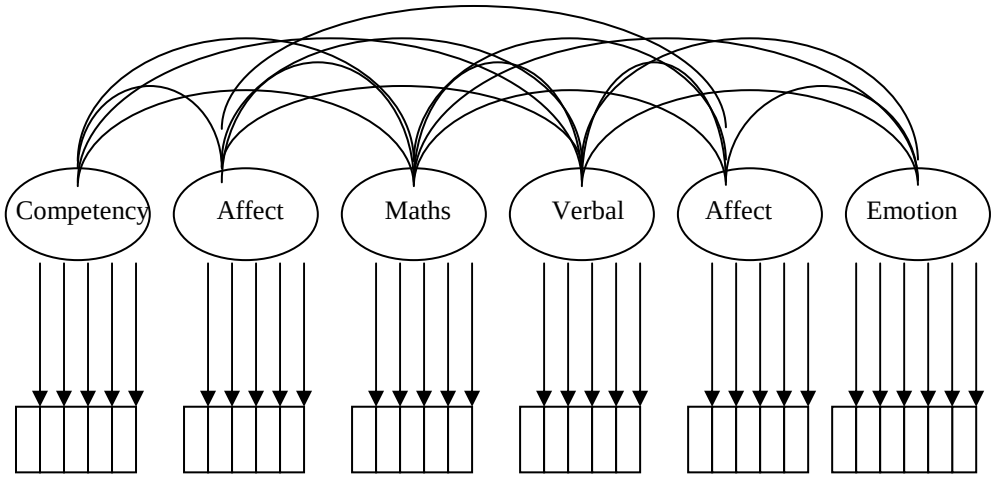

Figure 1.1: Six self-concept factors derived from 31 measured variables

Group comparisons. The most important concern of the present research is whether the potentially positive effects of PBL could be translated to enhancement of learning outcomes, including psychosocial outcomes such as academic self-concept. First, a range of self-concept scales were compared between the experimental (PBL Schools) and control groups (Non-PBL Schools). The means and standard deviations are presented in Table 1.5 and Figure 1.2. The MANOVA results showed that for all the self-concept measures, the experimental group tended to have higher scores than the control group. However, of the six measures, only three reached statistical significance at the .05 level. They were self-concept of competency at school, mathematics self-concept, and parent relations self-concept (see Figure 6.3). Nevertheless, although there was support for positive effects of PBL on students' self-concept (especially academic self-concepts such as school competency and mathematics), these effects seemed to be rather small (effect sizes < .05).

Table 1.5: Means and (Standard Deviations) of students' self-concepts

Self-concept Scale	Experimental		Control		F (2,258*df*)	*MSE*
	N= 1,799		*N*= 461			
School competency	4.39	(1.04)	4.27	(0.98)	4.59*	1.06
School affect	4.10	(1.28)	4.04	(1.13)	0.79	1.57
Maths	3.92	(1.35)	3.77	(1.35)	4.77*	1.82
English	4.25	(1.18)	4.16	(1.15)	2.50	1.37
Parent	5.04	(0.97)	4.92	(1.00)	5.86*	0.96
Emotion	4.33	(0.95)	4.25	(0.91)	2.80	0.88

Note: Because of missing data, for this analysis, total N = 2,681. * p < .05. ** p < .001.

Discussion

The purpose of this research was to assess the effects of PBL on learning. Changes to student behaviour and learning as a result of PBL can only be determined after extended periods of time than the initial 12-month research conducted in this study. However, research into attitudinal dimensions of change has found that this commonly precedes and predicts behaviour and academic outcomes. Consequently, the present study measured and compared attitudes and learning through examining student self-concept. As predicted, schools implementing PBL were found to have higher self-concepts in all six facets compared to schools who have not implemented PBL (control group). Significantly higher self-concepts were found in two academic dimensions (School competency self-concept and mathematics self-concept) and one non-academic dimension (Parent relations self-concept). Students in PBL schools perceive themselves to be better at school and judged their abilities in mathematics more favourably than students attending non-PBL schools. Interestingly students attending PBL schools perceived having a more positive relationship with their parents than students attending non-PBL schools. These results are promising as high self-concepts can significantly influence academic achievement (Marsh & Yeung, 1997a, 1997b). Therefore self-concept is an important educational outcome in its own right.

It is important to note, however, that while levels of compliance with PBL implementation were high, there were only weak indications of effects on learning as demonstrated through differences in academic self-concept. As PBL implementation moves into the next phase where classroom practices are a focus, further opportunities for assessing the effects of PBL on student learning should be followed up. It is recommended that future research considers the use of more contextually specific instruments to measure self-concept and self-efficacy in relation to PBL implementation over time.

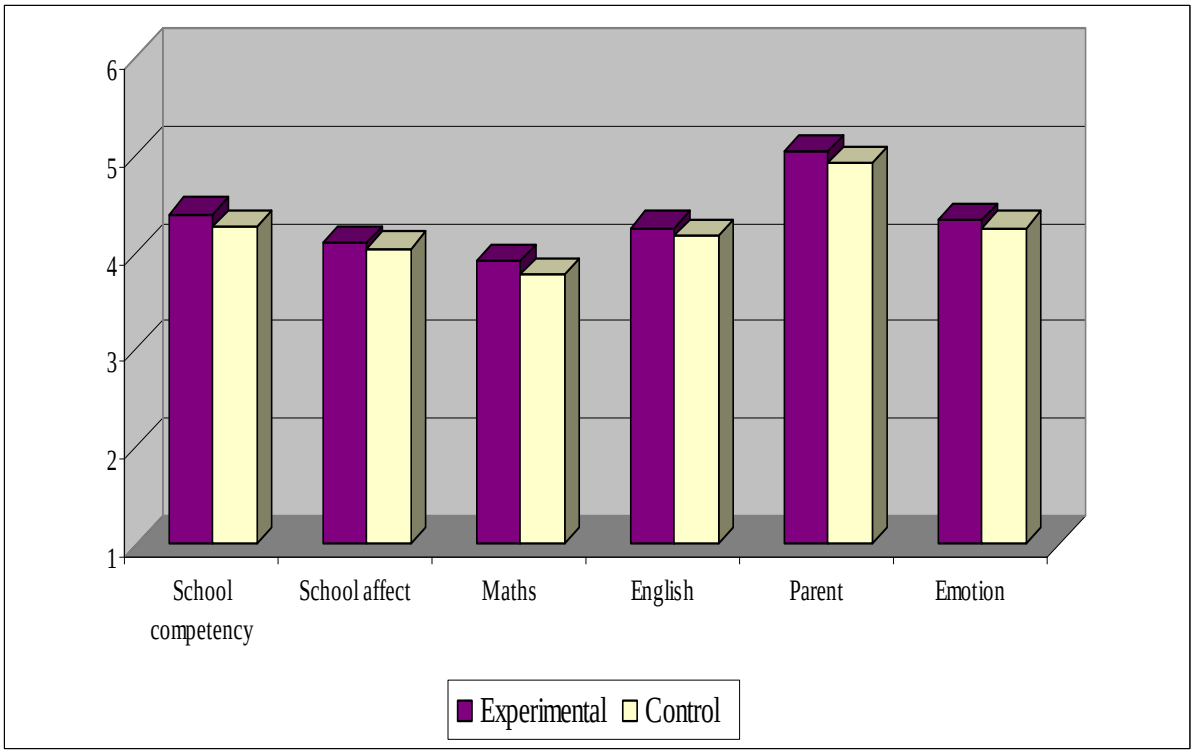

Figure 1.2: Self-concept scores in 2 groups

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