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## A longitudinal study of adolescents' academic self-concept and their perceptions of home environment and classroom climate

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**Abstract:** The 3-year longitudinal study of a single cohort (N = 495, average age 13) in Singapore used cluster analytic approach to identify trajectories of adolescents' academic self-concept and their perceptions of home environment and classroom climate. Four trajectories were identified. They were (1) steeply decreasing, (2) consistently low, (3) moderate and maintaining, and (4) consistently high. Higher-ability stream students were more likely than lower-ability stream students to be in the steeply decreasing group, while adolescents with better Secondary 1 and 2 class positions were more likely to be in the consistently high group. The results suggest that there are unique groups of adolescents in Singapore secondary schools. Some adolescents may have difficulties in adjusting to changes in adolescence; others may have struggled to cope long before they reach adolescence. Some adolescents may face minor 'hiccups' during adjustments while others may cope adequately on their own. As such, the notion of a single theory of adolescence may be too simplistic. Presumably, competing or conflicting theories of adolescence such as Hall's (1904) 'storm and stress' theory and Rutter's (1987) resiliency model may in fact all be relevant, albeit for different subgroups of youth.

Keywords: Academic self-concept, home environment, classroom climate

### Introduction

Adolescence is usually thought of as a developmental transition during which an individual passes from childhood to maturity (Coleman & Hendry, 1990). In addition to physiological maturation, the period is usually accompanied by an intertwined network of pressures, such as cognitive changes, shifting societal expectations, conflicting role demands, increasingly complex relations with parents, peers and opposite sex, and often choices of school courses and changes in school environments (Alsaker & Olweus, 1993; Block & Robins, 1993; Bolognini, Plancherel, Bettschart, & Halfon, 1996; Coleman & Hendry, 1990; Dacey & Kenny, 1997). It is also characterised as a time of questioning of self and subsequent reformulation of perceptions and evaluations of self (Block & Robins, 1993). Considering the changes that take place, several theorists have postulated that adolescent years are a time of confusion and ambiguity (Burns, 1979), a period of *sturm und drang* (storm and stress, Hall, 1904), and a phase of 'identity crisis' (Erikson, 1959). Others, however, are unwilling to accept a 'turmoil' formulation. They assert that adolescents can develop skills and psychological resources necessary to cope with the stresses of adolescence (Rutter, 1987; Zimmerman & Arunkumar, 1994).

To test the different hypotheses, many studies have utilised changes in self-concept or self-esteem as an indicator of disturbance or stability in development. Perhaps not unsurprisingly, the findings have not been conclusive (e.g., Alsaker & Olweus, 1993; Block & Robins, 1993; Chubb, Fertman, & Ross, 1997; Demo & Savin-Williams, 1992; Keltikangas, 1990; Wylie, 1979). Hirsh and Dubois (1991), as well as Zimmerman and his colleagues (1997) noted that most of the studies examining change or developmental stability have focused on average scores for all respondents to detect mean change over time. They contended that such an approach cannot determine if evidence of no change is due to no real change, or to the counterbalancing of increases and decreases of individuals in the sample. Using a cluster analytic approach they found that adolescents could be classified into distinct subgroups characterised by four self-esteem trajectories – consistently high, consistently low, slightly increasing and steeply decreasing.

In light of Hirsh and Dubois' (1991), and Zimmerman and his colleagues' (1997) findings, it is logical to assume that there may also be subgroup differences in terms of adolescents' academic self-concept. Although there appears to be a consensus that there may be a curvilinear age effect from pre-adolescence to late-adolescence on school or academic self-concept (e.g., Lau, 1990; Marsh, 1989; Marsh, Parker, & Barnes, 1985; Watkins & Dong, 1997), it is not known whether subgroups could have been overlooked with the use of average academic self-concept scores for all respondents. As such, the main goal of this study was to use the cluster analytic approach to explore the possibility of subgroup variations.

According to the symbolic interactionists, individuals define and evaluate themselves based on how they perceive their significant others define and evaluate them (Cooley, 1912; James, 1890; Mead, 1934). Since parents and teachers are some of the most significant persons in an adolescent's life (Claes, 1998; Juhasz, 1989a, 1989b; Juhasz & Yue, 1989; Lempers & Clark-Lempers, 1992; Rosenberg, 1979), it is tenable that adolescents' self-concepts should be related to their perceived regard and support from their parents and teachers, and the nature of their relationships with them. To have a more complete understanding of adolescents, it was decided that instead of focusing solely on academic self-concept, the study would also look at their perceptions of home environment and classroom climate. In essence, the study attempted to determine whether there were distinct subgroups of adolescents in terms of the trajectories of their academic self-concept, and their perceptions of home environment and classroom climate from early to mid-adolescence.

## **Method**

### *Participants*

The participants were 495 adolescents (284 higher-ability stream, 211 lower-ability stream; 255 males, 240 females) from three government-funded co-educational secondary schools in Singapore.

### *Measures*

Adolescents' academic self-concept was assessed by means of an Academic Self-Concept (ASC) scale, which comprised of 19 items. The scale assessed adolescents' feelings and perceptions

about their academic competence, as well as their commitment to, and involvement and interest in schoolwork. Example items included 'I am good in most of my school subjects' and 'I often feel like quitting school (negatively worded).

Adolescents' perception of home environment was assessed by means of a Home Environment (Home) scale, which comprised of 17 items. The scale assessed adolescents' perception of the extent in which their parents show affection for them, spend time with them and show approval for their behaviour, as well as the extent their parents give positive reinforcement, encouragement and help in academic areas. Example items included 'My parents like to spend time with me' and 'My parents believe that I can do well in my study'.

Adolescents' perception of classroom climate was assessed by means of a Classroom Climate (Class) scale, which comprised of 15 items. The scale assessed adolescents' perception of the amount of help, concern and friendship teachers direct to them, the extent to which teachers talk to them, trust them and are interested in them, as well as the extent their teachers' believe in their academic competencies and abilities. Example items included 'We find it easy to talk to our teachers about our problems' and 'Our teachers believe we can pass our 'O' level if we work hard'.

The construction of the ASC scale, Home scale and Class scale was done with reference to established instruments. The ASC scale was constructed with reference to Battle's (1981) academic self-esteem subscale, Marsh, Relich and Smith's (1983) school subjects self-concept scale, and Piers and Harris' (1964) general and academic status scale. The Home scale was developed with reference to Battle's (1981) parental self-esteem subscale, Hoelter and Harper's (1987) family support scale, Marsh et al.'s (1983) relations with parents scale, whilst the Class scale was developed with reference to Moos and Trickett's (1974) affiliation dimension and teacher support dimension. To avoid response set, several items were reworded so that there were positive and negative items. Several items were also rephrased to ensure that they were not too difficult for Secondary 1 adolescents. Answers for the items were given on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree). The item averages for the scales were utilised as bases for statistical analyses.

The concurrent validity of the ASC scale was established in a separate validation study (Liu & Wang, 2004). Specifically, the ASC scale was found to be significantly correlated to Battle's (1981) academic self-esteem subscale ( $r = .73$ ,  $p < 0.001$ ), Marsh et al.'s (1983) school subjects self-concept scale ( $r = .70$ ,  $p < 0.001$ ), and Piers and Harris' (1964) general and academic status scale ( $r = .64$ ,  $p < 0.001$ ). In addition, CFA conducted on the ASC scale to examine its factorial validity using EQS for Windows 5.7 (Bentler & Wu, 1998) supported the hierarchical model comprising of two first-order factors (academic confidence and academic effort) and one higher-order factor (academic self-concept) ( $\chi^2 = 287.45$ ,  $df = 146$ , NNFI = .903, CFI = .917, GFI = .941, RMSR = .023, RMSEA = .044; 90% CI of RMSEA = .036, .051). Likewise, CFA conducted on the Home scale supported the hierarchical model comprising two first-order factors (relationship with parents and academic support) and one higher-order factor (home environment) ( $\chi^2 = 429.47$ ,  $df = 169$ , NNFI = .896, CFI = .907, GFI = .913, RMSR = .024, RMSEA = .056; 90% CI of RMSEA = .049, .062). Whilst, CFA conducted on the Class scale supported the hierarchical model comprising two first-order factors (relationship with teachers

and teachers' expectations) and one higher-order factor (classroom climate) ( $\chi^2 = 189.86$ ,  $df = 86$ , NNFI = .926, CFI = .939, GFI = .948, RMSR = .022, RMSEA = .050; 90% CI of RMSEA = .040, .059).

Whilst, Cronbach's alpha coefficients showed that the ASC, Home and Class scales, administered on four occasions, all had satisfactory internal consistencies. Specifically, the internal reliability estimates of the scales were as follow: ASC alphas = .83 to .86, Home alphas = .87 to .91 and Class alphas = .81 to .86.

### *Procedure*

The self-report questionnaire that included the ASC scale, Class scale and Home scale was administered four times over three years. The survey at time<sub>0</sub> was administered at the beginning of Secondary 1 (average age 13), whilst the surveys at time<sub>1</sub>, time<sub>2</sub> and time<sub>3</sub> were administered at the end of Secondary 1, 2 and 3.

## **Results**

### *Descriptive Statistics and zero-order correlation*

The means and standard deviations of the main variables of the overall sample are shown in Table 1. In general, the pupils had high academic self-concept and positive perceptions of their classroom climate and home environment at the beginning of Secondary 1 (time<sub>0</sub>). However, their perceptions declined consistently over the 3 years. Table 2 shows the intercorrelations between the variables for the overall sample. The correlations between the academic self-concept scales ranged from .36 to .59, the classroom climate scales ranged from .32 to .53, and the home environment scales ranged from .51 to .67. All three main variables showed a decreasing temporal consistency with increasing passage of time.

**Table 1:** Means and Standard Deviations of the Measures

<b>Measure</b>	<b>Mean</b>	<b>Standard Deviation</b>
ASC <sub>0</sub>	3.15	.32
ASC <sub>1</sub>	3.04	.35
ASC <sub>2</sub>	2.92	.36
ASC <sub>3</sub>	2.83	.38
Class <sub>0</sub>	3.39	.33
Class <sub>1</sub>	3.25	.40
Class <sub>2</sub>	3.07	.42
Class <sub>3</sub>	3.03	.40
Home <sub>0</sub>	3.35	.39
Home <sub>1</sub>	3.29	.45
Home <sub>2</sub>	3.14	.47
Home <sub>3</sub>	3.05	.48

**Table 2:** Zero-Order Correlation of the Measures

Measure	1	2	3	4	5	6	7	8	9	10	11
ASC <sub>0</sub>	1.00										
ASC <sub>1</sub>	.55**	1.00									
ASC <sub>2</sub>	.38**	.60**	1.00								
ASC <sub>3</sub>	.37**	.53**	.59**	1.00							
Class <sub>0</sub>	.58**	.32**	.22**	.22**	1.00						
Class <sub>1</sub>	.33**	.54**	.34**	.32**	.48**	1.00					
Class <sub>2</sub>	.23**	.37**	.46**	.31**	.35**	.53**	1.00				
Class <sub>3</sub>	.23**	.39**	.39**	.51**	.33**	.50**	.52**	1.00			
Home <sub>0</sub>	.54**	.42**	.31**	.36**	.45**	.30**	.28**	.24**	1.00		
Home <sub>1</sub>	.36**	.54**	.33**	.41**	.29**	.44**	.26**	.31**	.65**	1.00	
Home <sub>2</sub>	.25**	.44**	.49**	.47**	.20**	.32**	.37**	.36**	.52**	.65**	1.00
Home <sub>3</sub>	.30**	.41**	.41**	.58**	.23**	.30**	.35**	.45**	.51**	.58**	.67**

Note. \*\*  $p < .01$ .

### *Clustering of Adolescents' Academic Self-Concept, Perceptions of Classroom Climate and Home Environment over Time*

In order to examine the developmental patterns of the clusters over time, a hierarchical agglomerative clustering technique was used (Hair, Anderson, Tatham, & Black, 1998). Ward's method was chosen as the clustering method as it minimises the within-cluster differences and avoids problems with forming long, snake-like chains found in other methods such as the single-linkage procedure (Aldenderfer & Blashfield, 1984). With the aid of an agglomeration schedule and dendrogram, the number of clusters can be determined. Before the cluster analyses were carried out, all three variables of the four time points were standardised using Z scores (mean of 0 and a standard deviation of 1).

From the agglomeration schedule, it was found that the merging of the five-cluster solution to the four-cluster solution created a bigger change in the coefficients (6 %) compared to previous merging (less than 4% change). This indicated that dissimilar clusters were being merged at that point. As such, it was decided that the four-cluster solution would be appropriate for the data and the decision was supported by the dendrogram.

Figure 1 shows the cluster profiles of the four clusters. From the figure, it can be seen that the four trajectories had distinct developmental patterns: Cluster 1 was 'steeply decreasing' (32.5%;  $n = 161$ ; 76 male, 85 female), Cluster 2 was 'consistently low' (23.2%;  $n = 115$ ; male = 63, female = 52), Cluster 3 was 'moderate and maintaining' (22.6%;  $n = 112$ ; male = 63, female = 49), and Cluster 4 was 'consistently high' (21.6%;  $n = 107$ ; 53 male, 54 female). Z scores of +/- 0.5 or greater were used as criteria to describe whether a cluster scored relatively 'high' or 'low' in comparison to their peers. Table 3 details the descriptive statistics and Z scores for each cluster.

A repeated-measure Multivariate Analysis of Variance (MANOVA) was conducted to examine the main cluster effect and the cluster by time interaction effect. The results of the repeated analysis MANOVA indicated that the patterns of change differed significantly across the four

clusters (Pillai's Trace = .95,  $F(9, 1473) = 75.70$ ,  $p < .001$ ,  $\eta^2 = .32$ ), and the patterns of change of the four clusters also differed significantly over time (Pillai's Trace = .18,  $F(27, 1455) = 3.33$ ,  $p < .001$ ,  $\eta^2 = .06$ ). The follow-up univariate tests revealed that the main effects and the interaction effects were significant for the academic self-concept, classroom climate and home environment measures (all  $ps < .001$ ).

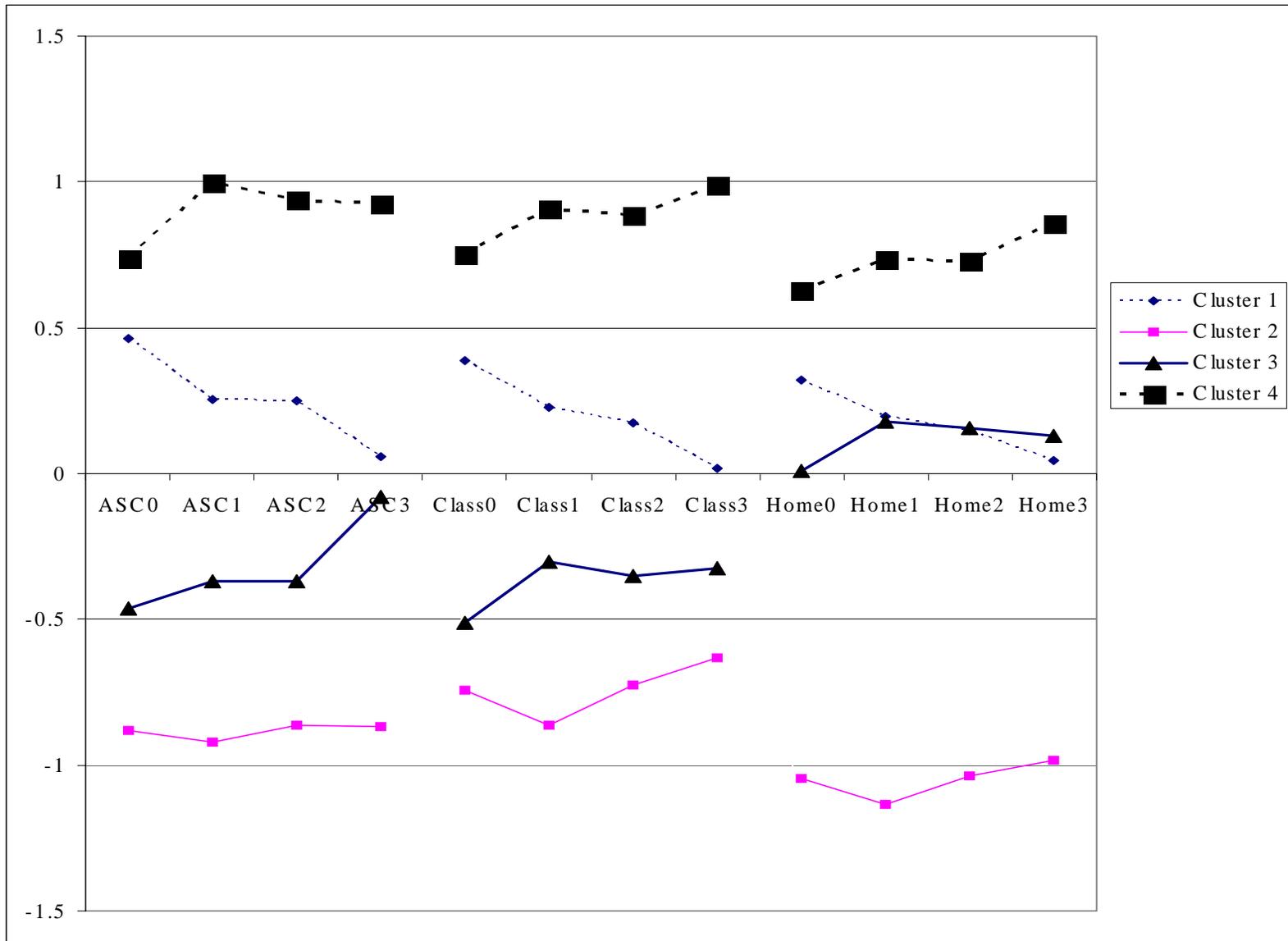
### *Differentiating Cluster Profiles*

To examine the characteristics of each cluster according to ability stream and gender, two chi-squares analyses were conducted. The results showed that there were more higher-ability stream students ( $n = 105$ ) in Cluster 1 than lower-ability stream students ( $n = 56$ ),  $\chi^2(3) = 8.32$ ,  $p < .05$ . There was, however, no significant difference across the four clusters in terms of gender. In addition, two one-way MANOVA were conducted. PSLE result (streaming criteria) and non-verbal reasoning test score (Elliott, 1983a, 1983b) were the dependent variables in the first MANOVA, whilst Secondary 1 and 2 class positions were the dependent variables in the second analysis. The results showed that there was no significant difference across the clusters in terms of PSLE results and non-verbal reasoning test scores (Wilks'  $\Lambda = .98$ ,  $F(6, 948) = 1.60$ ,  $p = .15$ ,  $\eta^2 = .01$ ). In contrast, the second MANOVA found a significant cluster effect on Secondary 1 and 2 class positions (Wilks'  $\Lambda = .963$ ,  $F(6, 980) = 3.10$ ,  $p < .01$ ,  $\eta^2 = .02$ ). Follow-up ANOVA showed that both Secondary 1 and 2 class positions differed significantly across clusters ( $F(3, 495) = 5.65$ ,  $p < .01$ ,  $\eta^2 = .03$  for Secondary 1 class position, and  $F(3, 495) = 4.91$ ,  $p < .01$ ,  $\eta^2 = .03$  for Secondary 2 class position). Post-hoc tests using Tukey's honestly significant difference (HSD) tests indicated that adolescents from cluster 4 had significantly better average Secondary 1 class position than the other clusters ( $ps < .05$ ), and better average Secondary 2 class position than clusters 2 and 3 ( $ps < .05$ ).

**Table 3:** Cluster Means, Standard Deviations, and z Scores for the Four-Cluster Solution *from the Hierarchical Cluster Analysis*

Clustering Variable	Cluster 1 (n=161)		Cluster 2 (n=115)		Cluster 3 (n=112)		Cluster 4 (n=107)	
	Means (z)	SD	Mean (z)	SD	Mean (z)	SD	Mean (z)	SD
1. ASC <sub>0</sub>	3.30 (.46)	0.25	2.87 (-.88)	0.25	3.00 (-.46)	0.26	3.39 (.74)	0.22
2. ASC <sub>1</sub>	3.13 (.25)	0.23	2.72 (-.92)	0.31	2.91 (-.37)	0.25	3.39 (1.00)	0.24
3. ASC <sub>2</sub>	3.01 (.25)	0.29	2.61 (-.86)	0.33	2.78 (-.37)	0.21	3.25 (.94)	0.25
4. ASC <sub>3</sub>	2.85 (.06)	0.28	2.50 (-.87)	0.35	2.79 (-.08)	0.25	3.18 (.93)	0.34
5. Class <sub>0</sub>	3.52 (.39)	0.25	3.15 (-.74)	0.28	3.22 (-.51)	0.27	3.64 (.75)	0.26
6. Class <sub>1</sub>	3.34 (.22)	0.28	2.91 (-.86)	0.36	3.13 (-.30)	0.34	3.61 (.91)	0.26
7. Class <sub>2</sub>	3.14 (.16)	0.29	2.77 (-.73)	0.40	2.92 (-.35)	0.36	3.44 (.89)	0.33
8. Class <sub>3</sub>	3.04 (.02)	0.34	2.78 (-.63)	0.36	2.90 (-.32)	0.30	3.42 (.99)	0.29
9. Home <sub>0</sub>	3.48 (.32)	0.29	2.94 (-1.04)	0.43	3.35 (.01)	0.25	3.60 (.63)	0.23
10. Home <sub>1</sub>	3.38 (.20)	0.36	2.78 (-1.14)	0.43	3.37 (.18)	0.27	3.62 (.74)	0.23
11. Home <sub>2</sub>	3.20 (.14)	0.40	2.65 (-1.04)	0.47	3.21 (.16)	0.28	3.48 (.73)	0.27
12. Home <sub>3</sub>	3.07 (.05)	0.42	2.58 (-.98)	0.45	3.11 (.13)	0.27	3.46 (.86)	0.31

**Figure 1:** Trajectories of academic self-concept, classroom climate and home environment for the overall sample (N=495)



## Discussion

It will be recalled that the clusters were identified with the use of the Ward's method of hierarchical agglomerative clustering technique based on the adolescents' self-evaluation of their academic self-concept, home environment and classroom climate over the 3-year period. The results revealed that there were four distinct clusters of adolescents with different developmental patterns. In essence, the trajectories can be classified as *steeply decreasing*, *consistently low*, *moderate and maintaining* and *consistently high*.

Essentially, the steeply decreasing cluster (cluster 1) had adolescents with relatively high academic self-concept, and very positive perceptions of home environment and classroom climate at the beginning of Secondary 1. However, as they entered mid-adolescence, their academic self-concept, and their perceptions of home environment and classroom climate took a dramatic, continuous dive when compared to their peers. In view of the depressing picture, it is noteworthy that there were significantly more higher-ability stream adolescents than lower-ability stream adolescents in this cluster.

The depressing picture established by the steeply declining cluster suggests that adolescence may indeed be a period of 'storm and stress' for this group of adolescents (Hall, 1904). In view of the fact that the cluster had significantly more higher-ability adolescents than lower-ability stream adolescents, and that higher-ability classroom climate is generally more pressurising and stressful, it is tenable that the declines could be related to long-term difficulties in adjusting to secondary schools. For instance, the adolescents could have problems coping with the increased academic demands, or adjusting to the more evaluative and competitive classroom climate. Alternatively, they could have difficulties accepting the more distant adolescent-teacher relationships, or establishing themselves in the larger comparison group.

The consistently low cluster (cluster 2) painted an equally depressing picture in which the adolescents' academic self-concept and their perceptions of home environment and classroom climate were always extremely low with respect to their peers. In view of the results, it is noteworthy that the adolescents in the cluster did not have significantly lower PSLE results or non-verbal reasoning test score than the other clusters. Their Secondary 1 and 2 class positions were only significantly lower than that of the consistently high cluster.

The results of the consistently low cluster show that the adolescents, in addition to having devastatingly low academic self-concept, had problems with their home and school environments. Essentially, the adolescents had difficulties with some of the most significant people in their life, namely, their parents and teachers. Although not conclusive, there is evidence to suggest that the adolescents' perception of home environment may be more negative, as compared to the norm, than their academic self-concept or their perception of classroom climate (see Figure 1). Since adolescents' perception of one environment may be influenced by their perception of another (Paulson, Marchant, & Rothlisberg, 1998), it is possible that their perception of the classroom climate may have been affected by the extremely negative view of their home environment. However, given the extremely negative picture right from the beginning of Secondary 1, their low academic self-concept and their adverse perceptions of home environment and classroom climate possibly did not emerge at the start of the study. The problems, whether originated from the home or school, could have been there for some time.

The moderate and maintaining cluster (cluster 3) revealed a more promising profile. In this case, the adolescents' academic self-concept and their perceptions of classroom climate started about -0.5 point (Z score) below the standardized means of the overall sample but they became closer to the norm over time. In addition, their perception of home environment started approximately at the standardised mean of the overall sample but it increased at the end of Secondary 1 and was maintained at more than 0.10 point above the standardized mean for the next 2 years. The evidence clearly shows that the adolescents' perception of home environment was more positive, as compared to the norm, than that of their classroom climate (refer to Figure 1). In this view, it is probable that the adolescents' relatively positive perception of home environment could have helped in stabilising their academic self-concept and their perception of classroom climate during the difficult period of adjustment to stresses of adolescence.

The consistently high cluster (cluster 4) established the most promising picture. Essentially, the adolescents had higher academic self-concept and more positive perceptions of classroom climate and home environment than the adolescents in the other clusters at all points in time during the study. In addition, their academic self-concept, and their perceptions of home environment and classroom climate also became more positive with respect to the norm from the beginning of Secondary 1 to the end of Secondary 3. In view of the results, it is interesting to note that the adolescents in the cluster had significantly better average Secondary 1 class position than the adolescents in the other clusters, and significantly better average Secondary 2 class position than the adolescents in the moderate and maintaining cluster and the consistently low cluster.

The results suggest that the adolescents in the consistently high cluster were confident about their own academic abilities and were happy with their classroom climate and home environment. These adolescents appear to be coping relatively well with the changes related to adolescence, and the effect of transition to secondary school. It is likely that the result reflects the resiliency model proposed by Rutter (1987), who asserts that adolescents can develop skills and psychological resources necessary to cope with the stresses of adolescence. The design of the study precludes any conclusion regarding causal direction, but it is tenable that the academic achievements of the adolescents could have been a resource that helped them cope with the problems they experienced during the first three years of their secondary education.

### **Conclusion**

To conclude, our findings show that there are indeed unique groups of adolescents in Singapore secondary schools. Some adolescents may have difficulties in adjusting to changes in adolescence; others may have struggled to cope long before they reach adolescence. Some adolescents may face minor 'hiccups' during adjustments; others may be well-adjusted and may cope brilliantly on their own. Clearly, adolescents are not a homogeneous developmental group, and hence competing or conflicting theories of adolescence such as Hall's (1904) 'storm and stress' theory and Rutter's (1987) resiliency model may in fact all be relevant, albeit for different subgroups of youths. In light of our findings, it is pertinent that future research should perhaps channel their effort towards the search of which model is more appropriate for a given subgroup of youths rather than for a global model of adolescent development. Such an approach will not only provide a more in-depth understanding of adolescents; it will also minimise incorrect conclusions made from over-generalisation.

**References**

- Aldenderfer, M. S., & Blashfield, R. K. (1984). *Cluster Analysis*. Newbury Park, CA: Sage Publications.
- Alsaker, F. D., & Olweus, D. (1993). Global self-evaluations and perceived instability of self in early adolescence: A cohort longitudinal study. *Scandinavian Journal of Psychology, 34*, 47-63.
- Battle, J. (1981). *Culture-free SEI: Self-esteem inventories for children and adults*. Seattle: Special Child Publications.
- Bentler, P. M., & Wu, E. (1998). EQS for Windows (Version 5.7). Encino, CA: Multivariate Software.
- Block, J., & Robins, R. W. (1993). A longitudinal study of consistency and change in self-esteem from early adolescence to early adulthood. *Child Development, 64*, 909-923.
- Bolognini, M., Plancherel, B., Bettschart, W., & Halfon, O. (1996). Self-esteem and mental health in early adolescence: Development and gender differences. *Journal of Adolescence, 19*, 233-245.
- Burns, R. B. (1979). *The self-concept: In theory, measurement, development and behaviour*. London: Longman Group Limited.
- Chubb, N. H., Fertman, C. I., & Ross, J. L. (1997). Adolescent self-esteem and locus of control: A longitudinal study of gender and age differences. *Adolescence, 32*(125), 113-129.
- Claes, M. (1998). Adolescents' closeness with parents, siblings, and friends in three countries: Canada, Belgium and Italy. *Journal of Youth and Adolescence, 27*(2), 165-184.
- Coleman, J. C., & Hendry, L. (1990). *The nature of adolescence* (2nd ed.). London: Routledge.
- Cooley, C. H. (1912). *Human nature and the social order*. New York: Scribners.
- Dacey, J., & Kenny, M. (1997). *Adolescent development* (2nd ed.). Boston: McGraw-Hill.
- Demo, D. H., & Savin-Williams, R. C. (1992). Self-concept stability and change during adolescence. In R. P. Lipka & T. M. Brinthaupt (Eds.), *Self-perspective across the life span*. New York: State University of New York Press.
- Elliott, C. D. (1983a). *British ability scales*. Windsor, England: NFER-Nelson.
- Elliott, C. D. (1983b). *British Ability Scales: Manual 2. Technical Handbook*. Windsor, England: NFER-Nelson.
- Erikson, E. H. (1959). Identity and the life cycle: Selected papers. *Psychological Issues, 1*, 1-171.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). New Jersey: Prentice-Hall.
- Hall, G. S. (1904). *Adolescence*. New York: Appleton.
- Hirsh, B. J., & DuBois, D. L. (1991). Self-esteem in early adolescence: The identification and prediction of contrasting longitudinal trajectories. *Journal of Youth and Adolescence, 20*(1), 53-72.
- Hoelter, J., & Harper, L. (1987). Structural and interpersonal family influences on adolescent self-conception. *Journal of Marriage and the Family, 49*, 129-139.
- James, W. (1890). *Principles of psychology*. New York: Holt, Rinehart and Winston.
- Juhasz, A. M. (1989a). *Significant others and self-esteem of American and Australian early adolescent*. EDRS Price. ED 340963.
- Juhasz, A. M. (1989b). Significant others and self-esteem: Methods for determining who and why. *Adolescence, 26*(95), 581-594.
- Juhasz, A. M., & Yue, M. (1989). *Significant others of U.S. white, black and Chinese early adolescents*. EDRS Price. ED 340962.

- Keltikangas, J. L. (1990). The stability of self-concept during adolescence and early adulthood: A six-year follow-up study. *Journal of General Psychology, 117*(4), 361-368.
- Lau, S. (1990). Crisis and vulnerability in adolescent development. *Journal of Youth and Adolescence, 19*(2), 111-131.
- Lempers, J. D., & Clark-Lempers, D. S. (1992). Young, middle, and late adolescents' comparisons of the functional importance of five significant relationships. *Journal of Youth and Adolescence, 21*(1), 53-96.
- Liu, W. C., & Wang, C. K. J. (2004). *A longitudinal study of students' academic self-concept in a streamed setting: The Singapore's context*. Unpublished manuscript, Singapore.
- Marsh, H. W. (1989). Age and sex effects in multiple dimensions of self-concept: Preadolescence to early adulthood. *Journal of Educational Psychology, 81*(3), 417-430.
- Marsh, H. W., Parker, J., & Barnes, J. (1985). Multidimensional adolescent self-concepts: Their relationship to age, sex and academic measures. *American Educational Research Journal, 22*(3), 422-444.
- Marsh, H. W., Relich, J. D., & Smith, I. D. (1983). Self-concept: The construct validity of interpretations based upon the SDQ. *Journal of Personality and Social Psychology, 45*, 173-187.
- Mead, G. H. (1934). *Mind, self and society*. Chicago: University of Chicago Press.
- Moos, R. H., & Trickett, E. J. (1974). *Classroom environment scale manual*. Palo Alto, CA: Consulting Psychologists Press.
- Paulson, S. E., Marchant, G. J., & Rothlisberg, B. A. (1998). Early adolescents' perceptions of patterns of parenting, teaching and school atmosphere: Implications for Achievement. *Journal of Early Adolescence, 18*(1), 5-26.
- Piers, E. V., & Harris, D. B. (1964). Age and other correlates of self-concept in children. *Journal of Educational Psychology, 55*(2), 91-95.
- Rosenberg, M. (1979). *Conceiving the self*. New York: Basic.
- Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry, 57*, 316-331.
- Watkins, D., & Dong, Q. (1997). Age and gender differences in the self-esteem of Chinese children. *Journal of Social Psychology, 137*, 374-380.
- Wylie, R. (1979). *The self-concept: Theory and research on selected topics* (Vol. 2). Lincoln: University of Nebraska Press.
- Zimmerman, M. A., & Arunkumar, R. (1994). Resiliency research: Models, issues, and policy implications. *Social Policy Rep, 8*, 1-18.
- Zimmerman, M. A., Copeland, L. A., Shope, J. T., & Dielman, T. E. (1997). A longitudinal study of self-esteem: Implications for adolescent development. *Journal of Youth and Adolescence, 26*(2), 117-141.