

The Academic Achievement and Aspirations of Chinese Immigrant Girls in Australia

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There has been a rapid increase in Asian immigration to Australia since 1976 (Jones, 1992) and among the Asian immigrants, many of them are Chinese immigrants. According to the 1991 Census, Chinese-speaking persons constitute the third largest non-English speaking group in Australia (Castles, 1993). An understanding of the adjustment of Chinese immigrants in Australian society is important so that appropriate services could be provided for them.

In this study, the focus is on the academic achievement and aspirations of Chinese immigrant adolescent girls, which is examined in terms of school performance and choice of academic subjects. The adjustment of Chinese immigrant girls in these two areas is considered in the light of the influences on them of various demographic, personal and interpersonal factors. These factors include the girls' ethnicity, ethnic identification, length of residence in Australia, countries of origin, auspices of immigration (for instance, whether they entered Australia as refugees or voluntary migrants), definitions of success, their perception of academic subjects that girls should excel in, and the influences on the girls of significant others such as parents, teachers and peers.

The decision to focus on females and the above named variables is based on research evidence which suggests that females tend to underachieve in academic areas such as mathematics and science. They tend to be under-represented in these disciplines and have stereotyped choices of academic subjects and careers (e.g. Stein & Bailey, 1973; Poole & Beswick, 1989; Commonwealth Schools Commission, 1987).

Research has also shown that academic achievement and participation are related to a host of factors. For instance, many researchers found that academic achievement was related to one's definitions of success.

A definition of success in terms of self-actualisation, or being

oneself and developing one's potential, was related to high academic achievement (LeMay and Damm, 1968). A definition of success emphasising academic success and competition with others (agentic success) was also related to high academic achievement (Rosen, 1956, Salili and Tse-Mak, 1988). These two aforementioned definitions of success are individualist as they emphasise individual autonomy and achievement (Hofstede, 1979). In addition, definitions of success emphasising relationship with other people are also related to academic achievement. It was found that, among Chinese students, social-oriented success, or respecting and fulfilling the wishes of important others such as parents was related to high academic achievement (Chan, 1987). However, definitions of success with an emphasis on interpersonal relationship or traditional female roles such as family and social

relationships (communion-affiliative success) were related to low academic achievement (Salili & Tse-Mak, 1988; Commonwealth Schools Commission, 1987). These definitions are collectivist in the sense that they emphasise emotional dependence on social groups (Hofstede, 1979). One's definitions of success were likely to be influenced by one's significant others, such as parents, teachers and peers (Poole, 1986; Oetting & Beauvais, 1986; Edgar, 1975).

Choice of academic subjects was also found to be related to one's definitions of success and students are likely to choose academic subjects which are consistent with their definitions of success. For example, students who emphasised individualist personal achievement and money (agentic success) preferred science subjects (Thomas, 1990; Ware and Lee, 1988). On the contrary, students who preferred to be involved with people (communion-affiliative success) preferred arts subjects and arts students often regarded their degree as an end in itself and they did their degree because they enjoyed it (Thomas, 1990). The latter rationale was consistent with a definition of success in terms of self-actualisation. Apart from definitions of success, choice of academic subjects is also likely to be related to one's achievement in the discipline. Ainley and Sheret (1992) and Ainley, Jones and Navaratnam (1990) found that academic achievement influenced the choice of academic subjects, especially science subjects. A high level of numeracy was associated with choice of physical science subjects. Furthermore, choice of academic subjects was related to the image of the subject in relation to sex roles. Yates (1993) reported that among girls, choice of science subjects was influenced by the masculine image of science subjects. Significant others such as parents and teachers might influence such attitudes through child-rearing practices or classroom practices (Kelly, 1987).

Apart from the influence of significant others, culture has an important influence on people's beliefs, values and behaviour (Sue & Sue, 1990). In terms of definitions of success, Australians have been found to emphasise self-actualisation and happiness (Feather, 1985, 1986; Musgrave, 1984) whereas Chinese people tended to endorse a social-oriented definition of success (fulfilling the expectations of

significant others) (Yang & Yue, 1988). In terms of the image of academic subjects such as science subjects, while researchers in the western world (e.g. Kelly, 1987) found that science subjects were often seen as masculine subjects among girls, Brimer and Griffin (1985) found that Hong Kong female students saw mathematics as a neutral academic subject. The relationships among the above discussed variables are represented in Figure 1.

Insert Figure 1 here

In addition to the above issues, among Chinese immigrant girls, their adjustment is likely to be influenced by factors such as their length of residence in Australia, their auspices of immigration (migrants or refugees) and their ethnic identification. Research showed that length of residence in the host country was positively related to academic achievement (Luckey & Jupp, 1990). Chinese students from a migrant background achieved better academic results than those from a refugee background (Chan, 1987). Furthermore, Chinese students who retained more Chinese cultural values achieved better academic results than those who retained fewer Chinese values (Chan, 1987). Among Chinese adolescents, identification with Chinese cultural values and culture was negatively correlated with length of residence in the host society (Rosenthal & Feldman, 1992).

The aim of the present study was to investigate the academic achievement and aspirations of Chinese immigrant girls in the light of a host of demographic and personal factors. The study employed a combination of quantitative and qualitative techniques. Results from quantitative analysis (phase one) could point to broad patterns of relationship among variables. Results from qualitative analysis (phase

two) could explain the dynamics behind the observed relationships among variables, and throw light on the subjective experience of Chinese immigrant girls in their adaptation to Australian society. The quantitative and qualitative results could complement and supplement each other, and provide for convergent validity (Patton, 1990).

Method

Participants

The participants for the phase one survey consisted of 78 Chinese-speaking girls and 47 Anglo-Australian, English-speaking girls living in Melbourne, Australia. The mean age of the girls was 14.5 years (s.d. = 1.6). The Chinese-speaking girls were older (mean = 14.9, s.d. = 1.8) than the Anglo-Australian, English-speaking girls (mean = 13.9, s.d. = 1.0). The majority of the girls (66.4%, 83 girls) attended state co-educational secondary colleges. The rest attended state girls secondary colleges, Catholic girls colleges and independent schools.

The Chinese-speaking girls came from different countries. According to Kee (1988), Chinese from Hong Kong, Taiwan, China, Singapore and Malaysia generally came to Australia as migrants whereas those from Vietnam, Cambodia and Timor came as refugees or on humanitarian backgrounds. The number and percentages of Chinese-speaking girls in

terms of countries of origin is shown in Table 1.

Out of the Chinese-speaking girls who participated in the phase one study, 30 girls were selected for phase two individual interviews. The girls were selected on the basis of their length of residence in Australia and countries of origin. The percentage of girls from different countries participating in phases one and two is shown in Table 1. The number of Chinese-speaking girls participating in the phase two interviews in terms of countries of origin and length of residence in Australia is shown in Table 2.

Insert Tables 1 and 2 here

Materials

In the phase one survey study, data was gathered by means of a largely closed format questionnaire, written in English. The variables included:

Demographic information. Participants were requested to indicate the language spoken at home, and their parents' places of birth.

Definitions of success of parents, teachers, classmates and participants. The participants were requested to list their definitions of success and that of their parents, teachers and classmates via open-ended questions. Based on their responses, a 5-point scale with 25 items was developed and four judges rated the responses of the participants on this scale. The inter-rater reliability was above .7 for the majority of items.

Academic achievement. Academic achievement was measured by grades awarded by teachers in English and Mathematics, based on a separate questionnaire completed by the participants' teachers.

Choice of academic subjects. This was determined by the number of academic subjects in various areas (e.g. business, arts, science) that the participants planned or intended to choose for their future Victoria Certificate of Education (VCE) course, the final year course in the secondary education system in Melbourne.

Academic subjects that girls should excel in. This was determined by the number of subjects in various areas (e.g. arts, science, business) listed by the participants as subjects that girls should excel in.

Length of residence in Australia and countries of origin. These were ascertained by open-ended questions.

Degree of Chinese identification. Chinese identification was measured by means of a single ordinal item with four alternatives (Chinese; mostly Chinese, a little Australian; mostly Australian, a little Chinese; Australian).

For the phase two interviews, the interviews were semi-structured and

involved the use of an interview guide consisting of a number of predetermined questions or topics. The questions covered issues including the girls' Chinese identification, definitions of success, academic work and aspirations, and social relationships.

Procedures

In the phase one survey, the participants completed the questionnaires in their schools in group sessions. In the phase two interviews, the

participants were interviewed individually and the interviews were tape recorded. The interviews were conducted in English except in cases where the participants preferred or requested to use Chinese.

Results

Path analysis was used to analyse the quantitative data. However, due to the large number of variables, factor analysis and correlation techniques were used to reduce and select items.

Selection of variables

For the definitions of success of parents, teachers and peers, factor analysis revealed 5 factors. They were self-actualisation, social relationship, material success, ability and effort and student behaviour. Self-actualisation, material success, and ability and effort are individualist in orientation and the raw scores of these items were summed to form a new variable named definition of success of significant others (individualist definitions). This variable was retained because of its significant correlation with participants' definition of success.

For the participants' definitions of success, factor analysis revealed four factors. The first two factors loaded on self-actualisation and social relationship respectively. The other two factors were unclear. The raw scores of items on the first two factors were summed up to form two variables, definition of success (self-actualisation) and definition of success (social relationship). The variable definition of success (self-actualisation) was retained because of its correlation with academic achievement and definition of success of significant others (individualist definitions). Choice of science subjects was chosen to represent choice of academic subjects because of theoretical considerations. Number of science subjects that girls should excel in was chosen to represent academic subjects that girls should excel in because of its correlation with choice of science subjects.

Length of residence in Australia ($r = .74$, $p < .001$) and degree of Chinese identification ($r = -.84$, $p < .001$) correlated highly with ethnicity and were excluded from the path analysis due to problems of multicollinearity. Country of origin was confounded with ethnicity and was also excluded from path analysis.

Descriptive statistics

The means and standard deviations of the participants on various variables are shown in Table 3.

Insert Table 3 here

Path analysis

Path analysis was used to test whether the data was consistent with the model. The endogenous variables were definition of success (self-actualization), number of science subjects that girls should excel in, academic achievement and choice of science subjects. The exogenous variables were ethnicity and definitions of success of significant others (individualist definitions). The results are shown in Figure 2.

Insert Figure 2 here

Definition of success (self-actualization) was related to definitions of success of significant others (individualist definitions) ($\beta = .26$,

$p < .05$). Girls whose significant others defined success more in individualist terms defined success more in terms of self-actualization than those girls whose significant others defined success less in individualist terms. Number of science subjects that girls should excel in was also related to definitions of success of significant

others (individualist definitions) ($r = .20$, $p < .05$). Girls whose significant others defined success more in individualist terms listed more science subjects as subjects that girls should excel in, compared to girls whose significant others defined success less in individualist terms.

Academic achievement was related to definition of success (self-actualization) ($r = .26$, $p < .05$). Girls who defined success more in terms of self-actualization achieved better school results than those who defined success less in terms of self-actualization. Choice of science subjects was related to academic achievement ($r = .21$, $p < .05$) and number of science subjects that girls should excel in ($r = .30$, $p < .05$). Girls who achieved better in school work chose more science subjects than those who achieved less well. Girls who listed more science subjects as subjects that girls should excel in chose more science subjects than those who listed fewer subjects.

Tables 4 and 5 show the direct, indirect and total effects of various variables on the endogenous variables, academic achievement and choice of science subjects. Table 6 shows the amount of variance explained, and the various goodness of fit indices of the theoretical model and the data.

Insert Tables 4, 5 and 6 here

According to Joreskog and Sorbom (1986), the Chi square statistics could be regarded as a measure of goodness of fit between the model and the data. A small chi square value corresponds with a good fit. In this case, the chi square value was small, suggesting that the model was consistent with the data (Pedhazur, 1982). The goodness of fit index was "a measure of the relative amount of variance and covariances jointly accounted for by the model" (Joreskog & Sorbom, 1986, I.41). Its values

range from zero to one. In this case, the value was close to one. The root mean square residual measured the average of the residual variances and covariances (Joreskog & Sorbom, 1986). In this analysis, the residual variances and covariances were small, suggesting that the differences between the observed and reproduced correlations were small, indicating strong goodness of fit (Pedhazur, 1982). Looking at these three indices of goodness of fit, they indicated that the overall fit of the model was good.

On the other hand, the squared multiple correlation for structural equations (a measure of the strength of relationship between variables) and the total coefficient of determination for structural equations (a measure of the strength of several relationship together) were not very high. This suggested the need to include additional variables in order to more fully explain the variance in the model. For example, the

variable, intelligence, may have been a legitimate variable to consider; however the practical difficulties associated with its administration did not allow for its inclusion. The other possibility was that Chinese-speaking girls might not be a homogeneous group and among them, there could be particular factors contributing to their academic achievement and participation. Further analysis on specific groups of Chinese-speaking girls is warranted.

Analyses specific to Chinese-speaking girls

Three multiple regression analyses were used to find out the predictors to academic achievement among Chinese-speaking girls. The independent variables were length of residence in Australia, degree of Chinese identification and auspices of immigration. The dependent variables were overall academic achievement, English achievement and mathematics achievement. In all three cases, R for regression was significantly different from zero; for overall academic achievement, $F(3, 73) = 6.3$, $p < .001$; for mathematics achievement, $F(3, 73) = 3.6$, $p < .05$; and for English achievement, $F(3, 73) = 7.4$, $p < .001$. Length of residence in Australia was positively related to overall academic achievement ($r = .52$, $p < .001$), mathematics achievement ($r = .40$, $p < .005$), and

English achievement ($r = .49$, $p < .001$). Degree of Chinese identification was positively related to Mathematics achievement ($r = .28$, $p < .05$). Auspices of immigration was related to overall academic achievement ($r = -.23$, $p < .05$), with migrant girls achieving better results than girls from a refugee background. Length of residence in Australia, degree of Chinese identification and auspices of immigration, however, were not predictive of choice of science subjects.

Degree of Chinese identification was negatively related to definition of success (self-actualisation) ($r = -.47$, $p < .001$), the more the Chinese-speaking girls identified with Chinese culture, the less they defined success in terms of self-actualisation. Length of residence in Australia was positively related to definition of success (self-actualisation) ($r = .46$, $p < .001$), the longer the Chinese-speaking girls have lived in Australia, the more they defined success in terms of self-actualisation. Length of residence in Australia was negatively related to degree of Chinese identification ($r = -.54$, $p < .001$), the longer the Chinese-speaking girls have lived in Australia, the less they identified with Chinese culture.

Comparison of Anglo-Australian, English-speaking girls with specific groups of Chinese-speaking girls

In the path analysis results, ethnicity was not significantly related to any endogenous variables. However, as seen above, the Chinese-speaking girls were not a homogeneous group and there were differences among them in terms of length of residence in Australia, degree of Chinese identification and auspices of immigration. It is possible that the Anglo-Australian, English-speaking girls might differ from specific groups of Chinese-speaking girls in various aspects. Specifically, Chinese girls who identified themselves as Chinese or

mostly Chinese ($n = 67$) achieved better in Mathematics (mean = 4.1, s.d. = 1.2) than Anglo-Australian, English-speaking girls, $t(112) = 2.8$, $p < .01$. Chinese-speaking girls who identified themselves as Chinese or mostly Chinese defined success less in terms of self-actualisation (mean = 2.4, s.d. = .8) than Anglo-Australian, English-speaking girls, $t(76.62) = -2.4$, $p < .05$. Furthermore, Chinese-speaking girls who have lived in Australia for 8 years or less ($n = 55$) defined success less in terms of self-actualisation (mean = 2.4, s.d. = .9) than Anglo-Australian, English-speaking girls $t(85.12) = -2.4$, $p < .05$. Chinese-speaking girls who have lived in Australia for 9 years or more ($n = 22$) achieved better in terms of overall academic achievement (mean = 8.5, s.d. = 1.7) than Anglo-Australian, English-speaking girls $t(52.44) = 2.9$, $p < .05$.

Qualitative results

The qualitative data was considered and coded by the author and another psychologist. Patton (1990) suggests that the use of more than one person to code the data is useful. This is because "important insight can emerge from the different ways in which two people look at the same set of data, a form of analytical triangulation" (p. 383).

The author and the other psychologist considered the responses of the participants to the questions listed in the interview guide. Based on the responses, categories were developed. The categories included, for example, participants' Chinese identification, friendship preference and perception of Australia.

The next stage in the analysis was to look at the conditions under which the categories occurred (Turner, 1981). Participants who were similar to one another in as many categories (e.g. friendship preference, Chinese identification) as possible were grouped together and five groups resulted.

There were 9 girls in the first group. The mean length of residence in Australia of this group of girls was 5.2 years and most of them were migrants. They were unenthusiastic in their impressions of Australia, describing Australia as a quiet and boring place. In terms of the

subjective aspects of identification (Rosenthal & Feldman, 1992), they identified themselves as Chinese and in terms of the objective aspects of identification such as friendship preference, they made friends mainly with Asians (Rosenthal & Feldman, 1992). In accordance with the Chinese culture emphasising importance of parents, they respected their parents and were influenced more by their parents than by their friends. The girls in this group did well academically and some of them also attributed their success, especially in mathematics and science subjects, to the influence and help of their fathers. This group could be termed the chauvinistic group because the experience of its members resembled that of the chauvinistic type as described by Bochner (1982) in his model on outcomes of cultures in contact. The chauvinistic type, according to Bochner (1982), rejects the new culture and retains the old culture.

There were 6 girls in the second group. The mean length of residence

in Australia of this group of girls was 5.6 years and most of them were from a refugee background. Unlike the chauvinistic girls, the girls in the second group were very positive in their impressions of Australia, regarding Australia as a better place than their countries of origin. However, they still identified themselves as Chinese. Their friendship circles, nevertheless, were mixed, including Asian and non-Asian friends. Though some of them were still influenced more by their parents, others were more influenced by their peers, who, in these cases, were Asians. Some of the girls in this group, especially those who had been in Australia for only a short period of time, reported having difficulties in their school work. This group could be called the ethnic-bicultural group. The experiences of its members resembled that of the ethnic-bicultural type in Wong-Rieger and Quintana's (1987) model on acculturation. The ethnic-biculturals, according to Wong-Rieger and Quintana (1987), are immigrants who are oriented towards their culture of origin but who, at the same time, identify with the new host culture.

There were 8 girls in the third group. The mean length of residence in Australia of this group of girls was 8.1 years and there were both migrants and refugees in this group. Unlike the chauvinistic and ethnic-bicultural girls, who identified themselves as Chinese, the girls in this third group were mixed in their ethnic identification, with some identification with Australian culture and some identification with Chinese culture. They were both Chinese and Australian. Their friendship circles were mixed and they were influenced either by their friends or by their parents. Moreover, they were mixed in their impressions of Australia. Some of them were unenthusiastic while others were quite positive. In terms of their academic achievement, some girls in this group did well whereas others expressed some reservations about their performances. This group could be called the Anglo-bicultural group. The experiences of its members resembled that of the Anglo-bicultural type in Wong-Rieger and Quintana's (1987) model on acculturation. The Anglo-bicultural immigrants, according to Wong-Rieger and Quintana (1987), are positive towards both their own culture and Anglo-culture.

There were 3 girls in the fourth group. Their mean length of residence in Australia was 13.3 years and they consisted of both migrants and refugees. Unlike the chauvinistic and bicultural girls who identified with Chinese culture to various extent, the girls in this fourth group identified themselves as Australians. They did not mix with Asian friends. They preferred non-Asian friends and their parents did not have much influence on them. They were more influenced by their friends than by their parents. From their descriptions, their parents did not seem to play an important part in their lives and they described their parents as flexible. They were positive in their impressions of Australia. The girls in this group did well academically and two of the three girls claimed that their best subject

was English. This group could be termed the passing group. The

experiences of members of this group resembled that of the passing type in the model of Bochner (1982) who reject the old culture and adopt the new culture.

There were 4 girls in the fifth group. The mean length of residence in Australia of girls in this group was 7.35 years and there were migrants and refugees in this group. Similar to the passing girls, they were positive in their impressions of Australia and they all identified themselves as Australians to some extent, mixed mainly with non-Asian friends and claimed to be influenced more by their friends than by their parents. However, unlike the passing girls, the girls in this fifth group were not always accepted by their peers and all of them reported experiences of discrimination and prejudice. They identified with the Australian culture and yet they did not feel accepted. In terms of their school work, some girls were concerned about their levels of performance while others admitted that they could put in more effort. This group could be named the marginal group. The experiences of the girls of this group resembled that of the marginal type in Bochner's (1982) model. The marginal type, according to Bochner (1982), are marginal to both the new and old cultures.

The major characteristics of these five groups are summarised in the form of a matrix (Table 10). The matrix describes the five groups of girls in terms of their degree of Chinese identification, perception of Australia, peer relationship, influential figures, and academic achievement. The mean scores of each group of girls on academic achievement (in the phase one quantitative survey1) are also presented.

They are largely consistent with the qualitative results.

Insert Table 7 here

From the above discussion, a clear pattern emerged. Chinese-speaking girls who were caught between two cultures and who were trying to bridge and synthesise two cultures, such as the marginal girls, had the poorest level of academic performance. Chinese-speaking girls who had a firm sense of identity with one culture achieved better academically.

This could be illustrated by the case of the chauvinistic and passing girls. The chauvinistic girls identified strongly with the Chinese culture and they did well academically, especially in mathematics and science subjects. The passing girls identified with Australian culture and they also did well in school, especially in English.

The above analysis suggests that a firm sense of identification, whether with the Chinese culture or Australian culture, was related to better academic achievement. The girls who were caught between two cultures or marginal to both cultures experienced more difficulties with their school work.

In terms of the image of science subjects to the Chinese-speaking girls, they perceived science subjects as subjects that Chinese girls were good at. Below is an example of a response to the question "What subjects are Chinese girls good at?":

Chinese girls, yeah, I would say mathematics and mainly biology and chemistry and physics.

Many of the Chinese-speaking girls intended to choose science subjects for their VCE program and they were interested in these subjects and

confident of their performance. In response to the question "What subjects do you plan to take in VCE and why?", one of the girls gave the following response:

Most likely, physics, chemistry and some kind of mathematics.

Chemistry, I like chemistry. I do pretty well in mathematics.

The Chinese-speaking girls perceived science subjects as subjects that Chinese girls were good at. They were interested in science subjects and were confident of their achievement in this area.

Discussion

The results suggested that academic achievement was related to the definition of success (self-actualisation) of participants. Choice of

science subjects was related to academic achievement and the number of science subjects that the participants thought that girls should excel in. The relationship between academic achievement, choice of science subjects and the number of science subjects that girls should excel in was also evident from the qualitative data. Many of the Chinese-speaking girls interviewed claimed that they chose particular science subjects because they were good in those subjects and they thought that Chinese girls did well in those subjects in general. The quantitative and qualitative results were consistent with the findings of Salili and Tse-Mak (1988), Kelly (1987), Ainley et al. (1990) and Ainley and Sheret (1992).

In terms of differences between Anglo-Australian, English-speaking girls and Chinese-speaking girls, Chinese-speaking girls who identified themselves as Chinese or mostly performed better in mathematics, compared to the Anglo-Australian, English-speaking girls.

Chinese-speaking girls who have lived in Australia for 9 years or more performed better in terms of overall academic achievement, compared to Anglo-Australian, English-speaking girls. Anglo-Australian, English-speaking girls defined success more in terms of self-actualisation than Chinese-speaking girls who identified themselves as Chinese or mostly Chinese and Chinese-speaking girls who have lived in Australia for 8 years or less.

Among Chinese-speaking girls, auspices of immigration was related to overall academic achievement. Degree of Chinese identification was related to mathematics achievement and definition of success (self-actualisation). The qualitative analysis also showed that degree of Chinese identification was related to academic achievement. Chinese-speaking girls with a clear sense of identification, whether with Chinese or Australian culture, performed better academically than the bicultural and marginal girls. Furthermore, length of residence in Australia was related to degree of Chinese identification, academic achievement and definition of success. The relationship between length of residence in Australia and degree of Chinese identification was also evident from the qualitative data. The chauvinistic girls and ethnic-bicultural girls had the shortest mean length of residence in Australia and they identified themselves as Chinese. The passing girls had the longest mean length of residence in Australia and they

identified themselves as Australian. These findings were consistent with that of Rosenthal and Feldman (1992), Chan (1987) and Luckey and Jupp (1990).

Overall, the results, both quantitative and qualitative, pointed to the importance of the influence of significant others on the adjustment of adolescent girls. Academic achievement was related to definition of success of participants (self-actualization). Choice of science subjects was related to the number of science subjects that the participants thought girls should excel in. Both definitions of success of participants (self-actualization) and number of science subjects that the participants thought girls should excel in were related to definitions of success of significant others. Encouragement and support from parents were important in influencing the girls' academic achievement and participation.

The results further indicated that Chinese immigrant girls were not a homogeneous group. They differed in terms of their length of residence in Australia, auspices of immigration and their degrees of Chinese identification. These differences were related to their academic achievement and their definitions of success. Service providers should be flexible and sensitive to the needs of different groups of Chinese immigrant girls.

Furthermore, the results indicated that among Chinese immigrant girls, a clear sense of identification, whether with Chinese culture or Australian culture, was related to satisfactory academic adjustment. On the other hand, girls who were caught between two cultures,

especially those who were marginal to both cultures, experienced more difficulties with school work. This suggests that assimilation may not be the only pathway to satisfactory adjustment. A firm identification with one's culture of origin is also related to satisfactory adjustment. Immigrant adolescents should be encouraged to find a personally suitable pathway, rather than being forced along one "modal pathway".

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Figure 1:
Model on academic achievement and participation.

Figure 2
Diagram showing the relationship among variables.

Table 1
Percentages of Participants from Different Countries of Origin
Participating in Phase one and Phase two Studies

Country orig	Ph 1No.	Perc	Ph 2No	Perc
Australia	4	5%	1	3.3%
China	9	11.6%	4	13.3%
Hong Kong	14	17.9%	6	20%
Malaysia	9	11.6%	2	6.6%
Taiwan	7	9%	4	13.3%
Timor	5	6.4%	4	13.3%
Vietnam	21	26.9%	9	30%
Others	9	11.6%	0	0%

Table 2
Number of Phase two Participants by Countries of Origin and Length of
Residence

Lgth resid	Aust	From Aust, HK, Taiwan, China, Mal	From Viet, Timor
15 years+		2	1
12 to 14 yrs		2	2
9 to 11 yrs		0	3
6 to 8 yrs		4	2
3 to 5 yrs		8	4
less than 3 years		2	1

Table 3
Means and Standard Deviations of the Participants on Various Variables
Variables

Table 4
Direct, Indirect and Total Effects of Various Variables on Academic
Achievement.

Variables	Direct eff	Indirect eff	Total eff
Ethnicity	--	.02	.02
Definitions of success of significant others (individualist definitions)	--	.07	.07
Definition of success (self-actualization)	.26	--	.26

Table 5

Direct, Indirect and Total Effects of Various Variables on Choice of Science Subjects.

Variables	Direct effect	Indirect eff	Total effect
Ethnicity	--	-.04	-.04
Definitions of success of significant others (individualist definitions)	--	.05	.05
Definition of success (self-actualization)	-.08	.05	-.03
Number of science subjects that girls should excel in	.30	--	.30
Academic achievement	.21	--	.21

Table 6

Amount of Variance Explained and Goodness of Fit Indices.

Squared multiple correlation for structural equations for definition of

success (self-actualisation)

.079

Squared multiple correlation for structural equations for number of science subjects that girls should excel in

.048

Squared multiple correlation for structural equations for academic achievement

.067

Squared multiple correlation for structural equations for choice of science subjects

.133

Total coefficient of determination for structural equation

.122

Chi square (d.f. = 6)

3.26 (p = .776)

Adjusted goodness of fit

.970

Root mean square residual

.034

Table 7
Characteristics of the Five Groups of Chinese-speaking girls with
Different Degrees of Chinese identification

1In both the phase one survey and the phase two interviews, information regarding the girls' dates of birth and schools were available. It was therefore possible to identify the phase one questionnaires completed by the 30 girls interviewed.