A Cross-cultural Comparison of Parental Expectations for the Mathematics Achievement of their Secondary School Students

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This paper presents results from a survey of 80 parents and 120 secondary school students in Australia. Many parents report that their children put in all their effort into mathematics education but they believe that their children can do better if they try harder. This paradox is more evident among parents from Asian-Australian backgrounds compared to parents from other backgrounds who also report having high expectations in mathematics education, which is not the common perception in Australian media and society.

Introduction

Evidence around the high achievement of Asian students is available from comparisons of international studies such as the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA). These studies indicate that students in many Asian countries perform better in mathematics than students in most European countries (Leung, 2012; Thomson et al., 2012). This same difference appears to occur between Asian-Australian students and European-Australian background students and there is therefore interest in factors contributing to those differences.

One relevant factor is arguably the involvement of parents in their children's education. Such involvement has captivated the attention of the world for some time. Chinese parents, for example, are often reported to spend time each day in monitoring the academic activities of their children (Chua, 2011). The term "Tiger mom" is sometimes used to describe an authoritarian parenting style in which parents give their children few choices, and seldom ask children for opinions (Baumrind, 1967; Maccoby & Martin, 1983). It is not only Chinese mothers who act as "Tiger moms". Chua (2011), for example, argued that non-Chinese parents from Korea, India and Pakistan have similar mindsets. The well-prepared offspring of these "Tiger moms" seem to be outperforming non-Asian counterparts at schools where both Asian and non-Asian ethnic background students study together (Chua, 2011).

In order to explore further the influences of parents on their children's education, and especially to explore differences between particular groups, the paper presents findings from a recent survey that seeks to identify the influences of parental involvement in the mathematics education of secondary students.

The Research Framework and Associated Literature

The research is informed by the theory of relative functionalism (Sue & Okazaki, 1990), which has been used to describe achievements of Asian-American students. Functionalism emphasises the adaptiveness of the mental or behavioural processes. In fact, migrants experience difficulties in upward mobility and issues with status in society if they belong to minority ethnic groups in their new country. It is likely that the recency of migration is a salient factor in influencing attitudes of migrant parents. Such parents are likely to be more involved in their children's education than other parents. The theory of relative functionalism explores the extent to which migrants adopt the cultural traits or

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social patterns of another country. Sue and Okazaki (1990) argued that education is increasingly functional as a means for mobility when other avenues such as sports, politics, entertainment, and so forth, are blocked. They also argued that the academic achievement of children of Asian-American migrants cannot be solely attributed to Asian cultural values but also to their migrant status. Similarly, in another study in an Australian context with primary school students, Dandy and Nettelbeck (2002) explained this theory as "immigrants attempt to exploit opportunities not available in their homelands, with the ultimate goal of upward social mobility by way of education" (p. 621). In explaining the outperformance of Asian students in countries such as Australia and America, Dandy and Nettelbeck (2002) and Sue and Okazaki (1990) considered those Asian background students as immigrants.

Of course it is not just migrants who take an interest in their children's education. Various studies have suggested that there is a significant relationship between parental involvement and the academic achievement of their children (e.g., Dandy & Nettelbeck, 2002; Fan, 2001; Hong & Ho, 2005) although it seems that the construct of parental involvement is multidimensional and complex. As Hornby and Lafaele (2011) described, the way that parents view their role in their children's education and the belief that parents have in their ability to help their children succeed at school were critical aspects in the study of parental involvement and their attitudes in children's mathematics education. However, Hoover-Dempsey and Sandler (1997) described a lack of confidence of parents in thinking that they may not have academic competence to help their children. Further, Hoover-Dempsey and Sandler argued that it is also critical what views parents hold about children's intelligence as well as how they learn and develop their abilities.

Importantly, as Leung (2012) highlighted, there are many variables within a country or culture that impact student achievement. Many of these variables are interrelated so it is difficult to isolate the effect of individual factors. Considering just one of these Ma (1999) argued that attitudes are important in mathematics participation, suggesting that efforts around improving cognitive skills alone may not necessarily lead to increased mathematics participation. The implication is that if parents spend more time on improving their children's attitudes towards mathematics, then this is likely to have an impact on their achievement.

Various studies have identified a focus on parental encouragement by ethnically Asian parents. In a study on parental roles and culture, Cai, Moyer, and Wang (1997) argued that Asian parents consistently motivate their children to achieve academic success and this encouragement may significantly contribute to the success of Asian students. Interestingly, in a comparison study of students in China and Australia, Cao, Bishop, and Forgasz (2007) found that the students in China had stronger perceived parental encouragement and higher perceived parental expectations than ethnically Chinese students in Australia. The authors also found that parents of Chinese speaking students and other non-European students in Australia have similar levels of parental encouragement but significantly higher levels of parental encouragement than English speaking students in Australia. This connects to their migrant status.

Some studies have found cultural differences in parental expectations for their children. In a survey of 239 Chinese, Vietnamese, and Anglo-Celtic Australian parents of primary school children aged 6 to 14 years in South Australia, Dandy and Nettelbeck (2002) found most parents had high expectations of their children's academic performance. They also found that Anglo-Celtic Australian parents seem to put less emphasis on academic achievement while having more flexible expectations when compared to Chinese- or

Vietnamese-Australian parents. However, Dandy and Nettelbeck (2002) stated that it is impossible to conclude that these factors are solely responsible for ethnic group differences in academic achievement. In a study of direct and indirect longitudinal effects of parental involvement on student achievement using a nationally representative sample of 24,599 eighth graders from 1,052 schools in USA, Hong and Ho (2005) randomly selected a sample of 1,500 students from Asian-American, African-American, Hispanic, and White groups with a total of 6,000 students for their analyses. They concluded that across all ethnic groups the higher the hopes and expectations of parents with respect to the educational attainment of their child, the higher the expectations of the child and greater their academic achievement. In another study based on cross-cultural comparison with 158 parents of students from two Chinese primary schools and one Anglo-Celtic primary school in Hong Kong, Phillipson and Phillipson (2007) argued that parents of different cultures have different intervention strategies and values in bringing up and educating their children.

The current study applies these perspectives in the Australian context with secondary school students using the following research questions:

> How do the expectations for their children in mathematics education vary between Asian-Australian and European-Australian background parents? Does either group have higher expectations than the other? What are the children's perceptions of the expectations of their parents?

Research Method

The data presented here are part of a larger study, which was planned primarily around surveys on parental involvement in mathematics education of their children, using two questionnaires one each for parents and children. In addition to parental expectations for their children, this study focussed on children's perspective about the expectations of their parents. Therefore, two separate instruments on mathematics education were developed with similar but different questions for parents and students. The instructions provided on the instruments informed participants that the responses should be in relation to mathematics education. Surveys were followed by semi-structured interviews for a parent and a child from purposively selected families, although these data are not presented here.

As this study involved participants from Asian and European backgrounds, it was required to invite multicultural schools to participate in the surveys. With the permission of the Department of Early Childhood and Education (DEECD), four multicultural schools with Asian and European background students in metropolitan Melbourne were invited to participate. Two of those schools are select-entry schools and the other two are public schools. Only three principals from the four schools agreed to participate in the study. Hence, the information about the student questionnaire was provided to secondary school students in one select-entry school and two public schools in the city of Melbourne. Next, the information about the parental questionnaire was given to families of those children who were interested in participating without being selective of their ethnic background or culture. The questionnaires were available online, and students and parents were able to respond whenever they wanted. For those who wanted to fill in the questionnaire on paper, a copy was provided.

A total of 200 volunteer participants from European-Australian and Asian-Australian backgrounds including 80 parents (28 European-Australian and 52 Asian-Australian parents) and 120 children (33 European-Australian and 87 Asian-Australian children) responded to the survey. The ethnic background of each participant was recorded. In addition to Australians of Anglo-Celtic heritage, the European group included participants

living in Australia who were originally from other European countries including Russia, Italy, Greece, and Turkey. The Asian group consisted of ethnically Sri Lankan, Indian, Chinese, Vietnamese, Malaysian, Singaporean, and Bangladesh participants who also live in Australia. A four-point Likert scale was used to record the responses in the questionnaires of this study (1 = Strongly agree, 2 = Agree, 3 = Disagree and 4 = Strongly disagree). No neutral option was provided thereby forcing specific choices.

Firstly, a table of summarised data was used in data analysis. Secondly, the Mann-Whitney U-Test, which is the non-parametric version of the independent samples t-Test was performed on the ranked data. The Mann-Whitney U-test compares medians of the groups involved. While parametric tests often include assumptions about the shape of the population distribution (e.g., normally distributed), non-parametric techniques do not have such stringent requirements. As the data collected were measured only at the ordinal level (ranked), a non-parametric technique is suitable for data analysis (Pallant, 2013). This study satisfies other requirements for non-parametric tests, which require random samples and independent observations where each person can be counted only once. The dependent variable of the data gathered in response to the following four statements of interest in the study is ordinal and were coded using a discrete number from 1 to 4. Finally, cross-tabulation was used to explore the data and identify relationships further.

Results

While observing the responses to questionnaires on mathematics education, the following items from the parents' questionnaire were of particular interest because responses to those items apparently led to a contradiction. Hence, the responses were analysed to provide particular insights into differences between European-Australian and Asian-Australian background participants.

My child puts all his/her effort into school related tasks. (statement 1)

My child can get better marks if he/she tries harder. (statement 2)

The following items relevant to the above statements were selected from the students' questionnaire.

My parents believe that I put all my effort into school related tasks. (statement 3)

My parents believe that I can get better marks if I try harder. (statement 4)

Table 1 presents responses of the various groups. According to the results, the various patterns of responses between the two groups appear similar. The majority of parents and students agree with the four statements in Table 1. If a parent agrees that his/her child puts all his/her effort into school related tasks, one may question why a parent thinks his/her child can get better marks if the child tries harder. In this paradox, students demonstrate the same attitude about their parents' thoughts highlighting the importance of elucidating parental expectations further in order to identify any similarities and differences between cultures.

Table 1
Summary of responses of parents and students

Statement	Cultural background	Strongly agree	Agree	Disagree	Strongly disagree	Total agree	Total disagree
1. My child puts all his/her effort into school related tasks.	E-A	9 (32.1%)	13 (46.5%)	6 (21.4%)	0 (0%)	78.6%	21.4%
	A-A	13 (25.0%)	30 (57.7%)	9 (17.3%)	0 (0%)	82.7%	17.3%
2. My child can get better marks if he/she tries harder.	E-A	8 (28.6%)	16 (57.2%)	2 (7.1%)	2 (7.1%)	85.8%	14.2%
	A-A	32 (61.6%)	18 (34.6%)	2 (3.8%)	0 (0%)	96.2%	3.8%
3. My parents believe that I put all my effort into school related tasks.	E-A	9 (27.3%)	18 (54.5%)	5 (15.2%)	1 (3.0%)	81.8%	18.2%
	A-A	27 (31.0%)	43 (49.5%)	16 (18.4%)	1 (1.1%)	80.5%	19.5%
4. My parents believe I can get better marks if I try harder.	E-A	15 (45.5%)	11 (33.3%)	6 (18.2%)	1 (3.0%)	78.8%	21.2%
	A-A	64 (73.6%)	22 (25.3%)	1 (1.1%)	0 (0%)	98.9%	1.1%

[1]E-A (European-Australian), A-A (Asian-Australian)

Although both European-Australian and Asian-Australian parents (85.8% and 96.2% respectively) think that their children can get better marks if they try harder, only 28.6% of European-Australian parents strongly agree with statement 2 while 61.5% Asian-Australian parents strongly agree with the statement. This difference between the two groups is further explored below.

Similarly, student responses for statement 4 align with the differences in parental expectations for statement 2 as discussed above. Students from both European-Australian and Asian-Australian backgrounds (78.8% and 98.9% respectively) report that their parents believe that they can get better marks if they try harder. Moreover, from the two groups 45.5% of European-Australian students strongly agree with statement 4 while 73.6% of Asian-Australian students strongly agree with the statement. Both these percentages of the two groups are the highest out of the four options of statement 4. However, it is worth exploring further the parental influence on Asian-Australian students because almost all of them (86 out of 87) agree with statement 4.

Comparing parents' and students' responses, 28.6% European-Australian parents strongly agree with statement 2 whereas 45.5% of their children strongly with statement 4. Also, 61.6% Asian-Australian parents strongly agree with statement 2 whereas 73.6% of their children strongly agree with statement 4. Even though strongly agreeing to these statements is a pressure on children, percentages of children's responses are higher than the parents' responses of similar items. Irrespective of culture, this shows beliefs of some children, which may improve their academic achievement.

Second level analysis using the Mann-Whitney U-Test confirmed that most of the European-Australian and Asian-Australian parents consider that their children put all their

effort into school-related tasks (statement 1). This is implied by the median value of 2 (= Agree) for both cultural groups. Most of the parents from both European-Australian and Asian-Australian backgrounds think that their children can get better marks if they try harder (statement 2). However, according to the results, European-Australian parents agree with statement 2 with a median score of 2 (= Agree) while Asian-Australian parents strongly agree with statement 2 with a median score of 1 (= Strongly agree). Although parents from both cultural groups have high expectations for their children, according to median values it is evident that Asian-Australian parents have higher expectations than European-Australian parents.

Students responded in a similar manner. From the responses of children from both cultural backgrounds, the above findings about parental expectations are supported by statement 3 with a median score of 2 (= Agree). This implies that most of the offspring from both European-Australian and Asian-Australian backgrounds think that their parents believe that they put all their effort into school related tasks. The above findings are further supported by the same median values of 2 (= Agree) and 1 (= Strongly agree) for European-Australian and Asian-Australian students respectively for statement 4 as shown in the results. This suggests that the parents from both cultural backgrounds not only have high expectations for their children but also they have successfully conveyed the message to their children.

The results of the Mann-Whitney U test provide probability values (*p*-values) for the four statements. There is no statistically significant difference between the groups as the *p*-value for statement 1 is 0.819. Although parents from both cultural backgrounds demonstrate a similar view to statement 1, there is a statistically significant difference between the two groups for statement 2 as shown by $p = 0.005$. Similarly, with the responses of children there is no statistically significant difference between the groups as the *p*-value for statement 3 is 0.820. However, the difference between groups for statement 4 is statistically significant with $p = 0.001$. This means, even though the majority of parents agree with statement 2 and the majority of students agree with statement 4, the responses which are skewed towards "strongly agree" and "agree" have a significant difference between the two cultural groups.

Thirdly, cross-tabulation is used to further analyse these skewed data to investigate cultural differences (see Table 2).

Table 2
Cross-tabulation of responses of parents and children for the four statements

		Statement 1										Statement 3							
		European-Australian				Asian-Australian						European-Australian				Asian-Australian			
		SA	A	D	SD[2]	SA	A	D	SD			SA	A	D	SD	SA	A	D	SD
Statement 2	SA	**2**	**3**	3	0	**7**	**17**	8	0	Statement 4	SA	**1**	**10**	3	1	**22**	**29**	12	1
	A	**4**	**9**	3	0	**5**	**12**	1	0		A	**4**	**5**	2	0	**4**	**14**	4	0
	D	2	0	0	0	1	1	0	0		D	3	3	0	0	1	0	0	0
	SD	1	1	0	0	0	0	0	0		SD	1	0	0	0	0	0	0	0

[2] Note: SA= Strongly agree, A= Agree, D= Disagree, SD= Strongly disagree

Cross-tabulation results demonstrate a variety of parental expectations and parenting styles. The majority of parents (i.e., 18/28 European-Australians and 41/52 Asian-Australians – shown bold in Table 2) either agree or strongly agree with both statements 1 and 2. This implies high expectations of parents that encourage high achievement of children in both cultural backgrounds. Considering the above fractions as percentages of 64.3% and 78.8% respectively, it is observed that parental expectations are relatively higher among Asian-Australians than European-Australians. Further, strongly agreeing with both statements 1 and 2 may create extreme pressure on children. Sometimes parents' beliefs and attitudes about their children's education act as barriers and prevent effective parental involvement. Literally, it does not make sense that students can put more effort into their work if they are already putting all their effort into their school work. However, this seems to be a technique used by parents to motivate their children. Some parents (6/28 European-Australians and 9/52 Asian-Australians) disagree with statement 1 but agreed or strongly agreed with statement 2. This seems to be because these parents are not satisfied with their children's effort and they expect more from them. Few parents (4/28 European-Australians and 2/52 Asian-Australians) agreed or strongly agreed with statement 1 and disagreed or strongly disagree with statement 2. These parents seem supportive of their children's effort. In this case the ratio is higher for European-Australian parents showing some flexibility in their expectations.

Offspring responses are similar to the results of parents. The figures show that the majority of children in both groups (i.e., 20/33 European-Australians and 69/87 Asian-Australians – shown bold in Table 2) have pressure from their parents and this pressure is higher among Asian-Australian children than European-Australian children. Further, there is extreme pressure felt by some children with 1/33 European-Australian and 22/87 Asian-Australian children strongly agreeing with both statements 3 and 4.

According to these results, even though acknowledging that their children do their best, Asian-Australian parents appear to be less satisfied with the effort of their children and have significantly higher expectations than European-Australian parents. However, it is impossible to underestimate the academic interaction of European-Australian parents with their children because results show that both Asian-Australian and European-Australian groups have high expectations in education of their children.

Conclusions

Although Chinese mothers are well known for putting pressure on their children's education it was found that parents from other Asian backgrounds also put pressure on their children. The expectations are higher among Asian-Australian parents and the results support the theory of relative functionalism about immigrant Asians (Sue & Okazaki, 1990). Therefore, in addition to Asian cultural values, beliefs, and practices, high expectations of Asian background parents may be explained by their migrant status too. Further, it is important to recognise that European-Australian parents too have high expectations for their children in mathematics education, even though it is not as significant as that of Asian-Australian parents. Overall, it appears that irrespective of culture, many parents have high expectations for their children. Interestingly, parent and student data provide similar results regarding parental expectations. Moreover, results found from students' data imply that the students are well aware of the expectations of their parents.

Opposed to the general perception, European-Australian parents also believe that their children can do better in mathematics if they try harder. One might argue that there has

been an influence on European-Australian parents by the recently migrated Asian population. However, there is no substantive data to support this view from this study. Parental high expectations may have positive consequences for children resulting in improved performances in mathematics because parents' attitudes are naturally communicated to their children. Therefore, all parents should monitor their children's study habits regularly to improve their skills, attitudes, and confidence in mathematics learning. They should also motivate, encourage, and support their children to work diligently in order to enhance academic achievement.

While the results from the sample of participants used in this study provide some interesting insights, it must be acknowledged that the sample does not represent the country as a whole as the participants belong to three public schools in metropolitan Victoria. If there were a larger number of participants the responses could be analysed according to year levels, which might provide more interesting results.

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