Chapter 4

Bullying behaviour I

In this chapter we describe the details of the first techniques for identifying the bullying outcome by counting the number of bullying behaviour categories, its prevalence, and its risk factors. The results presented in this chapter also appear in Laeheem et al (2008).

4.1 Identifying bullying outcome

The first technique for identifying bullying was by counting the number of bullying behaviour categories, (there are 7 categories of physical bullying and 7 categories of psychological bullying), with the criteria for identifying bullying based on students who admitted in any case more than 2 types of physical bullying, or more than 2 types of psychological bullying with at least 2 types of physical bullying. The methods of this technique are described as follows.

The first method involved combining the number of physical bullying behaviour categories, comprising kick, hit, bite, push, throw something at, beat, and pinch. Most students 600 (41.7%) reported that they had never instigated any type physical bullying, 330 (22.9%) of the students had ever bullied others using only 1 type of bullying categories, and 224 students (15.6%) had ever bullied others using 4 types of bullying categories. The second method, combining the number of psychological bullying; comprised scolding/ name calling, insulting parents' occupations, insulting parents' name, insulting appearance, insulting economic status, insulting academic

achievement, and insulting by stating a physical disability. The results showed that 497 (34.5%) of the students reported having never bullied others psychological, 395 (27.4%) of the students had ever bullied others using only 1 type of psychological bullying categories, and 256 (17.8%) students had ever bullied others using 3 types of bullying categories.

In the third method, assess the associations between the results of combining the number of physical bullying behaviour categories (first method) and psychological bullying behaviour categories (second method). This result is listed in Table 4.1.

Number of psychological bullying categories	Number of physical bullying categories							Total
	None	1 type	2 types	3 types	4 types	5 types	6 types	
None	404	37	0	35	19	2	0	497
1 type	107	267	0	18	2	1	0	395
2 types	51	16	36	11	11	0	2	127
3 types	24	9	3	87	117	15	1	256
4 types	13	1	10	13	72	8	3	120
5 types	1	0	29	2	3	3	0	38
6 types	0	0	7	0	0	0	0	7
Total	600	330	85	166	224	29	6	1,440

Table 4.1: Cross-tabulation between the numbers of physical and

psychological bullying types

The bullying behaviour outcome was as either 'bullied' or 'not bullied' by using data in Table 4.1. We found that 474 (32.9%) of students could be identified as having bullied others at school in the past year.

4.2 Association between bullying and risk factors

The associations between the outcome and the eight study determinants are shown in Table 4.2. Since all of the variables are categorical, Pearson's chi-squared test is used

to assess the statistical significance of the association in each case as described in

Chapter 2, equation (2.7) and (2.10). Results show that gender, age group, parental

physical abuse and cartoon type were strongly associated with bullying.

Determinant	Bullied behaviour		Chi-squared	p-value
	Not bullied (966)	Bullied (474)		
School type			0.4	0.504
Private	65.8	34.3		
Public	67.6	32.4		
School location			0.2	0.654
Urban	66.5	33.5		
Rural	67.6	32.4		
Gender			4.9	**0.026***
Female	69.5	30.5		
Male	64.0	36.0		
Age group			12.4	**0.002****
8 yrs or less	71.0	29.0		
9-10 yrs	68.9	31.1		
11 yrs or more	60.8	39.2		
Religion			0.6	0.447
Muslim	68.0	32.0		
Non-Muslim	66.1	33.9		
Parental physical abuse			135.6	**0.000****
Not witnessed	74.4	25.6		
Witnessed	38.6	61.4		
Cartoon type preference			28.2	**0.000****
Comedy	70.6	29.4		
Action	56.0	44.0		
Mystery	71.2	28.8		
Number of close friends			0.83	0.662
2 persons or less	66.8	33.2		
3-5 persons	68.3	31.7		
6 persons or more	65.5	34.5		

* p-value < 0.05   ** p-value < 0.01

Table 4.2: Associations between bullying and study determinants

Odds ratio plots of bullying categorized by four different risk factors are shown in Figures 4.1–4.4.
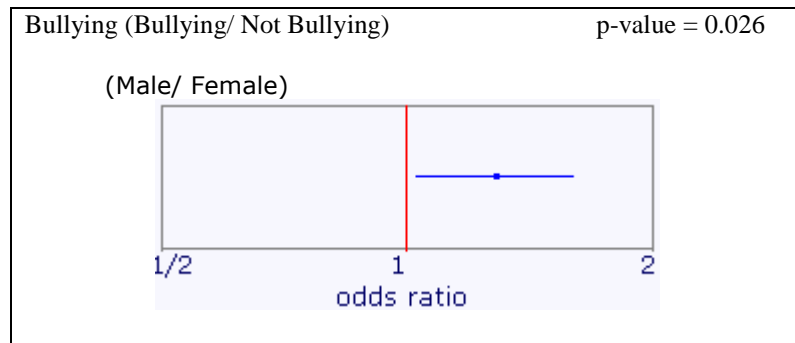

Figure 4.1: Odds ratio of bullying by gender

Figure 4.1 shows the odds ratio plot of bullying for the student's gender. Males more often reported having bullied others than did females (OR 1.28, 95% CI 1.02-1.61).
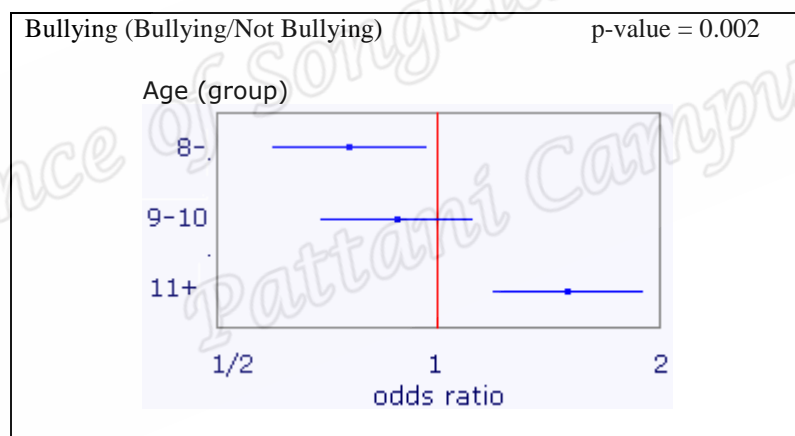

Figure 4.2: Odds ratio of bullying by age group

Figure 4.2 shows the odds ratio plot of bullying for the student's age (group). Older students (11+ years) were more likely to bully others than younger students (9-10 years and 8 years or less), (OR 1.50, 95% CI 1.19-1.91).
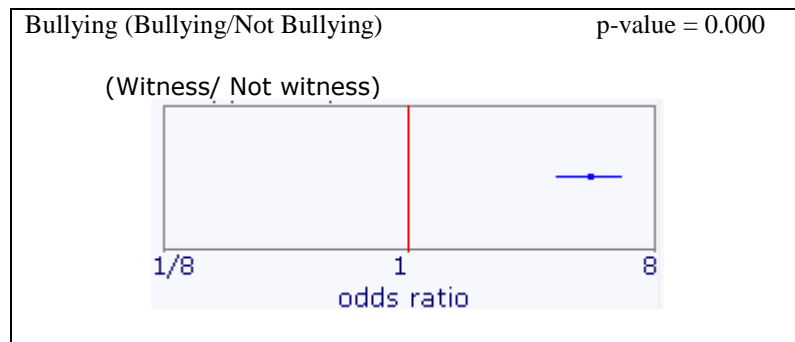
Figure 4.3: Odds ratio of bullying by parental physical abuse

Figure 4.3 shows the odds ratio plot of students who bullied others for witnessing parental physical abuse. The students who had witnessed physical abuse between their parents were more likely to be a bully than did those who had never witnessed physical abuse between their parents (OR 4.62, 95% CI 3.51-6.09).
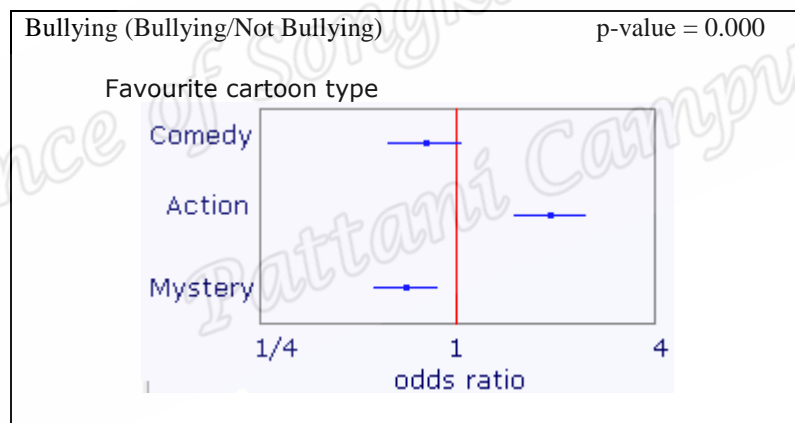

Figure 4.4: Odds ratio of bullying by favorite cartoon type

Figure 4.4 shows the odds ratio plot of students who bullied others for the student's preferred cartoons type. The students who preferred action cartoons were more likely to be identified as bullies than were those who preferred mystery or comedy cartoons (OR 1.92, 95% CI 1.50-2.46).

4.3 Logistic regression analysis of bullying

Logistic regression was used to examine the association between bullying and risk factors as described in Chapter 2, equation (2.14) and (2.15), and the results are shown in Table 4.3-4.4.

Determinant	OR	(95% CI)	p-value	L-R test p-value
School type				0.072
Private				
Public	0.78	(0.6,1.02)	0.072	
School location				0.609
Urban				
Rural	1.06	(0.84,1.35)	0.609	
Gender				0.293
Female				
Male	1.14	(0.89,1.45)	0.293	
Age group				**0.001**
8 yrs or less				
9-10 yrs	1.09	(0.82,1.46)	0.552	
11 yrs or more	1.71	(1.28,2.28)	**0.000**	
Religion				0.404
Muslim				
Non-Muslim	1.11	(0.87,1.41)	0.404	
Parental physical abuse				**0.000**
Not witnessed				
Witnessed	4.57	(3.46,6.03)	**0.000**	
Cartoon type preference				**0.001**
Comedy				
Action	1.58	(1.14,2.18)	**0.006**	
Mystery	0.89	(0.66,1.19)	0.428	
Number of close friends				0.989
2 persons or less				
3-5 persons	0.99	(0.75,1.31)	0.954	
6 persons or more	0.98	(0.72,1.33)	0.881	

r-sq: 0.150   df: 1428   deviance: 1660.2   p-value: 0.000

Table 4.3: Model of association between bullying and study risk factors

Table 4.3 shows the results after fitting a logistic regression model with all study variables to the outcome. The fitted model initially contained additive effects for school type, school location, gender, age group, religion, parental physical abuse, cartoon type and number of close friends. The r-squared for this model was 15.0%, and gave a residual deviance of 1660.2 with 1428 degrees of freedom (p=0.000).

Determinant	OR	(95% CI)	p-value
Age group			**0.003**
8 yrs or less	0		
9-10 yrs	1.03	(0.85,1.43)	0.849
11 yrs or more	1.56	(1.23,2.18)	**0.002**
Parental physical abuse			**0.000**
Not witnessed	0		
Witnessed	4.50	(3.40,5.89)	**0.000**
Cartoon type preference			**0.000**
Comedy	0		
Action	1.87	(1.32,2.18)	**0.000**
Mystery	0.97	(0.64,1.17)	0.860

r-sq: 0.146   df: 1434   deviance: 1665.2   p-value: 0.000

Table 4.4: Reduced model of association between bullying and risk factors

Table 4.4 shows the results after fitting a logistic regression model to the data with all determinants included, and then reducing the model by backward eliminating determinants with overall p-values greater than 0.05. The final model shows that three risk factors, namely age group, parental physical abuse, and cartoon type were all significantly associated with bullying. The r-squared for the final model was 14.6%, and gave a residual deviance of 1,665.2 with 1,434 degrees of freedom (p=0.000). When comparing the deviance from the models shown in Tables 4.3 and 4.4, it was found that the difference between the deviances is 5.0, and the number of parameters omitted is 5, corresponding to a p-value of less than 0.001.
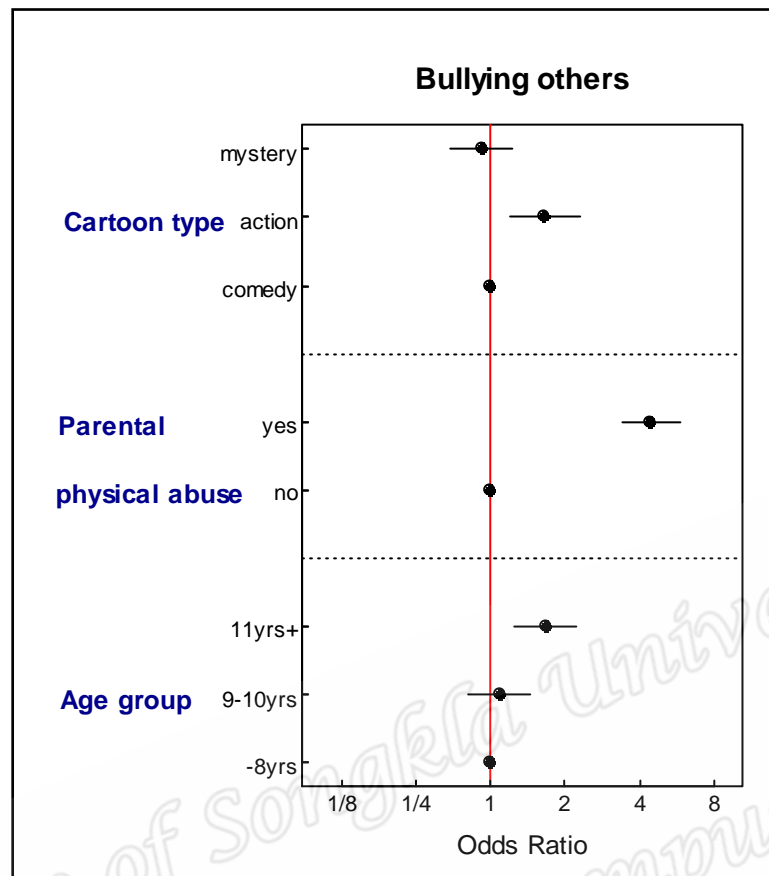
Figure 4.5: Risk factors of bullying in logistic regression; final model

Figure 4.5 shows the odds ratio plot of the results from fitting the final logistic

regression model. It was found that witnessing parental physical abuse was clearly the

most strongly associated determinant for bullying others. Students having witnessed

parental physical abuse were more likely to bully others than were those who had

never witnessed parental physical abuse (OR 4.50; 95% CI 3.40-5.89). Preference for

action cartoons was also a major risk factor for bullying others; students who

preferred action cartoons were more likely to be a bully than students who preferred

comedy and mystery cartoons (OR 1.87, 95% CI 1.32-2.18). Among the age groups

studied, older students (11+ years) were more likely to be a bully than younger

students (8 years or less); 1.56 times (95% CI 1.23-2.18).