

**FAMILY AND INDIVIDUAL CHARACTERISTICS OF A
COMMUNITY SAMPLE OF ADOLESCENTS WHO
GRAFFITI**

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Abstract

Objective: The aim of this study was to examine the covariates of graffiti behaviour in adolescents and to determine the independence of graffiti behaviour from antisocial behaviour.

Method: Two thousand, six hundred and three adolescents from a community sample completed the Youth Assessment Checklist, which measured perceived academic performance, family general functioning, parental care, overprotection and criticism, suicide thoughts and behaviours and a number of psychological factors (eg. depression), and behaviours (eg. antisocial behaviour and drug use). The differences between these variables for both boys and girls were examined in four group comparisons: (1) graffiti versus no graffiti; (2) low antisocial behaviour with graffiti versus low antisocial behaviour without graffiti; (3) serious antisocial behaviour with graffiti and serious antisocial behaviour without graffiti; (4) extreme antisocial behaviour with graffiti and serious antisocial behaviour without graffiti.

Results: Significant differences for both girls and boys were found between the graffiti and no-graffiti groups on all variables measured. For some variables, significant differences in both boys and girls were found between each of the antisocial behaviour (low, serious and extreme) with graffiti and antisocial behaviour (low, serious and extreme) without graffiti groups.

Conclusion: Results suggest that adolescent who graffiti are likely to also experience a number of other family, parental, behavioural, and psychological problems. Clinicians may need to ask an adolescent about graffiti even if they present only with low levels of antisocial behaviour.

Key Words: Graffiti, 'tagging', adolescents, community sample

Family and Individual Characteristics of a Community Sample of Adolescents who Graffiti

Graffiti has significant financial and social impacts on the community, through both the direct cost of graffiti clean-ups and increased insurance premiums and local government taxes. Much of the social impact is related to despoiling of community buildings, public utilities and sculpture. Accurate rates and costs of graffiti in Australia are difficult to determine. The Australian Bureau of Statistics does not measure acts of graffiti and costs are typically calculated at the local government level. One estimate of cost in Australia by the Parliament Secretary to the Minister for the Environment was in excess of 200 million Australian dollars annually [1].

This paper examines graffiti, a form of vandalism, which is considered a crime and most notable in the form of 'tags' also known as 'tagging'. Not considered here is graffiti or aerosol art which is legal and commissioned by property owners [2]. The concept of vandalism is defined as a conscious act directed towards the destruction of damage of object9s0 belonging to another person[3]. On its own graffiti behaviour is categorised in the DSM-IV as 'adolescent antisocial behaviour' but with other antisocial behaviours such as aggression towards people and animals, fire setting, and theft, 'conduct disorder' may be diagnosed. Graffiti behaviour or 'tagging' does not currently occur in the diagnosis manual as a specific antisocial behaviour only under 'has deliberately destroyed others' property (other than by fire setting)'.

Most studies in graffiti to date have used either content analysis [4-6] or experimental designs [7-9] to determine the reasons behind graffiti behaviour. There are no studies to date that use a community sample to examine the prevalence of 'tagging' in adolescents and its behavioural and psychological covariates. However studies on general antisocial behaviour including vandalism provide some insight into the possible covariates of graffiti behaviour.

Antisocial behaviours including vandalism have been associated with family and parental factors [10-13], drug and alcohol use [14, 15], self-esteem [12], and locus of control [16]. Several studies are worth detailing.

Chamberlain and Moore [17] in their study of girls referred for out-of-home placement because of repeated and chronic juvenile offending, noted several risk factors including family fragmentation, physical and sexual trauma, mental health problems, official arrest and self-report offending histories. In addition, with the exception of sexual trauma histories, these sample characteristics were similar to those found in a sample of chronically offending boys.

Vermeiren, Deboutte, Ruchkin and Schwab-Stone [18] report a cross-national self-report study assessing 955 students in Belgium, 1,026 in Russia, and 1,391 in the United States, all aged between 14 and 17 years. Adolescents were assigned antisocial group status according to the nature of their reported deviant behaviour. A non-antisocial group, a moderate antisocial group (non-aggressive behaviour) and a severe antisocial group (mainly aggressive behaviour) were identified. Results show that in both genders and in all three countries, depression, somatization, negative expectations for the future and sensation seeking gradually increased from the non-antisocial group to the moderate antisocial group, and finally to the severe antisocial group. Levels of anxiety were insignificant across most groups. The authors conclude that although cross-national differences exist, the variables of interest showed markedly similar trends between antisocial groups across countries.

Despite some work in these areas there is still much to understand about antisocial behaviours and vandalism. In his review of the literature, Goldstein reported a steady build-up of literature through the 1960s and 1970s but that theoretical, research and speculative writing about the nature of vandalism and its reduction virtually ceased in the 1980s [19].

The Current Study

The current study investigated possible family, behavioural and psychological co-variables of graffiti behaviour, and specifically attempted to determine differences and/or similarities between graffiti behaviour and serious antisocial behaviour.

Method

The Early Detection of Emotional Disorders program (EDED) was funded by the South Australian Government, and approved by the Department of Education and Children's Services, and Flinders Medical Centre Ethics Committee on Clinical Investigation. The EDED program was predicated on the fact that suicidality begins to rise sharply after the age of fifteen; it was reasoned that examination of risk factors for suicide behaviour beginning with thirteen year olds might allow prediction of those most vulnerable, followed by relevant preventive measures. School students were assessed on a number of cognitive, behavioural, family and life event constructs on three occasions in consecutive years – a repeated measures longitudinal design. This preliminary study reports cross-sectional data from a sub-set of cognitive constructs from the first year of data collection.

Participants

Participants in the study were 2603 ($n = 1442$ males; $n = 1154$ females; $n = 7$ undefined) eighth grade students (aged 13 years) from seventeen government owned and ten private schools. Participating schools were from both rural and suburban areas and in lower to upper middle socio-economic areas of South Australia (total population approximately 1.5 million). Permission to

undertake the project was obtained from school principals and parent teacher councils of all schools contacted. We have previously reported on the processes surrounding data collection (Martin et al., 1995; Allison, Roeger, Martin, & Keeves, 2001; Roeger, Allison, Martin, Dadds, & Keeves, 2001).

Questionnaire Administration

Teachers supervised the administration of questionnaires, informed students their participation was voluntary and that non-participation would have no adverse consequences. A counsellor was made available to talk with any student showing distress and a group debriefing session followed the completion of the questionnaire. Students placed their responses in a sealed container to maintain confidentiality.

Instruments

Items of interest reported here form part of a comprehensive questionnaire – the Youth Assessment Checklist [20]. Socio-demographic information collected included school, gender, age, country of birth, main language spoken at home, Aboriginal or Torres Strait origin.

(i) Graffiti behaviour was assessed by a single item drawn from the DSM-IV criteria for conduct disorder: *“I have graffitied (tagged) things in public places”* with a yes/no response.

(ii) Antisocial behaviour was assessed with an adaptation of the Self-Report Delinquency Scale [21]. Students responded ‘yes’ (score 1) or ‘no’ (score 0) to statements such as *“I have stolen out of a little shop”*. Three items were added to bring the scale closer to DSM-IV diagnostic guidelines for conduct disorder. These were: *“I have set fires to things in public places”*; *“I have deliberately tried to physically hurt someone”*; *“I have deliberately tried to attack someone in a sexual way”*. For this analysis, two items in the original scale regarding alcohol and illegal drug use were removed to avoid overlap with the current study’s assessment of drug use. Reliability for the adapted 21-item scale was good ($\alpha = 0.87$). Total scores were calculated and recoded to new 2-category variables based on cut-offs calculated from the mean (2.38) plus one standard deviation (SD) (3.24), and mean + 2SD. Thus, total scores 0-5 were coded ‘low antisocial’, scores between 6 and 8 coded ‘serious’, and scores ≥ 9 coded ‘extreme’.

(iii) Drug use was assessed by asking, *“Which of the following drugs have you used in the last year? alcohol; tobacco; marijuana, acid or LSD; sniffed glue, petrol, or solvents; injected illegal drugs (heroin, speed); oral stimulants (speed, crack, or ecstasy), magic mushrooms”*. Respondents rated frequency of use for each on a five-point scale: 0 (never), 1 (less than once per month), 2 (one to three times a month), 3 (once a week) or 4 (more than once a week). Total scores (0-32) were recoded to new 2-category variables based on cut-offs of the mean (1.82) plus SD (2.87), and mean + 2SD. Thus, total scores ≥ 5 coded ‘serious’, and scores ≥ 8 coded ‘extreme’. Internal reliability for the summed items was good, ($\alpha = 0.82$).

(iv) Risk-taking was assessed with the ‘Brief Adolescent Risk-Taking Scale’ (BART), a 9-item measure. Items include, *“I accept rides in cars from people I do not know”*; *“I take part in dangerous activities”*; *“I usually talk things over with my parents before doing something new”*. Responses are ‘never’ (score 0 or 2), ‘sometimes’ (score 1) or ‘often’ (score 0 or 2). Reliability of the summed items is good ($\alpha = 0.72$). Principal components analysis indicates two factors – danger and caution.

(v) Assessment of suicidality was based on the work of Pearce and Martin [22], which attempted to establish time frame, frequency and severity of suicidal behavior comprising thoughts, plans, threats, deliberate self-injury (DSI) and attempts. Items included were: *“Have you ever thought*

about killing yourself?”; “...made plans to kill yourself without carrying them out?”; “... made threats to others that you will kill yourself”; “...deliberately tried to hurt yourself?”; and “... tried to kill yourself?” Response choices are ‘never’, and ‘yes’ with six options of when it occurred, for example: ‘last month’, ‘between 1 and 3 months ago’ to ‘more than 12 months ago’. For this study, responses were collapsed to provide yes/no categorical data.

(vi) Students were asked to rate their current overall academic performance as; ‘failing’, ‘below average’, ‘average’, or ‘above average’. For this analysis, scores were recoded to a 2-category variable of failing/below average (‘failing’) or average/above average (‘ok’).

(vii) Sexual and physical abuse were assessed simply: “*Have you ever been sexually abused?*”; and “*Have you ever been physically abused, bullied or beaten up?*”, with yes/no responses.

(viii) Hopelessness was measured with the Beck Hopelessness Scale [23], a 20-item true/false self-report instrument to assess an individual’s negative expectations about their future.

(ix) Depressive symptomatology was measured with the Centre for Epidemiological Studies Depression Scale (CES-D), a self-report 20-item instrument recommended for use with community samples of adults [24] and adolescents [25, 26]. Respondents rate frequency of depressive symptoms in the past week on a four-point scale ranging from ‘rarely or none of the time’ (score 0), ‘some or a little of the time’ (score 1), ‘occasionally or a moderate amount of the time’ (score 2), to ‘most or all of the time’ (score 3).

(x) Rosenberg’s Self-Esteem Scale [27], a 10-item, self-report scale was used to measure students’ current level of self-esteem and global self-worth. Descriptive statements about life and self-satisfaction were rated on a 5-point Likert scale, ranging from ‘almost always true’ to ‘never true’. Total scores range from 10 to 50, with higher scores indicating higher self-esteem.

(xi) The Nowicki-Strickland Locus of Control Scale for Children (CNSIE)[28], a 40-item measure with yes/no responses, appropriate for ages 9-18 years, was used to measure internal and external attributional style. Total scores range from 0 to 40, with higher scores indicating external attribution style.

(xii) Anxiety was assessed with the Hospital Anxiety and Depression Scale [29], originally designed as a screen for depression and anxiety in non-psychiatric hospital patients. For our study, an item was added to the 8-item anxiety subscale to assess phobia: ‘I have fears about specific things or situations’. Respondents rate the frequency feelings during the past week on a four-point Likert scale (same as CES-D).

(xiii) Family functioning was assessed using the McMaster Family Assessment Device – General Functioning subscale (FAD-GF)[30]. Scores for the 12 items range from 1-4; higher scores indicate family pathology.

(xiv) Parenting style and quality of relationships between parents and adolescent were assessed with the Influential Relationships Questionnaire, a 37-item instrument consisting of Care, Protection and Criticism subscales [31].

Data Analysis

Data analysis was performed with SPSS v11 using both parametric and nonparametric procedures to investigate graffiti related differences in antisocial behaviour and other individual, parental and family factors. Separate analyses were conducted for boys and girls as significant gender

differences were expected. Pearson Chi-square tests were used to detect significant differences between groups for dichotomous variables including extreme antisocial behaviour, drug use, suicidality, abuse and others. Analysis of variance was used to detect differences in means of continuous variables for the same groups. Where the homogeneity of variance tests failed for groups that were significantly different, nonparametric Kruskal Wallis tests were performed to confirm any significant findings.

Results

Characteristics of the sample and prevalence of graffiti and antisocial behaviour are presented in Table 1. Similar proportions of graffiti occur girls (10.9%) and boys (12.3%), while the prevalence of serious or extreme antisocial behaviour is between 2 and 3 times more likely in boys. Six participants indicated 'yes' to graffiti and 'no' to all other forms of antisocial behaviour. Because of this low number, no antisocial behaviour was included in the low antisocial behaviour group (LowASB=scores 0 to 5).

[Insert Table 1]

Differences between the graffiti and no graffiti groups are significant for all variables measured in this study (Table 2). In addition to those result presented in Table 2, significant differences are also found for suicide thoughts (Boys, $\chi^2=60.93$, $p<0.001$; Girls, $\chi^2=75.62$, $p<0.001$), plans, (Boys, $\chi^2=63.88$, $p<0.001$; Girls, $\chi^2=72.44$, $p<0.001$), threats (Boys, $\chi^2=42.63$, $p<0.001$; Girls, $\chi^2=84.09$, $p<0.001$), and deliberate self-injury (Boys, $\chi^2=115.61$, $p<0.001$; Girls, $\chi^2=65.88$, $p<0.001$), as well as mother care (Boys, $F=80.03$, $p<0.001$; Girls, $F=69.86$, $p<0.001$), mother overprotection (Boys, $F=30.95$, $p<0.001$; Girls, $F=25.44$, $p<0.001$), mother criticism (Boys, $F=62.53$, $p<0.001$; Girls, $F=37.00$, $p<0.001$), father care (Boys, $F=47.27$, $p<0.001$; Girls, $F=62.70$, $p<0.001$), father overprotection (Boys, $F=15.93$, $p<0.001$; Girls, $F=40.87$, $p<0.001$), father criticism (Boys, $F=27.05$, $p<0.001$; Girls, $F=49.62$, $p<0.001$).

Those in the graffiti group are more likely to report serious or extreme drug use, perceived academic failure, physical and sexual abuse, suicide thoughts and behaviours, and are more likely to indicate higher family pathology, parental overprotection and criticism, depression, hopelessness, anxiety, external locus of control and risk-taking behaviours, and lower parental care and self-esteem.

Graffiti is also significantly related to low, serious and extreme antisocial behaviour. Given this strong association, the sample was grouped to aid elucidation of effects uniquely associated with graffiti. Thus low antisocial behaviour (LowASB) with graffiti was compared to LowASB without graffiti, serious antisocial behaviour (SASB) with graffiti was compared to SASB without graffiti and extreme antisocial behaviour (EASB) with graffiti was compared to EASB without graffiti. Results of these group comparisons using chi-square analysis and analysis of variance are summarised in tables 3 to 5 and the in following sections.

[Insert Table 2]

Low Antisocial Behaviour With or Without Graffiti

For boys, there are significant differences between the LowASB plus graffiti group and the LowASB minus graffiti group, including for suicide thoughts, deliberate self-injury, drug use, family functioning, locus of control and risk-taking with those in the LowASB and graffiti group (Table 3). In addition to those presented in Table 3, groups are significantly different for perceived academic performance (15.6% vs 6.6%; $=8.50$, $p<0.05$), mother care ($M=25.63$ vs $M=27.65$;

F=6.00, $p<0.05$), father care (M=23.46 vs M=25.69; F=5.13, $p<0.05$), and father overprotection (M=13.32 vs M=11.16; F=5.75, $p<0.05$) with boys in the LowASB plus graffiti group more likely to report 'failing' perceived academic performance, and lower parental care and higher father overprotection.

Girls in the LowASB plus graffiti versus LowASB minus graffiti groups are significantly different on all variables measured in this study (Table 3). In addition to those results reported in Table 3, groups are significantly different in mother care (M=25.07 vs M=28.37; F=24.67, $p<0.001$), mother overprotection (M=14.70 vs M=12.08; F=13.38, $p<0.001$), mother criticism (M=11.36 vs M=9.12; F=12.62, $p<0.001$), father care (M=21.75 vs M=26.12; F=29.52, $p<0.001$), father overprotection (M=14.84 vs M=11.45; F=19.63, $p<0.001$) and father criticism (M=12.52 vs M=9.21; F=22.82, $p<0.001$). Those in the LowASB plus graffiti group reported lower parental care and higher parental overprotection and criticism.

[Insert Table 3]

Serious Antisocial Behaviour With or Without Graffiti

For boys, there are several significant differences between the serious antisocial behaviour (SASB) plus graffiti and the SASB minus graffiti, including with deliberate self-injury, drug use, mother criticism, depression, anxiety and risk-taking. Group percentages, chi-square statistics, means and F values are reported in Table 4.

For girls, there are several significant differences between the SASB plus graffiti group and the SASB minus graffiti group including on suicide plans, serious drug use, self-esteem and anxiety. Details are provided in Table 4.

[Insert Table 4]

Extreme Antisocial Behaviour With or Without Graffiti

For boys there are several significant differences between the extreme antisocial behaviour (EASB) plus graffiti group and the EASB minus graffiti including suicide thoughts, deliberate self-injury, suicide attempts, drug use, mother care, mother overprotection, mother criticism, and depression. Details are provided in Table 5. For girls, there were no significant differences between these same groups on any of the variables measured in this study.

[Insert Table 5]

Summary

In all the results reported in Tables 3 to 5, those groups that included graffiti showed higher reported perceived academic failure, physical abuse, suicidal thoughts and behaviours, drug use, family pathology, parental overprotection and criticism, depression, hopelessness, external locus of control, anxiety, risk-taking and lower self-esteem and parental care.

Discussion

The results of this study suggest that adolescent who graffiti ('tag') are significantly different to those who do not graffiti on all of the factors measured in this study. Although this is the first population based study to date comparing these groups, the result is similar to the differences found with general vandalism and antisocial behaviour groups [Eg. 15]. Adolescents who graffiti show

higher reported drug use, perceived academic failure, physical and sexual abuse, suicide thoughts and behaviours, and are more likely to indicate higher family pathology, parental overprotection and criticism, depression, hopelessness, anxiety, external locus of control and risk-taking behaviours, and lower parental care and self-esteem.

Results also suggest that antisocial behaviour (low, serious and extreme) with graffiti is significantly different from antisocial behaviour without graffiti. Adolescent who graffiti in addition to various levels of antisocial behaviour show higher reported perceived academic failure, physical abuse, suicidal thoughts and behaviours, drug use, family pathology, parental overprotection and criticism, depression, hopelessness, external locus of control, anxiety, risk-taking and lower self-esteem and parental care.

One limitation of this study was the one-item measure of graffiti behaviour. Our focus in this study was 'tagging' but there are a number of other forms of vandalism that may be defined as graffiti. In addition, we did not measure the severity of the problem behaviour. The number of graffiti acts may have been an important factor to include in the analysis. Our measure of graffiti may have captured wrongly, graffiti art and other forms of doodling, which would not be considered vandalism.

Graffiti is not only a significant community problem but should be considered a serious action, which may have many other coexisting family, parental, behavioural and psychological problems. Clinicians may need to ask about graffiti even when an adolescent presents with low levels of antisocial behaviour.

Acknowledgements

The South Australian Health Commission funded the original EDED research project.

Table 1. Prevalence of graffiti and antisocial behaviour in boys and girls at mean age 13 years

	Boys n (%)	Girls n (%)
TOTAL	1442	1154
Born in Australia	1338 (92.9)	1075 (93.4)
English main language	1386 (96.4)	1111 (96.3)
ATSI Origin	17 (1.2)	7 (0.6)
Graffiti	169 (12.3)	121 (10.9)
No ASB†	407 (29.2)	516 (45.9)
Low ASB (scores 0-5)	1139 (81.7)	1038 (89.9)
Serious ASB (scores 6-8)	145 (10.4)	62 (5.4)
Extreme ASB (scores ≥ 9)	110 (7.9)	25 (2.2)
Graffiti + No ASB	2	4
Graffiti + Low ASB	45	74
Graffiti + Serious ASB	49	30
Graffiti + Extreme ASB	75	17

Note. ATSI=Aboriginal/Torres Straight Islander; ASB=antisocial behaviour. †Antisocial Behaviour is a 22-item Scale excluding graffiti item.

Table 2. Univariate associations (Pearson Chi-Square and analysis of variance) amongst family and individual variables showing group differences between those who show graffiti (G) and no graffiti (NoG)

	Boys			Girls		
	G (%)	NoG (%)	χ^2	G (%)	NoG (%)	χ^2
LowASB	26.6	89.4	388.57	61.2	96.1	186.13
SASB	29	7.9	70.11	24.8	3.1	97.02
EASB	44.4	2.7	353.90	14	0.6	95.70
‘failing’ PAP	19.9	7.7	41.52	15.9	4.3	30.46
Physical Abuse	42.2	32.8	5.70*	44.2	16.4	52.43
Sexual Abuse	4.8	1	14.60**	12.5	5.9	7.55**
Serious Drug	49.1	5.3	291.96	40.5	5.2	162.65
Extreme Drug	26.3	1.3	219.84	22.3	1.7	119.02
Suicide Attempts	15.4	2.1	67.96	21.5	4.4	53.79
	G (M)	NoG (M)	F	G (M)	NoG (M)	F
FADGF	2.10	1.81	64.73†	2.15	1.74	80.02†
Depression	16.98	10.50	81.23†	21.62	12.58	71.05†
Hopelessness	5.26	3.18	53.33†	6.23	3.38	61.18†
LOC	16.09	13.48	29.86	17.19	13.49	48.65
Self-Esteem	37.26	41.14	45.50†	34.15	39.62	58.96†
Anxiety	5.95	3.59	55.13†	7.80	4.54	53.54†
Risk-Taking	10.00	6.61	227.30	8.66	5.36	166.60†

Note. All chi-square and ANOVA statistics significant at the $p < 0.001$ level except ** $p < 0.01$; * $p < 0.05$. † test fails homogeneity of variance but remains significant with subsequent Kruskal-Wallis test. ASB=antisocial behaviour, SASB=serious antisocial behaviour, EASB=extreme antisocial behaviour, PAP=perceived academic performance, FADGF=family general functioning, LOC=locus of control, G=graffiti, NoG=no graffiti, M=mean.

Table 3. *Univariate associations (Pearson Chi-Square and analysis of variance) amongst family and individual variables showing group differences between those who show low antisocial behaviour (LowASB) with graffiti (G) and LowASB without graffiti (NoG)*

	Boys with LowASB			Girls with LowASB		
	G (%)	NoG (%)	χ^2	G (%)	NoG (%)	χ^2
Physical Abuse	-	-	ns	36.5	15.5	21.45
Suicide Thoughts	25.6	12.6	6.07*	48.6	21.5	28.14
Suicide Plans	-	-	ns	27.4	10.1	20.22
Suicide Threats	-	-	ns	30.1	7.3	42.98
DSI	20.9	9.6	5.87*	34.2	12.9	25.10
Suicide attempts	-	-	ns	14.9	3.6	20.88
Serious Drug	22.2	3.2	40.57	20.3	3.4	44.40
Extreme Drug	4.4	0.4	13.15*	10.8	0.8	44.03
	G (M)	NoG (M)	F	G (M)	NoG (M)	F
FADGF	1.98	1.79	8.19**	2.03	1.72	30.57†
Depression	-	-	ns	18.61	12.16	25.51
Hopelessness	-	-	ns	4.96	3.29	16.45†
LOC	15.58	13.23	7.07**	16.32	13.37	20.88
Self-Esteem	-	-	ns	35.94	39.76	19.64
Anxiety	-	-	ns	6.56	4.41	16.38†
Risk-Taking	8.42	6.30	30.10	7.23	5.18	49.53

Note. All chi-square and ANOVA statistics significant at the $p < 0.001$ level except ** $p < 0.01$; * $p < 0.05$. † test fails homogeneity of variance but remains significant with subsequent Kruskal-Wallis test. DSI=deliberate self-injury, FADGF=family general functioning, LOC=locus of control, LowASB=low antisocial behaviour, G=graffiti, NoG=no graffiti, M=mean.

Table 4. *Univariate associations (Pearson Chi-Square and analysis of variance) amongst family and individual variables showing group differences between those who show serious antisocial behaviour (SASB) with graffiti (G) and LowASB without graffiti (NoG)*

	Boys with SASB			Girls with SASB		
	G (%)	NoG (%)	χ^2	G (%)	NoG (%)	χ^2
Suicide Plans	-	-	ns	60	33.3	4.29*
DSI	44.9	28.6	3.77*	-	-	ns
Serious Drug	34.7	17	5.67*	73.3	46.7	4.44*
Extreme Drug	16.3	4.3	6.11*	-	-	ns
	G (M)	NoG (M)	F	G (M)	NoG (M)	F
Mother Criticism	12.77	10.91	4.42*	-	-	ns
Depression	18.91	13.08	9.30**†	-	-	ns
Self-Esteem	-	-	ns	31.46	36.37	4.56*
Anxiety	5.93	4.22	4.90*†	9.33	6.50	5.06*
Risk-Taking	9.90	8.93	4.79*	-	-	ns

Note. All chi-square and ANOVA statistics significant at the $p < 0.001$ level except ** $p < 0.01$; * $p < 0.05$. † test fails homogeneity of variance but remains significant with subsequent Kruskal-Wallis test. DSI=deliberate self-injury, SASB=serious antisocial behaviour, G=graffiti, NoG=no graffiti, M=mean.

Table 5. *Univariate associations (Pearson Chi-Square and analysis of variance) amongst family and individual variables showing group differences between those who show extreme antisocial behaviour (EASB) with graffiti (G) and EASB without graffiti (NoG)*

	Boys with EASB		
	G (%)	NoG (%)	χ^2
Suicide Thoughts	52.8	33.3	3.44*
Deliberate Self-Injury	58	24.2	10.19**
Suicide attempts	29.2	6.1	6.98**
Serious Drug	75.3	40.6	11.75**
Extreme Drug	46.6	21.9	5.70*
	G (M)	NoG (M)	F
Mother Care	21.35	26.61	13.48
Mother Overprotection	16.24	12.97	4.33*†
Mother Criticism	14.41	11.00	6.26*
Depression	19.04	14.09	4.82*

Note. All chi-square and ANOVA statistics significant at the $p < 0.001$ level except ** $p < 0.01$; * $p < 0.05$.
† test fails homogeneity of variance but remains significant with subsequent Kruskal-Wallis test.
EASB=extreme antisocial behaviour, G=graffiti, NoG=no graffiti, M=mean.

References

- Senator Campbell I. Dealing with Graffiti: First National Conference on Graffiti Control. In. Perth; 1996.
- Attorney General's Department. Graffiti Prevention: A report on local government responses in South Australia. In: Crime Prevention Unit; 1999.
- Moser G. What is vandalism? Towards a psycho-social definition and its implications. In: H. H. Christensen DRJMHB, editor. *Vandalism: Research, prevention, and social policy*. Portland, OR: U.S. Department of Agriculture Forest Services; 1992. p. 20-33.
- Peretti PO, Carter R, McLinton B. Graffiti and adolescent personality. *Adolescence* 1977;12(45):31-42.
- Greeson LE. Bus stop graffiti: An index of media based cultural intrusion in a Scandinavian city. *Nordisk Psykologi* 1990;42(5):358-369.
- Klofas JM, Cutshall CR. The social archaeology of a juvenile facility: Unobtrusive methods in the study of institutional culture. *Qualitative Sociology* 1985;8(4):368-387.
- Watson T. A prompt plus delayed contingency procedure for reducing bathroom graffiti. *Journal of Applied Behaviour* 1996;29(1):121-124.
- Norlander T, Nordmarker A, Archer T. Effects of alcohol and frustration on experimental graffiti. *Scandinavian Journal of Psychology* 1998;39(4):201-207.
- Mueller MM, Morre JW, Doggert RA, Tingstrom DH. The effectiveness of contingency-specific and contingency-non-specific prompts in controlling bathroom graffiti. *Journal of Applied Behaviour Analysis* 2000;33(1):89-92.
- Shek DT, Ma HK. Parent adolescent conflict and adolescent antisocial and prosocial behavior: A longitudinal study in a Chinese context. *Adolescence* 2001;36(143):545-555.
- Kim JE, Hetherington E, Reiss D. Associations among family relationships, antisocial peers, and adolescents' externalizing behaviors: Gender and family type differences. *Child Development* 1999;70(5):1209-1230.
- Arbone C, Power TG. Parental attachment, self-esteem, and antisocial behaviors among African American, European American, and Mexican American adolescents. *Journal of Counseling Psychology* 2003;50(1):40-51.
- Taylor DL, Biafora FA, Warheit G, Gil A. Family factors, theft, vandalism, and major deviance among a multiracial/multiethnic sample of adolescent girls. *Journal of Social Distress and the Homeless* 1997;6:71-87.
- Marcus RF. A gender-linked exploratory factor analysis of antisocial behavior in young adolescence. *Adolescence* 1999;34(133):33-46.
- Adalbjarnardottir S, Rafnsson FD. Adolescent antisocial behavior and substance use: Longitudinal analysis. *Addictive Behaviors* 2002;27(2):227-240.
- Schwartz JAJ, Kaslow NJ. Psychological, cognitive, and interpersonal correlates of attributional change in adolescents. *Journal of Clinical Child Psychology* 2000;29(2):188-198.
- Chamberlain P, Moore KJ. Chaos and trauma in the lives of adolescent females with antisocial behaviour and delinquency. 2002 2002; *Journal of Aggression Maltreatment and Trauma*(6):1.

- Vermeiren R, Deboutte D, Ruchkin V, Schwab-Stone M. Antisocial behavior and mental health: Findings from three communities. *European Child and Adolescent Psychiatry* 2002;11(4):168-175.
- Goldstein AP. *The Psychology of Vandalism*. New York: Plenum Press; 1996.
- Martin G, Allison S, Pearce CM, Cornelissen S, Rafferty S, Mead P, et al. Early detection of emotional disorder with particular reference to suicidal behaviours: a preliminary report. In: Singh B, Judd F, editors. *17th Geigy Symposium*; 1995; Melbourne, Australia: CIBA-Geigy; 1995.
- Rushton JP, Chrisjohn RD. Extraversion, neuroticism, psychoticism and self-reported delinquency: Evidence from eight separate samples. *Personality and Individual Differences* 1981;2(1):11-20.
- Pearce CM, Martin G. Predicting suicide attempts among adolescents. *Acta Psychiatrica Scandinavica* 1994;90:324-328.
- Beck AT, Weissman A, Lester D, Trexler L. The measurement of pessimism: The Hopelessness Scale. *Journal of Consulting and Clinical Psychology* 1974;42(6):861-865.
- Radloff LS. A self-report depression scale for research in the general population. *Applied Psychological Measurement* 1977;1(3):385-401.
- Garrison CZ, Addy CL, Jackson KL, McKeown RE, Waller JL. The CES-D as a screen for depression and other psychiatric disorders in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry* 1991;30(4):636-641.
- Radloff LS. The use of the Center for Epidemiologic Studies Depression Scale in adolescents and young adults. *Journal of Youth and Adolescence* 1991;20(2):149-166.
- Rosenberg M. *Conceiving the Self*. Malabar, FL: Krieger Publishing Company; 1979.
- Nowicki S, Jr., Strickland BR. A locus of control scale for children. *Journal of Consulting and Clinical Psychology* 1973;40:148-154.
- Zigmond A, Snaith R. The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica* 1983;67:361-370.
- Byles J, Byles C, Boyle M, Offord DR. Ontario Child Health Study: reliability and validity of the general functioning subscale of the McMaster family assessment device. *Family Processes* 1988;27:97-104.
- Kazarian SS, Baker B. Influential relationships questionnaire: data from a non-clinical population. *Psychological Reports* 1987;61(511-514).