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Characteristics of girls with early onset disruptive and antisocial behaviour

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ABSTRACT

Background *Crime, particularly among juvenile females, has increased in recent years. Little is known, however, about the development and precursors in childhood of female delinquent behaviour. This is primarily due to a lack of consensus on how to define and assess female antisocial behaviour, and a lack of studies using sufficiently large samples.*

Method *A community sample of 2451 girls between the ages of five and eight years were recruited into a longitudinal study following the enumeration of 103 238 households in the city of Pittsburgh. Data on disruptive and antisocial behaviours were collected from parents, teachers and children during the first wave of the study.*

Results *Prevalence rates of disruptive disorders varied by choice of informants and measurement thresholds. The prevalence of most disruptive behaviours was similar across the four age cohorts. Where there were differences, parents of younger girls tended to report fewer problematic behaviours compared with parents of older girls. Teachers reported more disruptive behaviours than parents and, by their reports, older girls were more likely to show oppositional/defiant behaviour and relational aggression than younger girls. Girls scoring highly on several domains relative to their peers were over-represented in disadvantaged neighbourhoods.*

Conclusions *A range of disruptive disorders are present among a subgroup of females at an early age, particularly among girls in the most disadvantaged neighbourhoods. Longitudinal follow-up is required to examine the developmental trajectories and predictive utility of these behaviours. The implications for clinical interventions are discussed.*

Introduction

During the past decade, crime rates have been increasing faster among adolescent females than male adolescents. For example, between 1988 and 1997, court referrals of females increased by 69% compared with males' increase of 26% (Bureau of Justice Statistics, 1999). These trends have also been observed in other countries, including the UK (Burman *et al.*, 1998; Farrington, 2000). Little is known, however, about the precursors, aetiological factors and correlates of female delinquency. This dearth of knowledge about developmental trajectories is partly due to the lower base rate of criminal activity among females relative to males, particularly at a young age. As a result, few longitudinal studies have been able to collect data on samples large enough to enable meaningful conclusions to be drawn about potential precursors of juvenile delinquency among females (Côté *et al.*, 2001).

The scarcity of research on girls may also be a function of the lack of consensus on how to define and assess female antisocial behaviour, with somewhat divergent approaches being taken within the fields of psychiatry, developmental psychopathology and criminology. These three traditions have differed in terms of methodology and the conceptualization of deviancy and, particularly in the case of females, they have rarely been compared or interlinked. In the area of child externalizing problems, psychiatry has focused on the diagnoses of attention-deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), and conduct disorder (CD), usually assessed by means of a psychiatric interview. The primary indicator of 'severity' is the qualification for one or more diagnoses, sometimes also with a rating of impairment in functioning. Developmental psychopathologists typically focus on the continua between normal and deviant child behaviour, usually by means of a rating scale. In this case, problematic behaviours are indicated by high scores on rating scales, which often do not have clinically established thresholds. The modus operandi of criminology utilizes either official records of juveniles' law-breaking, or perpetrators' self-reports of delinquent acts primarily defined by law. The primary indicator of severity in criminology is the type, frequency or seriousness of offending.

Approaches to studying developmental trends and gender-specific behaviours among these three traditions also vary. Developmental psychology focuses on behaviour from early childhood onwards, and is often attuned to capturing subtleties of children's interactions with others such as assessing whether aggression is proactive or reactive. In the case of girls, various forms of indirect or relational aggression, such as spreading of rumours and gossip, or ostracizing peers (Bjorkqvist *et al.*, 1992; Crick and Grotpeter, 1995), are sometimes studied along with contextual factors, motivations and sex-role expectations. Psychiatric nosology tends to assume similarity of disorders across the sexes, but this is a controversial issue (Hartung and Widiger, 1998; Zoccolillo, 1993). Also, it has been suggested that the DSM-IV (American

Psychiatric Association, 1994) requirement of three symptoms for a CD diagnosis is too high to correctly identify girls with persistent and significant antisocial behaviour (Zoccolillo et al., 1996). Although gender differences have occasionally been the focus of studies in criminology, there is a notable lack of research on girls' delinquent offending during the elementary school age period (Loeber and Farrington, 2001).

Incorporating these three approaches in longitudinal research on girls is appropriate for several reasons. First, no single approach is likely to have unique, proven utility that can explain why some girls escalate in time to serious problem behaviours whereas other girls do not. Second, the three approaches inform differently about the developmental aspects of girls' problem behaviour. Finally, since each approach places a different emphasis on aspects of problem behaviour, they are likely to have different utilities for interventions. The current paper attempts to bridge the gap between these different measurement traditions.

Most of the longitudinal data that exist for girls begin during late childhood and early adolescence, when antisocial behaviours are already apparent. These studies have provided strong evidence for a predictive relationship between adolescent conduct disorder and subsequent poor mental health and social dysfunction across multiple life domains in adulthood (e.g. Lewis et al., 1991; Robins and Price, 1991; Zoccolillo et al., 1992; Bardone et al., 1996; Pajer, 1998; Moffitt et al., 2001). In addition, recent evidence lends support to the notion that early onset of problem behaviours is a significant predictor of serious delinquency for a subgroup of girls (Côté et al., 2001; see review by Loeber and Farrington, 2001). It is also apparent, however, that a large proportion of young girls with antisocial behaviour do not go on to develop conduct disorders in adolescence. This may be because certain problem behaviours (e.g. non-compliance) are normative at an early age and tend to be 'outgrown' by middle childhood (Keenan and Wakschlag, 2000). Research is needed to investigate how to define and measure disruptive disorders in order to tease apart these different processes and establish whether an early age of onset of problem behaviour is an important factor in terms of the severity and persistence of CD symptoms leading to delinquent involvement.

Finally, it is well established that exposure to community violence and disorganization plays a role in the development of disruptive and delinquent behaviour in boys (Loeber and Wikström, 1993; Catalano and Hawkins, 1996; Sampson et al., 1997). For female adolescents, however, the evidence is equivocal (e.g. DuRant et al. 1994; Feigelman et al., 2000), and even less is known about the relationship between neighbourhood quality and disruptive behaviours in younger girls.

The current study investigates disruptive and antisocial behaviour in girls enrolled in the first phase of the Pittsburgh Girls Study (PGS). Three questions will be addressed. First, what is the nature and prevalence of early onset disruptive and antisocial behaviours in a representative community popula-

tion of girls? Second, is there a subgroup of disruptive girls who can be identified across theoretical disciplines? Third, how does neighbourhood quality impact on disruptive behaviour rates?

Method

Sample

The participants of the PGS are 2451 five- to eight-year-old girls recruited from a sample of 103 238 households in the city of Pittsburgh, which were enumerated during 1998–99. In the enumeration procedure, all households in the 23 lowest income neighbourhoods, and 50% of the remaining 66 neighbourhoods in the city were targeted (one Pittsburgh neighbourhood, the central business district, was not sampled due to the low density of residential dwellings). This process yielded 3118 potential participant children who were in the specified age range. Of these families, 15 met exclusion criteria (i.e. the child was severely developmentally delayed or hearing impaired with no sign-language skills, the mother was unable to speak English). A further 110 were designated ineligible because, for example, the interviewee was not the primary caregiver or the family had moved out of the area. In addition, one child had died since the enumeration phase was conducted. A further 117 families were lost between the enumeration and phase 1 of the follow-up because they could not be located despite extensive search efforts. Of the remaining 2875 potential participants, 2451 agreed to participate in the first phase of the longitudinal study, yielding a recruitment rate of 85.3%.

Table 1 shows the demographic characteristics of the cohorts. At the time of the first interview, 588 of the girls were age five, 630 were age six, 611 were age seven, and 622 were eight years of age. Approximately half of the sample (52.4%) was African-American, 40.8% was Caucasian and most of the remaining 6.8% of the sample described themselves as being of mixed or other race. In 93% of cases the primary caregiver was female, and in over 92% of cases the caregiver was also the biological parent. For ease of explanation, the caregiver will be referred to as the parent. In 56% to 61% of households the parent was cohabiting with a husband or partner. Approximately 17% of the parents in the sample had completed less than 12 years of formal education. The modal annual income for the sample was \$30 000, with 25% earning less than \$15 000 per annum (the 2001 US poverty threshold defined by the Bureau of Census for a family of four was \$17 960 per annum). There were no differences between the groups in the distribution of these variables.

Of the school attenders, 2140 (99.2%) of the parents gave consent for their child's teacher to be invited to take part in the study. Completed teacher data were obtained for 1831 girls, representing 84.8% of the sample of children attending school. There were no differences between girls with and without

Table 1. Demographic characteristics of the four cohorts (total $n = 2451$)

	5-year-olds ($n = 588$)		6-year-olds ($n = 630$)		7-year-olds ($n = 611$)		8-year-olds ($n = 622$)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Race:								
African-American	299	50.9	341	54.1	319	52.2	325	52.3
Caucasian	250	42.5	234	37.1	257	42.1	258	41.4
Mixed/multi-race	37	6.3*	54	8.6†	35	5.7	39	6.3
Primary caregiver								
Female respondent	544	92.5	595	94.4	562	92.0	576	92.6
Biological parent	553	94.0	584	92.7	571	93.5	563	90.5
Married/cohabiting	354	60.2	364	57.8	370	60.6	349	56.1
≤ 11 years of education	95	16.2	108	17.1	102	16.7	107	17.2

Notes: *Two parents refused to respond to the question on the child's race. †One caregiver did not know the child's race.

teacher data on any of the demographic characteristics or dependent variables used in the analyses.

Correction for over-sampling of girls in disadvantaged neighbourhoods

Data from the year 2000 US Census were used to establish the proportion of girls in the study relative to girls living in each of the neighbourhoods in Pittsburgh. Of the girls recruited into the study, 40.9% ($n = 1003$) were from the 23 lowest income neighbourhoods and 59.1% ($n = 1448$) were from higher income neighbourhoods. This compared with proportions of 27.6% and 72.4% (respectively) of five- to eight-year-old girls living in the same areas of Pittsburgh as identified by the census. Thus the low-income neighbourhoods were over-represented in the PGS compared with the census data by a ratio of 1.82:1. When adjusted to maintain the total sample size of 2451, this ratio produced weightings of 0.67 for the low-income neighbourhoods, and 1.23 for the higher income neighbourhoods. All the analyses were conducted using weighted data in order to enable conclusions to be drawn about the general population of Pittsburgh.

Data collection

Data were collected from three informants: the parents, the teachers, and children who were seven or eight years of age (five- and six-year-olds were too young to be interviewed directly). After obtaining written consent from the

parent and verbal assent from the child, parents and children were interviewed separately by trained interviewers using a laptop computer. The parent also completed pen-and-paper questionnaires. Each pair of interviews lasted about 2–3 hours.

Teachers were not contacted until three months after the start of the school year to ensure that they would have become familiar with the child. The teacher was asked to complete a booklet of questionnaires estimated to take about 20 minutes. The families and teachers were reimbursed for their cooperation: caregiver \$35, teacher \$20, and child \$15 (if interviewed).

Measures

Table 2 summarizes the measures administered to each informant. Cronbach's α is reported for those instruments whose items have similar properties of endorsement. This excludes most of the measures of antisocial behaviour because the individual items vary greatly in their prevalence and severity.

Demographic information

Demographic data were collected according to the format developed for the Pittsburgh Youth Study (Loeber et al., 1998) and included race, family composition and annual income.

Mental health

Child Symptom Inventory-4 (CSI-4, Gadow and Sprafkin, 1994): The CSI was used to examine the nature and severity of disruptive behaviours and to estimate diagnoses for DSM-IV for ADHD (inattention, hyperactive/impulsive and combined types) and ODD. CD diagnoses were formed using

Measure	Parent	Child (≥ 7 years)	Teacher	Interviewer
Demographic interview	✓			
Child Symptom Inventory (CSI)	✓	✓	✓	
Children's Global Assessment Scale (C-GAS)	✓			✓
Self-reported Antisocial Behaviour Scale (SRA)		✓		
Antisocial Behaviour Scale (AS)	✓		✓	
Psychopathy Screening Device (PSD)	✓		✓	
Children's Peer Relations Scale (CPRS)	✓	✓	✓	
Your Neighbourhood (YN)	✓			

information gathered from both the CSI and the Antisocial Behaviour Scale (AS, see below) in order to avoid duplicating questions. Children were administered 11 items of the CSI in combination with three items from the Self-reported Antisocial Behaviour Scale (SRA, see below; the children were not asked the DSM-IV symptom pertaining to enforced sex owing to their young age).

The symptoms were scored on 4-point (0-3) scales of *never*, *sometimes*, *often* and *very often*. Responses were analysed as both dichotomous and continuous scores. Dichotomous scores (0 or 1 vs. 2 or 3) were derived to indicate the presence/absence of clinical symptoms consistent with DSM-IV criteria. Continuous scores were used to investigate symptom severity. Data relating to behaviours present during the past year are reported in the current paper.

The child's level of global impairment was assessed using information from both the parent and the interviewer using the Children's Global Assessment Scale (C-GAS, Setterberg et al., 1992). This scale assessed the child's lowest level of functioning across four domains (home, school, with friends and during leisure time) during the past six months. A continuous 100-point scale with descriptive anchors ranges from 1-10 (extremely impaired) to 91-100 (doing very well). A score of ≤ 60 represents significant impairment of functioning (Bird et al., 1990).

Antisocial behaviour

Self-reported Antisocial Behaviour Scale (SRA, Loeber et al., 1989): The SRA comprises 33 items covering a range of antisocial and delinquent behaviours such as stealing, aggression and vandalism. Twenty-six items are used in the current paper (items relating to substance use are omitted). The three-point (0-2) answer format is *never*, *once* or *twice*, and *more than twice* for questions relating to the past 12 months. Responses coded as 'more than twice' were judged to represent clinically significant symptoms of antisocial behaviour and were used to contribute to the CD diagnosis. The total score was used as an index of the severity of self-reported antisocial behaviour. The children were only asked the questions in the SRA once they had demonstrated that they understood the meaning of the item (see below).

Antisocial Behaviour Scale (AS): The parent and teacher versions of the SRA comprised 26 and 13 items respectively assessing the child's behaviour. The items were scored on a three-point (0-2) scale in the same manner as previously described.

Psychopathy Screening Device (PSD, Frick & Hare, 1995): The six items comprising the 'callous/unemotional' subscale from the PSD were completed by both the parents and the teachers. This subscale includes items such as not showing emotions and lack of guilt. Each item is scored on a three-point (0-2) scale using the responses: *definitely true*, *sometimes true* and *not at all true* during the past two months.

Indirect aggression

Children's Peer Relationship Scale (CPRS, Crick and Grotpeter, 1995; Crick, 1996): A version of the relational aggression subscale of the CPRS was administered to each of the parent (five items), teacher (seven items) and child (five items). The subscale included items such as: 'When your daughter is mad at other children, she gets even by excluding them from her clique or play group.' The rating scales comprised five points for the parent and teacher with the response format ranging from *never* to *almost always*. The child's version used a simpler three-point (1–3) format (*never, sometimes, a lot*). Alpha coefficients ranged from 0.78 to 0.83 for the parent version; 0.83 to 0.91 for the teacher version; and were 0.68 and 0.65 for the seven- and eight-year-olds respectively.

Neighbourhood quality

Your Neighbourhood (YN, Loeber et al., 1998): This 17-item scale measures the parent's perception of problems within the neighbourhood (e.g. relating to racial strife, prostitution, assaults, burglary, drug dealing) on a three-point scale of: *not a problem, somewhat of a problem, a big problem*. Alpha coefficients ranged from 0.93 to 0.94 across the four cohorts.

Data management

When multiple informants were used, data will be presented separately for each informant to allow examination of differences in reporting. For example, DSM-IV disorders were generated using the parents' report for ADHD and ODD. CD was generated both by parent report as well as the combined reports of the parent and child.

In order to maximize the information gathered across measures and informants, missing data were pro-rated accordingly. On measures of continuous scores, missing data points were pro-rated if 67% or more of the items had been completed. If fewer than 67% of the items were completed, the summed score was deemed missing. In generating DSM-IV diagnoses using symptom counts, a more conservative strategy was adopted and no substitution of missing data was carried out. This procedure accounts for the variations in sample sizes shown in the results section. Pro-rating needed to be conducted on a very small percentage of cases (less than 1.8%).

The SRA, AS, PSD and CPRS do not have established thresholds representing 'deviancy' for five- to eight-year-old girls. Thus, in order to examine whether the different measures were identifying similar girls as disruptive/antisocial, and to manage the highly skewed distributions, continuous scores on these measures were dichotomized at the 75th percentile for each separate cohort. As there were no cohort effects on the parents' ratings of neighbour-

hood quality, the scores of the entire sample were divided into thirds representing 'advantaged', 'moderate' and 'disadvantaged' neighbourhoods.

The child's understanding of questions about antisocial behaviour

The seven- and eight-year-old girls were asked seven screening items on the SRA in an attempt to establish whether they understood the meaning of the subsequent questions and to thus increase the reliability and validity of their self-reports. If the child was unable to explain the meaning of the screening item, she was not asked any of the related questions and these data points were deemed 'missing'. In total, 441 (71.3%) and 529 (85%) of the seven- and eight-year-olds respectively understood all seven screening questions.

Results

Diagnosis of disruptive behaviour disorders

Between 3.5% and 4.7% of the girls qualified for ODD using parent report (see Table 3) and as such it was the most common diagnosis in each cohort. ADHD-inattention type was the least common diagnosis with rates of less than 1.3% across the four cohorts. Between 2.1% and 3.9% of the girls qualified for a diagnosis of ADHD-hyperactivity-impulsive type.

The most common of the inattention symptoms across the entire sample of children was 'easily distracted by extraneous stimuli' (14.5%, 18.4%, 17.0% and 14.8% of five-, six-, seven- and eight-year-olds respectively). Of the hyperactivity/impulsivity symptoms the most common was that the girl 'often talks excessively' (42.4%, 37.1%, 32.4% and 28.2% for the four cohorts respectively). Of the ODD symptoms, the most commonly occurring was 'loses temper' reported by between 9.8% (for eight-year-olds) and 15.1% (five-year-olds) of parents.

Diagnoses of conduct disorder were created using a threshold of three symptoms as described by DSM-IV and also of two symptoms as suggested by the literature for girls (Côté et al., 2001; Zoccolillo et al., 1996). The diagnosis was also derived using the parent report alone and in combination with information gathered from the child. Using the parent report and the DSM-IV criterion, very few girls were classified as conduct disordered (between 0.5 and 1.3%). Using the more lenient threshold of two or more symptoms, between 1.6 and 2.6% of the girls were categorized in this way. When the child's report was combined with the parent's the rates increased to 2.8% and 2.4% according to DSM-IV criteria, and to 6.3% and 5.7% using a threshold of two or more symptoms.

According to the parents, the most common CD symptom was 'lying to get things, avoid responsibility, or cons others' which occurred with a frequency of between 3.3% and 4.1% across the age groups. In all, 4.4% to 5% of the five-

Table 3. Weighted 12-month prevalence of ADHD and ODD diagnoses based on parents' reports, and CD diagnosis based on parents' and children's reports

Cohort	ADHD type						ODD						CD					
	Inattention		Hyperactive-impulsive		Combined		Parent report (≥ 3 symptoms)		Parent report (≥ 2 symptoms)		Parent & child reports (≥ 2 symptoms)		Parent report (≥ 3 symptoms)		Parent & child reports (≥ 2 symptoms)			
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
5 (n = 588)	3	0.5	23	3.9	6	1.0	25	4.2	4	0.7	10	1.7						
6 (n = 630)	4	0.6	15	2.4	7	1.1	22	3.5	4	0.6	10	1.6						
7 (n = 611)	8	1.3	15	2.4	8	1.3	29	4.7	8	1.3	16	2.6	17	2.8	38	6.3		
8 (n = 622)	4	0.6	13	2.1	10	1.6	25	4.0	3	0.5	14	2.3	15	2.4	35	5.7		

Note: The combined type of ADHD is mutually exclusive of the other sub-types as described in DSM-IV, i.e. if the child met criteria for ADHD combined, he/she does not appear in the frequencies for inattention or hyperactive-impulsive diagnoses.

to seven-year-old girls were reported as exhibiting at least one CD symptom of 'deceitfulness or theft' (e.g. lying or stealing) and 2.4% to 2.7% displayed at least one symptom of physical aggression. Among the eight-year-olds, approximately 3.5% of the girls displayed behaviours described as deceitful, and 3.5% exhibited aggressive symptoms (e.g. bullying other children).

Using a cut-off score of ≤ 60 on the C-GAS, 200 (8.2%) girls in the sample were judged by either the parent, or interviewer, or both, to be functionally impaired (5.6% of five-year-olds, 9.0% of six-year-olds, 10.5% of seven-year-olds, and 7.4% of eight-year-olds).

Continuous scores

Table 4 shows the mean parent and teacher scores of the ADHD items on the CSI. No age trends were evident in the reports of either informant. For the 1831 girls for whom there was both parent and teacher data, a weighted paired *t*-test showed that parents' mean score was significantly lower than the teachers' ($t = 24.63$, $df = 1846$, $p < 0.001$): parent mean = 4.67 (SD = 6.43); teacher mean score = 9.96 (SD = 9.38).

When the components of ADHD were examined separately, an age trend was revealed on the continuous scores of hyperactivity/impulsivity. Higher severity scores on hyperactive/impulsive symptoms were reported by parents of younger daughters compared with the reports of parents of older girls ($F[3,2447] = 5.1$, $p < 0.001$). Specifically, Scheffé post hoc tests revealed that five-year-olds scored higher than seven- and eight-year-olds, and six-year-olds scored higher than eight-year olds. A cohort effect was also revealed for continuous scores of inattention ($F[3,2447] = 4.5$, $p < 0.01$), whereby five-year-olds were rated as having significantly fewer difficulties than each of the other three cohorts. Teachers' scores of inattentive symptoms revealed a similar age trend ($F[3,1844] = 3.5$, $p < 0.01$): Scheffé post hoc tests showed that eight-year-olds were perceived as having more difficulties with attention compared with five-, six- and seven-year-olds. In addition, seven-year-olds were reported to be having more problems than five-year-olds. No age effects were found for the teachers' reports of hyperactive/impulsive behaviours.

The parents' mean scores on the oppositional/defiant items of the CSI ranged from 1.23 to 1.57. No cohort difference was detected. Compared with the parents, teachers reported higher severity scores on ODD symptoms (weighted paired $t = 15.48$, $df = 1846$, $p < 0.001$: teacher mean = 3.11 (SD = 4.45); parent mean = 1.37 (SD = 2.92)) and an effect of age was also apparent ($F[3,1843] = 5.6$, $p < 0.001$). Teachers reported that eight-year-olds were more likely to display ODD symptoms compared with five-, six- and seven-year-olds, and seven-year-olds were more likely to show these kinds of behaviours compared with five-year-olds.

The mean CD severity scores ranged between 1.07 and 1.30 using the 13 CSI items completed by parents. The mean teacher scores (based on seven

Table 4. Weighted scores on continuous measures by informant according to cohort.

Continuous scores	Informant	Score range	Cohort						Age trend			
			5-year-olds		6-year-olds		7-year-olds		8-year-olds		F	n.s.
			Mean	SD	Mean	SD	Mean	SD	Mean	SD		
ADHD symptoms	P	0-54	4.81	6.28	4.88	6.26	4.83	6.67	4.31	6.47	n.s.	
Inattention symptoms	T	0-54	9.50	9.32	9.92	8.79	9.79	9.83	10.50	9.51	n.s.	
	P	0-27	1.19	2.57	1.61	2.87	1.80	3.33	1.63	3.19	F[3,2447] = 4.5*	
Hyperactive-impulsive symptoms	T	0-27	5.23	5.43	5.79	5.45	5.92	5.92	6.48	5.71	F[3,1844] = 3.5*	
	P	0-27	3.62	4.54	3.26	4.26	3.02	4.33	2.68	4.17	F[3,2447] = 5.1**	
ODD symptoms	T	0-27	4.27	5.04	4.12	4.48	3.87	5.18	4.01	4.87	n.s.	
	P	0-24	1.57	3.10	1.33	2.69	1.40	3.07	1.23	2.92	n.s.	
CD symptoms	T	0-24	2.50	3.77	2.87	4.17	3.17	4.61	3.70	4.91	F[3,1843] = 5.6**	
	P	0-39	1.30	1.78	1.27	1.74	1.20	1.91	1.07	1.66	n.s.	
Antisocial behaviour	T	0-21	0.51	1.13	0.65	1.52	0.69	1.50	0.71	1.61	n.s.	
	C	0-33	-	-	-	-	1.21	1.97	1.43	2.1	n.s.	
Callous/unemotional behaviour	P	0-52	2.13	2.67	2.07	2.62	2.13	2.93	1.96	2.89	n.s.	
	T	0-26	0.65	1.31	1.00	1.77	0.97	1.75	1.0	1.87	n.s.	
Indirect aggression	C	0-52	-	-	-	-	1.59	2.54	2.02	2.98	F[1,1237] = 7.3*	
	P	0-12	2.92	1.89	2.40	1.91	2.45	1.91	2.32	1.93	F[3,2446] = 11.8**	
Indirect aggression	T	0-12	2.25	1.95	2.32	2.13	2.29	2.28	2.40	2.22	n.s.	
	P	5-25	8.86	3.16	8.96	3.10	9.15	3.30	9.10	3.14	n.s.	
Indirect aggression	T	7-35	12.59	5.64	13.55	6.23	13.56	6.53	14.61	6.79	F[3,1816] = 6.9**	
	C	5-15	-	-	-	-	5.97	1.51	6.05	1.46	n.s.	

Notes: *p < 0.01, **p < 0.001; P = parent, T = teacher, C = child

CSI items) were less than 0.72 for all four cohorts. No difference was found between the parent and teacher severity scores after they were standardized to adjust for the different number of items completed, nor were there any age trends by informant.

The mean scores on the 26-item AS reported by parents ranged from 1.96 to 2.13. The most commonly reported items were that the child had got into a physical fight with another child (36.9%) or with a sibling (22.9%). Twelve of the AS items were endorsed by less than 2% of the sample (e.g. deliberately setting fires, truancy, and cheating on school tests). The teachers' mean severity scores (based on 13 items on the AS) were also low, ranging from 0.65 for five-year-olds to 1.0 for six- and eight-year-olds. No differences were revealed between the informants on the AS items that were common to both.

A significant cohort effect using the parents' reports was revealed on the callous/unemotional construct indicating that these behaviours were more common among the younger girls ($F[3,2446] = 11.8$). Scheffé post hoc tests indicated that there were significant differences between the five- and six-year-olds, and between the seven- and eight-year-olds. No such effect was revealed when teachers' reports were examined.

Parents' average rating of the girls' relational aggression ranged between 8.86 and 9.15 for the four cohorts. The most commonly reported behaviour was that the girl ignored or stopped talking to another child when mad at her/him (74.8% scored more than occasionally). Teachers' mean ratings of relational aggression ranged from 12.59 to 14.61. Unlike the other measures, the distribution of scores for both the parent and teacher was not significantly skewed, indicating that these behaviours were generally common among girls in this sample. While there were no differences between informants once scoring differences were taken into account, the teachers' scores did reveal an effect of age ($F[3,1816] = 6.9, p < 0.001$). The eight-year-old girls were rated as more likely to display relationally aggressive behaviours compared with the five-year-olds.

Self-reported disruptive and antisocial behaviour

Mean scores of self-reported antisocial behaviour were very low (see Table 4). The seven- and eight-year old girls did not differ in terms of the severity of self-reported CD symptoms on the CSI. On the SRA, however, the eight-year-olds reported higher scores than the seven-year-olds ($F[1,1237] = 7.3, p < 0.01$). The most frequently reported behaviours for both cohorts were initiating fights with a sibling (19.4% and 25.5% of seven- and eight-year-olds), and with another child (7% and 9.3%, respectively). The seven- and eight-year-old children reported similar rates of indirect aggression with the most common behaviour being 'getting back at someone by not letting them in the group' (21.6% of seven-year-olds and 25.8% of eight-year-olds).

Disruptive behaviour index

A 'disruptive behaviour' index was derived from the parents' reports on the different measures of disruptive and antisocial behaviour. It was computed from the sum of positive scores on any of the following criteria: (1) qualification for any type of psychiatric diagnosis (ADHD, ODD, or CD); (2) scoring within the impaired range on the C-GAS (using parent and/or interviewer report); and scoring within the cohort's highest quartile on (3) the AS; (4) the CPRS; and (5) the PSD. The two-symptom criterion for a CD diagnosis was used, based on the parents' reports only. The correlation between a CD diagnosis and the dichotomized scores on the AS was examined to check whether these constructs were sufficiently separate entities. Kendall's tau-b was 0.23, indicating that the overlap was minimal.

It was found that 8.3% of the girls in the entire sample qualified for a psychiatric diagnosis. Of these girls, only 33.2% also scored below 61 on the C-GAS. There were no differences between the cohorts in the number of criteria met. Close to half of the sample scored 0, 28.1% met one, 12.9% met two, 5.9% met three and 3.6% met four or five of the index criteria.

Using a cut-off score of 3 or more on the index, the percentage of girls in each cohort was examined according to neighbourhood quality (see Figure 1). Again, there was no effect of age but a strong association between neighbourhood and index score was revealed ($\chi^2 = 56.59$, $df = 2$, $p < 0.001$). Of the girls living in disadvantaged neighbourhoods, 15.7% scored 3 or more on the index. This rate compared with 8.5% in the moderate and 4.7% in the advantaged neighbourhoods.

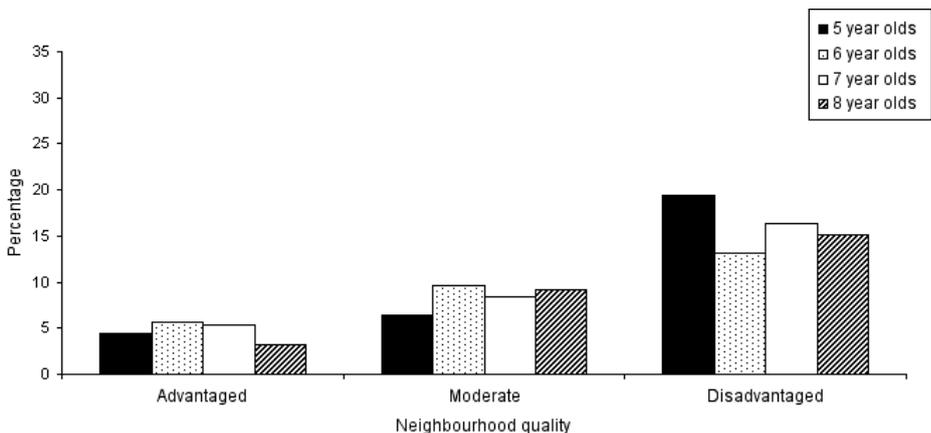


Figure 1: Weighted percentage of girls meeting three or more deviancy criteria by neighbourhood.

Discussion

Only two large-scale representative community studies are known to have reported prevalence rates for disruptive disorders in girls of a broadly comparable age. Costello et al. (1996) reported a 1.1% 3-month weighted prevalence rate of DSM-III-R defined CD for girls aged between nine and 13 years in the Great Smoky Mountains Study, and Offord et al. (1989) reported a six-month prevalence rate according to DSM-III of 0.4% for four- to 11-year-olds in the Ontario Child Health Study. These rates are based on parent reports and broadly compare with the current study's 12-month prevalence rates of 0.5–1.3% using DSM-IV criteria. While notably higher rates were found when the seven- and eight-year-olds' self-reports were combined with the parents', neither of the two comparable studies reported these data.

In terms of ADHD, Costello and colleagues reported prevalence rates of 0.95%, whereas Offord et al. reported that 0.8% of girls qualified for a diagnosis of 'hyperactivity'. In the current study, the weighted prevalence rates of ADHD ranged between 1% and 1.6% across the cohorts, with hyperactive/impulsive symptoms being more common than inattentive symptoms. Costello et al. (1996) reported a three-month prevalence of ODD of 2.3%, compared with between 3.5% and 4.7% for the slightly younger girls in the current study. This difference may indicate that rates of ODD decrease with age, a hypothesis that will be investigated in subsequent phases of the PGS.

The studies by Costello et al. (1996) and Offord et al. (1989) included children from urban and rural areas. Despite the methodological differences between the three studies, and the fact that diagnostic definitions have changed with each revision of DSM, the results of the PGS, with the exception of ODD, were broadly consistent with the rates previously reported.

The cross-sectional results at this phase of the study clearly do not allow conclusions to be drawn about the behavioural, emotional and social implications of these early psychiatric diagnoses. The multiple-age cohort design does, however, allow us to speculate about stability and change of disruptive and antisocial behaviours among young girls between ages five and eight. On the whole, the data suggest that the frequency of these behaviours remains similar in this age range. Some age trends, however, were evident on several constructs, although it is important to note that effect sizes were relatively small. By the parent's report, hyperactive symptoms and, to some extent, callous/unemotional characteristics, decreased with age. Some support for this finding on hyperactivity is provided by Hart et al. (1995), albeit based on a clinic sample of seven- to 12-year-old boys.

In the current study, the teachers, compared with the parents, reported more inattentive problems, oppositional and defiant behaviours among the older girls, and the eight-year-old girls reported more antisocial behaviour

than the seven-year-olds. These group comparisons, however, may be confounded by the co-occurrence of more than one developmental trajectory representing both positive and negative change. For example, many children may be 'outgrowing' normative antisocial behaviours during this developmental period (Tremblay et al., 1999), at the same time that novel and more enduring problems are emerging in other children.

The main task of the follow-up phases of the study will be to try to tease apart different developmental pathways and to identify at what age persistent antisocial behaviours first appear. These trajectories are likely to differ depending on the informants and the contexts that they represent. As a result, informants' reports in the current study were examined independently in order to consider behaviours occurring in the different settings. Because female antisocial behaviour is inconsistent with traditional sex-role expectations (Zahn-Waxler, 1993), it has been argued that it is more likely to be manifested in the home than at school. In the criminological literature there is, in fact, strong evidence of contextual effects as a function of gender (e.g. Daly and Wilson, 1988). In the current study, however, where there were differences between informants, the teachers were consistently more likely to report higher rates of disruptive and antisocial behaviours compared with the parents. Offord et al. (1989) reported a similar effect. This difference may have been due to informant biases (e.g. the parent may have been describing her daughter relative to antisocial siblings, or children in the local neighbourhood); the instability of girls' behaviour across settings; and/or differences in the meaning of the behaviours measured in each context. While the former explanation can be explored further in the current study by examining parental, family and community factors, these discrepancies nevertheless indicate that reliable assessment must involve multiple informants and methods. Finally, inclusion of the child's report of CD symptoms had a notable effect on the number of girls meeting diagnostic criteria. Again, important questions are raised about the predictive and discriminant power of varying informants' reports for future delinquency and antisocial behaviour among girls that await answers when further follow-ups of the samples are completed.

Because of the very limited investigation of the nature and severity of disruptive problems in elementary-school-aged girls, there are no standardized, empirically validated measures with established thresholds. By their very nature, the dimensions of interest in the current study are highly skewed, which raises some concerns about the sensitivity of mean scores. For these reasons, the scores were dichotomized and a disruptive behaviour index was generated. Chi-square analyses revealed a significant association between this broadly defined index and the quality of the neighbourhood as perceived by the parent. The proportion of girls categorized as disruptive increased incrementally across neighbourhoods classified as advantaged, moderate and disadvantaged. While this relationship could be the result of a negative response bias in the parent, it does find parallels in both the

psychiatric and criminological literature for girls. It suggests that the propensity to 'deviancy' may be influenced at least to some extent by community factors even at the young age of five to eight years. Possible mechanisms, however, need to be explored, in particular the relative import of aspects of family functioning such as the quality of parental supervision, discipline strategies, communication and caregiver changes (Stouthamer-Loeber et al., 1999).

Although no interaction between neighbourhood and the girl's age was found, the results were slightly provocative in this regard. We speculate that living in a disadvantaged neighbourhood had a particularly strong influence on five-year-old girls' adjustment, perhaps because they were less likely to have started school and were therefore more frequently exposed to violent or illegal activities in the immediate environment. It may be that the transition to school provides some temporary respite from these adverse influences. Data concerning the extent to which these girls have witnessed, or been the victims of, crime will be examined in a subsequent paper.

Clinical implications

Conduct problems have been documented as the most common referral problem for adolescent girls (Cohen, 1989; Zoccolillo, 1993) and as such represent a significant cause for concern to families, teachers, health services and the community at large. According to one developmental model, disruptive and antisocial behaviours with an early onset are at risk of becoming entrenched by the responses and influences of family, peers, school and community over time (Loeber and Farrington, 2001). Owing to sex-stereotypic socialization processes, it is likely that the cumulative effects may be more extensive for girls than for boys (Keenan and Shaw, 1997). This notion is, in fact, supported by the higher rates of co-occurring behavioural, emotional and social problems among disruptive female adolescents compared with their male counterparts (Offord et al., 1991; Zoccolillo, 1993). This aggregation of additional problems will clearly impact on the choice of, and ultimately the effectiveness of, clinical interventions for girls. The need for prevention of subsequent antisocial behaviour is further heightened by the likelihood that these girls may develop relationships with antisocial males, become pregnant at an early age, and display dysfunctional, harsh parenting with their own children (Huesmann et al., 1984; Serbin et al., 1991). These factors all point to the need for early, intensive, multi-modal interventions that target specific groups and disadvantaged populations (Bennett and Offord, 2001).

The current data indicate that, regardless of the subsequent trajectories that might be followed, there are children with significant difficulties at an early age who may benefit from clinical intervention. Yet it has been consistently shown in the literature that girls, compared with boys, tend to be overlooked for referral to mental health services (Offord et al., 1991), perhaps due

to an expectation that their problems will lessen with age. Even if contact is made with a mental health care provider, knowledge about the salient components of intervention for girls with disruptive and antisocial behaviours is limited. For example, how does the timing and sequencing of intervention impact on efficacy, and are there conditions in which some approaches are ineffective or, in fact, are contraindicated? This is clearly an area requiring further research.

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