

Long-Term Outcomes of Incredible Years Parenting Program: Predictors of Adolescent Adjustment*

Carolyn Webster-Stratton¹, Julie Rinaldi² & Jamila M. Reid¹

¹University of Washington, Box 354801, Seattle, WA 98195, USA. E-mail: cws@u.washington.edu

²Children's Memorial Hospital, Chicago, USA

Background and method: Fifty-eight boys and 20 girls with early onset conduct problems whose parents received the Incredible Years (IY) parent treatment program when they were 3–8 years (mean 58.7 months) were contacted and reassessed regarding their social and emotional adjustment 8–12 years later. Assessments included home interviews with parents and teenagers separately. **Results and conclusion:** Adolescent reports indicated that 10% were in the clinical range on internalising behaviours, 23% had engaged in major delinquent acts, and 46% reported some substance use. Eighteen percent of children had criminal justice system involvement and 42% had elevated levels of externalising behaviours (mother report). Post-treatment factors predicting negative outcomes (delinquent acts) were maternal reports of behaviour problems and observed mother–child coercion.

Key Practitioner Message:

- Positive outcomes from early intervention for children with conduct problems were mostly maintained 8–10 years later
- Level of post-treatment parent-child coercion predicted adolescent outcomes
- It may be important to reduce parent-child coercion below a clinically significant threshold
- In families where levels of parent-child coercion are still high post-treatment, further intervention may be warranted to prevent future problems

Keywords: Incredible Years; parent behaviour management; conduct problems

Introduction

Researchers have recognised the need to provide earlier treatment for children with 'early-onset' conduct problems (CPs; aggression, noncompliance, defiance and oppositional behaviour). CPs are relatively stable from preschool to adolescence with 30–50% of these children exhibiting continued behaviour problems over 3–9 year follow-ups (Campbell, Shaw, & Gilliom, 2000; Loeber & Farrington, 2001). Conduct problems place young children at high risk of underachievement, school drop-out, drug abuse, delinquency and violence (Moffitt, 1993; Tremblay et al., 1996). To prevent this trajectory toward antisocial behaviour in adulthood, parent-

training programs have been developed to treat conduct problems in the early years (Brestan & Eyberg, 1998).

The Incredible Years (IY) Parenting Program is one evidence-based program for treating young children's early-onset CPs. Randomised controlled studies demonstrate that the IY parenting program significantly improves parenting interactions, reduces conduct problems, and promotes children's social-emotional competence. For a review, see (Webster-Stratton & Reid, 2010). At 3-year follow-up, approximately two-thirds of treated children maintained clinically significant improvements on child externalising problems (Webster-Stratton, 1990a; Webster-Stratton & Hammond, 1990; Webster-Stratton, Hollinsworth, & Kolpacoff, 1989). These results are consistent with other parent training studies, which have found that 50–70% of treated families maintain clinically significant improvements over 1–3 year follow-up periods (Forehand & Long, 1986; McMahon, 1994).

While these shorter-term effects for the IY parenting programs are promising, it is unknown what effect the program's short-term success in strengthening the protective factor of positive parenting and reducing the

*The senior author of this paper has disclosed a potential financial conflict of interest because she disseminates these interventions and stands to gain from a favourable report. Because of this, she has voluntarily agreed to distance herself from certain critical research activities (i.e. recruiting, consenting, primary data handling, and analysis), and the University of Washington has approved these arrangements.

risk factor of CPs has on reducing later development of adolescent risk behaviours. In general, there are few studies that evaluate the longer-term outcomes of any early parent interventions, and those that have been conducted are beset with high attrition (approximately 50%), and small sample size (approximately 25 participants) (Brestan & Eyberg, 1998). One exception to this is a 14-year follow-up study (Long et al., 1994) of the Forehand and McMahon parenting treatment program (Forehand & McMahon, 1981), which found that adolescents who had received treatment did not differ significantly from a community sample. This study lends some support for long-term maintenance of early parent programs.

Because early-onset conduct problems are a primary risk factor for later delinquency (Loeber, 1990), substance abuse (Hawkins, Catalano, & Miller, 1992) and violent behaviour (Farrington, 1991), it is important to identify which post-treatment risk indices are predictors of poor or successful long-term outcome. This understanding of the post-treatment key risk factors (in contrast to pre-treatment variables often studied in longitudinal nonclinical studies) will help identify children who are at greatest risk for continued problems and lead to enhancements to the existing treatment options.

The current study is an 8–12 year follow-up of families who received the IY Parenting Program for their 3- to 8-year-old children's CPs. The first study aim was to describe the long-term outcomes of the treated children in terms of their adolescent emotional, social, and behaviour adjustment on standardised behaviour ratings. The second aim of the study was to identify risk and protective factors associated with long-term outcome. Family socioeconomic status (SES), parent stress, and short-term response to parent training treatment (e.g. low levels of coercive parent-child interactions) were considered as predictors of outcome. The aim was to see if low levels of post-treatment coercive parenting interactions (a key and malleable intervention risk factor target) predicted long-term child outcomes. This was important in order to determine whether the treatment model is based on a correct assumption, namely that low levels of coercive parenting interactions are important in sustaining improvements in children's behaviours. According to Patterson et al. (Patterson, Reid, & Dishion, 1992), the pathway to serious antisocial behaviour in adolescence is coercive parent-child interactions. Parent stress was also included as a possible predictor of outcome because of the research indicating that parent stress disrupts positive and consistent parenting and puts children at higher risk for developing maladjustment (Webster-Stratton, 1990b). While SES was not thought to be a malleable risk factor, it was theorised that poverty could be an important predictor of outcome apart from treatment response.

Our initial study with these families assessing their changes from baseline to post treatment indicated that 48.1% of mothers and 61.5% of fathers moved from the clinical to the normal range on the parent stress measure. On home observations, 61% of mothers and 70.2% of fathers showed a 30% reduction in critical/harsh statements and 72.7% of mothers and 63.2% of fathers showed a 30% increase in praise. Sixty-six

percent of children showed a 30% reduction in child deviance and noncompliance with mothers and 59.6% with fathers post treatment. We theorised that these parenting behaviours (increased praise, decreased coercion) and reductions in parenting stress would contribute to positive outcomes for children. Furthermore, we hypothesised that a mere reduction in coercive parenting and negative child behaviour might not be sufficient and that coercive parent-child interactions might need to be brought down into a 'non-clinical' threshold in order to sustain positive child behaviour outcomes (Webster-Stratton, 1990a). However, the clinical threshold for coercive interactions has not been established. Thus the third aim of this study was to look at whether post-treatment levels of parent-child coercion predicted adolescent antisocial behaviours and what threshold level needed to be achieved post treatment for a positive outcome.

Method

Participants

The sample included families (50% self-referred and 50% professionally referred) who had participated 8–12 years earlier in an IY parenting treatment for children diagnosed with Oppositional Defiant Disorder (ODD) and/or Conduct Disorder (CD; American Psychiatric Association, 1987). In the original study 85 families enrolled at baseline and 78 (91%) of those families completed treatment. Webster-Stratton (1994) reported no differences between the 7 study drop-outs and the 78 post treatment completers on any demographic or parent and child behavioural or mental health measures. Original criteria for study entry required that (a) the child was between 3 and 8 years; (b) the child had no debilitating physical impairment, intellectual deficit, or history of psychosis and was not receiving treatment at the time of referral; (c) the primary referral problem was child conduct problems that had been occurring for more than 6 months (e.g. non-compliance, aggression, oppositional behaviours); (d) parent rated the child as having a clinically significant number of behaviour problems according to the Eyberg Child Behavior Inventory (Robinson, Eyberg, & Ross, 1980); and (e) the child met the criteria of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1987) for ODD/CD.

These 1994 study children included 58 boys and 20 girls with a mean age of 58.7 months. All children were in the clinical range on the ECBI and met DSM criteria for ODD. Study parents included 77 mothers and 58 fathers. Of these, 54 were married or partnered. All participants received parent training; there was no randomised control group. Informed consent procedures approved by the Internal Review board at the University of Washington were followed for all participants.

The current study attempted to follow the 78 families who completed the parent program and the post-treatment assessments. Sixty-six of the 78 families (85%) gave informed consent to participate the follow-up assessments. Of the 13 families who did not participate, nine refused, and four were not located. The 66 follow-up participants did not differ from the 13 non-participants on any pre-treatment or post-treatment

demographic (SES, parental income, marital status, education, child sex) or behavioural variables (parental stress, observed harsh and positive parenting, parent-child coercion, and observations and reports of child behaviour as measured by the CBCL, ECBI, and DPICS observations. All measures are described below).

Procedures

Initial treatment and assessment. All families completed baseline assessments and then participated in the IY BASIC parenting group program, which consisted of 12 weekly, 2-hour sessions. Program topics included child-directed play skills, positive parenting, effective limit setting, and proactive discipline. A more complete description of the treatment program has appeared elsewhere (Webster-Stratton, 2006; Webster-Stratton & Herbert, 1994). Upon completion of the parenting program all families were reassessed.

Long-term follow-up assessment. The original study was conducted in cohorts of 17 families per year over 5 years, while the long-term follow up data were all collected within a 6-month time frame. Thus, there is a 5-year range between the shortest follow-up interval (8 years after study completion) and the longest follow-up interval (12 years after study completion). The mean follow-up interval was 10.25 years: 59% of the follow-up interviews were completed 8–10 years after treatment and 41% were collected 10–12 years after treatment. Data collected during in-home assessments were conducted by two highly skilled clinic therapists who did not know the families. Separate interviews and questionnaires were completed with parents and teenagers. Of the 66 families, data were collected from 57 mothers, 25 fathers, and 61 teenagers. The teens (48 male and 18 female) ranged from 12–19 years (mean age 15). Forty-eight percent of teens were between 12–14 years, 42% were 15–17, and 10% were between 18–19. Forty-eight of the teens were male (mean age = 14.9 years) and 18 were female (mean age = 15.6 years).

Measures

Long-term outcome measures: parent report of adolescent adjustment. To assess adolescent functioning, follow-up study measures included the following widely used parent interviews and reports.

Child Behavior Checklist (CBCL). The CBCL (Achenbach & Edelbrock, 1991) is a widely used informant report. The broad-band parent-report Externalising and Internalising factors were used (test-retest ICCs = .89).

Parent interview. From a parent interview developed by the Oregon Social Learning Center (Oregon Social Learning Center, 1984a), parents answered questions about whether the teenager had (a) been expelled from school, (b) any criminal justice system involvement, and/or (c) been placed out of the home for a month or more.

Long-term outcome measures: adolescent self-reports. Measures of adolescent functioning included the following adolescent self-report measures:

Delinquency. The Elliott Delinquency Scale (Elliott, 1983) is a self-report measure that assesses the number of major and minor delinquent acts over the past year. Minor delinquent acts include damaging property belonging to others, carrying a hidden weapon, obscene telephone calls, and hitting someone. Major delinquent acts include attacking someone with the idea of seriously hurting, selling hard drugs, and burglarising a residence. Test-retest reliability ranges from .75-.84)

Substance use and sexual activity. This interview measure (Oregon Social Learning Center, 1984b) assesses teen substance use and sexual activity. Five substances are queried (tobacco, beer, wine, hard liquor, and marijuana) for amount, frequency, and problems associated with use. Teens report about intimacy ranging from kissing to sexual intercourse.

Anxiety. The Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985) is a well-established self-report measure of anxiety. The total anxiety score was used in this study ($\alpha = .83$).

Depression. The Child Depression Inventory (CDI; Kovacs, 1981) is the most widely used self-report measure of children's depression ($\alpha = .71$). Two teenagers who were over 17 completed the Beck Depression Inventory ($\alpha = .80$) (BDI; Beck, 1972).

Self-worth. The Self-Perception Profile for Adolescents (Harter, 1988) is a self-report measure of children's self-perception. This study used the global self-worth subscale ($\alpha = .89$).

Predictors of outcome: short-term mother reports and home observations. To address our second aim regarding early childhood factors associated with long-term outcome, we chose demographic factors (SES) as well as variables from the original study that represented significant treatment changes (pre to post treatment) based on our original theory of the importance of reduction of parent stress and parent-child coercion (Webster-Stratton, 1994). Original measures, collected pre and post treatment, included the following:

Eyberg Child Behavior Inventory (ECBI). The ECBI (Robinson et al., 1980) is a parent-report measure of conduct problems. For the present study, we used mother reports of the Total Behaviour Problems score ($\alpha = .88-.94$).

Parenting Stress Index (PSI). The PSI (Abidin, 1990) is a parent-report instrument of child behaviour problems and parental adjustment. For this study only the Parent Domain stress score was used ($\alpha = .70-.84$).

Dyadic Parent-Child Interactive Coding System Revised (DPICS-R). The DPICS, originally developed by Robinson & Eyberg (1981) and revised by Webster-Stratton (1989) is a home observational measure for recording parent-child interactions. For each assessment, each parent-child dyad was observed for 30 minutes on two separate visits. Two parent variables were used: total

praise and total critical statements. For the target child, one summary variable was used: total deviance and noncompliance. A 'coercion' variable was formed by standardising the child deviance/noncompliance and parental criticisms variables and averaging them to form the composite. Exploratory principal components factor analysis indicated that each of the measures had standardised construct factor loadings of .77 or higher. To assess reliability, a second observer was present for 30% of home observations. For mother behaviour categories, the product-moment correlations calculated between observers ranged from .80 to .90; for child variable, the correlation was .80.

Socioeconomic status. A composite variable of socioeconomic status (SES) consisting of 3 variables—income, marital status, and education—was derived by standardising scores for each variable and averaging them together. Exploratory principal components factor analysis indicated that each of the measures had standardised construct factor loadings of .77 or higher.

Results

Adolescent adjustment

To characterise the adolescent sample in terms of both externalising and internalising outcomes, parent and teen reports on standardised measures, adolescent self-report of high-risk behaviours, and parent reports of child involvement with the criminal justice system are reported. First, comparisons are made to standardised measures with established norms for behaviours in clinical range (CBCL, CDI, RCMAS, and Harter Self Worth). On these measures *T*-scores ≥ 70 , 98th percentile, are the clinical range. Since teenager self-report of involvement in high-risk behaviours (e.g. substance use, delinquent acts, criminal justice system involvement) and parent reports of teenager's involvement with the criminal justice system do not have established norms, where possible comparison data from normative US-samples for school expulsion, delinquency, and substance use are reported to show the extent to which our sample differed from those populations. These comparison samples were taken from national samples presented by age level on delinquent acts (Elliott et al.,

1983), substance use (National Institute on Drug Abuse, 2009), school expulsion rates (National Center for Education Statistics, 2006) and involvement with the criminal justice system (Elliott et al., 1983) as well as with a longitudinal study of boys from the Oregon Youth Study (OYS; Wiesner, Kim, & Capaldi, 2005).

Parent report of CBCL externalising behaviours. Table 1 displays the means and standard deviations of the externalising sub-scale of the CBCL as reported by parents at the long-term assessment. Nine of 56 mothers (16.1%) reported teenage externalising behaviour in the clinical range (*T*-score ≥ 70). At post-test 25% of these same 56 mothers reported problems in the clinical range. Father reports of teen externalising behaviour on the CBCL indicated that 3 (12.0%) scored in the clinical range. At post-test 20% of these same 25 fathers reported clinical levels. See Table 1 for percentages of children in the clinical and borderline ranges.

Parent interview. Data from parent interviews ($n = 66$) indicated that 8 (12.7%) teenagers had been expelled from school, 12 (18.2%) had been involved with the criminal justice system, and 5 (7.9%) had been removed from their homes for more than 1 month.

Teenager self-report of delinquent acts or substance use. Table 2 displays a summary of the teen self-report outcomes. For substance use, 17 (27.9%) reported experimental or sporadic use of one of the 5 substances queried, and 11 (18.0%) used substances as often as monthly. On the major delinquency subscale, 14 (23%) had committed one or more serious acts. On the minor delinquency scale, a moderate number were involved in minor delinquent acts with 11 (18%) reporting more than 50 incidents. Thirteen (21%) reported sexual activity and 1 reported pregnancy.

Comparisons of IY youth outcomes to other samples. Overall, IY youth looked similar to comparison samples on substance use. They were somewhat higher than the comparison sample on the percentage that reported any delinquent acts, but had lower average rates of delinquent acts. They had been expelled from school at a higher rate than comparison samples;

Table 1. Parent report of child outcomes at long-term and post-treatment assessments

	Mean T-score	SD	Long-term outcome		Immediate post treatment	
			Borderline	Clinical	Borderline	Clinical
Mother report (CBCL)						
Externalising	57.96	12.58	26.8%	16.1%	25.0%	25.0%
Internalising	54.95	11.64	12.5%	12.5%	7.1%	10.7%
Father Report (CBCL)						
Externalising	53.28	11.17	4.0%	12.0%	12.0%	20.0%
Internalising	54.20	10.62	20.0%	8.0%	24.0%	0.0%
Long-term outcome						
Parent interview						
Expelled from school			12.0% (8)			
Involved with criminal justice system			18 > 2% (12)			
Removed from home			7.9% (5)			

however, the IY expulsion numbers indicate ‘ever’ been expelled, while the national comparison is for only one year, which could account for the difference. The IY sample had higher involvement in the criminal justice sample than the National Longitudinal Survey of Youth, but lower numbers than in the Oregon Youth Study. The IY youth reported less sexual involvement than the comparison sample. (see Table 3)

Adolescent internalising symptoms

Parent report of CBCL internalising adjustment. Table 1 displays means and standard deviations of the internalising sub-scale of the CBCL as reported by parents at the long-term assessment. Seven of 56 (12.5%) reported problems in the clinical range. At post-test 10.7% of these same 56 mothers reported problems in

the clinical range. Father reports of teen internalising behaviour on the CBCL indicated that 2 (8%) scored in the clinical range. At post-test none of these same 25 fathers reported clinical levels of internalising problems.

Teenager self-report. To assess depressive symptoms, all but 2 teens were administered the Child’s Depression Inventory (CDI; Kovacs, 1981). Two older teens completed the adult version, (BDI; Beck, 1972). Using a cut-off score of 10 on the BDI and T-score of 63 on the CDI, 6 teenagers (10%) met criteria for elevated depressive symptoms. On the Revised Child Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985), 7 of 60 (11.7%) scored in the clinical range. On the Harter Self Perception Scale, 5 of 60 (8.3%) scored in the clinical range using a z-score derived from normative data published in the manual (Harter, 1988).

Table 2. Long-term outcomes by adolescent self-report

Outcome and frequency	n (%)
Substance use	
No use	33 (54.1)
Once or twice in last year	8 (13.1)
Every 2–3 months	9 (14.8)
At least once per month	11 (18.0)
Sexual intercourse	
No	48 (78.7)
Yes	13 (21.3)
Total number of minor delinquent acts^a	
0	13 (21.3)
1–4	16 (26.2)
5–19	13 (21.3)
20–49	8 (13.1)
>50	11 (18.0)
Total number of major delinquent acts^b	
0	47 (77.0)
1–6	12 (19.7)
>100	2 (3.3)

Note: Total N = 61

^aMinor delinquency: damaging property, carrying hidden weapons,

making obscene telephone calls, hitting or threatening to hit.

^bMajor delinquency: attacking someone with intent to hurt, selling hard drugs, burglary.

Predictors of long-term outcomes

The second aim of this study was to identify post-treatment factors associated with the long-term outcomes of substance use and criminal justice system involvement. Multivariate regression analyses were used to test whether parent stress on the PSI, home observations of parent-child interactions (praise and parent-child coercion), and child externalising behaviour were associated with the adolescent outcomes.

Long-term outcomes with ecological validity in terms of social costs were selected: teen self-reported substance use and delinquency and parent report of criminal justice system involvement. Low frequency adolescent behaviours (i.e. expulsion from school and teenage pregnancy) were not included. The distributions of substance use and delinquency variables were negatively skewed with many cases of no occurrence and a few outliers of very high occurrence. These variables were transformed using a started logarithmic transformation, which successfully eliminated the outliers. Each outcome variable was regressed separately on the predictor variables. Age and gender were entered as control variables in Step 1, and SES and child negative behaviour and the parenting predictors in Step 2. As noted earlier, the coercion variable was formed by standardising the child deviance/noncompliance and

Table 3. Comparison of IY follow-up sample to national samples on teen age risk behaviours

IY outcomes	IY % or frequency	Comparison studies outcomes	Comparison sample	Comparison % or frequency
Mother report Expelled school (ever)	12%	Expelled School (in 2006)	NCES ^a	.02%
Mother report Criminal Justice system involvement (ever)	18%	Arrested (ever)	NLSY ^b OYS ^c	8% 54%
Youth report Substance use (alcohol and drugs combined, ever)	46%	10th grade drugs (ever) 10th grade alcohol (ever)	NIDA ^d NIDA ^d	34% 58%
Youth report Any delinquent acts	84%	Any delinquent act	NLYS ^b	67%
Youth report Avg # Delinquent acts	42 acts	Avg # delinquent acts	NLYS ^b	54 acts
Youth report sexual Intercourse (ever)	21%	9–12th grade intercourse (ever)	YRBS ^e	48%

^aNational Center for Education Statistics (NCES) (National Center for Education Statistics, 2006)

^bNational Longitudinal Survey of Youth (NLSY) (Elliott et al., 1983)

^cOregon Youth Study (OYS) (Wiesner et al., 2005)

^dNational Institute of Drug Abuse (NIDA) (National Institute on Drug Abuse, 2009)

^eNational Youth Risk Behavior Study (YRBS) (National Center for Chronic Disease Prevention and Health Promotion, 2009)

parental criticisms variables and then averaging them to form the composite. Criminal justice system involvement is a dichotomous variable and logistic regression was used for this variable.

Shown in Table 4 are the correlations of each predictor with the outcome in the first column, and the results of the regression analyses in columns 2 to 4. SES, mother report of child negative behaviour and observations of mother-child coercion were significantly and positively correlated with delinquency, and mother praise was negatively correlated with delinquency in the correlational analyses. In regression Model 1, predicting to adolescent reports of delinquency, after accounting for current age and gender, the combination of predictors accounted for an additional 26.8% of the variance, $F_{\text{change}}(5,51) = 4.18$, $p < .01$, but with all the predictors competing for variance, only mother report of child negative behaviour and mother low rates praise were significantly associated with later delinquency.

In predicting to adolescent reports of substance use (Model 2), only coercion showed a significant correlation with the outcome. The prediction model, after accounting for age and gender, was not significantly different from zero, $F_{\text{change}}(5,51) = .32$, $p = .90$.

In Model 3, predicting to parent report of criminal justice system involvement, SES, coercion, and child

negative behaviour all showed significant correlations with the outcome. The prediction model, after accounting for age and gender, was significantly different from zero, $F_{\text{change}}(5,56) = 4.37$, $p < .01$, accounting for an additional 26.4% of the variance. Mother report of child negative behaviour and the coercion composite significantly predicted criminal justice system involvement.

Prediction of long-term positive outcome from short-term clinical versus non-clinical rates of behaviours. To address the question of whether or not absolute levels of short-term post-treatment parent-child coercion and child behaviour problems were associated with delinquency and criminal justice system involvement, dichotomous variables were created for the parent and child predictor variables. Families were defined post-treatment as being in the non-clinical or clinical range on mother report of child problem behaviour (ECBI) and 3 home observational measures. On the ECBI, a cut-off score of fewer than 17 problem behaviours was used (Boggs, Eyberg, & Reynolds, 1990). For observed behaviours we used criteria from previous research (Webster-Stratton & Hammond, 1998): a 30% improvement in praise, fewer than 10 critical mother statements in a 30-minute period, and fewer than 10 child deviant or noncompliant behaviours in 30 minutes were considered in the non-clinical range. *T*-tests were performed separately using each long-term outcome as the dependent variable and the clinical/non-clinical distinctions as the independent variables. Chi-square analyses were used for the criminal justice system outcome

Table 4. Outcomes at 12–19 years of age regressed on post treatment predictors

Predictor	<i>r</i>	β	<i>t</i>	R^2_{change}
Model 1: Delinquency				
Step 1				.079 ⁺
Age/gender				
Step 2				.268**
SES	-.285*	-.184	-1.512	
Child negative behaviour	.469***	.387	3.218**	
Parent stress	.023	-.078	-.652	
Coercion	.257*	.040	.312	
Praise	-.283*	-.243	-2.073*	
Model 2: Substance consumption				
Step 1				.261***
Age/gender				
Step 2				.023
SES	-.049	.067	.529	
Child negative behaviour	.058	.014	.114	
Parent stress	-.085	-.043	-.347	
Coercion	.313*	.119	.891	
Praise	.039	.076	.617	
Predictor	<i>r</i>	β	<i>t</i>	R^2_{change}
Model 3: Criminal Justice System involvement				
Step 1				.060
Age/gender				
Step 2				.264**
SES	-.267*	-.094	-.803	
ECBI	.339**	.27	2.35*	
PSI	.001	.008	.062	
Coercion*	.497***	.414	3.311**	
Praise	-.125	-.066	-.576	

+ = $p < .10$, * = $p < .05$, ** = $p < .01$, *** = $p < .001$
 *'coercion' variable formed by standardising the child deviance/noncompliance and parental criticisms variables and then averaging them to form the composite

Delinquent acts. Results from the individual *t*-tests (or chi-square) revealed that children whose ECBI problem scores were in the non-clinical range immediately post treatment exhibited fewer delinquent acts in adolescence than children with scores in the clinical range, $t(58) = 4.52$, $p < .001$.

Criminal justice system involvement. Chi-squared analyses revealed several immediate treatment response variables that were related to whether or not a teen had criminal justice system involvement. Children whose post-treatment ECBI problem scores were in the non-clinical range were significantly less likely (7/56, 12.5%) to report later criminal justice system involvement than those with clinical scores (4/9, 44.4%), $\chi^2 = 5.63$, Fisher's Exact $p < .05$. Mothers who exhibited fewer than 10 critical statements were significantly less likely (4/43, 9.3%) to have children with later criminal justice system involvement than mothers who exhibited more than 10 critical statements (7/22, 31.8%), $\chi^2 = 5.25$, Fisher's Exact $p < .05$. Children who exhibited fewer than 10 deviant or noncompliant behaviours post treatment were less likely (3/37, 8.1%) to show later criminal justice system involvement than children who exhibited more than 10 deviant or non-compliant behaviours (8/28, 28.6%), $\chi^2 = 4.75$, Fisher's Exact $p < .05$.

Substance use. Level of post-treatment response was not significantly related to substance use.

Discussion

The purpose of this study was to evaluate the long-term adjustment of adolescents whose early-onset conduct problems were treated with the IY Parenting Program utilising standardised measures and comparison to national, normative US samples. Overall, findings indicated that the treated children showed less severe indications of conduct problems at adolescence than might have been expected (e.g. limited criminal justice system involvement) given their early onset clinical levels. Findings also indicated that high post-treatment levels of parent-child coercion and child externalising problems were associated with the adolescent problem outcomes. Parental stress at post treatment was not associated with long-term problems.

At long-term follow-up, 16% and 12% of the teens were in the clinical range according to mother and father reports respectively on the CBCL externalising scale, compared to 25% and 10%, immediately post-treatment. Thus, parent reports of externalising problems were stable or slightly improved over the follow-up period.

In terms of adolescent antisocial behaviours that we hoped to prevent, approximately half of the teens (46%) reported some lifetime use of drugs or alcohol. This is somewhat consistent with national norms of lifetime drug use (34%) and alcohol use (58%). Our sample reported less sexual activity than normal: 21% had engaged in sexual intercourse compared to 47.8% in a US national sample. In terms of delinquency and criminal justice system involvement, our sample showed a majority of teens (78%) who engaged in one or more minor delinquent acts, but only a few (23%) who exhibited major delinquent acts. There were 12 (18%) who were involved in the criminal justice system. These numbers are somewhat consistent with national norms. Numbers of students in our sample who had been expelled from school were high (12.7%) compared to national norms; but it is important to highlight that only one of the teenagers in this sample of 66 had dropped out of school and this was the teenager who had become pregnant. None of the teenagers from our study had served any time in juvenile detention or jail. In addition to the normative samples presented above, we compared our teenagers (grades 7–12) to a similar age group of boys assessed in 8th grade and again in 10th grade who had participated in a longitudinal study (OYS; Wiesner et al., 2005). These comparison boys had not been identified as having had early behaviour problems like the children in our sample. Data indicated that our treated teenagers engaged in about the same or fewer delinquent acts as this comparison group and had similar sexual activity. Our group reported greater abstinence from substance abuse (56.9%) than the comparison group (32% in grade 8 and 29.5% in 10th grade) and less involvement with the criminal justice system (18% our sample, 54% OYS sample) suggesting the success of the program in preventing and reducing these behaviours.

Our sample exhibited very low levels of internalising problems. According to mother and father reports on the CBCL, respectively 12% and 8% of teens exhibited a clinically significant number of internalising symptoms. A few (10%) of the adolescents self-reported elevated symptoms of depression, anxiety, or low self-worth.

Since early externalising problems have been shown to predict long-term internalising problems (Fischer et al., 1984), it is encouraging to find so few teens with internalising problems.

A second aim of the study was to determine whether family demographic factors or post-treatment parenting or child behaviour factors were associated with poor long-term outcomes. Results indicated that SES did not significantly predict long-term outcomes. However, immediate post treatment mother reports of conduct problems and low rates of mother praise did significantly predict teenager reports of delinquent acts. Post-treatment mother reports of conduct problems and coercive behaviour predicted teenager involvement in the criminal justice system.

When the clinical or nonclinical levels of post-treatment outcomes were used as the predictor of long-term outcomes, a similar result was found. Children with clinical post-treatment scores on the ECBI were more likely to engage in adolescent delinquent-acts (44%) than those whose post-treatment reports were in the normal range (12%). Children who were observed to have high post-treatment rates of deviant behaviour showed higher rates (28.6%) of criminal justice system involvement than those with lower rates of deviant behaviour (8.1%). Mothers who were observed to have high post-treatment rates of critical behaviour had adolescents with significantly higher rates (31.8%) of criminal justice system involvement than those with lower rates of critical behaviour (9.3%).

Our prior research has suggested that more than 10 critical parent statements or 10 child deviant and noncompliant behaviours during the 30-minute observation is in the clinical range (Webster-Stratton & Hammond, 1998). In the current study, when this level of improvement in coercion was not achieved post treatment, there was a higher likelihood of poor outcomes. Perhaps these mother-child interactions were more difficult to change, possibly because their children were more negative to begin with, or had more biological and developmental factors, or because there were other family risk factors such as substance abuse, spousal conflict or depression that disrupted parenting interactions. To make lasting improvements, these families would seem to need continued intervention to focus on these special parent or child needs in order to further reduce their coercion levels to below the threshold and promote more sustained positive parenting.

A few limitations of this study deserve comment. First, the follow-up sample does not include an untreated control group; thus there is no direct comparison of comparable children who did not receive the IY intervention. However, it is noteworthy that the rates of adolescent behaviours in our study are somewhat consistent with US-based, national published, age-related norms for children ages 12 to 19 on delinquent acts (Elliott et al., 1983), substance use (National Institute on Drug Abuse, 2009), school expulsion rates (National Center for Education Statistics, 2006), and involvement with the criminal justice system (Elliott et al., 1983), as well as with a longitudinal study of boys from the Oregon Youth Study (OYS; Wiesner et al., 2005). Nonetheless, future research designs addressing long-term effectiveness need a randomised control

group trial since the normative data provided here are based on a variety of different samples, and can only provide loose guidelines for comparison to our sample. A second limitation is that the sample includes a wide age range from a few young adolescents who might not yet be showing severe conduct problems to the later adolescent years, which represent the time in the developmental life span where youth typically exhibit the highest rates of antisocial activities. A later follow-up assessment when all of the children in this study have reached young adulthood would allow us to see whether these youth moved through this adolescent risk behaviour into typically functioning young adults or whether they continued on a trajectory of delinquency and antisocial behaviour. Lastly, almost no data were collected on intervention received by youth or their families during the follow-up period. A brief assessment collected 2 years after the original intervention indicated that, at that time, 17% of the sample was taking medication for ADHD, 19% was receiving special education programs at school, and 26% had received further therapy. However, information on the duration and intensity of these services was not collected. It would be valuable to know what role on-going intervention played in the long-term outcomes for these children.

The results from this study are encouraging in that the majority of the teenagers who received treatment for early-onset conduct problems were well adjusted and rates of risky behaviours seemed within the normal limits for typical adolescents according to national normative data. For those teenagers who were exhibiting delinquent behaviours and criminal justice system involvement, this study was useful in identifying post-treatment risk indices in early childhood, which predict long-term poor outcome. Most importantly, mothers who still reported clinical levels of aggressive behaviour in their young children post treatment or are observed with high levels of coercive interactions post treatment should be taken seriously, as their children are at higher risk of continued antisocial problems in adolescence. This supports the notion that it is necessary to continue treatment until coercion is reduced to a clinically significant threshold level in order to maintain improvements and prevent adolescent delinquency and criminal involvement.

Acknowledgements

The data for this paper were obtained for Julie Rinaldi's doctoral dissertation, and research was supported by an NIMH grant, #MH61016. It was originally presented at the Society for Prevention Research, 1-3 June 2000. Thanks to Dr Deborah Capaldi for her excellent and helpful review of a prior draft of this paper.

References

- Abidin, R. R. (1990). *Parenting stress index: Manual*. Virginia: Pediatric Psychology Press.
- Achenbach, T. M., & Edelbrock, C. S. (1991). *Manual for the Child Behavior Checklist and Revised Child Behavior Profile*. Burlington, VT: University Associates in Psychiatry.
- American Psychiatric Association (1987). *DSM III-R* (3rd-R ed.). Washington DC: American Psychiatric Association.
- Beck, A. T. (1972). *Depression: Causes and treatment*. Philadelphia: University of Michigan Press.
- Boggs, S. R., Eyberg, S., & Reynolds, L. A. (1990). Concurrent validity of the Eyberg Child Behavior Inventory. *Journal of Clinical Child Psychology, 19*, 75-78.
- Brestan, E. V., & Eyberg, S. M. (1998). Effective psychosocial treatments of conduct-disordered children and adolescents: 29 years, 82 studies, and 5,272 kids. *Journal of Clinical Child Psychology, 27*, 180-189.
- Campbell, S. B., Shaw, D. S., & Gilliom, M. (2000). Early externalizing behavior problems: Toddlers and preschoolers at risk for later maladjustment. *Development and Psychopathology, 12*, 467-488.
- Elliott, D. S. (1983). *Interview schedule, National Youth Survey*. Boulder, CO: Behavioral Research Institute.
- Elliott, D. S., Ageton, S. S., Huizinga, D., Knowles, B. A., & Canter, R. J. (1983). *The prevalence and incidence of delinquent behavior: 1976-1980. National estimates of delinquent behavior by sex, race, social class, and other selected variables*. (National Youth Survey Report No. 26). Boulder, CO: Behavioral Research Institute.
- Farrington, D. P. (1991). Childhood aggression and adult violence: Early predictors and later-life outcomes. In D. J. Pepler & K. H. Rubin (Eds), *The development and treatment of childhood aggression* (pp. 5-29). Hillsdale, NJ: Erlbaum.
- Fischer, M., Rolf, J. E., Hasazi, J. E., & Cummings, L. (1984). Follow-up of a preschool epidemiological sample: Cross-age continuities and predictions of later adjustment with internalizing and externalizing dimensions of behavior. *Child Development, 55*, 137-150.
- Forehand, R., & Long, N. (1986). *A long-term follow-up of parent training participants*. Paper presented at the meeting of the Association for Advancement of Behavior Therapy, Chicago.
- Forehand, R. L., & McMahon, R. J. (1981). *Helping the noncompliant child: A clinician's guide to parent training*. New York: Guilford Press.
- Harter, S. (1988). *Manual for the self-perception profile for adolescents*. Denver: University of Denver.
- Hawkins, J. D., Catalano, R. F., & Miller, Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin, 112*, 64-105.
- Kovacs, M. (1981). Rating scales to assess depression in school-age children. *Acta Paedopsychiatry, 46*, 305-315.
- Loeber, R. (1990). Development and risk factors of juvenile antisocial behavior and delinquency. *Clinical Psychology Review, 10*, 1-41.
- Loeber, R., & Farrington, D. P. (2001). *Child delinquents: Development, intervention and service needs*. Thousand Oaks, CA: Sage Publications.
- Long, P., Forehand, R., Wierson, M., & Morgan, A. (1994). Does parent training with young noncompliant children have long-term effects? *Behavior Research and Therapy, 22*, 101-107.
- McMahon, R. (1994). Diagnosis, assessment, and treatment, of externalizing problems in children: The role of longitudinal data. *Journal of Clinical Child Psychology, 62*, 901-917.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100*, 674-701.
- National Center for Chronic Disease Prevention and Health Promotion (2009). Trends in the prevalence of sexual behaviors, National YRBS: 1991-2007. <http://www.cdc.gov/yrbss>, Division of Adolescent and School Health. Retrieved 5 June 2009
- National Center for Education Statistics (2006). Number and percentage of students who were suspended and expelled from public elementary and secondary schools, by sex and race/ethnicity: 2002, 2004, and 2006, <http://nces.ed.gov/programs/coe/2009/section4/table-sdi-1.asp>, U.S. Depart-

- ment of Education, Institute of Education Sciences. Retrieved 5 June 2009.
- National Institute on Drug Abuse (2009). NIDA InfoFacts: High school and youth trends, <http://www.nida.nih.gov/infofacts/hsyouthtrends.html>. Retrieved 5 June 2009.
- Oregon Social Learning Center (1984a). G1 (Parent Interview): Unpublished instrument available from OSLC, 160 E 4th St, Eugene, OR 97401.
- Oregon Social Learning Center (1984b). G2 (OYS Male Interview): Unpublished instrument available from OSLC, 160 E 4th St, Eugene, OR 97401.
- Patterson, G., Reid, J., & Dishion, T. (1992). *Antisocial boys: A social interactional approach (Vol. 4)*. Eugene, OR: Castalia Publishing.
- Reynolds, C., & Richmond, B. (1985). *Revised Children's Manifest Anxiety Scale Manual*. Los Angeles: Western Psychological Services.
- Robinson, E. A., & Eyberg, S. M. (1981). The Dyadic Parent-Child Interaction Coding System: Standardization and validation. *Journal of Consulting and Clinical Psychology, 49*, 245-250.
- Robinson, E. A., Eyberg, S. M., & Ross, A. W. (1980). The standardization of an inventory of child conduct problem behaviors. *Journal of Clinical Child Psychology, 9*, 22-28.
- Tremblay, R. E., Mass, L. C., Pagani, L., & Vitaro, F. (1996). From childhood physical aggression to adolescent maladjustment: The Montreal Prevention Experiment. In R. D. Peters & R. J. MacMahon (Eds), *Preventing childhood disorders, substance abuse and delinquency* (pp. 268-298). Thousand Oaks, CA: Sage.
- Webster-Stratton, C. (1989). *Dyadic Parent-Child Interaction Coding System-Revised* (Unpublished manuscript). Seattle, WA: University of Washington.
- Webster-Stratton, C. (1990a). Long-term follow-up of families with young conduct problem children: From preschool to grade school. *Journal of Clinical Child Psychology, 19*, 144-149.
- Webster-Stratton, C. (1990b). Stress: A potential disruptor of parent perceptions and family interactions. *Journal of Clinical Child Psychology, 19*, 302-312.
- Webster-Stratton, C. (1994). Advancing videotape parent training: A comparison study. *Journal of Consulting and Clinical Psychology, 62*, 583-593.
- Webster-Stratton, C. (2006). *The Incredible Years: A troubleshooting guide for parents of children ages 3-8 years*. Seattle: Incredible Years Press.
- Webster-Stratton, C., & Hammond, M. (1990). Predictors of treatment outcome in parent training for families with conduct problem children. *Behavior Therapy, 21*, 319-337.
- Webster-Stratton, C., & Hammond, M. (1998). Conduct problems and level of social competence in Head Start children: Prevalence, pervasiveness and associated risk factors. *Clinical Child Psychology and Family Psychology Review, 1*, 101-124.
- Webster-Stratton, C., & Herbert, M. (1994). *Troubled families—problem children: Working with parents: A collaborative process*. Chichester: Wiley & Sons.
- Webster-Stratton, C., Hollinsworth, T., & Kolpacoff, M. (1989). The long-term effectiveness and clinical significance of three cost-effective training programs for families with conduct-problem children. *Journal of Consulting and Clinical Psychology, 57*, 550-553.
- Webster-Stratton, C., & Reid, M. J. (2010). The Incredible Years parents, teachers and children training series: A multifaceted treatment approach for young children with conduct problems. In J. Weisz & A. Kazdin (Eds.), *Evidence-based psychotherapies for children and adolescents* (2nd ed.) (pp. 194-210). New York: Guilford Publications.
- Wiesner, M., Kim, H. K., & Capaldi, D. M. (2005). Developmental trajectories of offending: Validation and prediction to young adult alcohol use, drug use, and depressive symptoms. *Development and Psychopathology, 17*, 251-270.