

Effects of the Incredible Years Parenting Program on Children's Interpersonal Conflict: An Integrative Data Analysis

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Behavioral parenting programs, such as Incredible Years (IY), reduce conduct problems in children. However, conduct problems encompass many different behaviors, and little is known about the effects of parenting programs on specific aspects of children's conduct problems, such as children's relationships with others. The aim of this study was to examine, for the first time, the effects of the IY parenting program on children's levels of conflict with their parents, siblings, and peers. We used individual participant-level data pooled across 12 randomized trials in Europe, comprising a total of 1,409 families: child aged 1–11 years ($M = 5.53$ years, $SD = 1.56$) and 61% male, 60% low-income families, and 30% from an ethnic minority. Multilevel models were used to explore the effects of IY on children's conflict with parents, siblings, and peers. The IY program reduced children's conflict with their parents ($\beta = -.21$), but there were no main effects of the program on conflict with siblings or peers. Moderation analyses showed that IY reduced conflict in sibling relationships for the 22% of families with the most severe sibling conflict at baseline. This suggests that high-quality behavioral parenting programs, such as IY, can effectively reduce children's conflict within the home (i.e., with parents and siblings), especially when initial levels of sibling conflict are high, but do not have broader benefits on children's interpersonal conflict outside of the home (i.e., with peers).

Keywords: interpersonal conflict, parenting program, conduct problems, individual participant data analysis, siblings


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Behavioral parenting programs are effective in reducing early conduct problems in children (Weisz & Kazdin, 2017). Most established programs, such as the Incredible Years (IY) parenting program (Webster-Stratton, 2015), teach parents to reduce coercive parent-child interaction patterns in which parents and children

unwittingly reinforce aversive behavior in each other. Coercion creates cycles of interactions that become increasingly difficult to manage and which can lead to the development of conduct problems in children (Patterson, 1982). The effectiveness of such programs in reducing overall levels of conduct problems in children has been

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continued

shown in numerous trials (Leijten, Gardner, Landau, et al., 2018; Menting et al., 2013). However, these kinds of problems encompass a range of disruptive behaviors, and less is known about how specific aspects of behavior, such as children's interpersonal conflict, are affected by parenting programs.

We use the term interpersonal conflict to refer to the negative aspects of children's relationships with others, including their parents, siblings, and peers, which might include defiance and anger toward, or arguing/fighting with, others. This can occur within the home or the child's wider environment. The specific types of conflict can differ depending on the nature of the relationship between the child and the person with whom the conflict occurs. In hierarchical relationships between a parent and child, conflict with parents might include defying parental requests (Leijten, Gardner, Melendez-Torres, et al., 2018). In relationships between children (siblings or peers), conflict might be more likely to take the form of physical or verbal arguments (Tucker et al., 2013). Exploring the effects of a parenting program on children's levels of conflict within different relationships, above and beyond their relationships with their parents, enables a more comprehensive understanding of the broader impact of such interventions.

Extensive evidence suggests that children's conflict with siblings and peers is a significant risk factor for both concurrent and later adjustment problems. A meta-analysis of 34 studies (85 effect sizes from approximately 12,000 children) found that sibling relationships characterized by high levels of conflict were significantly associated with high levels of internalizing and externalizing problems for both siblings (Buist et al., 2013). Longitudinal studies further support this, demonstrating that children experiencing high levels of sibling conflict are at much greater risk of subsequent externalizing problems (Pike & Oliver, 2017), with this association enduring into adolescence (Stocker et al., 2002). One explanation for this may be that sibling conflict "teaches" children to behave in antisocial ways (Patterson, 1984). It is also well-documented that children's peer relationships influence their social and behavioral development (Parker et al., 2015). Indeed, longitudinal research demonstrates that early peer relationship difficulties predict later adolescent psychopathology risk (Bornstein et al., 2010). For example, Woodward and Fergusson (1999) found that children with higher levels of peer problems were more likely to experience substance abuse problems and criminal offending at age 18. It may be that conflict with peers leads to externalizing behaviors via the fostering of friendships with similarly aggressive peers, who reinforce each other's disruptive behavior (Dishion et al., 2016).

Despite the myriad negative outcomes associated with children's violence toward others, remarkably little is known about the effects of parenting programs for child conduct problems on children's levels of interpersonal conflict. Two trials of the IY parenting program in the United Kingdom that reported conduct problems in the sibling of the target child as an additional program outcome (Gardner et al., 2006; Hutchings et al., 2007) found that the program reduced these problems in both the target child and their sibling. However, sibling relationships are rarely studied in the context of parenting programs for child conduct problems (Weeland et al., 2021), and, to our knowledge, conflict between siblings has not previously been assessed as a specific program outcome.

Several behavioral parenting program trials that included children's peer problems as an additional program outcome have found that programs are usually not effective in this regard. Although one trial of the IY parenting program for preschool-aged children in community services found immediate postintervention reductions in peer problems (Morpeth et al., 2017), these reductions are not seen in trials reporting longer term outcomes. For example, IY trials, in both community and outpatient psychiatric clinic settings, found no reductions in children's peer problems at 1–2.5 years postintervention (Overbeek et al., 2021; Scott, 2005). These findings, which have also been reported for other behavioral parenting programs, such as Triple P (Doyle et al., 2018), may be due, at least in part, to the use of the Strengths and Difficulties Questionnaire "Peer Problems" subscale (Goodman, 1997) in these studies. In addition to a general issue that the Strengths and Difficulties Questionnaire may not have sufficient sensitivity to detect subtle intervention effects (Overbeek et al., 2021), this specific subscale includes a range of items (e.g., rather solitary, tends to play alone), which might be less likely to be influenced by parenting programs for child conduct problems. Furthermore, the subscale contains items that assess children's peer relationships in general (e.g., whether children have friends and victimization experiences) rather than peer conflict specifically. Therefore, it is not known whether such programs would effectively reduce children's peer problems if a measure specifically assessing children's conflict with peers was used.

Previous research on parenting programs for child conduct problems has not assessed the effects on sibling conflict, nor focused specifically on children's conflict with peers. There is a need, therefore, to explore the effects of such programs on children's levels of conflict with other children. For example, we might expect that parenting programs for child conduct problems should also lead to improvements in children's relationships with their siblings. First, there may be a direct effect: The parenting techniques taught in such

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programs may also help parents respond to arguments between siblings more effectively, reducing sibling conflict. Additionally, if parents apply the parenting skills learned in the intervention (e.g., praising positive child behavior and effective limit setting) to other children in the family, then the sibling's behavior might also improve, thereby reducing sibling conflict. Second, there may be indirect effects: In line with family systems theory (in which dyadic relationships within a family are embedded in a network of interconnected family relationships, rather than occurring in isolation; Carr, 2016), parenting programs targeting one subsystem within the family (such as the parent-child relationship) may evoke changes in another subsystem (e.g., between siblings) because the subsystems are interconnected. For example, parental modeling of effective conflict management within the parent-child relationship may subsequently affect how children interact with their siblings, in turn reducing sibling conflict. Given the lack of existing programs for sibling conflict (Leijten, Melendez-Torres, & Oliver, 2021), and the associated negative outcomes, it is important to explore whether parenting programs aimed at reducing child conduct problems also help to improve sibling relationships and, if not, whether more specific programs may be needed.

We might also expect that such parenting programs would reduce children's conflict with their peers, as improvements in parenting behaviors are associated with children's improved social competence, which may help children to remain calm in peer settings, should the potential for conflict arise (Sandler et al., 2011). However, it is not clear whether there are differential effects of such programs on children's interpersonal conflict with peers, which is likely to occur in settings outside of the home, when compared with conflict with family members. We might expect that any reductions in children's conflict with peers will be smaller than those relating to conflict with family members, given that parenting programs focus primarily on improving family interactions. It is important to explore this to help inform the potential for such programs to reduce children's conflict outside of the home and to identify, therefore, whether separate or additional support might be needed.

The Present Study

The overarching aim of this study was to identify the effects of the IY parenting program on children's interpersonal conflict by analyzing pooled data from randomized controlled trials that have evaluated the IY parenting program in Europe. The IY program has been identified across multiple trials as effective for reducing conduct problems in children (Leijten, Gardner, Landau, et al., 2018; Menting et al., 2013) and is recommended by influential bodies (the National Institute for Health and Care Excellence [the United Kingdom], the Netherlands Youth Institute [the Netherlands], and Blueprints [the United States]) for the prevention and treatment of conduct problems. As with other established behavioral group parenting programs following the Hanf model (Reitman & McMahon, 2013), IY focuses on parenting techniques to build warm parent-child relationships (e.g., encouraging responsive play with children) as well as techniques to encourage positive child behavior (e.g., praise, rewards) and to discourage negative child behavior (e.g., limit setting and constructive discipline techniques). It is standard practice for group leaders and parents to work together on how different strategies can best be used with children of different ages (such

as time-out for younger children and removing privileges for older children). Techniques are taught via practice-based methods, including discussions of videos modeling parenting strategies and role-play practice. An important aspect of the program is its use of a collaborative delivery style that helps parents recognize their skills and empowers them to identify effective strategies to achieve their parenting goals (Gardner & Leijten, 2017).

Existing evidence for program effects on children's conflict with others is typically available from individual trials (e.g., Overbeek et al., 2021). The use of pooled data enables us to increase statistical power, allowing small program effects to be detected and estimated precisely, by synthesizing data from multiple trials on the same parenting program (Curran & Hussong, 2009). An additional advantage of this approach is the utilization of data across several countries and a diverse range of contexts (from psychiatric clinics to community services), versus a single setting, thereby substantially increasing the generalizability of findings.

Method

Transparency and Openness

We report how we determined our sample size, all data exclusions, and measures used in our analyses. Data were analyzed using R, Version 4.1.1 (R Core Team, 2021). This study's research questions, hypotheses, and analysis plan were preregistered at <https://osf.io/f795m> (Sellars et al., 2023). The data used are not publicly available. The analysis code is available at <https://osf.io/f795m>.

Design and Procedure

We obtained individual family-level data from 15 randomized trials on the effects of the IY parenting program for children aged 0–12 years across seven countries in Europe (the United Kingdom, Ireland, Norway, Portugal, Sweden, the Netherlands, and Wales). Fourteen trials were from a previously pooled data set of a complete set of available IY trial data in Europe, up to 2014 (see Leijten, Gardner, Landau, et al., 2018, for a detailed description of this data set). For the purposes of this study, data from a 15th trial (Weeland et al., 2017), which ended after 2014, was added to the pooled data set, following the same harmonization procedures as in Leijten, Gardner, Landau, et al. (2018). Trials were included only from European countries to help ensure relative homogeneity in the usual services that children received across trials, thus supporting the comparability of the pooled data. All trials were conducted by researchers independent of the program developer.

Our inclusion criterion was families who—at both baseline and at posttest (defined as the first measurement point after intervention termination)—completed at least seven of the nine items (i.e., more than 70%) on the Eyberg Child Behavior Inventory (ECBI; Robinson et al., 1980) used to assess children's conflict with others. The content of these items is described in the Measures section. Twelve of the 15 trials were eligible for inclusion. Three trials (Hutchings et al., 2017; Scott et al., 2001; Seabra-Santos et al., 2016) were excluded due to the absence of item level ECBI data on children's interpersonal conflict.

Details of included trial characteristics are shown in Table 1. Seven trials were indicated prevention (Trials 3, 6, 7, 8, 10, 11, 12), and two were treatment trials (1, 2), which included children

Table 1
Overview of Trial and Family Characteristics

Trial	Authors (year)	Country	Setting	Conduct problem screening	Number of families	Child age (<i>M</i>)	Baseline conflict with parents ^a (Mean)	Baseline conflict with siblings ^a (Mean)	Baseline conflict with peers ^a (Mean)	% Low income	% Ethnic minority
1	Larsson et al. (2009)	Norway	Outpatient psychiatric clinics	Yes	68	3–8 (6.60)	4.61	3.65	3.85	26	1
2	Axberg and Broberg (2012)	Sweden	Outpatient psychiatric clinics	Yes	45	3–8 (5.93)	4.80	4.62	3.22	35	0
3	McGilloway et al. (2012)	Ireland	Community services	Yes	137	2–7 (4.82)	4.77	4.44	3.32	45	6
4	Menning et al. (2014)	The Netherlands	Community services	No	81	1–11 (6.41)	2.90	3.51	2.30	91	77
5	Leijten et al. (2017)	The Netherlands	Outpatient psychiatric clinics and schools	Yes and no	89	2–8 (5.77)	3.63	3.66	2.57	71	56
6	Hutchings et al. (2007)	Wales	Community services	Yes	81	3–4 (3.82)	3.40	3.64	2.77	80	1
7	Morpeth et al. (2017)	England	Community services	Yes	160	2–4 (3.68)	4.16	3.49	2.69	64	52
8	Scott, Sylva, et al. (2010)	England	Schools	Yes	75	4–6 (5.18)	3.39	3.70	2.63	40	36
9	Scott, O'Connor, et al. (2010)	England	Schools	No	114	4–6 (5.42)	2.67	3.45	2.62	42	70
10	Scott et al. (2013)	England	Schools	Yes	142	5–7 (6.10)	4.05	4.40	2.87	77	16
11	Gardner et al. (2006)	England	Community services	Yes	53	2–9 (6.17)	4.93	5.14	3.79	62	2
12	Weeland et al. (2017)	The Netherlands	Community services	Yes	364	3–8 (6.29)	3.73	3.58	2.66	NA ^b	24

Note. Numbers reported in this study may differ from those reported in individual trials, due to this study's inclusion criterion. NA = not applicable.

^aPossible range of scores for children's conflict are 1–7, with a higher score indicating a higher level of conflict. ^bNo income data collected.

screened for high levels of conduct problems. Three trials were selective prevention trials (4, 5, 9), which targeted families at risk of, but not necessarily currently experiencing, conduct problems. Each trial received ethical approval from its respective internal ethical review board, and the protocol for the original pooling study protocol was reviewed by the Departmental Research Ethics Committee of the Department of Social Policy and Intervention, University of Oxford.

Participants

The pooled sample from the 12 trials included 1,409 families—854 in the intervention condition and 555 in the control condition (some trials used a 2:1 allocation). Children were predominantly male (61%) and aged 1–11 years ($M = 5.53$ years, $SD = 1.56$). Primary caregivers were aged 19–63 years ($M = 34.67$ years, $SD = 6.65$). The socioeconomic status of families was diverse including 60% low income, 31% low educational level, 29% single parent, 8% teen parents, 36% no employed parent in the household, and 30% reported to be from an ethnic minority. We used data from the primary caregiver (97% mothers) because most trials included data from one parent only.

There were very few statistically significant differences between conditions within each original trial (see [Supplemental Table S1a](#)). However, when pooling the data across trials and applying our inclusion criterion, there were some statistically significant ($p < .05$) differences between conditions for the baseline characteristics of child age, child ECBI score (excluding conflict items), parent age, parent education level, parental depressive symptoms, and lone parent status (see [Supplemental Table S1b](#)). These differences are likely to reflect the inclusion criterion used for this study. Any baseline characteristics identified as differing significantly between conditions were controlled for in subsequent analyses.

Missing data analyses (see [Supplemental Table S2](#)) showed that there were few significant differences for child characteristics between those meeting the study inclusion criterion ($N = 1,409$) and those excluded ($N = 408$, >30% missingness for interpersonal conflict items [i.e., did not complete three or more items] at either baseline or posttest). However, primary caregivers in families excluded from our study were more likely to be from a low-income household, be a teen parent, be a single parent, have a low level of education, and be from an ethnic minority.

Intervention and Control Condition

Families in the intervention condition were offered the IY parenting program (Webster-Stratton, 2015). The number of sessions ranged from 12 to 18 across trials, depending on when the trial was conducted and its context; early versions and prevention versions consist of fewer sessions. The most frequent number of sessions offered was 12. A total of 87% of parents attended at least one session, and this group attended, on average, 76% of the sessions (across trials, the average percentage of sessions attended was 65%–92%). Control conditions were either waitlist (seven trials), care as usual (three trials), or minimal intervention (two trials).

Measures

Children's Level of Conflict With Parents, Siblings, and Peers

For the purposes of this study, we used nine items from the Intensity Scale of the ECBI that are used to assess children's conflict with others. The ECBI is a well-established measure of conduct problems in children and includes 36 items on a 7-point Likert scale (1 = *never* to 7 = *always*) to indicate problem behavior frequency. This was completed in every trial by the primary caregiver (i.e., primary parent) at both baseline and posttest. The means of relevant ECBI items were computed to generate three variables corresponding to the child's conflict with their parents, siblings, and peers.

Conflict with parents was assessed using the mean of five ECBI items assessing conflict between the child and their parent: "acts defiant when told to do something," "argues with parents about rules," "gets angry when doesn't get own way," "sassess adults," and "hits parents" (internal consistency: baseline $\alpha = .82$, posttest $\alpha = .83$).

Conflict with siblings was assessed using the mean of two ECBI items assessing sibling conflict: "verbally fights with sisters and brothers" and "physically fights with sisters and brothers" ($r = .71$ at baseline, $r = .74$ posttest).

Conflict with peers was assessed using the mean of two ECBI items assessing conflict with friends: "verbally fights with friends his/her own age" and "physically fights with friends his/her own age" ($r = .58$ at baseline, $r = .57$ posttest).

Analytic Strategy

Multilevel modeling was used to capture the hierarchical structure of the data, as families (Level 1) are nested within trials (Level 2). Intention-to-treat principles (using data from all families, including those who did not attend any sessions) were followed. Continuous variables were grand mean-centered. Due to the low percentage of missing data for interpersonal conflict items in the starting sample (<1%), no additional methods were used to account for missing data. No meaningful power analysis could be conducted, as statistical power in multilevel analyses depends on parameters that are often unknown prior to analysis (Leijten, Wijngaards-de Meij, et al., 2021). However, our analyses are likely to be better powered than those of individual trials, as the pooled data set has a much larger sample size than that of a typical individual trial.

Three multivariate multilevel analyses, one for each interpersonal conflict type, were conducted to examine the extent to which the intervention condition (IY or control) predicted the mean level of conflict with parents, siblings, and peers at posttest (T2).

As an example, we highlight here the variables included in the model for conflict with parents: (a) outcome, that is, conflict with parents at T2; (b) covariates, that is, all baseline (T1) measures of conflict (with parents, with siblings, with peers); T2 conflict with siblings and T2 conflict with peers; and child and family characteristics identified as differing significantly between conditions at T1 (child age, child ECBI score [excluding conflict items], parent age, parent education level, and lone parent status)¹; (c) fixed effect for the predictor variable, that is, intervention condition (IY or control); and (d) random effects for the trial level (trial ID).

Analyses were then repeated for the outcomes of conflict with siblings and conflict with peers. Assumptions were checked, and the models were run both with and without 17 outliers (T2 conflict values three standard deviations above or below the T2 mean for that particular conflict type), providing similar results for all conflict outcomes. Results including outliers are presented below and excluding outliers in Supplemental Table S3.

Results

Descriptives

Table 2 shows the baseline and posttest interpersonal conflict scores for children by group. For both conditions, baseline mean levels of conflict were similar for conflict with parents and with siblings, with the lowest mean levels for conflict with peers.

Main Analyses

Table 3 shows the results from the multivariate analyses. A negative coefficient reflects benefit, as a lower conflict value represents a desired outcome. IY reduced children's levels of conflict with parents ($\beta = -.21$, 95% CI [-0.31, -0.12], $p < .001$), albeit with a small effect size. There were only very small, statistically nonsignificant, reductions in children's levels of conflict with siblings ($\beta = -.02$, 95% CI [-0.16, 0.11]) and peers ($\beta = -.11$, 95% CI [-0.23, 0.0001]). The intraclass coefficients indicate that there was very little variation between trials for intervention effects on each type of conflict, with most variation between individuals rather than at group level.

Preplanned Post Hoc Analyses

Sensitivity Analysis for the Possibility of Target Children Without Siblings

It is likely that our sample included some children without a sibling, and, therefore, the intervention cannot be expected to affect the level of sibling conflict in these cases. The pooled data set contains no direct measure of numbers of siblings in the family. Therefore, we conservatively treated families where parents answered *never* to both sibling conflict items from the ECBI and at all timepoints, as likely to have no siblings. To be clear, we do not assume that these are one-child families per se, but, since we were unable to exclude the possibility that they might be one-child families, rather than a child with no conflict with their sibling, this was a necessary approach. As a sensitivity analysis, we removed these children from our sample and repeated the analyses using this smaller sample ($N = 877$), finding comparable results to the main analyses (see Supplemental Table S5). This suggests that the lack of intervention effects on children's conflict with their siblings was not

¹ Parental depressive symptoms also differed significantly at baseline between intervention and control conditions. However, Trials 7 and 12 (37.2% of the pooled sample) included no measure of parental depression. Imputing this variable was not advisable because it was missing from two trials. To avoid excluding these trials in analyses, parental depressive symptoms were excluded as a covariate in the main analyses. Sensitivity analyses, including parental depressive symptoms as a covariate, were also conducted. Results were comparable to the main analysis and are presented in Supplemental Material 4.

Table 2

Descriptive Statistics for Children's Changes in Mean Levels of Conflict From Baseline (T1) to Posttest (T2)

Interpersonal conflict	Incredible Years T1	Incredible Years T2	Control T1	Control T2
Children's conflict with: ^a				
Parents (<i>M, SD</i>)	3.90 (1.31)	3.24 (1.18)	3.80 (1.24)	3.46 (1.21)
Siblings (<i>M, SD</i>)	3.85 (1.80)	3.54 (1.71)	3.81 (1.75)	3.68 (1.72)
Peers (<i>M, SD</i>)	2.86 (1.47)	2.47 (1.26)	2.82 (1.36)	2.65 (1.20)

Note. $N = 854$ for Incredible Years intervention condition, $N = 555$ for control condition.

^aPossible range of mean conflict scores are 1–7, with a higher score indicating a higher level of conflict.

due to the inclusion of families who might have only one child. It is also possible that families where the target child did not have a sibling were excluded from our pooled sample, as they might not have answered the sibling conflict items from the ECBI. However, we deem this unlikely as only five of the excluded families (1.2%) were missing both sibling conflict items at all timepoints.

Moderator Analyses

Moderator analyses were also undertaken to explore whether conflict rates were lower in children with higher baseline levels of conflict. For each multivariate model (conflict with parents, siblings, and peers) from the main analyses, an interaction term was added between the condition (intervention or control) and the baseline level of conflict which corresponded to the model outcome. Moderation analyses were conducted for all relationship types. The interaction term between condition and baseline conflict level was significant for conflict with parents ($\beta = -.20$, 95% CI $[-0.27, -0.12]$, $p < .001$) and conflict with siblings ($\beta = -.11$, 95% CI $[-0.19, -0.04]$, $p = .003$), but not for conflict with peers ($\beta = .01$, 95% CI $[-0.06, 0.09]$, $p = .717$). This suggests that the IY program helped to reduce children's conflict with parents and siblings

Table 3

Estimated Effects of Incredible Years on Children's Levels of Interpersonal Conflict

Interpersonal conflict	β value and [95% confidence interval] ^a	p	ICC ^b
Children's conflict:			
With parents	-0.21 $[-0.31, -0.12]$	<.001*	0.019
With siblings	-0.02 $[-0.16, 0.11]$.749	0.006
With peers	-0.11 $[-0.23, 0.0001]$.050	0.035

Note. Using complete case responses, $N = 1,295$; all models controlled for children's baseline levels of conflict with parents, siblings, and peers, along with the following variables that were identified in our starting sample as differing significantly between intervention and control conditions: child age, child ECBI score (excluding conflict items), age of parent, educational level of the parent, and lone parent status. ECBI = Eyberg Child Behavior Inventory; ICC = intraclass correlation coefficient.

^aThe β value represents group differences expressed in baseline standard deviations. For all outcomes, a negative regression coefficient reflects benefits of the Incredible Years program. ^bICC values closer to 0 indicate that there is relatively little variation between trials for intervention effects on each type of conflict, with most variation between individuals.

* $p < .001$.

especially in children with higher baseline rates of conflicts with parents and siblings, respectively.

Simple slopes illustrate the effects of the intervention on posttest levels of conflict with parents (Figure 1A) and with siblings (Figure 2A), according to differing baseline levels of conflict (-1 SD, M , and $+1$ SD). Simple slopes show that for both types of conflict, higher baseline levels of conflict were associated with greater intervention effects. This relationship was stronger for conflict with parents than with siblings. For conflict with parents, there were significant intervention effects for baseline score at the mean level ($\beta = -.21$, $t = -4.38$, $p < .001$) or higher ($+1$ SD: $\beta = -.46$, $t = -6.72$, $p < .001$). For conflict with siblings, there were only significant effects of the intervention for those with a baseline score of $+1$ SD ($\beta = -.22$, $t = -2.31$, $p = .02$).

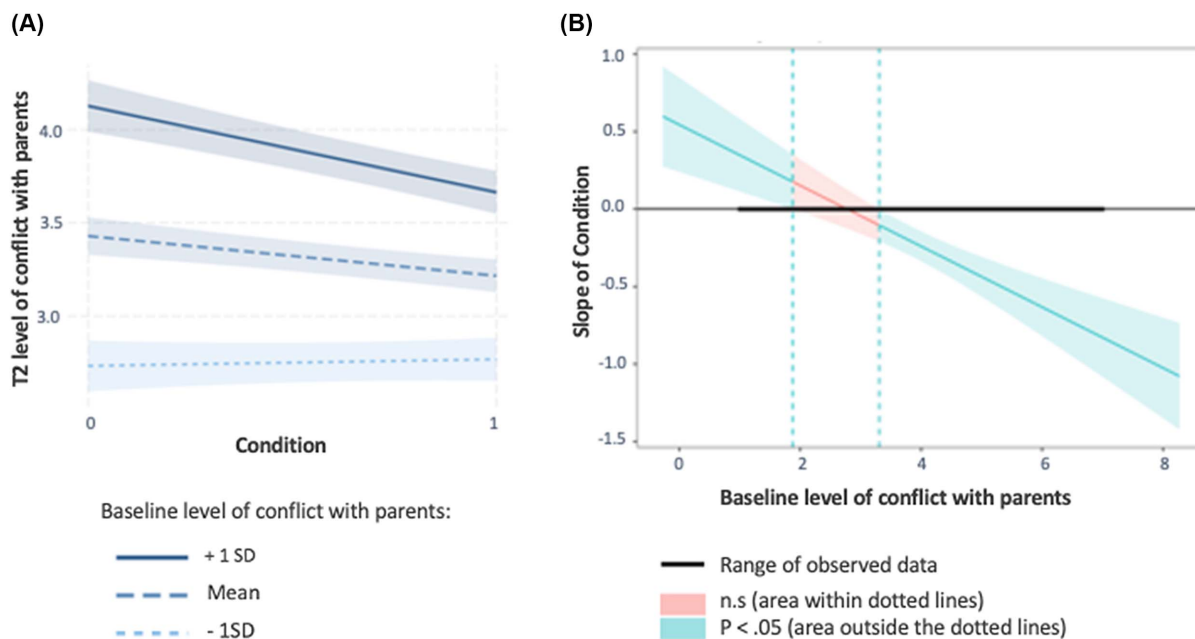
To further interpret these interactions, we examined regions of significance using the Johnson–Neyman procedure (Johnson & Neyman, 1936; Figure 1B and Figure 2B), to identify the values of baseline conflict at which there is a significant association between condition and posttest level of conflict. The regions of significance can be identified as those where the 95% upper and lower confidence intervals do not overlap on the y -axis.

The intervention condition had a significant effect on children's conflict with parents' posttest when children's average baseline conflict with parents was either >3.31 (849 children, 65.6% of the sample) or <1.87 (74 families, 5.72%) on the 1–7 Likert scale of the ECBI (Figure 1B). This suggests that the significant main effects of IY on reducing children's conflict with parents were predominantly driven by those with higher levels of conflict with their parents at baseline (i.e., scoring an average >3.31 on the conflict with parents' variable at baseline).

There is a smaller region of significance for conflict with siblings (Figure 2B). The intervention condition had a significant effect on posttest conflict with siblings when the average baseline level of conflict with siblings was either >5.10 (286 children, 22.1% of the sample) or <1.88 (221 children, 17.1%). This suggests that IY predominantly had a significant effect on reducing children's conflict with their siblings when their baseline level of conflict with siblings was very high. However, this pertains to less than a quarter of the sample, hence the nonsignificant overall main effects of the program on children's conflict with their siblings. Additional post hoc sensitivity analyses exploring age effects and session attendance are reported in Supplemental Section 7. Excluding very young children (<3 years old, $n = 54$) did not change our findings nor did excluding parents who did not attend any IY sessions ($n = 93$).

Figure 1

Illustrations of Interactions Between Baseline Level of Conflict With Parents and Condition for Level of Conflict With Parents' Posttest



Note. (A) Simple slopes; (B) Johnson–Neyman regions of significance. 95% upper and lower confidence intervals are shown; for the simple slopes (1A), 0 on the *x*-axis refers to the control condition and 1 to the intervention condition. The *y*-axis reflects the mean value for posttest (T2) level of conflict with parents. Possible values range from 1 to 7, reflecting average scores using the 7-point Likert scale of the ECBI; a higher value represents a greater frequency of conflict behavior. For the Johnson–Neyman plot (1B), the *x*-axis represents the mean level of baseline conflict with parents. Possible values range from 1 to 7, reflecting average scores using the 7-point Likert scale of the ECBI; a higher value represents a greater frequency of conflict behavior. The *y*-axis represents the conditional slope of the predictor (condition), and the plot shows where the condition slope differs significantly from 0. ECBI = Eyberg Child Behavior Inventory; n.s = nonsignificant. See the online article for the color version of this figure.

Discussion

This study examined the extent to which the IY parenting program was effective in reducing children's levels of interpersonal conflict with their parents, siblings, and peers. In line with our hypotheses, the program was found to have the largest effect on children's conflict with their parents, which is perhaps unsurprising given the focus of the program on improving parent–child relationships (e.g., by reducing or eliminating coercive parent–child interactions; Patterson, 1982). We would hypothesize that when a parent changes their behavior toward the child, the child also changes their behavior, leading to reductions in children's conflict with their parents.

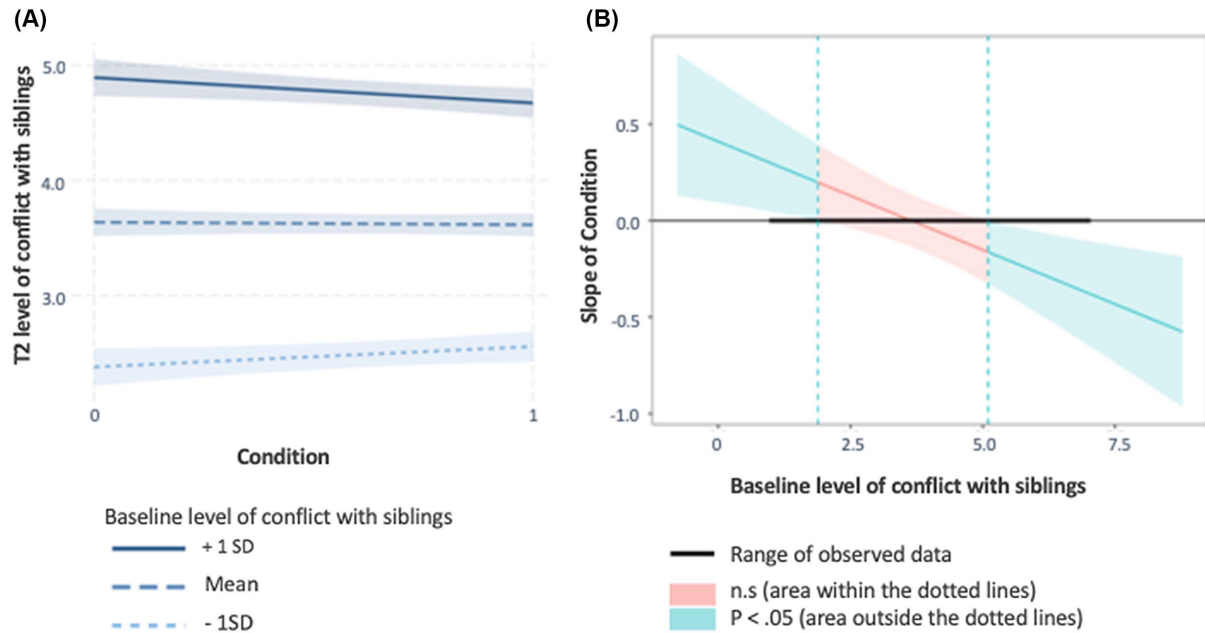
Our finding that the program does not have overall effects on children's levels of conflict with siblings and peers is consistent with previous research showing that while the IY program is extremely effective at reducing conduct problems, particularly when there are high levels of problem child behaviors, wider benefits are generally limited (Leijten et al., 2020; Overbeek et al., 2021). We propose several possible reasons for our findings. First, if changes in children's conflict with other children occur via improvements first in the parent–child relationship, a longer measurement point might be needed for such cascading effects to become apparent. Second, although parenting behavior plays a key role in the likelihood of children's conflict with others (Labella & Masten,

2018; Tippett & Wolke, 2015), there are additional contributory factors, not necessarily targeted by IY. For example, the differential treatment of siblings by parents influences sibling relationships (Jenkins et al., 2012), while school- and community-level factors influence children's peer relationships (Labella & Masten, 2018). In addition, it may be harder for children to change their behavior toward peers in environments where adults around the child have not taken part in the parenting program, so have not changed how they interact with the child. Therefore, in this environment there might be a higher likelihood of the child's negative behavior being reinforced, sustaining their conflict with peers. Finally, baseline levels of conflict with peers were low in our sample, perhaps because of the small number of treatment programs in our sample. Therefore, it may be that for many children, their scores could not be reduced any further.

The findings of our moderator analyses suggest that children with more severe conflict with parents or siblings prior to the program benefitted more from the intervention in terms of reductions in conflict with parents and siblings, respectively. This is in line with findings from the literature (i.e., on both parenting programs that address conduct problems in general, Kjøbli et al., 2023, and IY specifically, Leijten et al., 2020), which show that positive intervention outcomes are often more likely to be seen when there is more scope for changes to occur. Although we do not have

Figure 2

Illustrations of Interactions Between Baseline Level of Conflict With Siblings and Condition for Level of Conflict With Siblings' Posttest



Note. (A) Simple slopes; (B) Johnson–Neyman regions of significance. n.s. = nonsignificant. See the online article for the color version of this figure.

data on parental program goals, we would hypothesize that parents of children with high baseline conflict levels are more highly motivated to address this problem during the program, choosing to focus on helping their child navigate interpersonal relationships. Almost all parenting programs allow for this, by asking parents to choose their own goals for the child.

It may seem somewhat surprising that children's baseline level of conflict with peers did not moderate intervention effectiveness. It is possible, but unlikely, that the distribution of scores for children's conflict with peers at baseline was too narrow to detect baseline moderation (Howe & Leijten, 2023), as we used a large pooled data set from a range of trials. Alternatively, unmeasured contextual adversities, such as discrimination toward the child in the school environment, might better account for variations in the effectiveness of the program in terms of reducing conflict with peers. Such factors are often unmeasured in programs, yet they can influence their effectiveness (Parra-Cardona, 2023). Finally, our sample age range is broad (1–11 years), and it is possible that parents of very young children are less likely to endorse items assessing children's conflict with other children. However, sensitivity analyses excluding children below 3 years of age (Supplemental Table 7a) did not alter the findings.

Our moderation analyses also found that, for both conflict with parents and conflict with siblings, IY led to significant effects for a small number of families when baseline levels of conflict were extremely low. Unexpectedly, this appears to be driven by very small increases in interpersonal conflict levels from pre- to posttests (see Supplemental Material 6, for more information). It may be that the program increased parents' awareness of their child's conflict

behaviors, although this should be interpreted with caution given the small percentage of families involved (i.e., 5% of intervention condition families for conflict with parents and 15% for conflict with siblings).

This study had several strengths. First, the use of a uniquely large, pooled data set meant that we had a well-powered sample to estimate program effects and to rigorously test baseline moderation effects. Furthermore, the wide range of settings in our sample enhances the generalizability of our findings, not just geographically but also with respect to other established group parenting programs based on similar principles to those in the IY program (e.g., Parent Management Training–Oregon; Dishion et al., 2016). Second, the assessment of children's interpersonal conflict using the ECBI with its seven response options per item allowed us to assess subtle changes in children's conflict before and after program completion. The use of such a sensitive measure also allowed us to rule out the possibility that the lack of program effects on children's peer problems in previous studies is related to measurement issues (Overbeek et al., 2021).

At the same time, the study has limitations. First, there were differences in the ECBI items assessing conflict with parents when compared with those assessing conflict with siblings and peers, in terms of the number of items and their content. The ECBI has the same content for assessing conflict with siblings and peers (how often the target child physically or verbally fights with their siblings/friends) but slightly different content for conflict with parents. Therefore, we selected the five items that best captured children's conflict with parents. These assess a range of conflict behaviors (e.g., whether the child acts defiantly when told to do something and

argues about rules), with a greater specificity than the sibling and peer conflict items. It is possible that these differences account, at least in part, for the stronger program effects on children's conflict with their parents. Second, children's conflict behaviors were rated by parents only. Parents may not be best placed to assess conflict behaviors outside of the home (i.e., with peers), thereby accounting for the lack of intervention effects for peer conflict. It may be that teachers are better placed to assess this conflict behavior. The pooled data set also does not contain any objective measures of children's interpersonal behaviors, and it may be that parents' program engagement influences their ratings of children's interpersonal conflict. However, a recent meta-analysis of behavioral parent training programs (Doffer et al., 2023) found that effect sizes on child behavior obtained through independent observations did not differ from those obtained through parent report.

The most important implication of our study for practice is that IY reduces not only children's conflict with their parents but can also reduce sibling conflict in families with the most severe sibling conflict at baseline. However, there were no wider benefits to children's conflict with peers. When parents' goals include helping children manage peer relationships, it may be that a stronger focus is needed on existing program elements that target children's social competence and empathy skills. Collaboration between families and teachers might also be needed to ensure that a child's positive behavior change at home can be reinforced in the school environment, where most peer interactions take place. Alternatively, supplementing parenting programs with child-focused programs that address children's interpersonal difficulties may be needed, such as the IY school-based "Dinosaur" program (Webster-Stratton, 2015). Indeed, research suggests that multi-component programs for children with conduct problems, directed at more than one risk domain, show promise for improving children's prosocial skills (Webster-Stratton et al., 2004).

In summary, the findings reported here are based on the first study, to date, which has used individual participant data integrated across multiple trials of the IY parenting program, to examine the effects of IY on children's conflict with their parents, siblings, and peers. Little is known about sibling relationships in the context of parenting programs aimed at addressing child conduct problems (Weeland et al., 2021). Furthermore, sibling conflict has not been incorporated as a program outcome in previous research, despite a wealth of evidence highlighting its importance for child development and behavior. Children's conflict with peers is also seldom assessed as a specific program outcome. Thus, the results reported here represent an important and unique contribution to our understanding of the effects of behavioral parenting programs on children's interpersonal conflict. At the same time, our study also highlights areas for future research, such as incorporating teacher ratings of children's conflict with peers and exploring how parents' program participation goals might relate to program effects on children's interpersonal conflict.

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