Effects of Parent Training on Callous-Unemotional Traits, Effortful Control, and Conduct Problems: Mediation by Parenting

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Abstract Callous-unemotional (CU) traits and effortful control (EC) are personality and temperament traits implicated in early-onset antisocial trajectories. This secondary analysis of *Hitkashrut*'s randomized controlled trial first tested parent training's effects on EC and CU traits while controlling for more general treatment effects on conduct problems (CP), and subsequently tested mediation by parenting. Prekindergarten teachers in three Israeli cities identified 209 3–5 year-old (163 boys; 46 girls) preschoolers with subclinical-clinical range conduct problems. All participants were Jewish ranging from ultra-orthodox to secular. They were assigned to 14-session co-parent training groups ($n = 140$ couples), or to minimal intervention control groups with referral to local services as necessary ($n = 69$ couples). We employed averaged indices of pre- and post-intervention questionnaires completed by both parents. The testing of all hypothesized models controlled for treatment effects on CP in order to strengthen the robustness of the analyses. We found significant concurrent treatment effects on CP and on either CU traits or EC. All effects were mediated by ineffective parenting (IP): a latent variable that was indicated by negative/inconsistent practices and perceived parenting inefficacy. This is the first demonstration of parenting mediated treatment effects on both EC and CU traits in a randomized controlled study conducted in everyday practice contexts. This finding supports a disruption model of change: the reduction of IP facilitates a caregiving environment that affects children's behavior and developing personality. The changing of personality and temperament characteristics implicated in early-onset pathways suggests an innovative prevention strategy for disruptive behavior disorders.

Two moderately stable personality and temperament traits consistently implicated in early-onset conduct problems (CP) are callous-unemotional (CU) traits (i.e., limited empathy and guilt, uncaring about performance in important activities, and constricted emotionality), and effortful control (EC), which is a self-regulatory ability to inhibit a dominant response and/or to activate a subdominant response (Frick 2012). In young children with CP, high CU traits and low EC indicate two major early-onset antisocial pathways characterized by distinct etiological mechanisms and poor long-term prognoses (Eisenberg et al. 2010; Frick et al. 2014; Kochanska et al. 2009). The CU indicated group predisposes to a "cold" pathway to CP, characterized by low reactivity to negative affective cues, remorselessness, conscience deficits, and proactive aggression (Frick et al. 2014; Waller et al. 2015). The EC indicated group predisposes to a "hot" pathway to CP, characterized by deficient regulation of behavior, emotion, and attention, high anger/frustration, and reactive aggression. Consequently, early intervention that targets EC and CU traits and that may affect these trajectories is a strategic goal for preventing antisociality. The most rigorous testing of such intervention effects is by randomized controlled trial (RCT). The use of this design to test mediators of intervention effects can possibly elucidate the process of change and contribute to treatment innovation (Kazdin 2007).

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The purpose of this study is to use data from *Hitkashrut*'s RCT to test intervention specific effects on EC and CU traits in structural models that control for more general treatment effects on CP, and then test mediation by parenting. *Hitkashrut*'s parent training (PT) is especially suited for testing these hypotheses. Its delivery to moderate- to high-risk preschoolers in the formative stage of antisociality makes the program more likely to achieve relatively strong effects (Eisenberg et al. 2010; Hawes et al. 2014b). *Hitkashrut*'s RCT demonstrated post-intervention effectiveness in CP, EC and CU traits, with additional significant reduction in CP from post-intervention to 1-year follow-up (Somech and Elizur 2012). However, the analyses of intervention effects on EC and CU did not control for the more general intervention effect on CP. The use of this control procedure enables the estimation of specific effects on EC and CU traits, which are outcome variables that are correlated with CP (Gelman and Hill 2007).

EC and Parenting Effects

EC is a temperamental self-regulatory capacity that emerges in the first year of life, becomes increasingly coherent and stable over the second year and into early childhood, and has a substantial heritable component (Eisenberg et al. 2010; Spinrad et al. 2012). Impairments in self-regulation are highly associated with core attention-deficit/hyperactivity disorder (ADHD) symptoms of inattention-disorganization and hyperactivity-impulsivity, as well as with hostile attribution bias, and low ability to delay gratification and to anticipate negative consequence to behavior (Berger 2011). Low-EC children are at risk for an early-onset antisocial pathway characterized by unplanned and uncontrolled aggressive and antisocial behaviors for which they may later feel remorse (Frick 2012).

There is consistent evidence from developmental research that self-regulation is predicted by both positive (e.g., warmth, support, and guidance) and negative (e.g., authoritarian, punitive, and coercive) forms of parenting (Eisenberg et al. 2010; Karreman et al. 2006). In addition, several RCTs showed parenting-based treatment effects on self-regulation indices in children with CP. The Incredible Years PT reduced preschoolers' inattentive and hyperactive/impulsive difficulties (Jones et al. 2007; McGilloway et al. 2012). The Fast Track program reduced the lifetime prevalence of ADHD and disruptive behavior diagnoses among children at highest initial CP risk (Conduct Problems Prevention Research Group 2011). Furthermore, follow-up of the Family Check-Up intervention from age 2 to 7.5 years showed direct treatment effects on parental reports of children's inhibitory control and indirect effect on teachers' reports of children's self-control (Chang et al. 2014). However, no parenting-based RCT has hitherto tested theoretical models that included both CP and children's

self-regulation indices as correlated outcomes, nor demonstrated mediation of self-regulation outcome by parenting change.

CU Traits and Parenting Effects

Moderate temporal stability and acceptable internal consistency of CU traits have been documented from age three (Dadds et al. 2005; Hyde et al. 2013; Kimonis et al. 2015). High-CP children with high vs. normative CU level are less responsive to punishment cues and to distress in others, less anxious, and more thrill seeking and fearless (Frick et al. 2014). These features may affect moral development and have a unique predictive power of severe antisociality. The level of stability of CU traits and evidence for their neurobiological and genetic correlates suggest a temperament-based conceptualization (Longman et al. 2015). Nonetheless, Waller et al.'s (2013) recent review of research found consistent evidence that dimensions of parenting, both positive (e.g., warmth and involvement) and negative (e.g., harshness, and negative/inconsistent discipline), are prospectively associated with changes in CU traits. While the review included studies that covered different periods of development, the modest stability of temperament features across early childhood indicates that malleability of CU traits is particularly high during this period.

RCTs of CU traits' responsivity to parenting-based interventions have been limited (Hawes et al. 2014b). Prior to *Hitkashrut*'s effectiveness trial, McDonald et al. (2011) demonstrated treatment efficacy with mothers of 4–9 year-old children with clinical level CP, who were recruited from domestic violence shelters. The large post-intervention effect on callous/uncaring and narcissism traits was mediated by a reduction in harsh and inconsistent parenting. Another RCT demonstrated an effect of multisystemic therapy for young offenders on psychopathic traits (Butler et al. 2011). However, changes in parenting did not mediate this effect. Recently, Muratori et al. (2015) showed an effect of a combined parent and child intervention on CU traits in 9–12 year-old children, but assignment to study groups was not randomized and mediation by parenting was not tested.

The Present Study

The Treatment Model *Hitkashrut* (attachment in Hebrew, and an acronym for relationship- supporting and hope-inspiring parenting), was created and implemented in Israel in collaboration between the University-based first author and the Ministry of Education's Chief Psychologist and Director of Psychology Division. We identified a need for an economical and culturally adapted secondary prevention program for moderate- to high-risk preschoolers with CP that

would fit with the Response to Intervention model and respond to the Ministry's goal of reducing violence in the educational system. Since the expenses of certified training in brand-name programs were prohibitive, the author designed a generic developmental intervention. The theoretical framework was anchored in attachment, family-systems, and social interactional theories, as well as in research of antisocial development (Frick 2012). A two-stage strategy was used to organize a coherent sequence of evidence-based common practices (Kaminski et al. 2008). The initial emphasis is on the disruption of coercive family dynamics that play a well-established role in maintaining and escalating early-onset CP (Patterson et al. 2010). The parents are supported and challenged to focus on their own affective, cognitive, and behavioral aspects of parenting in order to modify the family dance (Elizur and Minuchin 1989). They learn about the unique needs of dysregulated and low-empathy children, and the rationale for *Hitkashrut*'s emphasis on committed compliance rather than on situational compliance, which is contingent on sustained parental control (Spinrad et al. 2012). The goals of this stage are to restore parental morale and sense of parenting efficacy, reduce negative attention and negative communication, practice self-regulation and non-reciprocation, and increase positive interactions in cool nondisciplinary situations. This sets the stage for improving parental competence in preventing and managing hot situations (e.g., a child's angry outburst that may trigger coercive responses), and fostering willing compliance. In the second stage, parents are taught to apply practices, such as contingencies, time out, and conjoint problem solving, to promote self-regulation and cooperativeness, and to stop CP. For additional details about *Hitkashrut*'s methods and components, see Somech and Elizur (2012).

The Hypothesized and Alternative Mediational Models

Following the two-stage strategy, we hypothesized that reduction in ineffective parenting (IP) would mediate treatment effects on EC and CU traits. Discipline practices have been repeatedly shown to mediate behavioral PT programs' effect on CP (Forehand et al. 2014). Furthermore, developmental and intervention research indicated that negative/inconsistent discipline is associated with EC and CU traits (Karreman et al. 2006; Waller et al. 2013). In addition, PT affects parents' sense of self. It reduces parenting stress, feelings of helplessness, and other symptoms of depression, and enhances hopefulness, motivation, and sense of competence (Kaminski et al. 2008; Shaw et al. 2009; Weinblatt and Omer 2008). Since parenting practices and perceived parenting efficacy are interrelated (Jones and Prinz 2005; Lipscomb et al. 2011), and since aggregation can create a more stable and reliable estimation of the proposed mediator, the hypothesized model used a latent factor of IP indicated by negative/inconsistent discipline and perceived parenting inefficacy.

Although our theoretical model and key strategy were built on the premise that disruption of dysfunctional dynamics would initiate a positive change process, there is uncertainty in the literature on this point. Forehand et al.'s (2014) review of parenting as mediator of PT's effect on CP found support for mediation by both positive and negative parenting. Furthermore, some randomized trials have found positive and not negative parenting to mediate intervention effects on CP (Dishion et al. 2008; Gardner et al. 2006, 2010). Consequently, the mediation of treatment effect on CP, EC, and CU traits by positive parenting behaviors is an alternative model.

Hypotheses Two outcome models tested treatment effects on either CU traits and CP or EC and CP. We expected that treatment would reduce CP in both models, while increasing EC or reducing CU traits. We also expected treatment effect on IP. Subsequently, we added the hypothesized IP mediator to both models. The hypothesized mediational chain satisfied the requirement for temporal precedence. The parenting intervention preceded change in IP, and since children were not directly engaged, it is reasonable to assume that parenting change preceded change in EC and CU traits, rather than the other way around. We used baseline scores to control for temporal stability and to assess change in parenting, CP, EC, and CU traits. The mediational models' hypotheses were: (a) In both models, treatment predicts a reduction in posttreatment IP; (b) In both models, the reduced posttreatment IP is positively associated with the reduced posttreatment CP; (c) In the CU/CP mediational model, treatment's effect on posttreatment reduction in CU traits is mediated by the reduction in IP from Time 1 to Time 2. In the EC/CP mediational model, treatment's effect on posttreatment reduction in EC is mediated by the reduction in IP from Time 1 to Time 2. In these models, we did not predict direct treatment effects on outcomes since the hypothesized mediation could be either partial or full.

Method

Participants

The sample of 209 families, recruited during 2006–9, was composed of 163 boys and 46 girls, 32–64 months at pretest ($M = 48.63$, $SD = 7.20$). The prekindergarten teachers rated all their 3–5 year-old children on the CP subscale of the Strengths and Difficulties Questionnaire (Goodman and Scott 1999), and referred children with significant disruptive behaviors. Thus, 84.6 % were at the subclinical-clinical range (above percentile 80), with no significant difference between study groups. Subsequently, the facilitators interviewed all parents, discussed the program and its requirements, such as two caregivers' regular attendance, and screened out children with

significant intellectual impairment or pervasive developmental delay, and unmotivated or highly conflicted divorced parents.

The sample was mostly composed of intact families (86.6 %). The 21–50 year-old mothers ($M = 33.46$, $SD = 4.76$) and 23–61 year-old fathers ($M = 36.48$, $SD = 5.99$) were born in Israel (78 %), Europe (7.7 %), North America (5.6 %), South America (3.9 %), and Africa (4.8 %). All participants were Jewish of different affiliations: 19 % ultra-orthodox, 20 % orthodox, 23.5 % traditional, and 36.5 % secular. Most parents were employed or in Yeshivas (Jewish educational institutions of higher learning): 94.3 % fathers, 89 % mothers (in many ultra-orthodox families, mothers work and fathers study in Yeshivas). Education: high-school degree (55.5 % fathers, 49.3 % mothers), college (14.8 % fathers, 26.3 % mothers), and higher degrees (18.7 % fathers, 17.2 % mothers). Monthly income per family: 54 % low to very low (less than $2850), 39.7 % average ($2850–$5700), and 6.2 % high (> $5700).

Procedure

The Ministry of Education's Chief Scientist and the Hebrew University's Institutional Review Boards approved the study. All procedures were in accordance with the ethical standards of these institutional and national research committees, and comparable with the 1964 Helsinki declaration and its later amendments. Informed consent was obtained from all individual participants included in the study. *Hitkashrut* was implemented by the local educational psychology services (EPSs) in three cities: Jerusalem, Modi'in, and Modi'in-Illit. Potential harm to participants was minimized by implementation within the practice context of EPSs that provided more intensive interventions when needed or made referrals to public clinics. Control group parents were referred to two consultation sessions with *Hitkashrut*'s facilitators who monitored their situation and provided clinic referrals where necessary. The random assignment on a 2:1 basis followed a preference for enabling more participants to take advantage of the intervention without a serious loss of power. Following initial identification by the kindergarten teachers, locally employed educational psychologists made telephone contact and scheduled intake interviews. Graduate psychology students made home visits at pre-intervention (T1) and within 1 month after the last meeting (T2), during which both parents completed identical sets of questionnaires (demographic data taken at T1). The treatment condition was masked.

Participants were randomly allocated to intervention ($n = 140$) and control (minimal treatment) ($n = 69$) groups using random numbers. The post-intervention assessment included 182 families (87.08 %): 125 intervention (89.3 %) and 57 control (82.6 %). All baseline group differences on demographics and the variables of CP, CU, EC, negative/inconsistent parenting, and parental distress were not significant. Comparisons of completers and noncompleters across all baseline variables and the association between groups and attrition were also nonsignificant. For the tests, the flow chart, and additional details about the RCT, see Somech and Elizur (2012).

Intervention Groups of 5–7 couples that were co-facilitated by two masters-level educational psychologists met for 14 two-hour weekly meetings. We used the Involvement, Collaboration, and Empowerment model that has been implemented with difficult-to-engage families to engage both parents (Elizur 1996). Once the parent groups convened, psychoeducational interventions were used to establish an emotionally supportive and empowering group process that combats helplessness and facilitates reconnection with feelings of parenting competence. There were also individual meetings with couples during the behavior management sessions. Similar to other PT programs, *Hitkashrut* was organized in a sequence of steps that build on each other. Initially, the emphasis was on reducing IP and strengthening positive parent–child interactions. Subsequently, Positive Behavior Support type practices (i.e., communication skills, behavior management, and effective discipline), parental self-regulation and couple teamwork were used to promote more regulated and cooperative parent-child, parent-teacher, and co-parental relationships. Although the sessions were structured, the definition of core strategies and practices introduced flexibility and simplified cultural adaptation. For example, the ultra-Orthodox were divided into same-sex groups and more play skills time was provided for fathers, who discovered that playing contributes to child development and was not time wasted from religious study.

Minimal Intervention Control Group The parents were referred for two consultation sessions. The facilitators made use of *Hitkashrut*'s key components and handouts, and where necessary referred parents to treatment at the local educational psychology service or community clinics.

Training, Supervision and Treatment Integrity Services' directors selected facilitators with preschool experience and group facilitation skills. They attended a 2-day training workshop and had regular bi-weekly supervision. Newly trained facilitators were paired with experienced facilitators. The facilitators worked with a detailed manual with guidelines and materials that specified each sessions' objectives and layout, including a slide presentation, video clips, structured demonstrations, role-plays, and take-home handouts. To insure program adherence and fidelity, each supervisory session began with a report on the implementation of the previous sessions, followed by a discussion of specific problems or issues (e.g., lateness, reservations concerning contingency management, and disrespectful spouse communication).

Parent attendance was high: 100 % of the mothers and 86 % of the fathers attended 10–14 sessions. The high attendance in comparison with similar treatment studies was apparently related to both the screening procedure and program requirements (e.g., the referring teachers were involved and supportive of the program, the fathers were required rather than invited to attend, and uncommitted parents were screened out by the facilitators). The between sessions telephone calls also strengthened engagement (Nix et al. 2009).

Measures

We used previously translated Hebrew-validated self-report scales completed by both parents, except for the Eyberg Child Behavior Inventory, the Inventory of CU traits, and two Alabama Parenting Questionnaire scales that were translated for the purpose of this study using the back-translation procedure. These measures were first translated into Hebrew by one bilingual professional and retranslated into English by another bilingual professional. Subsequently, the two professionals deliberated over the translation until they reached agreement on the Hebrew version. We used 5-point Likert scales unless specified otherwise.

Demographics Child age and sex, family status, income, parents' age, country of birth, educational level, and employment status.

Effortful Control An 18-item 7-point scale of inhibitory control (behavior regulation; i.e., "Approaches places s/he has been told are dangerous slowly and cautiously"; "Is good at following instructions"), attention focusing (task concentration; e.g., "When picking up toys or other jobs, usually keeps at the task until it's done"; "Will move from one task to another without completing any of them"), and attention shifting (moving attention from one activity to the next; e.g., "Can easily shift from one activity to another"; "Has an easy time leaving play to come to dinner") was based on the widely used validated subscales of the Child Behavioral Questionnaire (Rothbart et al. 2001) that were used to assess 42-, and 54-month old children (Spinrad et al. 2012). Coefficient alpha for this sample was 0.82.

Callous-Unemotional Traits CU traits, often assessed by the Inventory of Callous–Unemotional Traits (ICU), are comprised of three subdimensions: callousness toward others, uncaring about performance, and shallow or deficient affect (Frick 2004; Frick et al. 2014). However, following repeated findings that the unemotional vs. the callousness and uncaring factors exhibited relatively low reliability and poor correlations with external correlates, Hawes et al. (2014a) used item response theory methods to develop a more psychometrically sound measure. They found that a two-factor model

(Callous and Uncaring) provided optimal fit in their sample of 6–12 year-old boys exhibiting significant CP. Subsequently, Kimonis et al. (2015) reconfirmed and validated this 2-factor model in a community sample of both high-risk and healthy 3–6 year-old preschoolers. Furthermore, studies of preschoolers that used other measures, such as the Antisocial Process Screening Device (APSD), also found that the unemotional items did not load with the callousness and uncaring index (Dadds et al. 2005; Hyde et al. 2013). Overall, the findings suggest that unemotional items may have a different meaning in early childhood than the unemotional dimension that is associated with adult psychopathy. Following this rationale, we used an 11-item measure of commonly used age-appropriate items that assess early manifestations of callous and uncaring traits. Coefficient alpha for this sample was 0.81. The measure included three APSD items for prekindergarten that loaded on a CU factor in Dadds et al's community study (e.g., "Is good at keeping promises"; "Is concerned about the feelings of others"; "Feels bad or guilty when s/he does something wrong"). Eight additional items that assessed callous and uncaring traits were drawn from Frick's (2004) Inventory of Callous-Unemotional traits, preschool version (e.g., "does not seem to know "right" from "wrong"; "Does not care who s/he hurts to get what s/he wants").

Conduct problems The Eyberg Child Behavior Inventory is a 36-item validated measure of child behavioral problems that correlates with behavioral observations and differentiates between clinic-referred and control children (Robinson et al. 1980). We used the highly reliable Total Intensity score. Coefficient alpha for this sample was 0.89.

Negative/Inconsistent and Positive Parenting The Alabama Parenting Questionnaire (APQ; Shelton et al. 1996) is a validated and widely used instrument that links parenting practices with CP in school-age children. We used the Preschool Revised APQ that eliminated age-inappropriate items to assess both negative/inconsistent practices (e.g., "You threaten to punish your child and then do not actually punish him/her"; "Your child talks you out of being punished after he/she has done something wrong"), and positive practices (e.g., "You have a friendly talk with your child"; "You tell your child that you like it when he/she helps around the house"). The revised scales had good temporal stability and higher internal consistency than the APQ scales when applied to preschool samples (Clerkin et al. 2007). The validity of APQ-PR was further supported in a large community study of Spanish preschoolers, where the inconsistent scale was found to have the strongest association with CP (de la Osa et al. 2014). Coefficient alphas for this sample were 0.66 for the negative/inconsistent scale and 0.65 for the positive parenting scale.

Parental Distress We used two of the three subscales of the research validated 36-item Parental Stress Index-Short Form (PSI-SF) (Abidin 1990): Parental distress (e.g., "I feel trapped by my responsibilities as a parent") and perceptions of stressful interactions with the child (e.g., "My child rarely does things for me that make me feel good"). The perception of the child as "difficult" subscale was not used since it confounded with the outcome measure. Coefficient alpha for the 24 item scale of this sample was 0.85.

Parental Helplessness We used a 9-item measure of parents' sense of helplessness in dealing with their child that was developed and validated in Israel and adapted for parents of preschoolers in communication with the authors (Weinblatt and Omer 2008) (e.g., "I have no influence over my child"; "my child rules the house; he is stronger than me", and "I feel helpless when my child loses his/her temper"). Coefficient alpha for this sample was 0.90.

Ineffective Parenting A latent factor in our structural equation model that was indicated by the negative/inconsistent scale and an index of perceived parenting inefficacy. The perceived parenting inefficacy index was created by aggregating the highly correlated scales of parental distress and parental helplessness (respectively for Time 1and 2: $r = 0.74$, 0.73, $p < 0.001$). The reliability the latent factor, based on the correlations of 0.45 at Time 1 and 0.55 at Time 2 between the two indicators of negative/inconsistent parenting and perceived parenting inefficacy, amounted to 0.62 and 0.71, respectively.

Data Analysis

For the primary analysis performed in this paper, we used Structural Equation Modeling (SEM) to capitalize on its main advantages: it provides unattenuated parameter estimates, overall goodness of fit measures for evaluating the adequacy of an entire model and allows the testing of mediation within the context of a complete model. Analyses were performed using item averaged reports of parents who completed the pre- and posttreatment assessments (87.08 %). We report the results of the intent-to treat design, which were similar to those of the completers design (See Somech and Elizur 2012). For computation of procedures requiring a complete data matrix, expectation maximization (EM) methods were used to estimate missing values. We conducted SEM to examine the hypothesized mediational models, using EQS 6.0 with EM algorithm (Bentler 2006). We report the goodness-of-fit measures of non-normed fit index (NNFI), comparative fit index (CFI), and the misfit index of root mean square error of approximation (RMSEA). Rules of thumb indications for minimum acceptable fit are provided by fit indices that exceed 0.90 and RMSEA values less than 0.08 (Browne and Cudeck 1993). We followed Russell et al.'s (1998) guidelines for a latent

variable structural equation modeling approach for experimental studies. More specifically, we allowed error terms for repeated measures to correlate and constrained the loadings of same indicators of parallel latent factors to be equal over time. The procedures for establishing mediation and using effect ratios to evaluate the strength of the mediation were based on Shrout and Bolger (2002). We first established significant direct effects of the predictor on outcome, predictor on mediator, and mediator on outcome. Then, we used the RMediation program to estimate 95 % confidence interval for indirect effects. Mediation is significant at $p < 0.05$ if zero is not included in the 95 % confidence interval for an indirect effect (Tofighi and MacKinnon 2011).

Results

Table 1 presents the means, standard deviations of the key measures at T1 and T2, as well as treatment effects and effect size. As expected, treatment was found to have significant effects on indices of IP, all of which were moderate in size. There was no treatment effect on positive parenting, the alternative mediator; hence, we did not proceed with testing the alternative meditational model. Table 2 presents the intercorrelations among study variables.

Measurement Models

Using SEM to test the hypothesized models, IP was indicated by parenting practices and parenting efficacy, while EC, CU traits, and CP were each indicated by two parcels following Russell et al.'s recommendations (1998). Parceling is advantageous in small-sample analyses when a set of items is assumed to be unidimensional (Kline 2015). Furthermore, parceling has the advantage of creating indicators (parcels) that have more acceptable distribution properties such as less skewness and better approximation to a normal distribution. In this way, it may eliminate the need for including unique unpredictable correlated errors among single item indicators and may thereby prevent Heywood effects. Following an exploratory factor analysis using maximum likelihood extraction, we allocated items to parcels according to rank order of factor loadings (Bandalos 2002): pairs of highest and lowest items were assigned to each parcel in order to equate average loadings (Roger and Schmitt 2004). We used confirmatory factor analysis with SEM Software to examine the measurement models (Bentler 2006). All the following measurement models showed an adequate fit to the data: (a) The CU/CP outcome measurement model: χ^2 (18, $N = 209$) = 62.41, $p < 0.05$; NNFI =0.93; CFI = 0.96; RMSEA = 0.08; (b) The EC/CP outcome measurement model: χ^2 (18, $N = 209$) = 46.97, $p < 0.05$; NNFI =0.95; CFI = 0.97; RMSEA = 0.08; (c) The CU/CP mediational measurement

Table 1   Means (SDs), analyses of covariance of treatment effects, and effect size for study variables

Variable	Treatment		Control		ANCOVA		Effect size Cohen's d
	Pre[a] M (SD)	Post M (SD)	Pre M (SD)	Post M (SD)	df	F	
Child CP	87.69 (11.36)	78.64 (11.99)	88.98 (13.30)	87.71 (11.83)	1206	31.05*	0.76
Child CU traits	29.43 (5.76)	27.88 (5.41)	28.84 (4.49)	30.59 (4.71)	1206	30.25*	0.72
Child EC	4.48 (0.64)	4.70 (0.69)	4.38 (0.59)	4.33 (0.55)	1206	16.52*	0.57
Parental distress	2.22 (0.39)	1.96 (0.38)	2.18 (0.38)	2.13 (0.37)	1206	19.45*	0.48
Parental helplessness	2.15 (0.59)	1.76 (0.51)	2.10 (0.64)	2.11 (0.65)	1206	27.83*	0.63
Negative/Inconsistent parenting	2.43 (0.40)	2.11 (0.41)	2.37 (0.42)	2.34 (0.39)	1206	26.14*	0.57
Positive parenting	4.10 (0.38)	4.15 (0.39)	4.02 (0.37)	4.06 (0.35)	1206	1.03	

Pre Pre-intervention; *Post* Post-intervention; Sample size for ITT design: treatment, $n = 140$; control, $n = 69$. Baseline measure was used as a covariate in each case. Cohen's d effect size: small (0.15–0.40); medium (0.40–0.75); large (>0.75)

[a] No significant differences between groups on all baseline variables; *$p < 0.001$

model: χ^2 (45, $N = 209$) = 91.48, $p < 0.05$; NNFI =0.94; CFI = 0.97; RMSEA = 0.070; (d) The EC/CP mediational measurement model: χ^2 (45, $N = 209$) = 75.42, $p < 0.05$; NNFI = 0.96; CFI = 0.98; RMSEA = 0.057. All factor loadings in the models were substantial, statistically significant, and in the expected direction.

The Outcome and Mediational Models

The results of testing the outcome models are presented together in Fig. 1. The structural CU/CP model had an adequate fit to the data: χ^2 (18, $N = 209$) = 35.32, $p < 0.05$; NNFI =0.96; CFI = 0.98; RMSEA = 0.064. The model accounted for 48 % of the variance of CP, and 77 % of the variance of CU. The stability coefficients of the latent variables were moderate to high (0.72 to 0.95). The structural EC/CP model had an adequate fit to the data: χ^2 (18, $N = 209$) = 31.02, $p < 0.05$; NNFI =0.97; CFI = 0.99; RMSEA = 0.052. The model accounted for 53 % of the variance of CP, and 58 % of the variance of EC. The stability coefficients of the latent variables were moderate to high (0.82 to 0.94). All the expected effects were found: 1. Treatment predicted CP reduction in both the CU/CP and EC/CP models ($\beta = -0.33$, $p < 0.05$; $\beta = -0.33$, $p < 0.05$, respectively); 2. Treatment predicted reduction of CU traits in the CU/CP outcome model ($\beta = -0.33$, $p < 0.05$), and increase of EC in the EC/CP outcome model ($\beta = 0.22$, $p < 0.05$).

Figure 2 presents the results of testing the CU/CP and EC/CP mediational models, with IP as the hypothesized mediator of treatment effect. The structural CU/CP model had an adequate fit to the data: χ^2 (48, $N = 209$) = 76.90, $p < 0.05$; NNFI =0.97; CFI = 0.98; RMSEA = 0.054. The model accounted for 42 % of the variance of IP, 75 % of the variance of CP, and 78 % of the variance of CU. The stability coefficients of the latent variables were moderate to

high (0.60 to 0.97). The structural EC/CP model had an adequate fit to the data: χ^2 (48, $N = 209$) = 74.19, $p < 0.05$; NNFI = 0.97; CFI = 0.98; RMSEA = 0.051. The model accounted for 41 % of the variance of IP, 79 % of the variance of CP, and 67 % of the variance of EC. The stability coefficients of the latent variables were moderate to high (0.61 to 0.93).

All hypotheses of the mediational models were supported: 1. Treatment predicted IP reduction in both the CU/CP and EC/CP models ($\beta = -0.37$, $p < 0.05$; $\beta = -0.38$, $p < 0.05$, respectively); 2. Reduced IP predicted reduced CP in both the CU/CP and EC/CP models ($\beta = 0.65$, $p < 0.05$; $\beta = 0.63$, $p < 0.05$, respectively); 3. In the CU/CP model, reduced IP predicted reduced CU traits ($\beta = 0.19$, $p < 0.05$); while in the EC/CP model, reduced IP predicted improved EC ($\beta = -0.37$, $p < 0.05$). Testing mediation in the CU/CP model with the Rmediation program (Tofighi and MacKinnon 2011), IP was found to partially mediate treatment's effects on CU traits (95 % CI for the product of the coefficients was −0.62 to −0.08), and on CP (95 % CI for the product of the coefficients was −4.45 to −1.80). The strength of the partial mediation (i.e. effect ratio) was 0.28 and 1.85, respectively. Direct treatment effects of reduction in both CU traits and CP were significant ($\beta = -0.25$, $p < 0.05$; $\beta = -0.13$, $p < 0.05$, respectively). Testing mediation in the EC/CP model, IP was found to fully mediate treatment's effects on EC (95 % CI for the product of the coefficients was 0.09 to 0.28), and partially mediate treatment's effects on CP (95 % CI for the product of the coefficients was −4.50 to −1.83). The strength of the partial mediation (i.e. effect ratio) was 1.84. Direct treatment effect on EC was nonsignificant, while direct treatment effect of reduction in CP was significant ($\beta = -0.13$, $p < 0.05$).

Table 2 Intercorrelations among study variables

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14
1. CP T1	0.50***	0.30***	0.24***	−0.49***	−0.31***	0.53***	0.30***	0.55***	0.36***	0.36***	0.21**	−0.17*	0.01
2. CP T2	1	0.25***	0.43***	−0.47***	−0.68***	0.37***	0.57***	0.34***	0.62***	0.26***	.51***	−0.29***	−0.31***
3. CU traits T1		1	0.65***	−0.38***	−0.30***	0.34***	0.29***	0.37***	0.19**	0.15*	0.08	−0.20**	−0.13
4. CU traits T2			1	−0.39***	−0.44***	0.29***	0.44***	0.29***	0.37***	0.08	0.19**	−0.25***	−0.28***
5. EC T1				1	0.65***	−0.47***	−0.30***	−0.35***	−0.29***	−0.23***	−0.18*	0.25***	0.13
6. EC T2					1	−0.31***	−0.47***	−0.21**	−0.41***	−0.17*	−0.39***	0.22**	0.33***
7. Parental distress T1						1	0.58***	0.74***	0.47***	0.41***	0.24***	−0.30***	−0.10
8. Parental distress T2							1	0.43***	0.73***	0.31***	0.50***	−0.32***	−0.37***
9. Parental helplessness T1								1	0.51***	0.43***	0.20**	−0.23***	−0.02
10. Parental helplessness T2									1	0.31***	0.52***	−0.23***	−0.31***
11. Negative/inconsistent parenting T1										1	0.51***	−0.25***	−0.10
12. Negative/inconsistent parenting T2											1	−0.22**	−0.35***
13. Positive parenting T1												1	0.61***
14. Positive parenting T2													1

T1 Time 1 Pre-intervention, *T2* Time 2 Post-intervention; $N = 209$

$*p < 0.05$, $**p < 0.01$, $***p < 0.001$

Discussion

The findings that treatment effects on EC and CU traits were mediated by posttreatment controlled for pretreatment parenting strengthen confidence in a parenting-based mechanism of change (Kazdin 2007). The results are consistent with longitudinal studies that showed that different aspects of parenting predicted future children's CU traits (Waller et al. 2013) and self-regulation when controlling for baseline levels of the constructs (Eisenberg et al. 2010). Earlier RCTs demonstrated parenting-based treatment effects on children's self-regulation (Chang et al. 2014; Conduct Problems Prevention Research Group 2011; Jones et al. 2007; McGilloway et al. 2012), and CU traits (Butler et al. 2011; McDonald et al. 2011). The current results strengthen these findings by providing RCT-based evidence that PT has distinct treatment effects on CU traits and EC when the more general effect on CP is included in the outcome models. Furthermore, the study provides the first RCT-based evidence to our knowledge for parenting mediated effect on EC, and the second such evidence for parenting mediated effect on CU traits.

The significant mediator in this study was negative parenting, indicated by perceived parenting inefficacy and negative/inconsistent practices. This finding is consonant with *Hitkashrut*'s focus on disrupting coercive dynamics during intervention's first stage. Both our conceptual premise and our experience suggested that when parents feel helpless, ineffective, and distressed, they are more likely to be depressed and angry, and overreact with coercive and dysregulated parenting behaviors that exacerbate children's oppositionality and disruptive behaviors. Likewise, the overuse of negative discipline practices increases the sense of parental incompetence and demoralization. As these circular dynamics escalate, the level of reactivity increases and parents experience loss of control and a sense of helplessness vis-à-vis the child, as well as hostility, social shame and isolation (Granic and Patterson 2006; Weinblatt and Omer 2008). Hence, the initial disruption of these dynamics is vital both to prevent further escalation that increases children's oppositionality against the parental agenda, and to facilitate a shift to a more functional family configuration that promotes socialization. Previously reported within control group findings of significant deterioration in perceived parenting inefficacy, marital quality, and CU traits, and no change in all other outcome variables, supported our initial emphasis on thwarting an adverse family and child developmental path (Somech and Elizur 2012). In contrast, the within treatment group findings of significant improvement in both children's CP, EC, and CU traits, and parents' perceived inefficacy, negative/inconsistent practices, and marital quality, showed that a beneficial family and child developmental path can be engendered. Patterson et al.'s (2010) findings of long-term positive cascading effects in families that reduced coercion provides further support for the premise that the

Fig. 1 Structural equation models estimating treatment concurrent effects on (**a**) CP and CU Traits and (**b**) CP and EC. *Note.* T1 = Pre-intervention, T2 = Post-intervention. The *bold arrows* represent hypothesized effects. Full lines represent two-tailed significant paths ($p < 0.05$), and *dashed lines* represent nonsignificant paths. Path coefficients are standardized. For model **a**: χ^2 (18, $N = 209$) = 35.32, $p < 0.05$; NNFI =0.96; CFI = 0.98; RMSEA = 0.064 [0.03, 0.09]; For model **b**: χ^2 (18, $N = 209$) = 31.02, $p < 0.05$; NNFI =0.97; CFI = 0.97; RMSEA = 0.05 [0.01, 0.08]
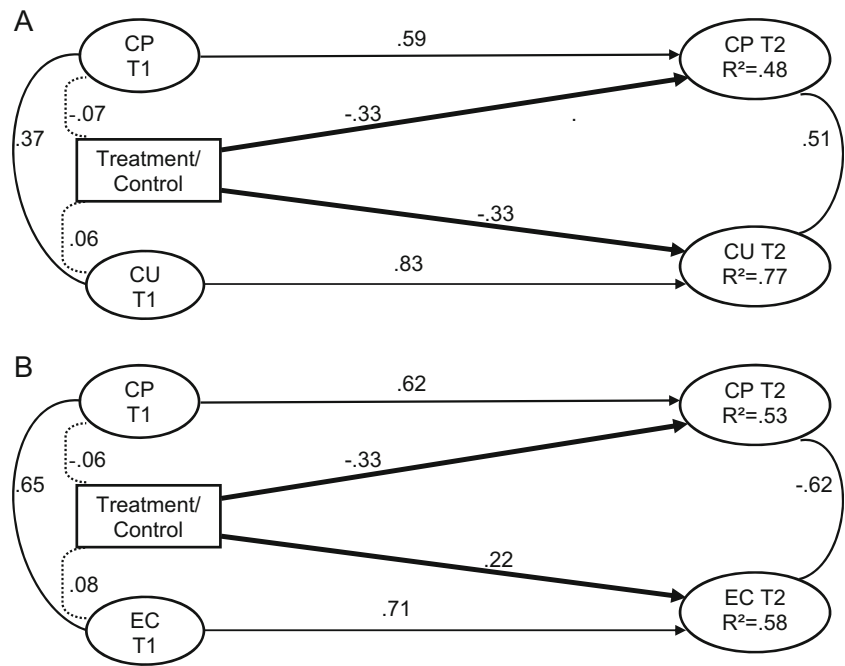
disruption of negative dynamics sets the stage for family reorganization.

We did not find a treatment effect on positive parenting and thus the data did not support an alternative hypothesis of mediation by positive parenting. This contrasts with Forehand et al.'s (2014) review that showed evidence for both positive and negative parenting as mediators of PT's effects on child CP. Furthermore, in some intervention studies only positive parenting was found to mediate treatment effects (Dishion et al. 2008; Gardner et al. 2006; Gardner et al. 2010). We have two explanations for the discrepancy. The first is related to *Hitkashrut*'s relatively short 6-month time span between pre-

Fig. 2 Structural equation models estimating IP concurrent mediation of treatment effects on (**a**) CP and CU Traits and (**b**) CP and EC. *Note.* T1 = Pre-intervention, T2 = Post-intervention. The *bold arrows* represent hypothesized effects. *Full lines* represent two-tailed significant paths ($p < 0.05$) and *dashed lines* represent nonsignificant paths. Direct treatment effects on CP and CU in the CU/CP model, and on CP in the EC/CP model were significant. Path coefficients are standardized. For model A: χ^2 (48, $N = 209$) = 76.90, $p < 0.05$; NNFI =0.97; CFI = 0.98; RMSEA = 0.054 [0.02, 0.07]; For model B: χ^2 (48, $N = 209$) = 74.19, $p < 0.05$; NNFI = 0.97; CFI = 0.98; RMSEA = 0.051 [0.01, 0.06]
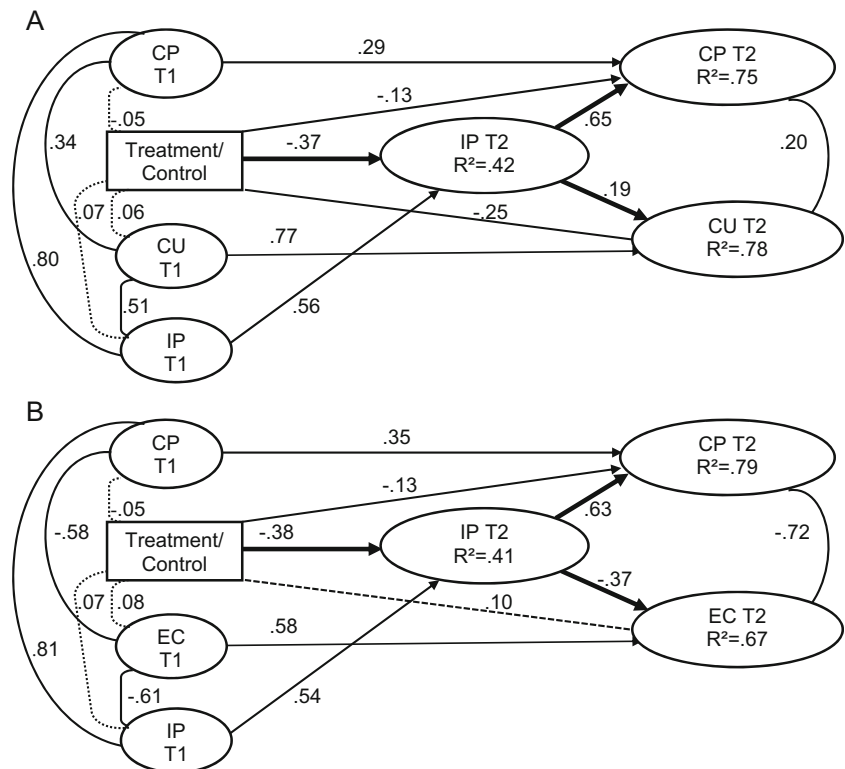
and post-treatment assessments. There is solid evidence from developmental research supporting the association between positive parent-child relationship qualities, such as warmth, cooperativeness, and mutual responsiveness, and the development of self-regulation and conscience (Eisenberg et al. 2010; Frick et al. 2014; Karreman et al. 2006; Kochanska and Kim 2014; Waller et al. 2013). However, the rehabilitation of these relationship qualities may take a longer time span, particularly since oppositional children sometimes respond to parental attempts to set limits by increasing coercive behavior. The second explanation is that a self-report scale that assessed broad aspects of positive parenting was used, while Dishion et al. and Gardner et al. used observational assessment of more specific practices that were part of the training program (e.g., positive reinforcements, problem solving, positive and proactive discipline). We believe that our treated parents did apply the effective positive behavior support practices that they had trained, even while their general view of the parent-child relationship did not change during this time span.

The main implications of study findings to practice and policy are that early intervention PT programs can be effectively applied to improve self-regulatory and social-emotional competencies, in addition to behavior problems, and that the reduction of IP is a strategic target for achieving these objectives. The significance of these implications is amplified by the consistent implication of children's dispositional characteristics in early-onset antisocial trajectories (Eisenberg et al. 2010; Frick 2012; Kochanska et al. 2009; Nigg 2006). Furthermore, recent reviews of research suggested that children with CP who are characterized by CU traits and/or ADHD dysregulated symptomatology are at risk for poor treatment outcomes (Frick 2012; Frick et al. 2014). The reviewers' conclusion is that outcome might improve by interventions that are comprehensive, tailored to the specific needs of this high-risk group, and delivered early in childhood. The current findings suggest that the restoration of perceived parenting inefficacy and the disruption of negative interactions have a role in such early intervention programs. Furthermore, our experience, which is consistently supported by longitudinal research (Kochanska and Kim 2014; Spinrad et al. 2012), indicates that children's receptivity toward parental influence increases as parent-child relationships become more regulated and cooperative. In response to these implications, we have designed and incorporated into our program a playful intervention that is based on a children's story that externalizes Anger, describes a method for coping with hot situations, and models how to ask for forgiveness and make amends (Elizur 2016). In Hitkashrut's new RCT, this narrative-based component is utilized to reduce blame and to inspire an alliance between children and their caretakers in which both sides are challenged to learn new steps that improve their relational dance. Future studies may broaden the knowledge of how to foster committed compliance with young children during the most malleable period of their development, and how to work collaboratively with children to compensate for dispositional deficits and to enhance strengths.

Limitations

The study has some limitations. First, mediational analysis may suggest a mechanism of change, but since there was no experimental manipulation of the mediator or an assessment of mechanism and outcomes during treatment, other third variables could alter the relationship between treatment and outcomes (Kazdin 2007). Hence, the secondary analyses should be viewed as exploratory and findings considered with caution. Ideally, the mediator should be measured at a previous time point, but since we had only pre- and post-treatment assessments, the mediator and outcomes were measured at the same time. Second, the assessment of both mediator and outcomes was based on parental reports. Expectancy effects and shared method variance may have artificially inflated the associations between variables. The inclusion of other sources of information and particularly independent observational data would have made for a stronger design and increased confidence in the findings. Third, CU measurement in very young children has not been consistent across studies and there is a need for a body of solid validation studies of CU assessment at this age group. Fourth, although program adherence was regularly monitored in supervisory sessions, we did not use scales or observation-based data to assess fidelity. Fifth, the results may not apply to other ethnic groups, to parent groups that do not include two engaged caregivers, to more dysfunctional and less motivated parents, and to the highest-risk children with diagnosed disorders. Hitkashrut is secondary prevention program, and its objective is to improve early conduct problems and prevent the formation of diagnosed disorders. It was tested with an all-Jewish sample and its requirements and screening procedure ensured favorable conditions: 86.6 % of the families were intact, there was high participation of fathers, and the children's level of CP ranged from moderate to high-risk. Children who do not respond to a tier 2 group program are more likely to benefit from more intensive individualized treatment (Frick 2012). Sixth, a follow-up is necessary for testing the sustainability of program effects on EC and CU traits.

Notwithstanding the limitations, the current report presents an original investigation of the interplay between a PT program, negative/inconsistent practices, perceived parenting inefficacy, and children's CP, EC and CU traits. The generic intervention demonstrated the applicability of a theory-based integration of evidence-based practices that is flexible, economical, and culturally-adapted. Hitkashrut was implemented by publicly employed educational psychologists who facilitated diverse parent groups in three different cities, and the evaluation of its effectiveness was based on data provided by both

parents. The findings showed for the first time in a RCT that early intervention can affect both EC and CU traits, in addition to facilitating a more general behavioral improvement, and that IP mediates these effects. Increased confidence in our ability to understand change processes and to design generic cost-effective parent-collaborative early prevention programs has implications for practice and for policy. The investment of public resources in CP prevention programs is justified given the impairment and poor long-term prognosis associated with early-onset antisocial trajectories, and the cost of criminal and violent behavior to society (Frick 2012). At the same time, in view of the study's methodological limitations, the support of the mediational model is but a first step toward the testing of a mechanism of change. Further empirical exploration of this mechanism may provide innovative directions for the prevention and treatment of early-onset disruptive disorders.

References

Abidin, R. R. (1990). *Parenting stress index manual*. Charlottesville: Pediatric Psychology Press.

Bandalos, D. L. (2002). The effects of item parceling on goodness-of-fit and parameter estimate bias in structural equation modeling. *Structural Equation Modeling, 9*, 78–102.

Bentler, P. M. (2006). *EQS 6 structural equations program manual*. Encino, CA: Multivariate Software.

Berger, A. (2011). *Self-regulation: Brain, cognition, and development*. Washington, DC: American Psychological Association.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.

Butler, S., Baruch, G., Hickey, N., & Fonagy, P. (2011). A randomized controlled trial of multisystemic therapy and a statutory therapeutic intervention for young offenders. *Journal of the American Academy of Child and Adolescent Psychiatry, 50*, 1220–1235.

Chang, H., Shaw, D. S., Dishion, T. J., Gardner, F., & Wilson, M. N. (2014). Direct and indirect effects of the family check-up on self-regulation from toddlerhood to early school-age. *Journal of Abnormal Child Psychology, 42*, 1117–1128.

Clerkin, S. M., Marks, D. J., Policaro, K. L., & Halperin, J. M. (2007). Psychometric properties of the Alabama parenting questionnaire-preschool revision. *Journal of Clinical Child and Adolescent Psychology, 36*, 19–28.

Conduct Problems Prevention Research Group (2011). The effects of the fast track preventive intervention on the development of conduct disorder across childhood. *Child Development, 82*, 331–345.

Dadds, M. R., Fraser, J., Frost, A., & Hawes, D. J. (2005). Disentangling the underlying dimensions of psychopathy and conduct problems in childhood: a community study. *Journal of Consulting and Clinical Psychology, 73*, 400–410.

de la Osa, N., Granero, R., Penelo, E., Domènech, J. M., & Ezpeleta, L. (2014). Psychometric properties of the Alabama parenting questionnaire-preschool revision (APQ-Pr) in 3 year-old Spanish preschoolers. *Journal of Child and Family Studies, 23*, 776–784.

Dishion, T. J., Shaw, D., Connell, A., Gardner, F., Weaver, C., & Wilson, M. (2008). The family check-up with high-risk indigent families: preventing problem behavior by increasing parents' positive behavior support in early childhood. *Child Development, 79*, 1395–1414.

Eisenberg, N., Spinrad, T. L., & Eggum, N. D. (2010). Emotion-related self-regulation and its relation to children's maladjustment. *Annual Review of Clinical Psychology, 6*, 495–525.

Elizur, Y. (1996). Involvement, collaboration, and empowerment: a model for consultation with human-service agencies and the development of family-oriented care. *Family Process*,

Elizur, Y. (2016). *Tommy turtle's brainpower* [Kindle Edition]. Retrieved from Amazon.com.

Elizur, Y., & Minuchin, S. (1989). *Institutionalizing madness: Families, therapy and society*. New York: Basic Books.

Forehand, R., Lafko, N., Parent, J., & Burt, K. B. (2014). Is parenting the mediator of change in behavioral parent training for externalizing problems of youth? *Clinical Psychology Review, 34*, 608–619.

Frick, P. J. (2004). *The Inventory of Callous-Unemotional traits. The University of New Orleans*. New Orleans, LA: Unpublished rating scale.

Frick, P. J. (2012). Developmental pathways to conduct disorder: implications for future directions in research, assessment, and treatment. *Journal of Clinical Child & Adolescent Psychology, 41*, 378–389.

Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous-unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents? A comprehensive review. *Psychological Bulletin, 140*, 1–57.

Gardner, F., Burton, J., & Klimes, I. (2006). Randomised controlled trial of a parenting intervention in the voluntary sector for reducing child conduct problems: outcomes and mechanisms of change. *Journal of Child Psychology and Psychiatry, 47*, 1123–1132.

Gardner, F., Hutchings, J., Bywater, T., & Whitaker, C. (2010). Who benefits and how does it work? Moderators and mediators of outcome in an effectiveness trial of a parenting intervention. *Journal of Clinical Child and Adolescent Psychology, 39*, 568–580.

Gelman, A., & Hill, J. (2007). *Data analysis using regression and multilevel/hierarchical models*. New York: Cambridge University Press.

Goodman, R., & Scott, S. (1999). Comparing the strengths and difficulties questionnaire and the child behavior checklist: is small beautiful? *Journal of Abnormal Child Psychology, 27*, 17–24.

Granic, I., & Patterson, G. R. (2006). Toward a comprehensive model of antisocial development: a dynamic systems approach. *Psychological Review, 113*, 101–131.

Hawes, S. W., Byrd, A. L., Henderson, C. E., Gazda, R. L., Burke, J. D., Loeber, R., et al. (2014a). Refining the parent-reported inventory of callous–unemotional traits in boys with conduct problems. *Psychological Assessment, 26*, 256–266.

Hawes, D. J., Price, M. J., & Dadds, M. R. (2014b). Callous-unemotional traits and the treatment of conduct problems in childhood and adolescence: a comprehensive review. *Clinical Child and Family Psychology Review, 17*, 248–267.

Hyde, L. W., Shaw, D. S., Gardner, F., Cheong, J., Dishion, T. J., & Wilson, M. (2013). Dimensions of callousness in early childhood: links to problem behavior and family intervention effectiveness. *Development and Psychopathology, 25*, 347–363.

Jones, T. L., & Prinz, R. J. (2005). Potential roles of parental self-efficacy in parent and child adjustment: a review. *Clinical Psychology Review, 25*, 341–363.

Jones, K., Daley, D., Hutchings, J., Bywater, T., & Eames, C. (2007). Efficacy of the incredible years basic parent training programme as an early intervention for children with conduct problems and ADHD. *Child: Care, Health and Development, 33*, 749–756.

Kaminski, J. W., Valle, L. A., Filene, J. H., & Boyle, C. L. (2008). A meta-analytic review of components associated with parent training program effectiveness. *Journal of Abnormal Child Psychology, 36*, 567–589.

Karreman, A., van Tuijl, C., van Aken, M. A. G., & Dekovic, M. (2006). Parenting and self-regulation in preschoolers: a meta-analysis. *Infant and Child Development, 15*, 561–579.

Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology, 3*, 1–27.

Kimonis, E. R., Fanti, K. A., Anastassiou-Hadjicharalambous, X., Mertan, B., Goulter, N., & Katsimicha, E. (2015). Can callous-unemotional traits be reliably measured in preschoolers? *Journal of Abnormal Child Psychology*, Advance online publication. doi:10.1007/s10802-015-0075-y

Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). New York: The Guilford Press.

Kochanska, G., & Kim, S. (2014). A complex interplay among the parent–child relationship, effortful control, and internalized, rule-compatible conduct in young children: evidence from two studies. *Developmental Psychology, 50*, 8–21.

Kochanska, G., Barry, R. A., Jimenez, N. B., Hollatz, A. L., & Woodard, J. (2009). Guilt and effortful control: two mechanisms that prevent disruptive developmental trajectories. *Journal of Personality and Social Psychology, 97*, 322–333.

Lipscomb, S. T., Leve, L. D., Harold, G. T., Neiderhiser, J. M., Shaw, D. S., Ge, X., et al. (2011). Trajectories of parenting and child negative emotionality during infancy and toddlerhood: a longitudinal analysis. *Child Development, 82*, 1661–1675.

Longman, T., Hawes, D., & Kohlhoff, J. (2015). Callous–unemotional traits as markers for conduct problem severity in early childhood: a meta-analysis. *Child Psychiatry & Human Development*, Advance online publication. doi:10.1007/s10578-015-0564-9

McDonald, R., Dodson, M. C., Rosenfield, D., & Jouriles, E. N. (2011). Effects of a parenting intervention on features of psychopathy in children. *Journal of Abnormal Child Psychology, 39*, 1013–1023.

McGilloway, S., Mhaille, G. N., Bywater, T., Furlong, M., Leckey, Y., Kelly, P., et al. (2012). A parenting intervention for childhood behavioral problems: a randomized controlled trial in disadvantaged community-based settings. *Journal of Consulting and Clinical Psychology, 80*, 116–127.

Muratori, P., Milone, A., Manfredi, A., Polidori, L., Ruglioni, L., Lambruschi, F., Lochman, J. E. (2015). Evaluation of improvement in externalizing behaviors and callous-unemotional traits in children with disruptive behavior disorder: a 1-year follow up clinic-based study. *Administration and Policy in Mental Health and Mental Health Services Research*, Advance online publication. doi:10.1007/s10488-015-0660-y

Nigg, J. T. (2006). Temperament and developmental psychopathology. *Journal of Child Psychology and Psychiatry, 47*, 395–422.

Nix, R. L., Bierman, K. L., & McMahon, R. J. (2009). How attendance and quality of participation affect treatment response to parent management training. *Journal of Consulting and Clinical Psychology, 77*, 429–438.

Patterson, G. R., Forgatch, M. S., & DeGarmo, D. S. (2010). Cascading effects following intervention. *Development and Psychopathology, 22*, 949–970.

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*, 22–29.

Roger, W. M., & Schmitt, N. (2004). Parameter recovery and model fitting multidimensional composites: a comparison of four empirical parceling algorithms. *Multivariate Behavioral Research, 39*, 379–412.

Rothbart, M. K., Ahadi, S. A., Hersey, K. L., & Fisher, P. (2001). Investigations of temperament at three to seven years: the children's behavior questionnaire. *Child Development, 72*, 1394–1408.

Russell, D. W., Kahn, J. H., Spoth, R., & Altmaier, E. M. (1998). Analyzing data from experimental studies: a latent variable structural equation modeling approach. *Journal of Counseling Psychology, 45*, 18–29.

Shaw, D. S., Connell, A., Dishion, T. J., Wilson, M. N., & Gardner, F. (2009). Improvements in maternal depression as a mediator of intervention effects on early childhood problem behavior. *Development and Psychopathology, 21*, 417–439.

Shelton, K. K., Frick, P. J., & Wootton, J. (1996). Assessment of parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology, 25*, 317–329.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and non-experimental studies: new procedures and recommendations. *Psychological Methods, 7*, 422–445.

Somech, L. Y., & Elizur, Y. (2012). Promoting self-regulation and cooperation in pre-kindergarten children with conduct problems: a randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry, 51*, 412–422.

Spinrad, T. L., Eisenberg, N., Silva, K. M., Eggum, N. D., Reiser, M., Edwards, A., et al. (2012). Longitudinal relations among maternal behaviors, effortful control and young children's committed compliance. *Developmental Psychology, 48*, 552–566.

Tofighi, D., & MacKinnon, D. P. (2011). RMediation: an R package for mediation analysis confidence intervals. *Behavior Research Methods, 43*, 692–700.

Waller, R., Gardner, F., & Hyde, L. W. (2013). What are the associations between parenting, callous–unemotional traits, and antisocial behavior in youth? A systematic review of evidence. *Clinical Psychology Review, 33*, 593–608.

Waller, R., Hyde, L. W., Grabell, A. S., Alves, M. L., & Olson, S. L. (2015). Differential associations of early callous-unemotional, oppositional, and ADHD behaviors: multiple domains within early-starting conduct problems? *Journal of Child Psychology and Psychiatry, 56*, 657–666.

Weinblatt, U., & Omer, H. (2008). Nonviolent resistance: a treatment for parents of children with acute behavior problems. *Journal of Marital and Family Therapy, 34*, 75–92.