

## Study Preregistration: Individual Participant Data Meta-Analysis: Individual Differences in Mediators of Parenting Program Effects on Disruptive Behavior

### STUDY SYNOPSIS

#### Introduction Summary

Parenting programs are the most widely used strategy to prevent and reduce children's disruptive behavior,<sup>1</sup> and yet we know very little about what exact changes in parenting behavior underlie program effects on disruptive child behavior. In fact, most studies have been unable to identify any mediators of parenting program effects.<sup>2</sup> This is likely because, at least in part, individual trials tend to be underpowered to detect mediation effects,<sup>3</sup> and are unable to take the known heterogeneity in program effects<sup>4</sup> into account.

One way of achieving sufficient statistical power, as well as increased generalizability of findings across populations and programs (eg, in terms of sociodemographic variables, problem severity, and complexity), is to pool data from different studies in an individual participant data meta-analysis (IPDMA).<sup>5,6</sup> This is a promising, but still uncommon approach in child and adolescent psychiatry research to examine mediators of program effects.<sup>7</sup>

This study will pool individual participant data from multiple parenting program trials to test the mediators of change underlying parenting programs. As potential mediators, we will include 5 parenting behaviors typically targeted in programs and commonly measured in parenting program evaluation studies. We will explore which of these parenting behaviors play the biggest role in explaining program effects on disruptive child behavior.

In addition, in line with increasing calls to combine the study of how psychotherapy programs work with the study of for whom they work,<sup>8</sup> we will explore whether different subgroups of families can be identified for whom parenting programs work through different changes in parenting behavior. Because such differences are hard to explain by individual family characteristics,<sup>9</sup> we will do so using a latent class approach that identifies family profiles with distinct mechanisms.

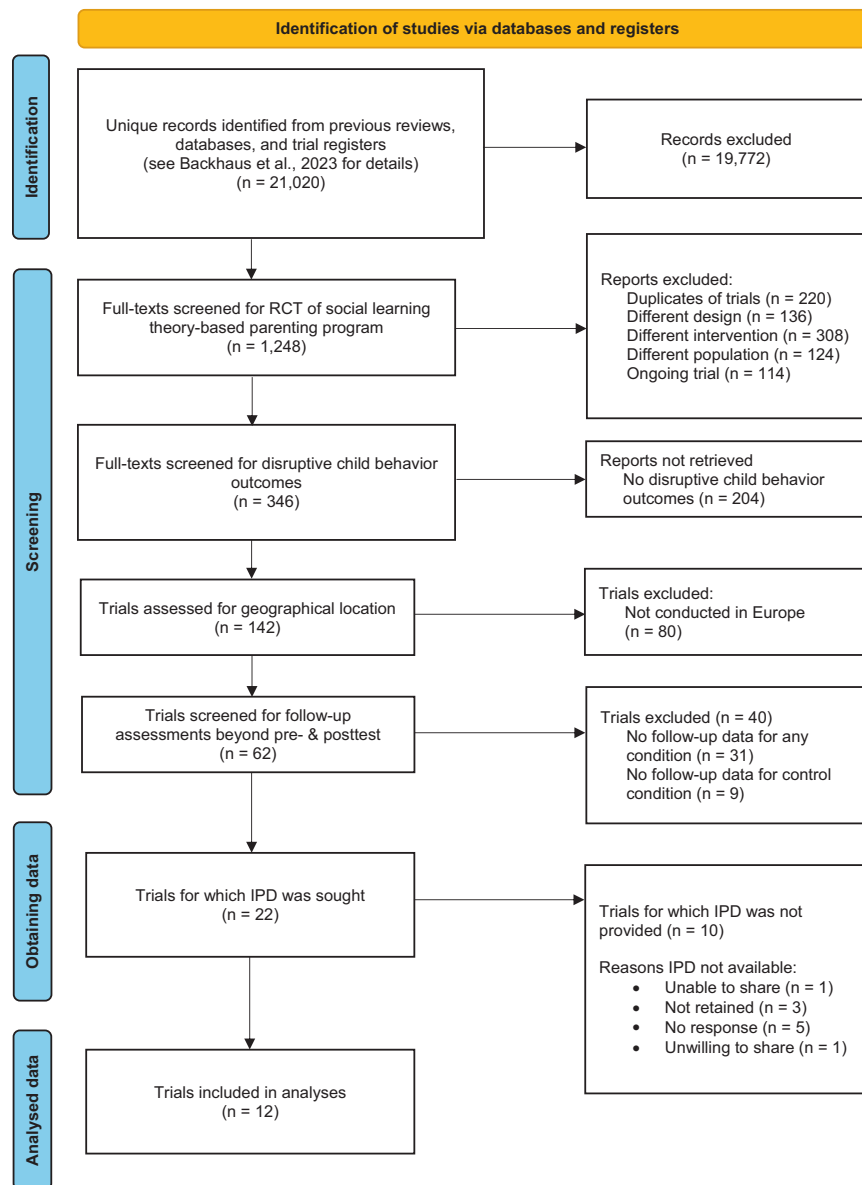
#### Method Summary

*Procedure.* We will use data from a recent systematic literature review on parenting program effects that identified trials through systematic searches in online databases and trial registries up to August 2022 (PROSPERO #CRD42022262594). Specifically, we will include randomized controlled trials of social learning-based parenting programs with at least 2 post-intervention assessments of parenting and child outcomes, in children with a mean age of 2 to 10 years in Europe. Principal investigators of the 22 eligible trials were contacted; 12 (55%) shared their anonymized data (see Figure 1 for the trial selection process).

*Participants.* Data will be from 2,982 families, diverse in terms of country of residence (7 European countries), educational level (24% primary or lower secondary education), income (41% low income), marital status (19% single parents), and cultural and ethnic background (eg, in Alsem *et al.*,<sup>10</sup> 76% were born outside of the Netherlands). Families participated in 12 trials on 5 theoretically similar parenting programs. Five trials included children who scored above a cut-off for disruptive behavior, and 7 were prevention trials. A small majority (55%) of the target children were male.

*Parenting Behavior.* We will include as potential mediators parental use of praise, tangible rewards, physical discipline, harsh verbal discipline, and not following through on discipline, measured immediately post-intervention. Because different parent-reported measures are used across trials, we will select from each trial the items that fit each construct, compute an average score for each parenting behavior for each individual, and harmonize the response scales.<sup>6</sup>

*Children's Disruptive Behavior.* We will use the Eyberg Child Behavior Inventory (used in 6 of 12 trials) as our primary parent-reported measure for children's disruptive behavior at the second post-intervention assessment. For trials using an alternative measure (eg, the Child Behavior Checklist, the Strengths and Difficulties Questionnaire), norm deviation scores will be used to convert scores to the scale of the primary measure.<sup>6</sup>

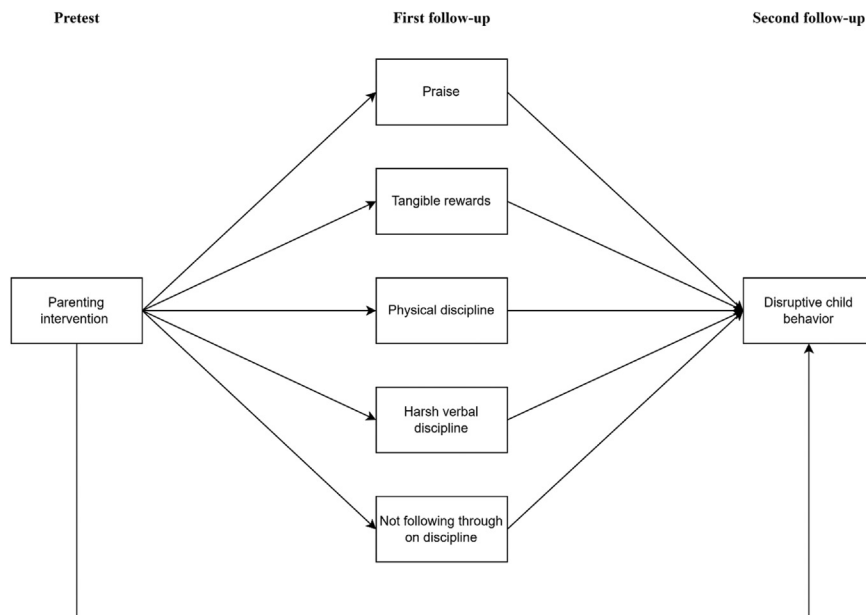
**FIGURE 1** Flowchart of Data Collection Procedure

**Analytic Strategy.** First, we will test a mediation model with all 5 mediators included simultaneously to examine whether program effects on children's disruptive behavior can be explained by changes in parenting behaviors, and which parenting behaviors explain the program effects best (Figure 2). Next, we will use a mixture mediation model to explore whether latent subgroups of families showing different mediational pathways can be identified, and which family functioning and sociodemographic characteristics describe these subgroups.






### Significance Summary

A clearer understanding of how parenting programs for disruptive child behavior work remains a key avenue for improving them, allowing more direct and effective targeting of the crucial processes by which these programs achieve their effects in individual families. This study contributes to this goal by testing the changes in parenting behavior that explain program effects on disruptive child behavior, and individual differences between families in these, using an unprecedentedly large sample from different countries and different programs.

**FIGURE 2** The Conceptual Mediation Model



**Note:** Pretest measures of parenting behaviors and disruptive child behavior were included as covariates in the model but are not depicted in the figure.

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This work has been prospectively registered: [https://www.crd.york.ac.uk/prospero/display\\_record.php?ID=CRD42022262594](https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42022262594).

Dr. Melendez-Torres served as the statistical expert for this research.

**Author Contributions**

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