

# Incredible Years: Expected Effects and Recommendations for Monitoring Outcomes

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## **Project Summary**

North Carolina family-serving agencies and funders have made large investments in the implementation of Incredible Years (IY) throughout the state, with the goal of improving parenting skills and child outcomes for families who have children with conduct problems. Efforts include funding for implementation infrastructure. As part of this infrastructure, state-level IY coordinators monitor ongoing outcomes across programs. To date, outcome measurement has relied on parent self-report of their parenting behavior (using the Parenting Practices Interview, adapted by Webster-Stratton) and child's behavior (using the Eyberg Child Behavior Inventory, Robinson et al., 1980). To inform outcomes monitoring and ensure that outcomes are being assessed effectively, Duke University's Center for Child and Family Policy (CCFP) conducted a literature review on Incredible Years (IY) evaluation and research, with the goal of understanding:

- expected outcomes of IY, including effect sizes;
- optimal evaluation tools for accurately capturing all relevant IY outcomes; and
- adequacy of self-reported outcomes on rating scales as compared with observation measures.

To meet these goals, evaluators carefully reviewed the literature on IY outcomes, with particular attention to the accuracy of the Eyberg Child Behavior Inventory when compared with child observation tools, as well as the accuracy of the Parent Practices Interview when compared with parent observation tools. A brief summary of findings is presented below, followed by recommendations for ongoing IY outcomes monitoring in North Carolina.

## **Expected Outcomes of IY**

In numerous randomized trials, IY has been shown to decrease parents' use of harsh discipline and criticism, increase effective limit-setting, and improve parent-child relationships. Along with parenting improvements, IY evaluations have also shown reduction in child aggression and behavior problems both at home and school. Effects are maintained or even improved at follow-up one year after services are complete.

To get a better understanding of the size of these effects, we calculated effect sizes for intervention versus comparison groups across the major IY evaluation studies. These effect sizes indicate how much parents and children who participated in IY improved on study measures relative to comparison groups without IY. Effect sizes can range from 0 to infinity, but for social interventions are commonly between 0 and 1. An effect size of 1 means that the intervention group improved by one standard deviation more than the control group. Conventionally, effect sizes of .2 are considered small, .5 moderate, and .8 and above are large (Cohen, 1962). Effect sizes for improvement in parenting skills and parenting confidence ranged from .35 to .85, with most falling in the moderate range of .4 to .6. Child behavior outcomes had a larger range, from .05 to .85, with an average of .4. Again, the majority of studies identified a moderate effect (e.g., Gardner, Burton & Klimes, 2006; Webster-Stratton, Reid, & Hammond, 2004).

Effect sizes can also be calculated for the amount of change in the intervention group alone—that is, the size of the improvement in scores from pre-intervention to post-intervention. Calculation of these effect sizes requires raw data (because we need to know the correlation between pre-test and post-test scores), thus we could not accurately calculate pre-post effect sizes from the existing literature. Estimated effect sizes based solely on available data are between .3 and 2.0, with most falling between .7 and 1.2. This means that families can be expected to improve by approximately one standard deviation on each outcome measure.

Several studies also examined clinically significant changes in child functioning, generally defined as movement from a clinical level of disturbance to a normative level of functioning. On the externalizing behavior scale of the Child Behavior Checklist (CBCL), 70-80% of mothers reported that their children moved from the clinical range to the normative range following participation in IY parent training, as compared with 27% of comparison mothers (Webster-Stratton & Hammond, 1997). Based on the Eyberg Child Behavior Inventory (ECBI), 43-85% of mothers reported a shift in child behavior from above to below the clinical cutoff (Webster-Stratton, Reid, & Hammond, 2004). In this latter study, parent training by itself produced clinical change for the smallest number of kids (43%), hardly more than that shown by the comparison group (40%). When parent training was supplemented by teacher or child training, though, 65-85% of parents reported clinically significant change. This study had a relatively small sample size, with around 25 parents per group, likely leading to this variability in results across groups. Observer ratings for these same groups indicated that 67-85% showed clinically significant improvement, including those with parent training alone.

### **Typical Measures for IY Outcomes**

Outcomes for Incredible Years have generally been measured using both self-report rating scales and observer ratings of parent and child behaviors. The most common self-report measures utilized in the randomized trials of IY include:

- the Eyberg Child Behavior Inventory (ECBI), with subscales for total problems (representing the number of behavior problems) and total intensity (representing the frequency of behavior problems)
- the Parenting Practices Interview (PPI, adapted from the Oregon Social Learning Center's discipline questionnaire), with subscales for harsh/inappropriate discipline and supportive parenting

Both of these measures are currently in use across North Carolina. Other common self-report measures, most often used in earlier studies of IY, include the Child Behavior Checklist (CBCL; Achenbach, 1991) and the Parent Attitude Survey (PAS; Hereford, 1963).

To ensure external validity of findings, IY evaluations have added observer ratings of parents and children interacting in various settings with varying levels of structure. These observer ratings provide a more objective examination of parent practices and child behaviors to ensure that positive results are not due only to social desirability in parent responses. Early IY evaluation studies used the Interpersonal Behavior Construct Scale (IBCS; Kogan & Gordon, 1975) to code videotapes of parent-child dyads interacting in a playroom. More recent evaluations have moved to the Dyadic Parent-Child Interaction Coding System (DPICS; Robinson & Eyberg, 1981). Parent

domains measured by the DPICS include total praise, total critical statements, and total commands/direct command ratio. Child domains include total child deviancy and noncompliance ratio.

### **Comparison of Self-Report and Observer Findings**

To ensure that programs are maximally effective, both to monitor individual family progress and for the goal of ongoing quality improvement, IY programs need regular, valid data on family outcomes. Observation of parent-child interactions provides the most objective measure of parenting skill and child behavior, but this method is cumbersome as a means of regularly assessing IY outcomes in community settings. Both live observation and videotaping present logistical challenges along with increased cost, and to adequately assess outcomes, these observations would need to be conducted both pre- and post-intervention with a large proportion of participating families. The use of self-report tools, in contrast, is much more convenient and inexpensive, as well as less threatening and intrusive for families. Self-report tools are only useful to the extent that they accurately gauge treatment effectiveness, however. To determine the adequacy of self-report measures in assessing IY outcomes, findings from self-report tools were compared with findings from observer ratings. If outcomes reported by parents on measures such as the ECBI are consistent with observed outcomes, parent self-report should be an adequate method for the ongoing monitoring of IY outcomes.

### **Child Outcomes**

There are several rigorous evaluations of IY that include both the ECBI and an observation measure (either the DPICS or the IBCS). Across studies, improvement in child behavior reported by the parent on the ECBI is consistent with improvement reported by observers. Results on the ECBI and observer measures show the same patterns and significance levels from pre-test to post-test and from post-test to follow-up. In general, calculated effect sizes are also equivalent, though there is some variability. In some studies, observers reported larger effects (e.g., Webster-Stratton, 1982; Webster-Stratton, 1984; Webster-Stratton, 1985c; Webster-Stratton, 1998; Webster-Stratton, Reid, & Beauchaine, 2011). In a few studies, mothers (though not fathers) reported larger effects (e.g., Webster-Stratton, 1992; Webster-Stratton & Hammond, 1997). Some level of discrepancy is to be expected due to normal variability or due to chance. These differences in effect sizes do not change the results of the data: effects are always in the same direction and lead to the same conclusions. If anything, the above studies suggest that the observer measure results in stronger effects. Based on these data, parent report on the ECBI is more likely to underestimate true effects than to overestimate them. If significant improvements are found using the ECBI, evaluators can be confident that these represent real outcomes. Father report may be more closely matched with objective observer findings than mother report, but it is not clear which more accurately reflects true child improvement. Mothers may have experience with child behavior in a wider variety of settings or over a larger portion of the day, and could thus have a better sense of their child's improvement. Regardless, reports on IY outcomes are consistent across respondents; only the magnitude of effects varies.

Few studies provide direct information about the correlation of ECBI ratings with observer ratings, but those that do find a significant relation. Correlations between specific subtests are small to moderate, ranging from .20 to .45. Specific findings are listed below:

- Ratings on the DPICS during a structured parent-directed interaction correlated .40 with mother's report of child problem behavior on the ECBI (Webster-Stratton, 1985b).
- Conduct problem ratings on the DPICS correlated .20 with mother reports of child problem intensity on the ECBI (Reid, Webster-Stratton, & Baydar, 2004).
- ECBI scores correlated with DPICS observations of child noncompliance (.37) and deviancy (.37) as well as with IBCS observations of child negative affect (.45) (Webster-Stratton, 1985).

When all DPICS subscales are entered into a regression model together, the DPICS subscales as a group account for between 40% and 61% of the variance in parent reports on the ECBI (Eyberg, McDiarmid, Duke, & Boggs, 2004; Robinson & Eyberg, 1981). These numbers correspond to correlations of .63 to .78, indicating that the DPICS as a whole has substantial predictive ability for ECBI ratings. In other words, parents' report of child problem behavior matches closely with overall observer accounts of parent and child behavior during a 30-minute interaction. This large correlation suggests that parents are fairly accurate reporters of the level of problems occurring in the parent-child relationship.

### **Parent Outcomes**

There are fewer studies that incorporate both observer ratings and the Parenting Practices Interview in evaluating Incredible Years effectiveness, but those that do find similar results on the two measures. As with the ECBI, results on the PPI and observer measures show the same patterns and significance levels from pre-test to post-test and from post-test to follow-up (e.g., Webster-Stratton, 1998; Webster-Stratton & Hammond, 2007; Webster-Stratton, Reid, & Beauchaine, 2011). Effect sizes on the DPICS may be slightly larger than those on the PPI (e.g., Webster-Stratton, 1998), again suggesting that parent report is more likely to underestimate true effects than to overestimate them. We found no studies that provided direct correlational data between the PPI and observer ratings, so the strength of the relationship between these measures cannot be ascertained; findings from the two are consistent, however, so PPI results should serve as a reasonable proxy for objective parenting changes.

### **Conclusions and Recommendations**

Though observer data on parent and child behavior is thought to provide a more objective view of true changes in family functioning, available data from Incredible Years evaluations suggest that parent report on the Eyberg Child Behavior Inventory and the Parenting Practices Interview provides valid data on outcomes. Indeed, the correlation between observer ratings and ECBI scores appears quite substantial, making parent report a strong proxy for family observation. Given the significant advantage of parent report in terms of cost and convenience, ongoing use of the ECBI and PPI (or similar parenting scale) to track family outcomes is encouraged. The current outcome measurement that is underway for IY in North Carolina appears adequate and should

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provide an effective means of assessing parent outcomes and program quality at the state and local level.

We recommend that IY coordinators continue to collect data from the ECBI and PPI assessments conducted both prior to and following IY intervention. When analyzed across participants (perhaps on a yearly basis), you should expect statistically significant improvement on both measures. Effect sizes comparing pre- to post-intervention scores should be moderate to large (at least .4, and up to 1.5). In terms of clinical significance, you should expect at least 45% of participants who have initial ECBI intensity scores over the clinical cutoff of 142 to report a reduction to the normative range by the end of services. In fact, it is reasonable to expect this shift into the normative range to be reported by 60% to 80% of families. Regular monitoring of outcomes will inform IY coordinators regarding the effectiveness of each IY program, and can provide valuable information on the need for program improvements to ensure that maximal outcomes are reached. Secondary analyses of outcome data along with family characteristics can also provide information on the types of families most likely to benefit from services.

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