

Children of Divorce Coping with Divorce (CoD-CoD): Evaluating the Efficacy
of an Internet-Based Preventative Intervention for Children of Divorce

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved November 2011 by the
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ARIZONA STATE UNIVERSITY

December 2011

ABSTRACT

An ever expanding body of research has shown that children of divorce are at increased risk for a range of maladaptive outcomes including academic failure, behavior problems, poor psychological adjustment, reduced self-concept, and reduced social competence (Amato, 2001). Furthermore, the widespread prevalence of divorce makes preventing these poor outcomes a pressing public health concern. The Children of Divorce-Coping with Divorce (CoD-CoD) program is an internet-based selective prevention that was derived from recent research identifying modifiable protective factors in children of divorce including active and avoidant coping, divorce appraisals, and coping efficacy. CoD-CoD addresses these putative mediators through careful adaptation of intervention components previously demonstrated to be effective for children from disrupted families (Pedro-Carroll & Alpert-Gillis, 1997; Stolberg & Mahler, 1994; Sandler, et al., 2003).

In the CoD-CoD efficacy trial, 147 children ages 11-16 whose family had received a divorce decree within 48 months of the intervention start date served as participants. Participants were assessed in two waves in order to test the small theory of the intervention as well as the interventions effects on internalizing and externalizing behaviors. Analyses indicated that the program effectively reduced the participants total mental health problems and emotional problems as reported on the Strengths and Difficulties Questionnaire (SDQ) ($d = .37$) and for total mental health problems this effect was stronger for children with greater baseline mental health problems ($d = .46$). The program also had mediated effects on both

child and parent-reported total mental health problems whereby the program improved coping efficacy for children with low baseline coping efficacy which led to reduced parent-reported mental health problems. To the author's knowledge this is the first randomized controlled trial of internet-based mental health program for children or adolescents which utilizes an active control condition.

DEDICATION

Dedicated to the most wonderful group of family and friends anyone could ask for. It is a challenge to live up to the love you have given me.

Hi Mom!

ACKNOWLEDGMENTS

It would have been impossible to complete this project without the support of a large group of people. I am deeply indebted to Irwin Sandler for his multi-faceted support of the study, guidance throughout the process, and love of good science. This project never would have occurred without the mentorship of Keith Crnic who not only encouraged me to be myself but also enthusiastically supported my efforts to do so. The advice and guidance of Jenn-Yun Tien was absolutely invaluable to the study and she is responsible for many of its best qualities. John Horan supported CoD-CoD from the beginning and lent his limitless enthusiasm and support to the project in its darkest hours.

The project was made possible by the work of a tremendous group of RA's who spent countless hours in a windowless basement collecting public court records so that the study could include participants. A heartfelt thank you to Taylor Cody, Jessica Mueller, Joanne Rzucidlo, and Siliva Baez. CoD-CoD would not exist in its current form without the help and talents of Matthew Berry who never refused a challenge. Thank you.

It would not have been possible to create a program like CoD-CoD without the foundation laid by Joanne Pedro-Carroll, Arnold Stohlberg, Sharlene Wolchick, and Irwin Sandler. The CoD-CoD program is an extension of their valiant efforts to better protect children and families from hardship.

Lastly I would like to thank my family and friends. I love you. Without you CoD-CoD would not exist and I'm not sure I would either. A special thank you to my parents, my brothers, and my step-siblings for kindly allowing me to

take advantage of their time, talent, and good will. Thank you also to the many people who have supported me throughout my doctoral program and in completing this project. The world did me a major solid by putting my wonderful friends Denise Kruszewski and Clorinda Valez in my doctoral program, each of whom are a source of support and inspiration. Finally, I cannot in good conscience write an acknowledgments section without expressing my gratitude to Bridget Gleeson, Jeni Josephson, Bill Neumire, Mike Jones, Katherine Veach, Jacob Benninger, Abby Kraai, Kurtis Vondracek, Amanda Cohen, Jodie Barber, and Cassia Denton for their support of this project, my doctoral aspirations, and of me.

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Introduction

An ever expanding body of research has shown that children of divorce are at increased risk for a range of maladaptive outcomes including academic failure, behavior problems, poor psychological adjustment, reduced self-concept, and reduced social competence (Amato, 2001). Furthermore, the widespread prevalence of divorce makes preventing these poor outcomes a pressing public health concern. The U.S. Bureau of the Census (2008) estimates that 1.1 million children experience parental divorce each year.

The primary approach to delivering preventative interventions for children is through small groups designed to provide social support and teach appropriate coping skills. While a small number of these group interventions for children have been shown to be efficacious (e.g. Pedro-Carroll, Sutton, & Wyman, 1999; Stolberg & Mahler, 1994;), an internet intervention has unique potential to have a significant impact on this large population of at risk children because this format is conducive to widespread dissemination. Over the past decade there has been a sharp increase in the number of internet-based intervention trials and the results of these trials have been promising. However, methodologically rigorous evaluations have been rare (Barak et al., 2008; Kiluk et al., 2011). In addition, only a handful of interventions targeting children and adolescents have been developed or tested (Barak et al., 2008; Calear and Christensen, 2010). As of yet, no trial of an internet-based intervention designed for children of divorce has been published.

The subject of the current study, the Children of Divorce-Coping with Divorce (CoD-CoD) program employs an internet-based format to deliver intervention components that have previously demonstrated effectiveness in reducing mental health problems in children of divorce and other elevated risk groups (Pedro-Carroll & Alpert-Gillis, 19971; Stolberg & Mahler, 1994; Sandler, et al., 2003). CoD-CoD's design was informed by research identifying modifiable protective factors including active coping (Sandler, Tein, & West, 1994), divorce appraisals (Wolchik, Vridin, Sandler, & West, 1999), and coping efficacy (Sandler, Tein, Mehta, Wolchik, Ayers, 2000). The intervention is delivered in a five-module interactive program intended for children of divorce ages 11-16. In order to facilitate participant engagement and minimize attrition, the content and format of the intervention employ a multitude of strategies including: offering highly interactive content, inclusion of a user created program goal that is regularly tracked during the program, use of two program guides who appeared in videos and provided narration throughout the program, maintaining a personal, informal, and humorous style throughout the program (e.g. through program guides' use of true personal stories to highlight program elements and the inclusion of "behind the scenes" footage in a number of the program videos), personalization of program material to program participants individual situations (e.g. by allowing users to choose which content areas to focus on and helping them problem-solve the divorce-related problem that concerns them most), and creating a system for rewarding demonstrations of content knowledge.

Evidence for positive effects of CoD-CoD would: 1) support the efficacy of an easily disseminated intervention for children of divorce; 2) be the most rigorous experimental demonstration to date of the effects of an internet-based intervention for children; and 3) provide support for the design innovations of the intervention, thus providing a possible template for the design of future internet based interventions for children and adolescents.

Divorce as a Risk Factor for Children

Experiencing a divorce is one of the most common major stressful events encountered by children and adolescents in the United States. The U.S. Bureau of the Census (2008) estimates that 1.1 million children experience parental divorce each year, and it has been estimated that 40% of all children will experience parental divorce before reaching adulthood (Bumpass, 1990). There are a multitude of mechanisms through which divorce may impact children including deterioration of positive parenting (Sigal, et al., 2008), exposure to interparental conflict (Forehand, Neighbors, Devine, & Armistead, 1994)), and exposure to a cascade of other stressful events and transitions (Sandler, Wolchik, Braver, & Fogas, 1991). Though it appears that for most children divorce will not have a long term negative effect, for some children the experience of divorce is highly detrimental to development (Amato, 2000). Children of divorce are at increased risk for academic failure, behavior problems, poor psychological adjustment, reduced self-concept, and poorer social competence (Amato, 2001). The negative effects of parental divorce have been found to last into adulthood. One study

found that 33 year-old adults who experienced divorce as children were nearly twice as likely to have high levels of psychological distress as their same age peers who had not experienced parental divorce (Rodgers, Power, & Hope, 1997).

The impact and prevalence of divorce taken together indicates that reducing the negative effects of divorce on children may have considerable public health benefits.

Programs for Children of Divorce Supported by Randomized Controlled Trials

Previous research has indicated a number of programs that have been successful in ameliorating divorce's detrimental effects on children (e.g. Pedro-Carroll, Sutton, & Wyman, 1999; Stolberg & Mahler, 1994; Wolchik, Sandler, Millsap, Plummer, Greene, Anderson, Dawson-McClure, Hipke, & Haine, 2002; Braver, Griffin, Cookston, 2005). These interventions have successfully worked with both parents and children in order to improve children's mental health.

One of the most successful program targeting children is the Children's Support Group (CSG), a preventative intervention for 7 to 13 year-old children of divorce (Stolberg & Mahler, 1994). This group intervention relies on a combination of social support and skill building. Skills taught during the intervention target improvement in identification of emotions, communication, anger control, and relaxation skills. Two randomized trials have indicated that the intervention successfully improved self-esteem, social skills, and both internalizing and externalizing behaviors in the home (Stolberg & Garrison, 1985;

Stolberg & Mahler, 1994). The most recent of these randomized trials employed a dismantling design which indicated that when the intervention combined support and skill building components, parents' reported substantial improvements in child internalizing and externalizing problems at post-test and one-year follow-up assessments. In contrast, participants in the support only condition showed little or no improvement across the same assessment periods. These results suggest that skill building is an important factor leading to improved outcomes for children of divorce.

Another successful child focused program is the Children of Divorce Intervention Program (CODIP), an 11-week school-based preventative intervention run in a group format originally evaluated for use with fourth through sixth graders. More recent versions of the program have been adapted for children in kindergarten through eighth grade (Pedro-Carroll & Cowen, 1985; Pedro-Carroll, Cowen, Hightower, & Guare, 1986; Pedro-Carroll, 2005). CODIP is based on the CSG program but with several notable modifications including a reduced emphasis on anger control training, the addition of exercises concerning divorce related feelings and experiences, the inclusion of a session promoting self-esteem, and an increased focus on the interactivity of the intervention achieved through the addition of discussions, role-plays, and use of videos to the program curriculum (Pedro-Carroll & Cowen, 1985; Greenberg, Domitrovich, & Bumbarger, 2000). CODIP utilizes social support, self-esteem building, normalization of divorce related feelings and events, and the teaching and

refinement of coping skills as mechanisms to prevent divorce related problems. The coping skills participants are taught include problem-solving, effective communication, and anger control.

CODIP has been evaluated in numerous trials which have employed experimental and quasi-experimental designs. These trials have consistently indicated improvements in intervention participants' adjustment by child, parent, and teacher report (Pedro-Carroll, 2005). Improved outcomes have included reduced anxiety, increased frustration tolerance, increased sociability, reduced externalizing behaviors, improved divorce-related attitudes, and improved overall adjustment (Pedro-Carroll, 1985; Pedro-Carroll, Alpert-Gillis, & Cowen, 1992). Three caveats to these promising findings are that only one of the CODIP trials used a true experimental design, the majority of the studies measured outcomes only immediately after the intervention, and reporters have typically been aware of participant condition and thus may have been influenced by an expectancy bias. However, a two-year follow-up of CODIP which utilized the ratings of teachers blind to condition indicated that intervention children maintained improved adjustment relative to the matched control group (Pedro-Carroll, Sutton, & Wyman, 1999). This study also had a significant methodological limitation in that assignment to condition was not randomized, instead a quasi-experimental design was used in which children from divorced families were matched with the intervention group on teacher, gender, and SES to evaluate intervention effects. Taken together, despite some significant methodological limitations the

preponderance of available evidence indicates that CODIP is efficacious in improving the adjustment of children of divorce. Similar to findings for CSG discussed previously, a component analysis of CODIP indicated a condition providing support alone was less effective than the full program which included both support and the presentation of coping skills (Sterling, 1986; as cited by Pedro-Carroll, 2005).

The New Beginnings for Kids program (NBP-K) was developed using a small theory approach with similar targets to that of the currently proposed intervention including active coping, avoidant coping, and negative appraisals of divorce stressors. The targets of the current intervention are in fact largely based on the work of Sandler and colleagues who are the authors of that intervention. The NBP-K program has been tested in one randomized trial; however, this trial employed an additive design which included the program only as a complement to the New Beginnings for Parents Program. Similar to the findings from Stolberg & Mahler's (1994) trial combining CSG with a parenting program, the New Beginnings trial indicated no additive effects for participant families conjointly enrolled in both parent and child programs. Though the parent-child combined program significantly improved adjustment as compared to the control group at post-test and six-year follow-up, no evaluation of the effects of child program in isolation was possible because this configuration wasn't administered. Thus, evidence for this program is inconclusive. However an evaluation of the efficacy of a related intervention, the Family Bereavement Program (FBP), indicated the

capacity of these strategies to improve child coping. A randomized experimental trial demonstrated that as compared to a literature comparison group, FBP improved children’s active coping and negative appraisals which mediated intervention related improvements in the internalizing symptoms of parentally bereaved girls (Sandler et al, 2003; Tein, Sandler, Ayers, Wolchik, 2006). These findings suggested that cautious modification and use of program activities from NBP-K and FBP could provide a partial basis for the development of CoD-CoD.

Table 1. Program Skills for Divorce Related Preventions Programs

	CSG	CODIP	NBP-K / FBP
Program Skills	<ul style="list-style-type: none"> • Identification of Emotions • Expression of Emotions • Problem-solving • Identifying controllable and uncontrollable events • Effective communication • Anger control and expression 	<ul style="list-style-type: none"> • Identification of Emotions • Expression of Emotions • Problem-solving • Identifying controllable and uncontrollable events • Effective communication • Anger control and expression • Normalization of divorce related feelings and events • Accurate Attributions about divorce events • Self-esteem building 	<ul style="list-style-type: none"> • Identification of Emotions • Expression of Emotions • Problem-solving • Identifying controllable and uncontrollable events • Effective communication • Anger control and expression • Normalization of divorce related feelings and events • Accurate Attributions about divorce events • Deep-breathing relaxation • Coping Efficacy • Self-esteem building

Although many child coping programs have been developed for children whose parents have divorced (Grych & Fincham, 1992; Geelhoed, Blaisure & Geasler 2001; Lee, Picard, & Blain, 1994), only the CSG and CODIP programs have demonstrated efficacy in randomized experimental trials. Despite their demonstrated efficacy, dissemination remains a significant impediment to these programs realizing their full impact on the total population of children experiencing parental divorce. Divorce support programs for children are offered in many school districts, churches, community organizations, and mental health centers yet it is likely that few of these are based on research supported models. For example, a review by Geelhoed and colleagues (2001) indicated that the majority of programs offered through the court system were delivered in one or two sessions. Few of these programs include the CODIP or CSG curriculum (Pedro-Carroll, 2005) which can cost up to \$500 per participant to provide (National Dropout Prevention Center/Network, 2009).

Developing effective strategies for disseminating efficacious programs is considered to be one of the most pressing issues prevention scientists currently face (Barrera & Sandler, 2006). Internet interventions present one promising approach to this issue. The availability of coping enhancement strategies from evidence-based group programs provide an opportunity to adapt these techniques to an internet-based program that can more easily be delivered to those who can benefit from it. CoD-CoD was created to provide such a program.

The Promise of Internet Interventions

Internet interventions offer several important advantages over traditional face-to-face interventions including the relative ease of dissemination, client determined access time, increased user anonymity in accessing services, minimal therapist time requirements, and high fidelity of program presentation and content. Taken together, these advantages address some of clinical psychology's most pressing issues in the current healthcare environment: how to get the most effective treatments, to the most people, with the least resources expended. Internet-based interventions may be particularly well suited to the needs of providers of prevention programs because they can be efficiently offered to large groups of people.

The proliferation of broadband internet connections in recent years has increased the accessibility of multi-media content and thus made internet interventions an increasingly viable alternative to traditional treatment strategies (Clark, Horan, Tompkins-Bjorkman, Kovalaski, & Hackett, 2000). The use of internet interventions is particularly appropriate for use with families as fully 93% of children aged 12-17 and 87% of their parents use the internet (Macgill, 2007).

Health care professionals have begun to recognize the potential impact of internet interventions, resulting in a sharp increase in the number of web-based or computer aided prevention and intervention programs available (Griffiths et al., 2010; Wantland, Portillo, Holzemer, Slaughter, & McGhee, 2004). These interventions have targeted a wide variety of physical and mental health disorders

including depression (Andersson, Bergstrom, Hollandare, Ekselius, & Carlbring, 2004; Clarke, et al., 2002), social phobia (Carlbring, et al., 2007), post-traumatic stress disorder (Knaevelsrud & Maercker, 2007), and panic disorder (Carlbring, Ekselius, & Andersson, 2003), as well as bulimia nervosa and binge eating disorder (Ljottson, et al., 2007). Computer-based preventative interventions (which are administered over a computer without using the internet) have also proliferated, with a wide array of foci including smoking cessation (Cobb, Graham, Bock, Papandonatos, & Abrams, 2005), violence prevention (Mauricio, Dillman-Carpenter, & Horan, 2005), and STD/HIV and Pregnancy prevention (Bull, Phibbs, Watson, & McFarlane, 2007).

Initial results from trials of internet interventions generally support their efficacy (Spek, et al., 2007; Barak et al., 2008; Griffiths, Farrer, & Christensen, 2010). Indeed, recent meta-analytic data has indicated that the effect size of internet-based intervention and prevention programs are similar to those obtained in traditionally delivered treatments (Barak et al., 2008). Individual studies making direct comparisons between internet delivered and traditionally delivered interventions also support this conclusion (Spence et al., 2011). However, methodological limitations such as small sample sizes, non-randomized assignment to conditions, use of non-active control conditions, limited outcome measures, and infrequent use of follow-up assessments cloud interpretation of the majority of internet-based intervention trials (e.g. Carlbring, Ekselius, & Andersson, 2003; Wilson, Revkin, Cohen, Cohen, & Dehaene, 2006; Barak et al.,

2008). The importance of the limitation of weak study designs is heightened by a recent meta-analysis by Kiluk and colleagues (2011) which found that lower methodological quality is associated with a greater likelihood of reporting significant main effects. This finding calls into question the fields otherwise promising early findings which as a whole support the efficacy of internet-based programs and underscores the urgent need for methodologically rigorous studies.

Several common problems have been identified in the implementation of internet-based interventions. Internet-based interventions commonly use recruitment methods such as mailed brochures or internet recruitment and the rates of recruitment for interventions using these methods are often quite low (Koo & Skinner, 2005; Clarke, et al., 2005). Rates as low 2.4 in 1000 have been reported for internet interventions using these methods (e.g. Clarke, et al., 2005). Another extremely common problem is that of low program completion rates (Richardson, Stallard, Velleman; Wantland et al., 2004). For example Buller and colleagues reported a completion rate of just 18.6% in their smoking prevention program targeting adolescents (Buller et al., 2006). Waller and Gilbody's (2009) systematic review of computerized CBT program's found an average completion rate of just 56%. The use of intervention programs featuring interactive content and mailed reminders to prompt participants to use the intervention may partially address this concern (Ritterband et al., 2003; Wantland et al., 2004; Clarke et al., 2005). Relatively simple and inexpensive implementations of these techniques can be quite effective. In Clarke and colleagues second trial of their depression

intervention (ODIN) they were able to increase the mean number of log-ins for the program from 2.6 in the first trial to 5.9 in the second trial using mailed postcard reminders three times over a period of 3 months (Clarke, et al., 2005). Providing modest incentives for program completion have also been found to effectively increase participation rates (Fridrici, Lohaus, & Glab, 2009).

Reviews of the Effects of Internet-based Interventions

Ritterband and colleagues (2003) reviewed twelve internet interventions which had been evaluated in randomized trials. These interventions targeted a variety of psychological (i.e. anxiety) and medical conditions (i.e. obesity). On the basis of their qualitative review the authors concluded that evidence from intervention trials supports the efficacy and feasibility of internet interventions as well as the potential for behaviorally related psychological treatments to be effectively translated to an internet-based format.

A meta-analysis conducted by Wantland and colleagues (2004) reached a similar conclusion. Their analysis included 22 studies with a total of 11,754 adult participants. These studies included interventions for medical (e.g. HIV/AIDS) as well as psychological (e.g. depression) problems. Inclusion criteria for this study included five areas: study design, selection and specification of the study sample, specification of illness\condition, reproducibility of the study, outcome specification and quality of outcome measurement instrument. Studies were rated on quality across these five areas on a 1-3 scale and included if their total score was exceeded 11. Six of the studies included in the analysis were non-randomized

trials. Sample sizes for the included studies varied dramatically with the smallest sample size of an included trial being 24 (12 controls and 12 intervention) and the largest being 4,876. Effect sizes for the studies ranged from -.01 to .75 with six of the studies having effect sizes that were statistically significant. Overall, the evidence from this meta-analysis indicates the promise of internet interventions though limits in methodology of the studies included in the analysis such as non-randomized trials and small sample sizes impede clear interpretation of the findings.

A more recent meta-analysis of internet-based cognitive-behavioral interventions for anxiety and depression by Spek and colleagues (2007) included data from 12 randomized control trials with a total of 2334 adult participants. This analysis is particularly relevant because, in contrast to the meta-analysis reported by Wantland and colleagues, the authors of this study only included randomized trials of interventions targeting psychological disorders that used validated measures of symptomatology such as the CES-D to measure outcome variables. The average effect size for the studies included in the analysis was between medium and large ($d = .60$). Five of the studies included in the analysis utilized a therapist support component (this was characterized by monitoring of site usage and providing feedback to participants in three of the studies with one study also including weekly therapist phone calls and another providing six group sessions in addition to the internet-based intervention). Studies including some therapist support had a large average effect size ($d = 1.0$) with those that did not exhibiting

a small (but statistically significant) average effect size ($d = .24$). The authors suggested cautious interpretation of this finding due to "substantial differences" in the treatment approach and symptoms targeted in the relatively small pool of studies included in the analysis.

This meta-analysis provides further evidence that internet-based interventions can be effective in reducing symptoms of psychological disorders. In particular, it suggests that cognitive interventions may be well-suited to adaptation to internet-based programs and, more tentatively, that therapist support may increase the effectiveness of these programs.

Barak and colleagues (2008) is the most recently published meta-analysis of internet-based programs. This study used broad inclusion criteria, including all empirical articles which examine the efficacy of online therapies. This resulted in the inclusion of 92 studies ($n = 11,992$) which examined the effects of 64 programs. This meta-analysis is particularly instructive because the authors tested several potential moderators of program effects. They reported that intervention effect sizes vary as a function of type of measures used (e.g. behavioral observation vs. self report), the type of problem being addressed (e.g. anxiety vs. depression), theoretical approach (e.g. CBT vs. Psycho-educational), participant age, and website style (e.g. interactive vs. static).

More specifically, this analysis found that effect sizes were larger for CBT approaches, programs utilizing interactive web-sites and when trials included expert evaluations rather than self-ratings of symptomatology. Of relevance to the

current study, the analysis found a low average effect size for programs treating children under age 18 ($ES = .15$). However, in their discussion the authors noted that in light of the results reported by studies which emerged too recently to be included in their sample these results should be viewed cautiously. It is important to note that each of the moderated findings in the study are correlational. While they are helpful as indicators of potentially important factors in program and evaluation design, assumptions about the causal relationships suggested must be verified with experimental data before being relied upon.

Barak and colleagues' study also included an analysis of the subset of evaluations which included a comparison between internet-based and face-to-face therapy conditions ($n = 14$). The effect size found for each modality (.39 and .34 respectively) were not significantly different from each other. This finding is consistent with other meta-analytic data and later studies which suggest that internet-based approaches yield improvements that are equivalent in size to traditional interventions. In contrast to the moderational analyses reported in the study that were discussed earlier, these effects were culled from studies which experimentally compared internet-based to face-to-face therapy, so this finding can be relied upon with more confidence.

Another important finding of this meta-analysis was that effect sizes of the internet interventions did not vary as a function of the latency between the end of the intervention and the measurement point. The ES for post-test assessments was .52 whereas the measured effectiveness at follow-up was .59. This finding

supports the conclusion that internet-based interventions typically engender stable improvements in mental health.

In 2010, Griffiths and colleagues published a review of randomized control trials (RCTs) of internet-based interventions for depression and anxiety disorders. This review included 26 trials, all employing a CBT treatment modality, with 23 of the 26 reporting some effectiveness relative to controls. Program effect sizes ranged from .42 to .65 for depression and .29 to 1.74 for anxiety. The authors of this review noted the rapid and steady growth in the yearly prevalence of RCTs of internet-based treatments for anxiety and depression in the literature. For example, a similar review by the same authors conducted in 2007 yielded only 10 trials. By June of 2009 26 trials met criteria for review. Thus in less than 3 years the field had more than doubled its previous volume. A limitation of the findings from this review is that of the 26 studies the authors reviewed, only 2 of them targeted children or adolescents.

Another limitation of the studies in this review is the widespread reliance on inactive control groups. Of the 26 studies examined, only 6 included an active control group which consisted of a relevant psychoeducational program. Though the authors did not statistically examine the difference in effect size for programs comparing the treatment group to an active control, it is noteworthy that of the 26 studies included in the review, two of the three which did not report program effects used a psychoeducational control. This may be because psychoeducation is an active intervention for depression. The one study which compared such a

condition to an attention control found a significant program effect of the psychoeducational group (Christensen et al., 2004). Of the 20 studies which did not utilize an active control group, 17 used a waitlist control.

Effect sizes reported by prevention programs in the review (ES = .30-.53) were somewhat lower than those for treatment studies (ES = .42-.65) though this difference was not assessed for statistical significance. Similarly to the conclusions made in Barak and colleagues (2008) meta-analysis, the authors conclude that the effect sizes associated with the internet-based programs included in the review were "at least as large as those reported in recent meta-analyses of psychological treatment in primary care ($d = .31$) and antidepressant treatment of depression ($d = .37$)."

Kiluk and colleagues (2011) conducted a methodological analysis of RCTs of computer-assisted interventions (72% of which were internet-based) which raised concerns about the conclusions of prior meta-analyses of internet-based programs. In their study of 75 trials targeting adult populations published between 1990 and 2010 the authors found that none of the studies met all 14 of the basic quality criteria they had identified. The most consistent weaknesses were in evaluating program participation, inclusion of follow-up assessments, use of assessment methodology other than self-report measures, conformity to intent-to-treat principles, and inclusion of active control groups rather than wait list controls. This last feature is particularly striking in that 88% of the trials that used a wait list control group reported significant program effects while just 48% of

trials utilizing an active control condition reported significant effects. This discrepancy was statistically significant. Conformity to intent-to-treat analysis principles is also of primary concern as only 13% of the studies included true intent-to-treat analysis. Instead, authors frequently relied on inadequate methods such as carrying forward the last observation. The authors conclude that this practice combined with differential attrition across conditions "likely led to biased finding in many cases."

Overall, the authors conclude that much of the research on computer assisted interventions falls short of current standards for evaluating the efficacy of behavioral and pharmacological therapies and that there is no clear evidence that the methodological quality has improved over time. The results of this analysis once again confirm the urgent need for methodologically rigorous efficacy trials of internet-based programs for both children and adults.

Internet-based Interventions for Children and Adolescents

While there are indications that children and adolescents frequently turn to the internet as a source of support, relatively few internet-based programs for the prevention or treatment of mental health problems of children have been developed or evaluated (Barak et al, 2008; Oltjenbruns & James, 2006; Griffiths et al., 2010). Despite this relative scarcity in the total number of studies of internet-based programs for children and adolescents, there has been a tremendous increase in the number of studies in recent years (Richardson, Stallard, & Velleman, 2010). For example, as of 2005 only one trial of an

internet-based program targeting depression or anxiety in children or adolescents existed in the literature. This trial (Vorhees et al., 2005) was a pilot study of the depression prevention program Project CATCH-IT which included just 14 participants all of whom were assigned to the intervention condition. The field has advanced significantly since that point and as of this writing there are six separate programs addressing this same target population and evaluations of these six programs have been reported in 12 published studies (Calear & Christensen, 2010; Richardson et al., 2010).

Though internet-based treatments for children have now been used to address a variety of presenting problems including eating disorders (Brown, Winzelberg, Abascal, & Taylor, 2004; Pretorius et al., 2009), smoking cessation (Buller, et al., 2006), pediatric encopresis (Ritterband et al., 2003), and alcohol abuse (Schinke et al., 2005), the treatment and prevention of internalizing problems is the most well developed research area for internet-based programs serving children and adolescents. Two recent reviews of this area each concluded that internet-based programs have shown promise as a potentially effective method for reducing internalizing symptoms in children and adolescents (Richardson, Stallard, Velleman, 2010; Calear & Christensen, 2010). However the reviews of these studies note serious limitations in the literature such as the lack of studies using randomized control designs, inadequate assessment of user satisfaction, infrequent use of follow-up assessments, and the absence of moderational analyses examining the influence of factors such age, gender,

ethnicity, and problem severity on program effects (Richardson, Stallard, Velleman, 2010; Caelear Christensen, 2010).

Like internet-based programs for adults, program attrition is a very common problem for programs targeting children and adolescents. Program completion rates in the 30-40% range are quite common in efficacy trials with this population (Richardson, Stallard, Velleman, 2010; e.g. Gerrits et al., 2007; O'Kearney, 2009; March et al., 2009) even in studies conducted in controlled environments such as a school setting (e.g. O'Kearney, 2006).

While neither the Richardson et al. (2010) or Caelear & Christensen (2010) reviews mention the issue of control group modalities in their discussion of the field, it is noteworthy that none of the reviewed studies included an active control group. Rather studies which included a control group relied on wait-list or no intervention controls. Similarly to research on internet-based programs for adults, this weakness is particularly concerning in light of data suggesting that the use of non-active control conditions in trials of computer-assisted interventions may result in effects that are biased toward detecting program effects (Kiluk et al., 2011).

It is interesting to note that in contrast to the rapidly increasing number studies regarding the efficacy of internet-based programs for reducing child and adolescent internalizing problems, to the author's knowledge there are no published studies of internet-based programs for externalizing problems. The reason for this gap in the literature is unclear. It is notable that Cognitive-

Behavioral Therapy (CBT) has been the major treatment model tested in the internet-based programs evaluated thus far. It may be that CBT (which is closely associated with the treatment of internalizing problems) is perceived as being more amenable to the capabilities and limitations of an internet-based program than the most common treatment modalities for disruptive behavior (e.g. parent training). The current study will be the first efficacy trial of an internet-based intervention to target the reduction of disruptive behavior problems in addition to internalizing problems.

To date there have been three internet-based programs targeting the reduction of mental health problems in children and adolescents which have been tested using randomized trials. The literature evaluating each of these programs will be evaluated and the implications of these results for the current study will be discussed.

Project CATCH-IT

Vorhees and colleagues have published three trials of their depression prevention program Project CATCH-IT. The first of such studies was a (2005) pilot study with 14 participants ages 18-24 recruited through a primary care practice. All participants were assigned to complete the intervention (no control condition was included in the trial) during a motivational interview administered by a primary care physician. Participants were offered \$100 in compensation for completing the program and eight of the fourteen participants (57%) completed the 11 internet-based modules over an average period of eleven days. The mean

time participants spent per session was 41 minutes with the entire intervention requiring an average of 145 minutes to complete (Vorhees, Ellis, Stuart, & Fogel, 2005). Participants reported relatively low average satisfaction with the internet intervention (5.9 out of a possible 10).

In 2008 Voorhees and colleagues published their second trial of Project CATCH-IT. In this trial 84 adolescents aged (14-21) experiencing sub-threshold depression were randomized to receive the intervention program plus either brief advice (1-2 minute interview) or a motivational interview (5-15 minutes) from their primary care provider. The primary purpose of the motivational interview was to increase participant motivation and engagement by helping participants develop a personal rationale for completing the program. Participants in the motivational interview condition also received 3 motivational phone calls during the course of the program. No control condition was included in the study.

Participant program participation rates in this efficacy trial were similar to those observed in the authors' pilot study though program completion rates were not reported. Across the brief advice and motivation interviewing condition the percentage of participants visiting the site (77.5 and 90.7) and the percentage of modules completed (37.7 and 50.0) were statistically equivalent. Mean time spent on the site did differ significantly by condition (143.7 minutes vs. 98.4 minutes), suggesting the possibility that a brief motivational interview with a healthcare provider prior to the start of an online program, motivational calls made during the program, or the combination of both factors may increase user engagement.

Interpretation of the results regarding the program's efficacy in reducing depressive symptomatology is made difficult by the lack of a control comparison group. The authors report significant reductions in depressed mood across each intervention condition. However, the sample was recruited based on initially high levels of depressive symptomatology, making alternative explanations such as regression to the mean and natural remission quite viable.

A follow-up study reporting on program effects at 12-weeks was published in 2009. Though the limitations to the reported effects of the program over time remained, the authors found that participants in the motivational interview condition had significantly fewer depressive episodes than their counterparts who received brief advice prior to the program. This finding supports the use of motivational interviewing prior to program participation and motivational calls during the program participation period. Further study of these elements is warranted to delineate their individual and combined effects on program participation and program effects.

Project CATCH-IT is freely available to the public at <http://catchit-public.bsd.uchicago.edu/>.

BRAVE Online

The research team studying the BRAVE Online anxiety treatment for children and adolescents have published one pilot study and two efficacy trials to date (Spence et al., 2008; March et al, 2009, and Spence et al., 2011). This program was derived from an evidence-based treatment program for anxiety

based on CBT that was previously shown to significantly reduce anxiety symptoms and disorders (Spence et al., 2006). BRAVE Online is delivered over the course of ten 60-minute sessions and six 60-minute parent sessions as well as two booster sessions at 1-month and 3-months after program completion. Participants are provided with an "online therapist" who tracks their progress through the program and provides advice and feedback via regular e-mails and a 30-minute mid-program phone call which is used primarily to establish an exposure hierarchy. The online therapist is introduced to participants via a 30-minute introductory phone call prior to beginning the program and also through an online activity in which participants view a short biography of their online therapist and then complete an activity where the participant and therapist exchange information about themselves through a series of guided questions. The in program therapeutic presence of the online therapists is through a combination of automated and therapist-enacted means. Two automatic e-mails regarding participant progress are personalized with the participants and therapists name and sent automatically as part of the program and do not require therapist input. Participants are also given automatic feedback during their program which is personalized with their name and the name of their therapist. Online therapists also generate personalized feedback each week which is provided to participants via e-mail on participant. These e-mails generally require 10-15 minutes of therapist time to create and provide feedback on user responses during program activities as well as their performance on homework assignments.

BRAVE Online is provided in two versions. The first is intended for younger children ages 8-12 and the second for older children ages 13-17. While both programs deliver similar content, the program for adolescents has more complex text, advanced graphic, and a greater number of interactive exercises. Both programs use characters which appear throughout the program to model program points. Like Project CATCH-IT these models were characters developed by the program's creators rather than actual people.

BRAVE Online is notable for its inclusion of numerous components supporting user engagement such as the use of minimal text, heavy reliance on graphics, and the inclusion of interactive tasks, quizzes, and cartoon animations. There was also a heavy program emphasis on fostering a therapeutic alliance between the user and their online therapist through a variety of mechanisms which were described in detail above. The advantage of such an approach is that it represents an innovative method for addressing the issue of user engagement. The disadvantage is that while this method uses therapist time far more efficiently than traditional treatment approaches, it is also far less efficient than stand alone internet-based programs. This strategy may be more appropriate for treatment programs (which serve a smaller population of participants with more severe problems) than prevention programs (which serve a broader population that typically have less severe problems).

A pilot study of BRAVE Online which presented two case illustrations with positive results was published in 2008. Since that time two efficacy trials

have been published. The first of these (March et al., 2009) was a randomized control trial in which 73 participants with anxiety disorders aged 7-12 were assigned to either the intervention condition or a wait list control condition.

The program demonstrated small but significant effects whereby the program caused improvements in parent-reported anxiety symptoms and global functioning. A 6-month follow-up indicated that these gains were maintained and indeed the extent of improvement increased significantly. An important caveat to this finding is that after the initial post-test assessment the wait list condition was offered the BRAVE Online program and ceased to be a part of the study. In the absence of a control condition, comparisons from follow-up to post-test were made within the program condition, making it impossible to discount the possibility that these improvements occurred naturally rather than being caused by program participation.

A number of process variables were reported as part of the 2009 trial of BRAVE Online. At pretest the authors report that participants and their parents had strong expectancy for positive outcomes and for the credibility of the treatment approach. The lack of an active control group does not allow for testing whether the program effects are due to expectancy rather than program content. At post-test the authors reported that client satisfaction was moderate for both parents and children. The mean proportion of the program that children had completed at post-test was relatively high compared to similar internet-based programs (75%) but program completion rates for children in the trial were low

(33%). This rate of children completing the program had risen substantially at 6-month follow-up (62%).

A 2011 randomized controlled trial of BRAVE Online assigned 115 adolescents with clinical levels of anxiety ages 12-18 to participate in either BRAVE Online ($n = 44$), the clinic-based version of BRAVE ($n = 44$) which BRAVE Online was developed from, or a wait list control group ($n = 27$). A post-test assessment indicated that both the clinic and online versions of BRAVE were associated with significantly greater reductions in anxiety diagnoses and anxiety symptoms as compared to the wait list control group. As in the 2009 study, the wait list controls were offered BRAVE Online after the post-test and thus were not included in follow-up data. Follow-ups with both the BRAVE Online and BRAVE clinic group at 6-months and 12-months indicated no significant differences between these two conditions in their effects on symptom levels or anxiety diagnoses. Both groups demonstrated significant within group reductions in anxiety diagnoses and symptoms levels at 6-months and 12-months. A test of gender as a moderator of these program effects was not significant.

While interpretation of the findings the 2011 trial are obscured somewhat by the lack of an adequate control group at 6-month and 12-month follow-up, the fact that the clinic based version of BRAVE was previously demonstrated to be efficacious and that BRAVE Online did not differ significantly from this group at follow-up assessments is encouraging. At the 12-week assessment participants in the online and clinic-based versions of BRAVE were free of any

anxiety diagnosis in (18.2% and 20.5% of cases respectively) compared to the wait-list which had achieved total remission rate of only 3.7%. At 6-months the online and clinic version of BRAVE achieved 45.5% and 40.9% remission respectively and by 12-months these rates were 54.5% and 59.1%. These rates reported are similar to those found in follow-ups in other efficacy trials involving children and adolescents (James et al., 2008; Silverman et al., 2008). Despite these positive signs, the lack of an adequate control group does not allow discounting of natural remission as a cause of the decrease in anxiety. In addition the relatively small sample sizes of 44 participants per condition does not provide a high level of power to detect small differences between the treatment and on-line conditions.

There was no difference in the satisfaction levels across the two treatment conditions for children but parents reported being somewhat more satisfied with the clinic-based version of BRAVE. Overall both parents and children reported moderate to high satisfaction. The mean percentage of the program children had completed was 75% for the BRAVE Online condition and 83% for the clinic-based version of BRAVE. The percent of participants who had completed their entire program was 39% and 57% for the online and clinic-based conditions respectively. Neither difference was statistically significant. By the 12-month follow-up 57% of adolescents in the BRAVE Online condition had completed the program while 79% of those assigned to the clinic based version of BRAVE had completed the entire program. This difference was statistically significant. The

completion rates reported 2011 trial of BRAVE Online are similar to those reported in the 2008 efficacy trial of BRAVE Online with children ages 7-12. The BRAVE Online website can be found at <http://brave.psy.uq.edu.au/>.

Mood Gym

The Mood Gym program is a CBT based universal prevention program designed to reduce depression and anxiety in adults and adolescents. To date, two controlled efficacy trials (O'Kearney et al., 2006; O'Kearney et al., 2009) and one randomized controlled efficacy trial with adolescents (Calear et al., 2009) have been published. Each of these studies were conducted in a school setting. Mood Gym was originally designed for adults and has demonstrated efficacy with that population (Griffiths et al., 2004).

Mood Gym consists five self-directed modules each lasting 30-60 minutes. These modules are composed of interactive content, animated demonstrations, quizzes, and homework exercises which are designed to reduce dysfunctional thoughts, increase self esteem, and improve interpersonal relationships. Mood Gym is delivered in a classroom setting where the teacher introduces the program and guides and supports student use as needed.

The 2006 evaluation of Mood Gym (O'Kearney et al., 2006) took place in a private Australian single-sex high school for boys. This study included 78 male adolescents ages 15-16 years of age who were assigned to either the intervention condition ($n = 40$) or the school's typical health curriculum ($n = 38$). Assignment to condition was made at the classroom level with the first classes to complete

their normal curriculum assigned to the Mood Gym condition. In the full sample, no significant difference was found in depressive symptoms at post-test or 4-month follow-up. This absence of effects may have been partially due to extremely low rates of program completion in the intervention condition. Only 40% of the sample completed 3 or more of programs 5 modules. The average percentage of the program completed and percentage of participants experiencing the entire program were not reported. Analyses using the subset of participants who had completed 3 or more modules indicated a small to moderate reduction in depressive symptoms ($ES = .34$) though this effect was not sustained at the 4-month follow-up.

Similarly to the 2006 study, the 2009 evaluations of Mood Gym conducted by O'Kearney and colleagues took place in a private Australian single-sex high school. In this study 157 female students ages 15-16 were assigned to participate in either Mood Gym ($n = 67$) or their school's typical personal development curriculum on nutrition ($n = 90$). No significant intervention effects were present at post-test but a 5-month follow-up assessment found a moderate reduction in depressive symptoms ($d = .46$) and a large effect for participants with high baseline levels of depression ($d = .92$). Program attrition in this study was extremely high, with only 30% of participants completing 3 or more of the program's 5 modules. In the case of a universal prevention program such as Mood Gym, it might be assumed that participants for whom the content is not relevant are the most likely to attrite, thus explaining high dropout rates in both studies.

However, it is interesting to note that in the 2009 the authors found that study participants who completed 3 or fewer modules were significantly more depressed than those completing a larger proportion of the program.

The third efficacy trial of Mood Gym was also published in 2009 (Calear et al., 2009) and represented the first randomized trial of the program. Once again the program was offered in a school based setting those in this case a much broader pool of participants was recruited both in terms of the size of the sample ($n = 1,477$) and the number ($N = 30$) of schools included. In this study randomization occurred at the level of the schools. Schools were stratified on type (public vs. private) and location (urban vs. rural) and then randomly allocated to the intervention condition or a wait list control. This procedure resulted in 1,477 adolescents (651 male, 826 female) aged 12-17 from 30 schools randomized to experience either Mood Gym ($N = 14, n = 563$) or a wait list control ($N = 16, n = 914$).

Mood Gym significantly reduced anxiety symptoms in the overall sample at both post-test ($d = .15$) and 6-month follow-up ($d = .25$). Mood Gym did not significantly reduce depressive symptomatology in the full sample at post-test or follow-up. There was a significant effect on depressive symptoms for boys at both post-test ($d = .43$) and follow-up ($d = .31$). While these effects on anxiety and depression are small to moderate, they represent a potentially significant clinical effect in the context of a global prevention. The author's estimate that the number of participants needed to be treated to prevent a clinical case of depression is 14 to

18, indicating that on average approximately 2 cases of depression can be prevented for each class of boys the program is provided to. Though this study presents arguably the most rigorous efficacy trial of internet-based program for children to date, the use of a wait list control is a major limitation to the confidence that can be placed on the program's effects. It could be argued that the effects found were the result of expectancies or demand characteristics generated by being aware of receiving an intervention. This possibility is particularly concerning given the relatively small effects found in the overall sample. Despite these concerns, if such an effect did exist it would likely apply equally to both genders and to reports of anxiety and depression which is not consistent with the study's pattern of findings.

Program completion rates in the trial were higher than those reported in previous trials of Mood Gym with adolescents (62% of participants completed 3 or more modules vs. 30% and 40%). The mean percentage of the program completed was 63% with 32.7% of participants completing all five of the program's modules. These completion percentages are roughly in line with other internet-based mental health program for children.

The Mood Gym program is freely available at <http://moodgym.anu.edu.au/welcome>.

Summary

Despite some promising early indications of efficacy in both adult and child populations, there is a pressing need for adequately powered randomized

trials using an active control condition to clarify the viability of internet-based programs. Future trials of these interventions should also develop and test innovative solutions to the problems most commonly associated with trials of internet-based interventions, particularly with regard to low program completion rates. A trial of the CoD-CoD program can provide a significant contribution to the literature on internet-based interventions for children and adolescents by including an active control comparison group for the first time and testing innovative program and study elements which might improve rates of program completion. In addition this trial is the first use of an internet-based preventive intervention for children who have experienced the divorce of their parents.

The Children of Divorce Coping with Divorce Program (CoD-CoD)

Intervention Targets

A small theory approach was used to determine the skills and abilities targeted by the CoD-CoD program. A small theory approach identifies putative modifiable mediators as the targets of change in order to bring about a desirable change in some outcome. An intervention is then designed to improve the identified mediators (West & Aiken, 2007). Evaluation of the intervention tests both whether the program has successfully changed the targeted mediators and the targeted outcomes variables (West & Aiken, 1997). This approach has been identified as having several distinct advantages for program development and evaluation (Wolchik, Sandler, Weiss, & Winslow, 2007). The major advantage for program design is that intervention content can be focused on addressing the

specific modifiable domains previously identified as influencing the outcomes of interest. Small theory based intervention design also allow analyses which yield more information than a simple test of program efficacy. The major advantages for program evaluation are: 1) tests of the theoretical model provide an experimental test of associations identified by generative research, 2) core components that are essential to the program's efficacy are identified, 3) the evaluation results provide a framework for modifying future iterations of the intervention (West & Aiken, 1997; Sandler, Braver, Wolchik, Pillow, & Gersten, 1991; Sandler, West, Baca, & Pillow 1992). Putative mediators included in CoD-CoD's small theory will be informed by correlational research identifying modifiable mediators of the relation between divorce and children's outcomes.

Intervention Targets Identified by Correlational Research

A number of studies have examined correlates of mental health outcomes for children following parental divorce and several reviews have suggested potential modifiable mediators which could be targeted in interventions for children (e.g. Emery & Kelly, 2003; Grych & Fincham, 1992; Sandler, Wolchik, MacKinnon, et al., 2003). Most commonly, coping skills and cognitive attributions have been identified as potential targets (Grych & Fincham, 1992; Sandler et al., 2003). A review of this literature was used to define the intervention's putative mediators, which are summarized in Table 2.

One modifiable mediator identified by the literature is children's active coping strategies (Sandler, Tein, & West, 1994). Active coping involves

behavioral and cognitive strategies for dealing with a stressor and includes decision making, problem solving, and positive cognitive restructuring (Ayers, et al., 1996). Active coping has been demonstrated to be associated with reduced reports of anxiety, depression, and conduct problems in both cross-sectional and longitudinal studies with children of divorce (Sandler, Tein, & West, 1994; Krantz, Clark, Pryun, & Usher, 1985).

Avoidant Coping is another potentially modifiable factor identified by previous research. Avoidant coping, which includes behavioral and cognitive strategies used by the child to avoid the stressor, has been associated with negative outcomes in children of divorce as well as with children more generally (Sandler, Tein, Mehta, Wolchik, & Ayers, 2000; Ayers, Sandler, & Twohey, 1998). Use of avoidant coping strategies reduces feelings of coping efficacy, ultimately leading to poorer mental health (Sandler, et al., 2000). Children of divorce are often faced with chronic stressors outside their control (Amato, 2001) and it is logical to speculate that these uncontrollable stressors may make children of divorce more prone to adopting avoidant coping strategies. Therefore, in developing the CoD-CoD program particular emphasis was placed on providing healthier alternatives to avoidant coping strategies

Coping Efficacy, the belief that one can deal with the demands of a situation, has been shown to mediate both active and avoidant coping's relation to children's psychological problems in cross-sectional and longitudinal analyses (Sandler, Tein, Mehta, Wolchick, & Ayers, 2000). Convincing children that they

can effectively cope with divorce situations may be the key link in a coping based intervention. Based on their findings that coping efficacy mediates the relations between coping styles and mental health (Sandler, et al., 2000) the authors of the New Beginnings for Kids program (NBP-K) suggested that a failure to improve their participant's coping efficacy may have explained why NBP-K improved children's knowledge of effective coping strategies without improving the strategies the children used to cope with stressors (Wolchik, West, Sandler, et al., 2000).

Children's cognitive appraisals of divorce related events are another intervention target suggested by empirical work. Children who are more prone to appraising interparental conflict and divorce related events as being threatening or their own fault have consistently exhibited more internalizing and externalizing problems (Grych & Fincham, 1993; Grych, Harold, & Miles, 2003; Sheets, Sandler & West, 1996; Mazur, Wolchik, Virdin, Sandler, & West, 1999). One study found that negative cognitions regarding interparental conflict accounted for 21% of the relation between parental conflict in divorce and children's mental health problems (Lutzke, Sandler, MacKinnon, & Wolchik, 1995).

Table 2. CoD-CoD Putative Mediators

Putative Mediator	Description	Expected Effect	Refs
Active Coping (Increased)	Behavioral and cognitive strategies for managing a stressor (decision making, problem solving, positive cognitive restructuring, etc.	Reduce anxiety, depression, and conduct problems. Increased feelings of coping efficacy.	Sandler, Tein, & West, 1994; Krantz, Clark, Pryun, & Usher, 1985
Avoidant Coping (Reduced)	Behavioral and cognitive strategies used by the child to avoid a stressor.	Reduced depression, anxiety, and conduct problems. Increased feelings of coping efficacy	Sandler, Tein, & West, 1994; Sandler et al., 2000
Coping Efficacy (Increased)	Belief that one can deal with the demands of a situation.	Reduced internalizing and externalizing symptoms.	Sandler et al., 2000
Divorce Appraisals (More Positive)	Use of negative interpretations or positive illusions in appraising interparental conflict and divorce related events. Particularly interpretation of events as being threatening or their own fault.	Reduced internalizing and externalizing symptoms.	Mazur, et al., 1999; Sheets, Sandler, & West, 1996; Grych, Harold, Miles, 2003.

Skills and Techniques Used in Efficacious Programs

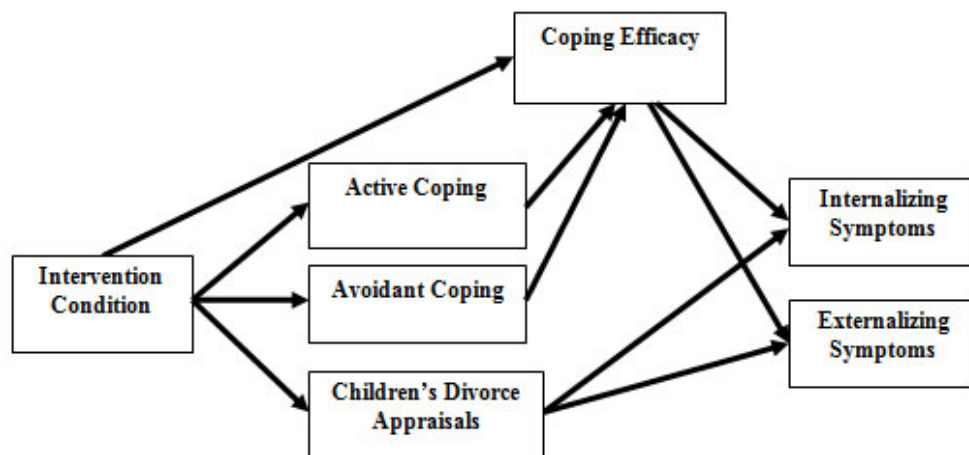
Child focused interventions have concentrated primarily on improving the child's ability to cope with divorce related stressors while providing a supportive group environment for learning and practicing program skills (Pedro-Carroll, Sutton, & Wyman, 1999; Stolberg & Mahler, 1994). For example, The Children of Divorce Intervention Program (CODIP) uses a group format to deliver modules

targeting communication, anger control, relaxation skills, and an affective unit on divorce related feelings and experiences (Pedro-Carroll & Cowen, 1985). CODIP demonstrated efficacy in improving outcomes in 9-12 year-olds across a variety of domains as rated by both teachers and parents (Pedro-Carroll & Cowen, 1985). None of CODIP's evaluation have included a mediational analysis identifying the mechanisms supporting the program's efficacy. Another program utilizing a combination of support and skill building, The Children's Support Group (Stolberg & Mahler, 1994) teaches skills similar to CODIP including identifying feelings, self-control and problem solving skills, identifying solvable and unsolvable problems, and anger control techniques. This program has demonstrated effectiveness in reducing internalizing and externalizing symptoms at post-test and 1 year follow-up. Like CODIP, no mediational analyses have been performed to assess if program induced changes in coping skills accounted for CSG's effects on mental health outcomes.

Taken together, the effectiveness of these two programs indicated the advisability of including program elements which encourage the identification and normalization of feelings, improvements in communication skills, increased anger control, the development of relaxation techniques, and use of a problem-solving system. It is not possible to identify which of the intervention skill components are the "active ingredients" in either of the two evidence-based interventions because mediational analyses have not been included in evaluations of either program. A component analysis was performed for both the CODIP and

CSG programs but in each case the study was designed to determine if the full program provided an advantage over a support only condition and not to clarify which program skills accounted for program effects on outcomes (Stolberg & Mahler, 1994; Sterling, 1986; as cited by Pedro-Carroll, 2005). For this reason, the basis for selecting the skills included in the CoD-CoD program was primarily their theoretical ability to address the putative mediators identified in the intervention's small theory.

Figure 1. CoD-CoD theoretical model.



Program Theory

The small theory of the CoD-CoD program (see Figure 1) is that the program will increase active coping and decrease avoidant coping which will lead to improved coping efficacy. Improved coping efficacy will in turn would lead to reduced internalizing and externalizing problems. The program was also hypothesized to have an independent direct effect to improve coping efficacy. In addition, program effects to reduce children's threatening divorce appraisals are

also theorized to lead to reduced internalizing and externalizing problems. Fostering an active coping strategy is one of the most common targets of interventions for children of divorce (e.g. Pedro-Carroll, 2005; Stohlber & Mahler, 1994; Sandler et al., 2000). The CoD-CoD program targets increased active coping by encouraging the use of problem-solving strategies to identify the best response to stressful situations, the use of cognitive positive restructuring to reduce negative cognitions about stressful events, and includes psycho-education about divorce and coping to encourage the participants' use of active coping strategies. The FBP program successfully increased parentally-bereaved children's positive coping using similar strategies (Tein et al, 2006).

Reducing avoidant coping is also a strategy commonly employed by evidence-based prevention programs for children of divorce. One method CoD-CoD used to decrease avoidant coping was to encourage feeling awareness and the appropriate expression of feelings. Another method of decreasing avoidant coping which CoD-CoD teaches is to replace its use with distraction coping. Distraction coping is distinguished from avoidant coping because it includes active seeking of a distracting activity to take the child's mind off of the stressor (Sandler, Tein, & West, 1994). Longitudinal research with children of divorce has indicated that distraction coping is associated with lower levels of depression and anxiety (Sandler, Tein, & West, 1994). The replacement of avoidant coping with distraction coping may be particularly important for children of divorce because they are faced with chronic stressors which are often uncontrollable. Emotion

focused strategies which reduce the negative emotions associated with stressors may be particularly useful. While both avoidant coping and distraction coping are emotion focused strategies, avoidant coping strategies have been related to lower feelings of coping efficacy (Sandler et al., 2001) whereas distraction coping strategies may provide the child a sense of control over their stress reaction despite being unable to control the stressor itself.

Increasing coping efficacy is a core aim of the proposed intervention. Coping efficacy has been shown to be positively associated with active coping and perceived controllability of stressors but negatively associated with wishful thinking and avoidant coping (Tsay, Halstead, McCrone, 2001; Sandler, et al., 2000).

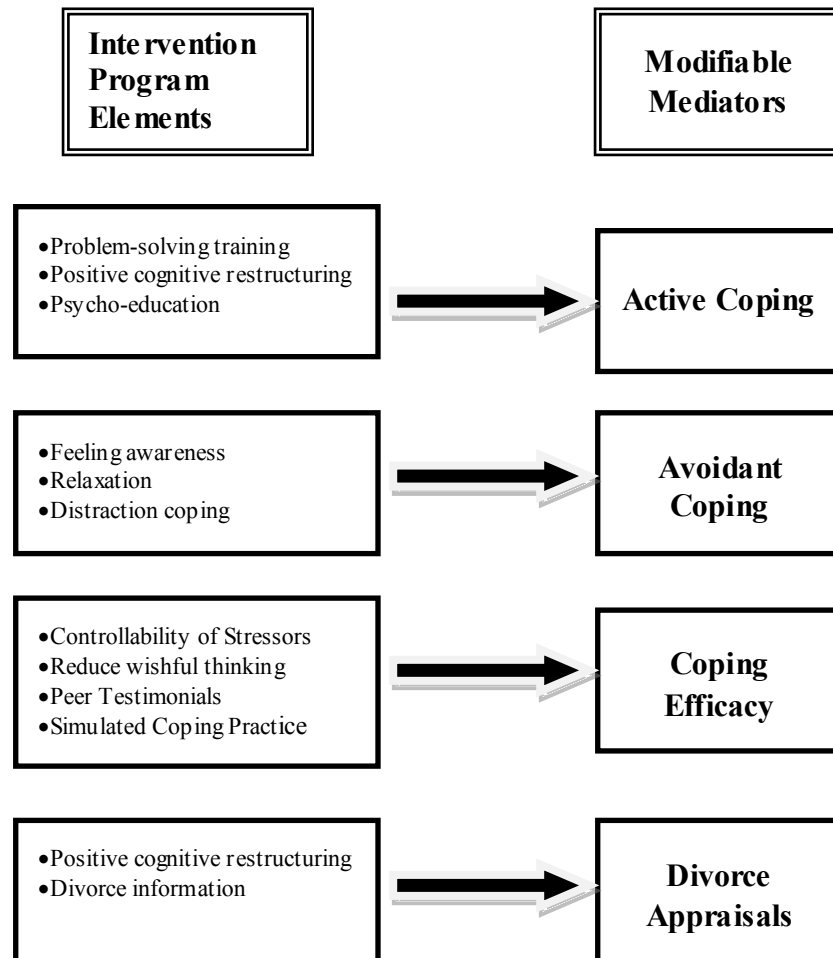
Bandura has theorized that efficacy beliefs are created from four principal sources: “enactive mastery experiences that serve as indicators of capability; vicarious experiences that alter efficacy beliefs through transmission of competences and comparison with the attainments of others; verbal persuasions and allied types of social influences that one possesses certain capabilities; and psychological and affective states from which people partly judge their capableness, strength, and vulnerability to dysfunction” (Bandura, 1997). Empirical work has demonstrated the importance of enactive mastery experiences in which the subject experiences success (Bandura, Adams, Hardy, & Howells, 1980).

The CoD-CoD program addresses coping efficacy both directly and indirectly. Coping efficacy is targeted directly through teaching the identification of controllable and uncontrollable events and instilling a belief that using the appropriate coping skills can reduce the stressfulness of any situation. This belief is fostered by CoD-CoD primarily in two ways. The first is through providing participants with opportunities to gain "enactive mastery experiences" as they put their new coping skills into action during in-program simulations of relevant situations and use program skills between modules to complete home practice tasks. The opportunity to increase coping efficacy provided by these program elements is augmented by the use of "verbal persuasion" through giving participants feedback which identifies and reinforces successes and providing unsuccessful participants with encouragement and suggestions for refining their skill use. Coping efficacy is also directly addressed in CoD-CoD through the use of video testimonial which provide "vicarious experiences" of coping efficacy. Video testimonials include both program leaders describing actual situations in which they have used the program skills successfully and videos of real world examples showing children successfully using program skills and describing their success experience. This stands in contrast to the techniques typically used in online programs for children and adolescents such as Project CATCH-IT and BRAVE Online where vignettes comprised of the hypothetical peer stories are used to illustrate program material. CoD-CoD relies primarily on documenting true examples because this approach is more closely aligned with the vicarious

experiences which alter efficacy beliefs described by Bandura (1997) and is more in keeping with the therapeutic principal of genuineness.

CoD-CoD's final putative mediator is divorce related threat appraisals. Children's appraisals of self-blame and perceived threat in conflict and divorce events have been found to relate to their level of mental health problems (Grych & Fincham, 1993; Grych, Harold, & Miles, 2003). To address these constructs, empirically supported interventions have universally provided children with non-threatening divorce related information that precludes the possibility of blaming children for parental divorce or parental conflict. They have also included exercises on positive cognitive-restructuring in order to decrease self-blame and threat appraisals. (Pedro-Carroll, 2005). CoD-CoD uses adaptations of the divorce related information provided by the available evidence-based programs to reduce participants' self-blame for divorce events and teaches positive-cognitive restructuring to reduce divorce related threat appraisals. A summary of the predicted effects of program components on each of the theoretical mediators is presented in Figure 2.

Figure 2. Links Between CoD-CoD Program Elements and Modifiable Mediators



Method

Participants

One hundred forty-seven children and adolescents (78 girls and 69 boys) who experienced parental divorce served as participants for this study.

Participants were recruited primarily through court records of divorce filings in a large Southwestern metropolitan county (1.4% were recruited through clinician referral). Family eligibility criteria included parents having filed for divorce within the past 4 years, having at least one child between the age of 11 and 16, availability of one parent who had at least one overnight per week to complete assessments, and the ability of the child to access the internet sufficiently to complete the intervention and assessments. Children who were currently participating in psychotherapy or who were anticipated to participate in psychotherapy during the trial were excluded from the study because of the program's preventative nature and to protect internal validity. Any children who met criteria in eligible families were invited to participate in the study.

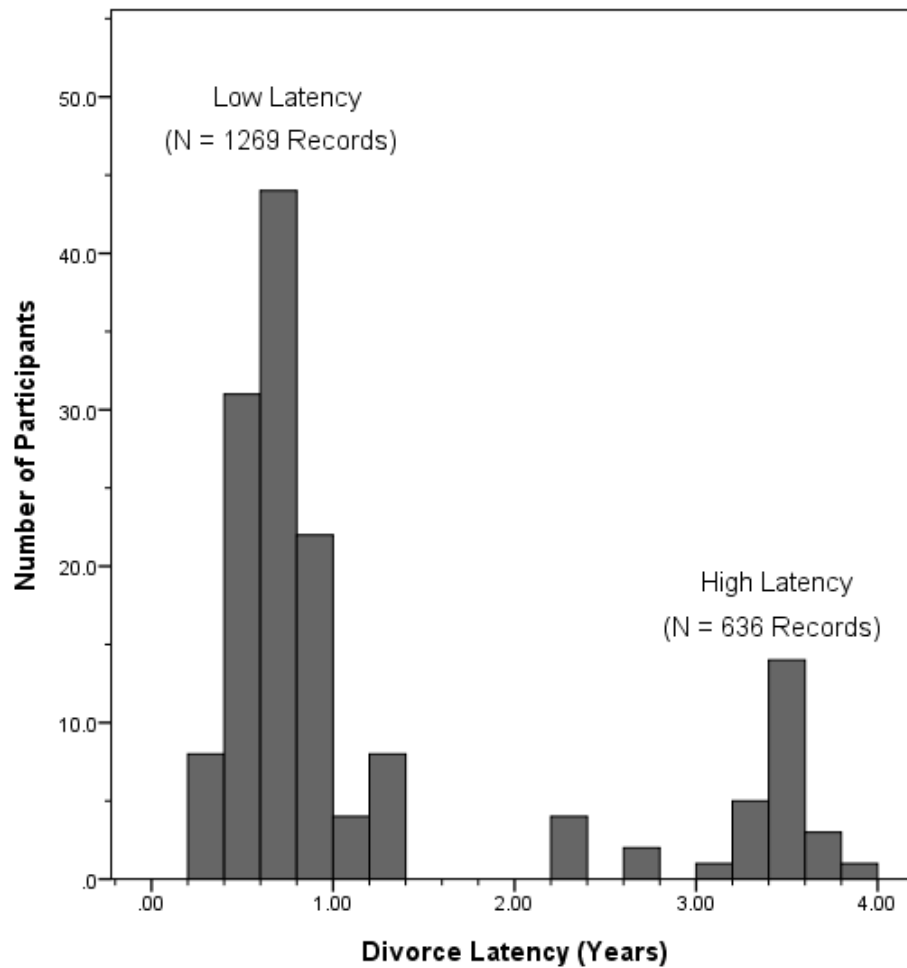
Both mothers and fathers were invited to serve as the participating parent in the study and families were able to include multiple children in the study given that each child met eligibility criteria. This resulted in 112 families participating in the study with 88 mothers serving as the participating parent for 116 child participants and 24 fathers serving as the participating parent for the remaining 31 child participants.

The ethnic composition of the sample includes 75.2% Non-Hispanic white, 15.8% Hispanic, 3.8% Non-Hispanic Black, 3.7%, 0.8% Native American,

and 1.4% other. The average age of the children participating in the trial was 13.78 (SD = 1.66). Average years of mother's education were 14.83 (SD = 2.94) and average years of father's education was 14.64 (SD = 2.95). The average time difference between parents initial divorce filing and the child's intervention start date was 1.23 years. However, because the records available for the recruitment procedure were split into two groups characterized by a low-latency group (3-16 months) and a high-latency group (25-45 months), divorce latency had bi-modal distribution in the current study (see figure 3). A second feature of this distribution is that there many more participants in the low-latency group ($n = 121$) than the high-latency group ($n = 26$). It is important to note that these two characteristics of the divorce latency distribution dramatically reduce the power to detect any effects which divorce latency may cause.

The bimodal distribution of latency since filing for divorce was due to three factors. First more records were gathered in the low-latency group (1364 vs. 818). Second, the low-latency group had a higher percentage of records which included accurate telephone numbers. Third, the percentage of participants willing to participate when contacted by telephone was higher for the low-latency group. Overall, the recruitment rates across these two groups were quite discrepant with the high-latency group yielding a much lower percentage of participants (2.9%) than the lower latency group number (9.4%).

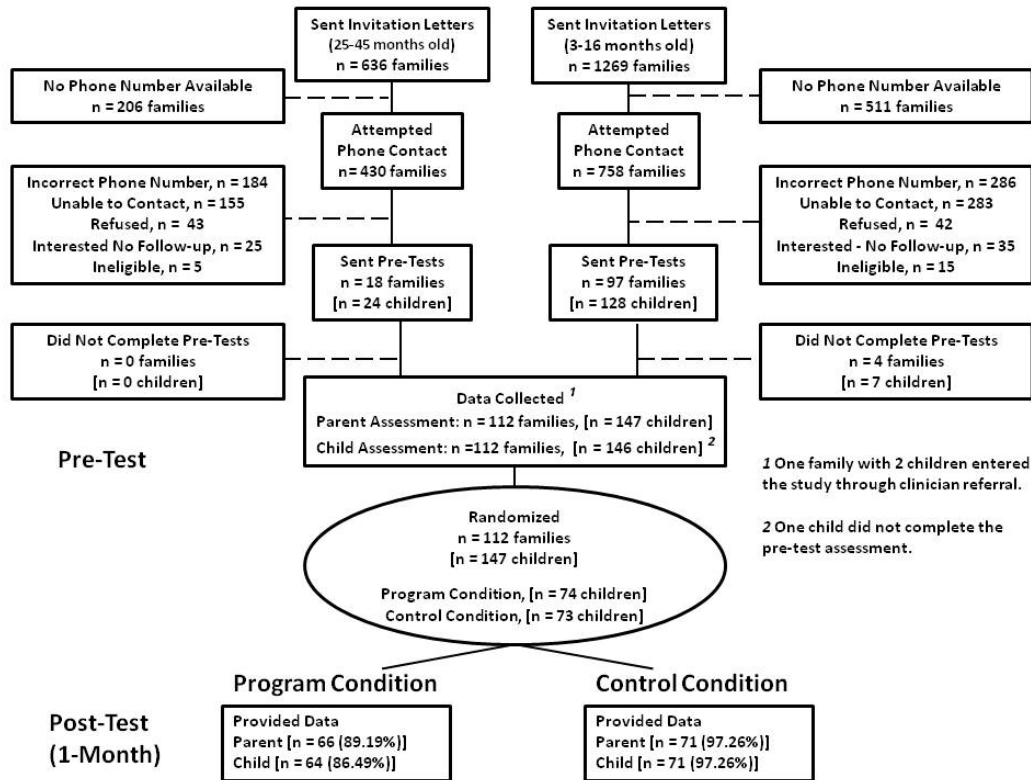
Figure 3. Frequency Distribution of Participants by Divorce Latency



Study Design

Children were assigned to either an internet-based prevention program (CoD-CoD) or to a control condition consisting of an internet self-study program (BTN) using block-random assignment. Blocks were defined using the child's parent-reported risk score as the criteria. Participants and their parents completed assessment batteries at pre-test and 1-month post-intervention. See figure 4 for details of results at each stage of the recruitment process.

Figure 4. Recruitment Flow Chart



Recruitment Methods

The parents of potential participants were identified through public court records and mailed letters describing the study. They were then contacted via follow-up telephone calls to request their family's participation in the study. Court records were gathered in two waves, the first occurred two years prior to the study and the second occurred while recruitment was ongoing. As a result, the divorce latency of these two groups was quite discrepant (see Figure 1). The rate of participants successfully recruited from records which met initial recruitment criteria (child age and divorce latency) was lower for the group with higher latency (3.8 participants per 100 records vs. 9.6 participants per 100 records).

Attrition Prevention

Six strategies were used to minimize attrition in the current study. 1) During the initial telephone screening participants and their parents were informed of the requirements of the study and were asked to verbally commit to fulfill those requirements. 2) Participants in the intervention and self-study groups were compensated with \$50 if they participated in the entire program to which they were assigned (compensation was prorated for partial program completion). 3) E-mailed reminders were sent to participants each week to review their progress and encourage continued participation in the assigned program. These reminders were generic but contingent on the number of modules the child had already completed as well as the number of weeks remaining in their 5-week program completion period. 4) If a participant was two-weeks behind schedule to complete their assigned intervention, their participating parent was contacted and encouraged to participate in their program. Only one call of this nature was made per child. Families were also contacted if their child was behind schedule to complete the program in the last week of their program period. 5) Participants and their parents were each compensated with \$10 if they chose to participate in their post-test assessment battery. 6) Participants who completed their assigned program were entered into a raffle for a free iPad in which they knew they would have at least a 1 in 150 chance of winning.¹ 7) All measures were completed

¹ Participants were informed that a maximum of 150 children would be enrolled in the study. The expected value of being included in this raffle (calculated as the probability of winning multiplied by the value of winning) was \$4.57 as 118 participants in the study completed their program.

online, minimizing participant burden in completing and returning each assessment.

The mean number of attrition prevention calls made to parents was .47 per child. Ninety-seven parents of children received no such calls, 31 received 1 call, and 19 received 2 calls. In both groups the majority of participants received no follow-up calls, however, CoD-CoD participants had a higher average number of calls (mean = .62, SD = .79) than BTN participants (mean = .32, SD = .60) because participants in this condition more often met the pre-determined criteria for follow-up calls. This was likely a result of the difference in time commitment required to complete the two programs (i.e. five 35-55 minutes sessions vs. two sessions of participant determined length). In the CoD-CoD condition 42 of 74 children received no calls, with 18 children receiving 1 call, and 14 receiving 2 calls. In the BTN condition 55 of 73 children received calls with 13 children receiving 1 call and 5 receiving 2 calls.

Assignment to Condition

Participants were ranked and matched on a previously validated measure of risk for children of divorce (Tein, Braver, & Sandler, 2009) and then randomly assigned to either the CoD-CoD or BTN conditions in blocks of two. The risk index that participants were matched on was a 15-item measure composed of items assessing child mental health problems and environmental stressors. This measure has been shown to be predictive of long term adolescent outcomes, accounting for 16.8% of the variance in child behavior problems six-years later

(Tein, Braver, & Sandler, 2009). The major advantage of the randomized block design is that it increases the statistical power of comparisons across conditions (Shadish, Cook, & Campbell, 2002) without compromising the advantages of random assignment. Block random assignment was carried out with a minimum of 4 and a maximum of 10 participants at a time based on the number of participants available at each wave of program assignment (mean = 7.75, SD = 2.05). A total of 124 participants were assigned using block random assignment with the remaining 23 participants assigned randomly to the CoD-CoD or BTN condition without blocking on risk. It was necessary to use random assignment without blocking on risk when the number of participants in the wave was lower than 4 or there was an odd number of participants to assign at the time the procedure was performed. When a wave contained an odd number of participants, one participant was randomly selected for random assignment without being blocked on risk. All random numbers used for the randomization procedures were obtained through www.random.org which generates true random numbers using an algorithm that incorporates atmospheric noise readings to create true random numbers (Kenny, 2005). True random numbers, which by definition must include a source of entropy in their creation, have several advantages over pseudo-random numbers created by deterministic algorithms such as the *RAND()* function offered by Microsoft Excel. Most importantly, they have no periodicities and are completely unpredictable (Kenny, 2005).

Data Collection Procedure

Participants were assessed in two waves to test the small theory of the intervention as well as the interventions effects on internalizing and externalizing behaviors (See Table 1). A pre-test assessment was given prior to assignment to condition in order to obtain baseline levels of symptomatology and risk. The post-test assessment occurred one month after the participants 5-week program period ended. At each wave, participants were measured on multiple domains by self and parent report. All measures were completed and submitted online, using a secure HTTP connection. This type of connection is commonly used to collect highly sensitive data such as credit card information, passwords, and social security numbers. Previous work with electronic versions of self-report instruments indicates that the results obtained are similar to those obtained using the traditional paper-based versions of the instruments and that participants may in fact report potentially sensitive information more accurately (Taylor & Luce, 2003; Wantland, et al., 2004).

Table 3. Measures by Assessment Period

Pre-Test	1-Month Post-Test Assessment
<p><u>Child Report</u></p> <ul style="list-style-type: none"> • Child Coping Strategies Checklist • Coping Efficacy Scale • Children’s Cognitions about Divorce Situations Scale • Strengths and Difficulties Questionnaire. <p><u>Parent Report</u></p> <ul style="list-style-type: none"> • Behavior Problems Index • Coping Efficacy Scale • <i>Risk Index</i> 	<p><u>Child Report</u></p> <ul style="list-style-type: none"> • Child Coping Strategies Checklist • Coping Efficacy Scale • Children’s Cognitions about Divorce Situations Scale • Strengths and Difficulties Questionnaire. • <i>Consumer Satisfaction Survey</i> <p><u>Parent Report</u></p> <ul style="list-style-type: none"> • Behavior Problems Index • Coping Efficacy Scale • <i>Consumer Satisfaction Survey</i>

**Italicized measures are administered at only one assessment period.*

Measures

Risk.

The 15-item risk index used in this study was developed by Tien, Braver, and Sandler (2009) as a brief measure based on the lengthier measure of risk created by Dawson-McClure, Sandler, Wolchik, & Millsap (2004). The index is composed of items measuring child mental health problems and environmental stressors. As previously stated, this measure has been shown to be predictive of long term adolescent outcomes (Tien, Braver, & Sandler, 2009). The risk index demonstrated adequate reliability in the current sample ($\alpha = .71$).

Putative mediators.

Child report.

Active and Avoidant Coping were measured using the 36-items child report Children's Coping Strategies Checklist—Revised (Program for Prevention Research, 1999). The 20-item active and 12-item avoidant scales from this checklist are supported by confirmatory factor analysis and demonstrated adequate reliability in the current study (Sandler, Tein, West, 1994; T1 Active Coping $\alpha = .86$; T2 Active Coping $\alpha = .92$; T1 Avoidant Coping $\alpha = .80$; T2 Avoidant Coping $\alpha = .86$). Coping Efficacy was assessed using the 7-item child-report Coping Efficacy Scale (Sandler et al., 2000). This scale has previously demonstrated adequate reliability and validity. Coefficient alphas in the current sample were .88 and .90 at T1 and T2.

Divorce related cognitions were measured using the Children's Cognitions about Divorce Situations Scale (Mazur, et al., 1999) which yields scales measuring negative cognitive errors and positive illusions. Both the negative cognitive errors and positive illusions scales have previously demonstrated validity and adequate reliability (Mazur, et al., 1999). Cronbach's alpha coefficients in the current study were .80 and .86 respectively at pre-test and .88 and .90 respectively at post-test.

Parent report.

No parent reported measures of child coping strategies, coping efficacy, or divorce-related cognitions analogous to the child reported measures of these variables are currently available. As such, the child-report Coping Efficacy Scale was converted for use as a parent report measure as an initial attempt to measure one of the studies putative mediators through parent report. For example, the child reported item "Overall, how well do you think that the things you did during the last month worked to make the situation better?" was converted to "Overall, how well do you think that the things *your child* did during the last month worked to make the situation better?" (emphasis added). Coping Efficacy was chosen because it was deemed to be the variable which parents could report with the greatest face validity as well as being the putative mediator most directly tied to child mental health problems by previous research (Sandler et al., 2000). Parent reported Coping Efficacy demonstrated reliability in the current study (T1 $\alpha = .93$;

T2 $\alpha = .94$) and was consistently correlated with other study variables in a theoretically consistent manner (see Table 8 and Table 9).

Intervention outcomes.

Child report.

Total mental health problems was measured using the 20-Item Strengths and Difficulties Questionnaire (SDQ) (Goodman, 2001; T1 $\alpha = .78$; T2 $\alpha = .85$). Externalizing problems were measured using the 5-item Conduct Problems subscale of the SDQ (T1 $\alpha = .61$; T2 $\alpha = .69$). Internalizing problems were measured using the 5-item Emotional Problems subscale of the SDQ (T1 $\alpha = .69$; T2 $\alpha = .72$). The SDQ has been used previously in clinical trials with children and has demonstrated adequate reliability and validity that is on par or superior to the Child Behavior Checklist (Goodman & Scott, 1999).

Parent report.

Total mental health problems were measured using the 32-Item Behavior Problems Index (BPI) (Peterson & Zill, 1986; T1 $\alpha = .93$; T2 $\alpha = .93$). Externalizing problems were measured using the 17-item Externalizing subscale of the BPI (T1 $\alpha = .90$; T2 $\alpha = .89$). Internalizing problems were measured using the 14-item Internalizing subscale of the BPI (T1 $\alpha = .89$; T2 $\alpha = .87$). The BPI was developed to measure behavior problems in children and adolescents and has demonstrated adequate reliability and validity (Peterson & Zill, 1986).

Implementation

A major concern in intervention evaluation is the fidelity of program implementation. Internet based interventions facilitate consistently delivering program elements as designed and thus a degree of implementation fidelity. However, they also present unique challenges to fidelity such as tracking participant usage.. In the CoD-CoD trial, participant usage was tracked through unique login IDs created for each participant which were used to monitor log-ins, time spent on the assigned website, and navigation through the intervention. In the program condition 68.9% of participants completed the entire program and the average number of modules completed was 3.83 (76.6% of the 5-module program). For the BTN condition 84.93% of participants completed the entire program and the average number of modules completed was 1.78 (89.04% of the 2-module program). In both the program and BTN conditions, a module was considered complete when users participated in the content quiz at the end of that module (these quizzes were not accessible until after participants completed the module or visited the website corresponding to the content quiz).

To ensure that participants experienced program material as intended, the program condition website was programmed to grant user's access to each activity in sequence. Thus, users were able to freely review activities they had previously completed but were granted access to the subsequent activity in the program sequence only after completing the activity prior to it. To the extent possible, individual activities were programmed in such a way that users were required to

complete each activity before being granted access to the next activity (discouraging users from skipping through activities without participating in them).

Internet Self Study Control Condition: Best of The Net (BTN)

Participants in the control condition were assigned to the "Best of The Net (BTN)" program. They participated in this program by logging in to the study website with their unique username and password and then navigating via the BTN program to two internet sites specialized in helping children cope with divorce. They were given the instruction to "go to each of the two websites and spend time using them. After going to each website, a quiz will appear when you login to your program that will ask you about what you learned." During the recruitment phone call participants were told to expect that it would take 2-3 hours to participate in BTN.

To determine the two websites included in the BTN condition, the search term "divorce help for kids" was entered in a Google search. Google is the most popular search engine on the internet and the search term was intended as a prototypical example of what a child experiencing parental divorce might use in an attempt to find helpful online resources (StatCounter.com, 2011). The two sites used in the BTN condition were listed among the top four sites addressing children (as opposed to parents) in the search results. The other two websites listed in the top four websites addressing children were primarily advertisements for group-based programs rather than being stand-alone resources for children of

divorce. Websites that ranked lower in the search results were not chosen because none offered help as comprehensive as the two sites ranked higher in the search results.

The first self-study condition site contains solely information and advice about coping with divorce related feelings and reactions (http://kidshealth.org/teen/your_mind/Parents/divorce.html). The second site contains hyperlinks to a number of websites which address the issue of divorce. These sites include discussion forums, divorce related activities, divorce related information, and stories written by children of divorce (<http://www.kidsturncentral.com/topics/issues/divorce.htm>). Visiting these two sites and completing a quiz related to their content was intended as a simulation of the experience a child may have while searching the internet for help coping with a divorce.

Preventative Intervention Condition: Children of Divorce-Coping with Divorce (CoD-CoD)

The Children of Divorce-Coping with Divorce (CoD-CoD) intervention consists of five modules which present information and teach skills that may favorably impact the program's putative mediators. As discussed previously, minimizing program attrition by maximizing user engagement and motivation was of primary importance in developing CoD-CoD. A multitude of strategies were employed to accomplish this task including: offering highly interactive content, inclusion of a user created program goal that was tracked through the

program, the use of two program guides who appeared in videos and provided narration throughout the program, maintaining a personal, informal, and humorous style throughout the program (e.g. through program guides' use of true personal stories to highlight program elements and the inclusion of "behind the scenes" footage in a number of the program videos), personalization of program material to the individual situations of program participants, including testimonials of children who had successfully used the program's communication skills, providing feedback on participant skill usage in simulated environments, and implementing a system for rewarding demonstrations of content relevant knowledge with advantages in a videogame provided at the end of each module. This is consistent with previous empirically supported programs targeting children of divorce which have incorporated game-like formats and emphasized the importance of increasing participant engagement (Pedro-Carroll & Cowen, 1985; Stolberg & Mahler, 1994).

The content contained in each module was informed by the content and activities utilized by other interventions developed for children of divorce and disrupted families including the Children's Support Group (Stolberg & Mahler, 1994), the Children of Divorce Intervention Program (Pedro-Carroll, 2005), New Beginnings for Kids (Wolchik, et al., 2002), and the Family Bereavement Program (Sandler et al., 2003). These programs have been largely cognitive-behaviorally based and have included well-established techniques such as positive cognitive restructuring and problem-solving training. Similarly to the New

Beginnings for Kids program, CoD-CoD used video modeling of the skills being taught by the program.

Table 4. Intervention Outline

<u>CoD-CoD Program Outline</u>	
<p>Module 1: Introduction</p> <ul style="list-style-type: none"> • Introduction to the Intervention Format • The Challenge of Divorce <ul style="list-style-type: none"> ○ Divorce stressors • Normalizing Divorce Experiences • Recognizing Feelings • How CoD-CoD Can Help <ul style="list-style-type: none"> ○ Stressful Situations ○ Difficult Feelings ○ Hiding Feelings <p>Module 2: Inside Tools</p> <ul style="list-style-type: none"> • Cognitive Restructuring <ul style="list-style-type: none"> ○ Divorce Appraisals ○ Doom and Gloom Thinking • Events, Thoughts, Feelings, and Actions • Information About Divorce • Relaxation • Using Distraction Coping 	<p>Module 3: Tools for Communication</p> <ul style="list-style-type: none"> • Identifying controllable and uncontrollable problems • 4-Steps To Good Communication • Problem solving vs. Support Conversations • How to initiate a positive discussion <p>Module 4: Problem-Solving</p> <ul style="list-style-type: none"> • Problem-solving training • Choosing Coping Strategies <p>Module 5: Integrating Program Skills</p> <ul style="list-style-type: none"> • Using Problem-Focused Coping • Summary of Skills Learned • Opportunity to Apply CoD-CoD Skills • Practicing Skills in the Real World

Results

Analytic Strategy

All intervention analyses were performed using an intent-to-treat analysis approach. Intent-to-treat analysis, which includes all available data from participants who have been randomized into a condition, is considered the gold standard in intervention research because it minimizes the effect of participant attrition on estimates of intervention effects (Lee, Ellenberg, Hirtz, & Nelson, 1991). The drawback to this approach is that it may provide an overly conservative estimate of intervention effects (Kazdin, 2003). In all cases, missingness in the data was handled using M-Plus's Full Information Maximum Likelihood (FIML) algorithm (MPlus 6th edition; Múthen & Múthen, 1998-2010). FIML has been demonstrated in Monte Carlo simulations to be superior to other common strategies for handling missingness (Enders & Bandalos, 2001).

Pretest Equivalence of Conditions

Tables 3 and 4 show the descriptive statistics of the studied variables at the pretest and posttest, respectively. All of the variables were within the acceptable range of skewness (≤ 2) and kurtosis (≤ 7), as suggested by West, Finch, & Curran (1995). The pretest equivalence of conditions was assessed using regression models. Due to the multilevel nature of the data, in which multiple children are nested within families, M-Plus was used to conduct multilevel analyses (Bryk & Raudenbush, 1992; Heck, 2001). None of the 17 comparisons approached significance at the $p \leq .05$ level (see Table 3).

Attrition

The rate of completion of the post-test was high across conditions, 89.2% in the Cod-COD condition and 97.3% in the self-study condition. Because attrition in the BTN group was quite low ($n = 2$) a chi-square test was inappropriate and Fisher's exact test was used to test equivalence in rates of attrition at post-test across the two study conditions. Fisher's exact test provides an exact test of the probability that data deviates from the null hypothesis rather than obtaining a probability derived from the sampling distribution as is computed in a chi-square test (Agresti, 1992). Thus Fisher's exact test is still valid when cells contain very few observations. The test indicated a marginally significant difference in attrition rates ($p = .09$).

The possibility of differential attrition across program conditions (that attrition status was related to one or more of the study variables) was assessed using analysis of covariance through the multilevel regression framework (MPlus 6th edition; Múthen & Múthen, 1998-2010) to compare the pretest scores of participants who attrited versus those who participated in the post-test. This analysis indicated that attrition status was not associated with any of the variables measured at pre-test. The two-way interaction procedure suggested by Jurs & Glass (1971) to examine the possibility that attrition status was related to one or more study variables depending on condition is not reported because two of the cell sizes are too small to allow a valid group x attrition comparison. For example,

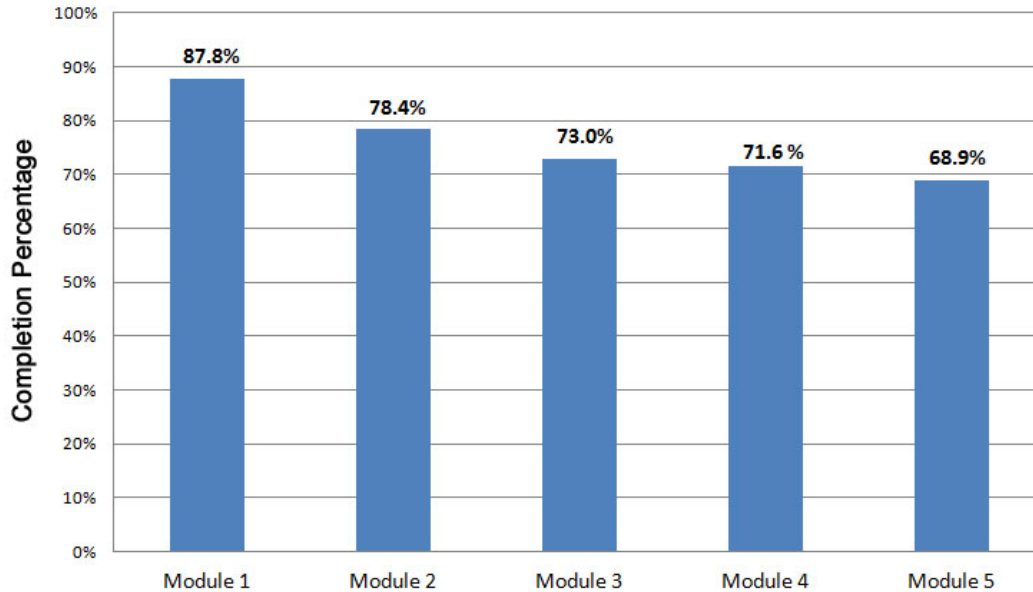
the cell consisting of attriters from the BTN condition is comprised of only two participants.

Fidelity of Program Implementation

An important aspect of fidelity is the extent to which participants experience all of the activities which the program is designed to deliver to them. The CoD-CoD program was designed to ensure sequential delivery of activities and this effort appears to have been successful as 100% of participants who completed a given module completed all the activities contained in that module. This measure of adherence was measured by the database connected to the program.

Fidelity was also assessed using module completion rates. For the CoD-CoD program module completion rates were fairly high throughout the program (see Figure 5), particularly when compared to the completion rates reported by other internet-based programs. Interestingly, the majority of participants attriting from the program did so either before the first module or before the second module (21.6% of participants) with remarkably low program drop-out between modules 2 and 5 (9.5% of participants). There were only 3 cases where a module was partially completed. Each of these cases reflected a participant who began the first module but did not complete it.

Figure 5. Percentage of Participants Completing Each Program Module



Because participants in internet-based interventions complete their program independently and are not monitored as they participate (for example by a group leader), it is particularly important to gather indicators of participant effort and engagement throughout the program as part of assessing implementation fidelity. These types of measures indicate that participants attended to the activities which they completed. One measure collected of participant effort collected during the CoD-CoD program is the participant's quiz score at the end of each module. These quizzes were designed to be challenging for participants in order to encourage them to pay attention during the modules. Participants scores on the quizzes were fairly consistent across module (See Table 5). The overall mean of correct answers across all quizzes was 71.4% (20.0%) which is roughly what might be expected of a child who was providing reasonable effort during the modules considering the difficulty of the quiz items. In the final

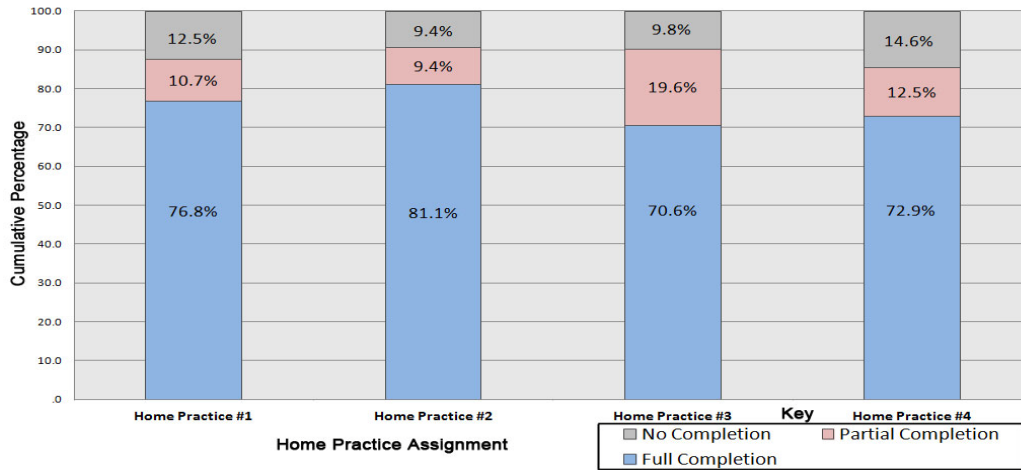
module, rather than including a content quiz, user's grasp of the program content was assessed using a video game. In this assessment, users completed a five-trial session of a challenging helicopter flying game and were then guided through using the program's problem-solving system to improve their score during a second five-trial session. All but two participants were successful in improving their score and the mean scores for trial 1 (mean = 179, SD = 181) and trial 2 (mean = 328, SD = 258) reflect this improvement.

Table 5. Mean CoD-CoD Program Quiz Scores

	Mean % Correct	SD
Quiz 1	74.9%	18.9%
Quiz2	75.0%	20.6%
Quiz3	67.3%	21.2%
Quiz4	68.4%	19.1%

The extent to which CoD-CoD participants completed their home practice tasks between modules was assessed as an indication of participant engagement with the program. This may be a particularly important measure of participant engagement because it indicates the user's willingness to attempt program skills in their day to day lives. Participants reported on the home practice from the previous module at the start of each module. Participants indicated whether they had completed all, some, or none of the home practice. Figure 6 illustrates the percentage of participants completing the home practice at each time point. Participation in home practice was quite high, with 85.4% - 90.6% of participants reporting that they had completed some or all of their Home Practice across the four modules where Home Practice participation was reported.

Figure 6. Home Practice Completion Rates by Assignment Period.



Fidelity of program implementation in the BTN condition was measured using participant use of each of the two websites provided to them and also their percentage scores on the content quizzes associated with each website. Program completion, defined as accessing each of the two program websites and completing each of the content quizzes associated with those sites was quite high in the BTN condition (91.8%). Quiz scores in the BTN condition were very similar to those obtained in the CoD-CoD condition with participants getting an average of 71.1% of their answers correct across the two quizzes.

Outlier Analysis

Screening for outliers was conducted in the regression framework using multiple indicators of outliers. Mahalanobis Distance was used as a measure of leverage in the multivariate equations; no data points met criteria as an outlier (Stevens, 1984). Difference in Fits (DFFITS) was used as a global measure of influence to determine how cases affect parameters of the overall regression model. Cohen et al.'s (2003) guidelines were used which suggest that cases with

DFFITs greater than or equal to one are selected for further analysis with Difference in Betas (DFBETAS). No cases had DFFITS greater than or equal to one. Finally, Cook's Distance was estimated using a cutoff of one (Cook, 1977; Stevens, 1984); no cases reached this cut-off. As a result of the outlier analysis, all cases were retained for the analysis of program effects.

Table 6. Descriptive Statistics and Pre-Test Equivalence of Groups on Wave 1 Demographic and Outcome Variables

Measure (Wave, Reporter)	<i>M (SD)</i>	Actual Minimu m	Actual Maximu m	Skew	Kurtosi s	<i>M (SD)</i> BTN	<i>M (SD)</i> CoD-CoD	P-Value ¹
1. Child Age (R)	13.78 (1.66)	10.86	16.99	0.09	-1.08	13.89 (1.71)	13.69 (1.63)	.49
2. Child's Gender (R)	.47 (.50)	0.00	1.00	0.12	-2.01	.49 (.50)	.45 (.50)	.58
3. Divorce Latency (R)	1.23 (1.08)	0.26	3.81	1.46	0.48	1.27 (1.10)	1.19 (1.07)	.65
6.Active Coping (C)	2.49 (.52)	1.26	3.95	0.13	0.07	2.45 (.56)	2.52 (.47)	.37
7.Avoidant Coping (C)	2.50 (.58)	1.25	3.83	0.05	-0.86	2.48 (.57)	2.52 (.59)	.39
8. Coping Efficacy (C)	2.85 (.65)	1.14	4.00	-0.25	-0.35	2.82 (.70)	2.88 (.60)	.54
9. Positive Illusions (C)	3.22 (.69)	1.20	4.60	-0.22	-0.20	3.25 (.67)	3.18 (.71)	.59
10. Negative Errors (C)	1.92 (.62)	1.00	3.75	0.81	0.28	1.95 (.62)	1.89 (.62)	.59
11. SDQ - Total (C)	1.56 (.28)	1.00	2.30	0.29	-0.35	1.56 (.28)	1.57 (.28)	.88
12. SDQ - Conduct (C)	1.43 (.37)	1.00	2.60	0.66	-0.09	1.43 (.37)	1.43 (.36)	.94
13. SDQ - Emotional (C)	1.69 (.47)	1.00	3.00	0.46	-0.62	1.69 (.49)	1.69 (.46)	.99
14. SDQ - Hyperactivity (C))	1.75 (.48)	1.00	3.00	0.25	-0.68	1.75 (.45)	1.75 (.52)	.97
15. Risk (P)	1.63 (.26)	1.00	2.40	0.30	0.00	1.62 (.26)	1.64 (.26)	.68
16. Coping Efficacy (P)	2.86 (.67)	1.00	4.00	-0.38	0.05	2.86 (.65)	2.86 (.68)	.95
17. BPI - Total (P)	1.45 (.33)	1.00	2.63	0.89	0.79	1.44 (.34)	1.45 (.33)	.81
18. BPI - Externalizing (P)	1.47 (.36)	1.00	2.88	1.03	1.37	1.46 (.36)	1.49 (.37)	.59
19. BPI - Internalizing (P)	1.40 (.37)	1.00	2.64	1.05	0.71	1.41 (.38)	1.40 (.36)	.86

Note: P = Parent Report; C = Child Report; R = Court Records; Child Gender: 0 = Female, 1 = Male.

¹P-Value Difference = P-values for test of pre-test equivalence across study conditions for each variable.

Table 6. Descriptive Statistics of Wave 2 Outcome Variables

Measure (Wave, Reporter)	<i>M (SD)</i>	Actual Minimum	Actual Maximum	Skew	Kurtosis
1. Active Coping (C)	2.58 (.60)	1.05	3.95	0.13	-0.10
2. Avoidant Coping (C)	2.40 (.60)	1.00	4.00	0.11	-0.16
3. Coping Efficacy (C)	2.94 (.65)	1.14	4.00	-0.30	-0.31
4. Positive Illusions (C)	3.21 (.79)	1.13	4.80	-0.41	-0.04
5. Negative Errors (C)	1.79 (.65)	1.00	4.15	1.02	0.67
6. SDQ - Total (C)	1.52 (.32)	1.00	2.65	0.68	0.33
7. SDQ - Conduct (C)	1.38 (.38)	1.00	2.60	1.08	0.56
8. SDQ - Emotional (C)	1.58 (.46)	1.00	2.80	0.81	-0.06
9. SDQ - Hyperactivity (C)	1.74 (.51)	1.00	3.00	0.25	-0.81
10. Coping Efficacy (P)	2.97 (.70)	1.00	4.00	-0.53	-0.25
11. BPI - Total (P)	1.35 (.31)	1.00	2.67	1.46	2.55
12. BPI - Externalizing (P)	1.39 (.35)	1.00	2.82	1.42	2.41
13. BPI - Internalizing (P)	1.29 (.32)	1.00	2.50	1.48	1.91

Note: P = Parent Report; C = Child Report

Analytic Procedure to Test Program Main and Interactive Effects

As discussed previously, because the data structure fits the paradigm of a multilevel model in which multiple children are nested within families, the M-Plus program was used to conduct multilevel analyses (Bryk & Raudenbush, 1992; Heck, 2001).

Analysis of covariance through the multilevel regression framework (MPlus 6th edition; Múthen & Múthen, 1998-2010) was used to compare the posttest scores of participants in the COD-COD versus BTN condition, using baseline scores and risk as covariates. For each analysis, the moderation models were first tested to examine if there were differential program effects based on baseline levels of the dependent variable, risk score, child age, child gender, or divorce latency (i.e., test the hypothesis that the slopes were equal for the two groups). When the hypothesis was not rejected, a common slopes (main effect) model was used and the adjusted means of the conditions used. When a variable significantly moderated an effect, slopes of the two conditions were plotted and the program effect was calculated by comparing the adjusted means at each 10th percentile on the pre-test score (e.g., 10%, 20%, to 90%) using $t = 1.96$ (i.e., $p \leq .05$) as an index of significance in a manner consistent with that described by Sandler, et al. (2003). If $t = 1.96$ fell between two testing points, the significance of group differences was tested at the midpoint of the two points. Similar to the Johnson–Neyman technique (Aiken & West, 1991), this procedure indicates the point on the pretest beyond which the posttest scores of the groups differ

significantly, and also provides information about the percentage of the sample in the range where the groups differ significantly. The Johnson–Neyman technique could not be used because of the multilevel nature of the data.

For program effects that were statistically significant, an estimate of the standardized effect size, Cohen's d , was calculated using procedures described by Rosenthal (1994). For analyses with common slopes (i.e., program effects that were the same for all the subjects), each effect size represents the magnitude of the program effect on the given variable. For analyses that contain significant Program x Baseline or Program x Risk interactions, the magnitude of effect size varies as a function of the participant's baseline or risk score. The effect size at the point 1 SD above or below the mean of the moderating variable is presented when the effect is significant at that point.

Program Effects on Mediators and Outcomes

Analysis of moderation indicated that three of the five moderators examined (child gender, child age, and divorce latency) did not significantly moderate program effects on any of the study variable. Tests of the Program X Baseline and Program X Risk interactions each yielded two significant moderation results. Table 1 presents the results for the analyses of the Program, Program X Baseline, and Program X Risk interactions on posttest mediator and outcome variables.

Table 8. *Main Effects of CoD-CoD and Moderated Intervention Effects at Post-Test*

Measures	Main Effect		Baseline x Group Effect		Risk x Group Effect	
	<i>Regression weight</i> (Cohen <i>d</i>) ¹	<i>p</i>	<i>Regression weight</i> (Cohen <i>d</i>) ¹	<i>p</i>	<i>Regression weight</i> (Cohen <i>d</i>) ¹	<i>p</i>
Mental Health Problems						
<u>BPI (Parent Report)</u>						
Total Problems	-.02	.69	-.26	.10†	-.40	.04* ¹
Externalizing Problems	-.005	.92	-.26	.11	-.36	.06†
Internalizing Problems	-.03	.48	-.16	.37	-.44	.04* ¹
<u>SDQ (Child Report)</u>						
Total Problems	-.08 (<i>d</i> = .37)	.03*	-.24 (+1SD, <i>d</i> = .46)	.02*	-.22	.21
Conduct Problems	-.09	.07†	-.09	.52	-.19	.30
Emotional Problems	-.13 (<i>d</i> = .37)	.03*	-.06	.55	-.23	.41
Hyperactivity Problems	-.07	.32	-.19	.14	-.30	.26
Mediating Variables						
<u>Parent Report</u>						
Coping Efficacy	-.05	.60	-.18	.14	.54	.15
<u>Child Report</u>						
Coping Efficacy	.115	.19	-.30 (-1SD, <i>d</i> = .39)	.03*	.76	.05†
Active Coping	.01	.90	-.42	.06†	.12	.65
Avoidant Coping	.02	.76	.03	.82	-.33	.26
Divorce Cognitions - Positive Illusions	.15	.14	.23	.08†	.64	.18
Divorce Cognitions - Negative Errors	.02	.84	-.06	.70	-.61	.15

¹Cohen's *d* was reported only for findings with $p \leq .05$. Effect sizes for interactive effects are reported at probes 1 SD from the mean when $p \leq .05$ at that point.

As shown in Table 5, significant main effects for program condition were found on two of the seven outcome variables and there were no significant main effects on the six mediators. The significant main effects on SDQ-Total Problems and SDQ-Emotional Problems each favored the program condition, with an effect size in the small to moderate range ($d = .37$). The adjusted mean for T2 SDQ-Total Problems was .15 and .07 in the BTN and CoD-CoD condition respectively. The adjusted mean for T2 SDQ-Emotional Problems was .20 and .07 in the self-study and program group respectively. In both cases a higher mean indicates more problems. There was a significant Program X Baseline interaction on SDQ-Total Problems and child-reported Coping Efficacy. There was also significant Program X Risk interaction on BPI-Total Problems and BPI-Internalizing Problems.

Probes of Significant Interactive Effects

As shown in Figure 7a, the program improved SDQ-Total Problems at post-test for those who started the program with more problems, with 55% of the sample being in the region of significant differences ($d_{+1SD} = .46$). As shown in Figure 7b, the program improved coping efficacy at post-test for those who started the program with lower coping efficacy, with 30% of the sample being in the region of significant differences ($d_{-1SD} = .39$).

As shown in Figure 7c and 7d, for those who started the program with lowest risk, the children in the program group had higher BPI-Total Problems and Internalizing Problems than the children in the BTN group, with 10% of the sample of being in the region of significance. For both BPI variables, there was

also a corresponding marginally significant effect whereby for the 5% of participants who began the program with the highest risk, the children in the program group had lower mental health problems than those in the BTN group. Note that the standard error was higher for the region with higher risk than the region with lower risk. The region of significance might be biased due to the issue of heteroscedasticity. Effect sizes were not calculated because probes of simple effects one standard deviation above and below the mean were not significant.

Figure 7. Post-Test SDQ- Total Problems on Group X Baseline SDQ-Total Problems

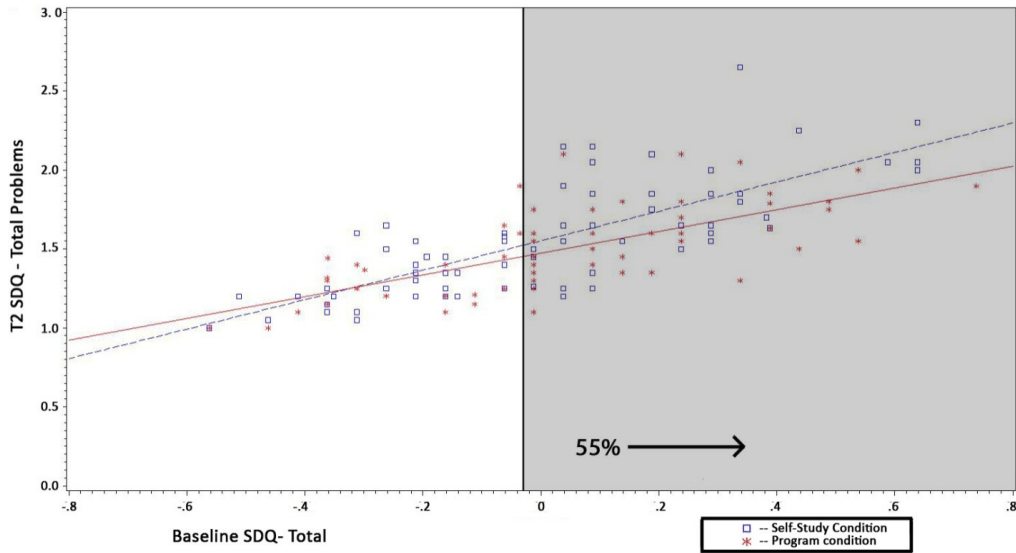


Figure 8. Post-Test Child-Reported Coping Efficacy on Group X Baseline Coping Efficacy

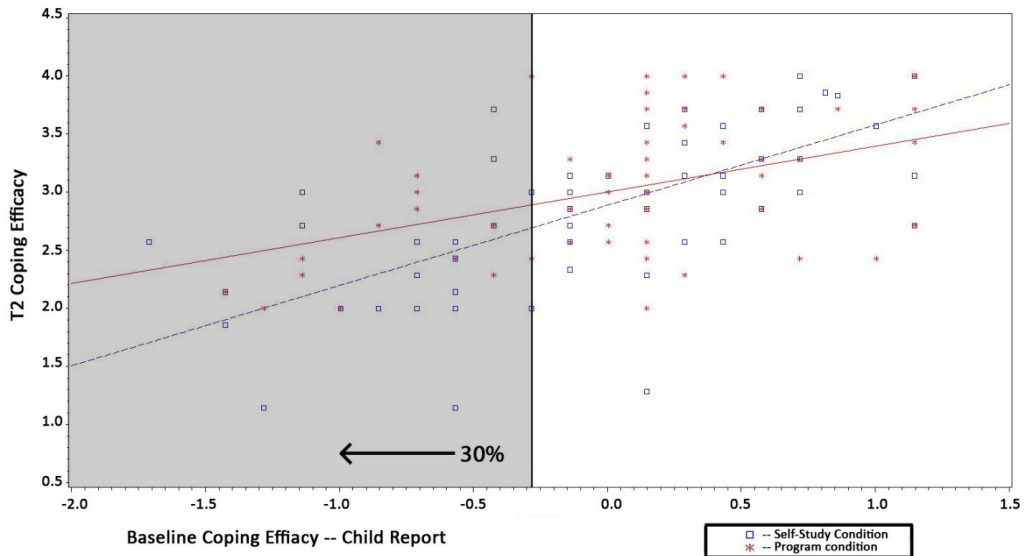


Figure 9. Post-Test BPI-Total Problems on Group X Baseline Risk

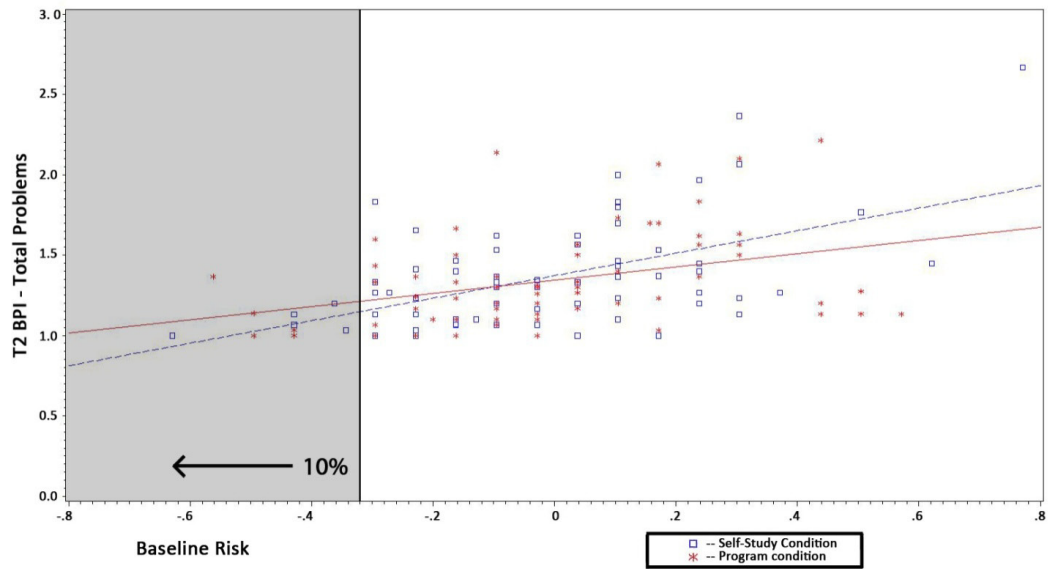
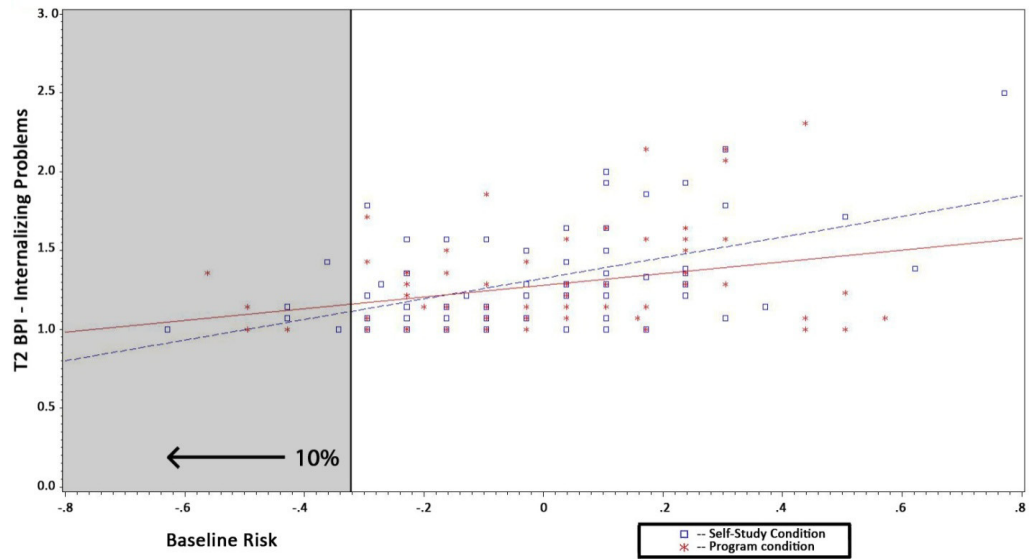


Figure 10. Post-Test BPI-Internalizing Problems on Group X Baseline Risk



Analytic Procedure to Test Program's Small Theory: Mediation Models

An analysis of mediation was conducted for each significant main and interaction effect using SEM conducted with M-Plus utilizing multi-level modeling and maximum likelihood estimation (MPlus 6th edition; Múthen & Múthen, 1998-2010). Two time-point cross-lag models were used to test the hypothesis that coping efficacy (which was the only putative mediator with a significant program effect at posttest) mediate program effects on posttest mental health problems.

Baseline outcome x program effects were added to the model when these effects were significant in outcome analyses. For example, a significant baseline x program interaction was found on SDQ-Total Problems, so the mediation model for SDQ-Total Problems included the interaction term (see Figures 3 for an example).

For post hoc probing, differential mediation effects for coping efficacy were examined following the procedures outlined by Tein *et al.*, (2004). Significance of the mediation effect was tested statistically using the PRODCLIN asymmetrical confidence limits procedure outlined by Mackinnon and colleagues (MacKinnon *et al.*, 2002; MacKinnon, Lockwood, & Williams, 2004). They argue that two sets of hypotheses are necessary to establish mediational pathways: (a) the independent variable should predict the hypothesized mediators and (b) the mediators should predict the outcomes after controlling for the direct program effect. In the PRODCLIN method, the significance of the mediation pathway is

tested by forming asymmetric confidence limits using upper and lower critical values from the distribution of the product of two normal random variables (Meeker, Cornwell, & Aroian, 1981). If zero does not fall in the 95% confidence interval (CI) of the upper and lower critical values, the mediation effect is considered significant. A study using simulated data to examine the most common tests of mediation, indicated that this procedure provides a more powerful method of testing mediation than more traditional approaches, such as Baron and Kenny (1986) (Fritz & MacKinnon, 2007).

Table 6 summarizes the statistics for the models tested for mediation effects: (a) the program condition to the mediator variable, (b) the mediator variable to the outcome variable, (c) the direct program effect to the outcome variable, (d) the path coefficients for the Program X Baseline Mediator interaction or the Program X Baseline Moderator interactions that were significant, (e) the upper and lower limits of the 95% confidence interval around the mediation effect, and (f) the chi-square, degree of freedom, and comparative fit index (CFI) for model fit.

Three of the four tests found significant mediation of program effects on the posttest mental health problems with the fourth test indicating marginally significant mediation (see Table 2). As shown in Table 6, there was a significant T1 Coping Efficacy X Program interaction effect on T2 Coping Efficacy. The evaluation of the simple mediation effect of coping efficacy found that T2 coping efficacy mediated program effects on T2 SDQ-Total Problems, SDQ-Emotional

Problems, and BPI-Total Problems for children who were initially low on coping efficacy. The mediation model for BPI-Internalizing problems was marginally significant. The model specifying T2 SDQ-Total Problems as the outcome variable indicated partial mediation as the program retained a direct effect on T2 SDQ-Total Problems. Path diagrams illustrating the mediation paths are provided for the models with SDQ (child-reported) outcomes (see Figures 8 and 9) and BPI (parent-reported) outcomes (see Figures 10 and 11).

Table 9. Test of Mediation

Moderator variable	Outcome Variable	<i>a</i>	<i>b</i>	<i>c</i>	Program x Med	Program x Out	<i>CIab</i>	<i>X</i> ²	<i>df</i>	<i>CFI</i>
<i>Posttest cross-lag mediation evaluation.</i>										
T1 Coping Efficacy	T2 SDQ-Total Problems	.10	-.16***	-.06	-.30*	-.15†		1.78	4	1.00
Low Coping Efficacy		.30*	-.16***	-.06	-.30*	-.15†	-.0956 to -.0064*	1.78	4	1.00
High Coping Efficacy		-.10	-.16***	-.06	-.30*	-.15†		1.78	4	1.00
T1 Coping Efficacy	T2 SDQ-Emotional Problems	.10	-.17***	-.11*	-.30*	-.1		0.85	3	1.00
Low Coping Efficacy		.30*	-.17***	-.11*	-.30*	-.1	-.1076 to -.0055*	0.85	3	1.00
High Coping Efficacy		-.10	-.17***	-.11*	-.30*	-.1		0.85	3	1.00
Moderator variable	Outcome Variable	<i>a</i>	<i>b</i>	<i>c</i>	Program x Med	Program x Risk	<i>CIab</i>	<i>X</i> ²	<i>df</i>	<i>CFI</i>
<i>Posttest cross-lag mediation evaluation.</i>										
T1 Coping Efficacy	T2 BPI - Total Problems	.10	-.10*	-.01	-.30*	-.32†		6.95	4	.98
Low Coping Efficacy		.30*	-.10*	-.01	-.30*	-.32†	-.0722 to -.0003*	6.95	4	.98
High Coping Efficacy		-.09	-.10*	-.01	-.30*	-.32†		6.95	4	.98
T1 Coping Efficacy	T2 BPI - Internalizing Problems	.10	-.08†	-.02	-.30*	-.37†		5.96	4	.98
Low Coping Efficacy		.30*	-.08†	-.02	-.30*	-.37†	-.0660 to .0015†	5.96	4	.98
High Coping Efficacy		-.09	-.08†	-.02	-.30*	-.37†		5.96	4	.98

Note. Med = mediation; Out = outcome; CIab = 95% confidence interval around mediation effect; CFI = comparative fit index; Because of the interaction of Program X Baseline Level and Program X Risk, the significant test of the mediation was conducted only for simple structural equation models at -1SD and +1SD of the moderator variable.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

¹ For SDQ-Emotional Problems the Program x Baseline Outcome interaction was not significant so it was not included in the mediation model.

Figure 11. Mediation Model for Program on Coping Efficacy on SDQ-Total Problems

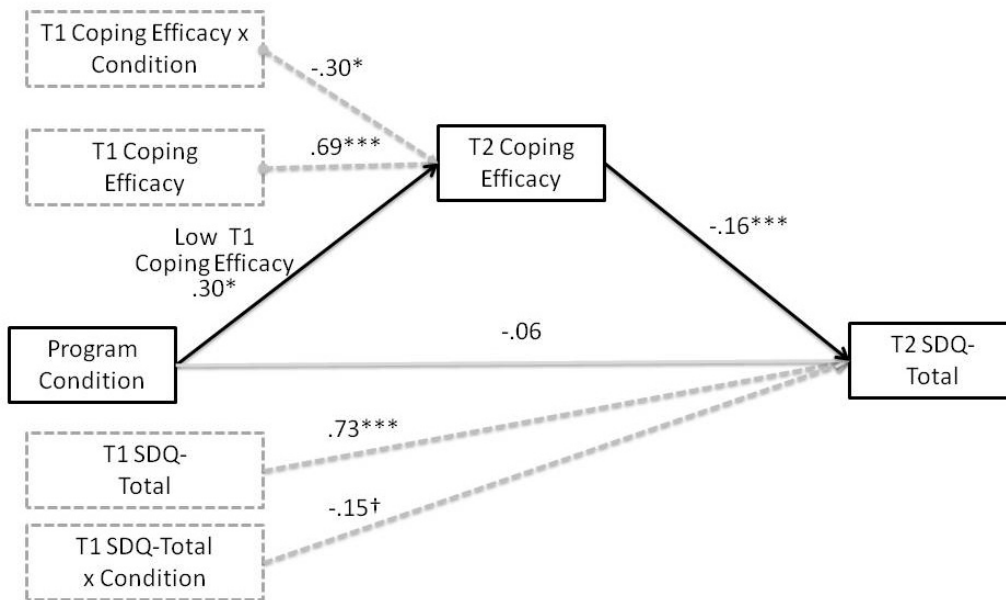


Figure 12. Mediation Model for Program on Coping Efficacy on SDQ-Emotional Problems

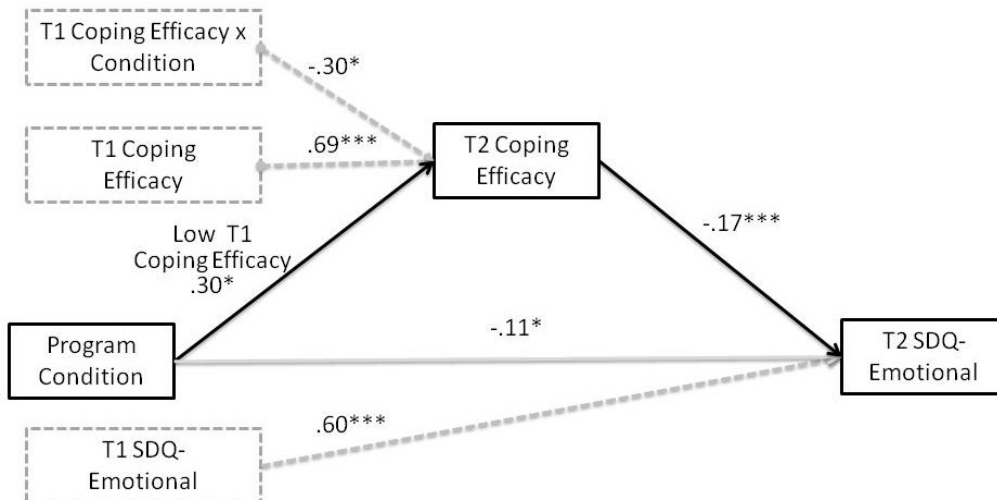


Figure 13. Mediation Model for Program on Coping Efficacy on BPI-Total Problems

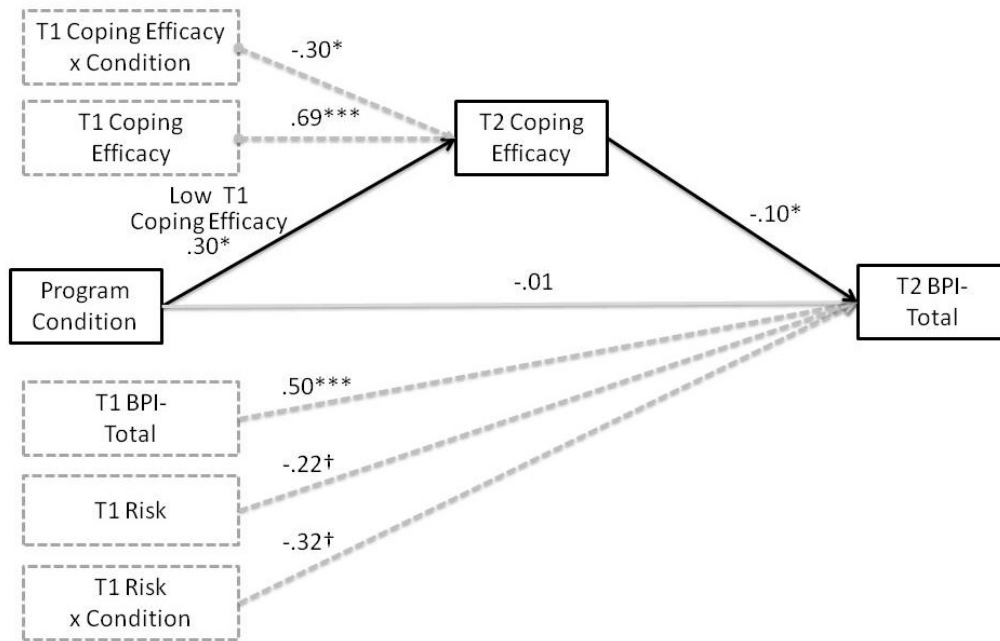
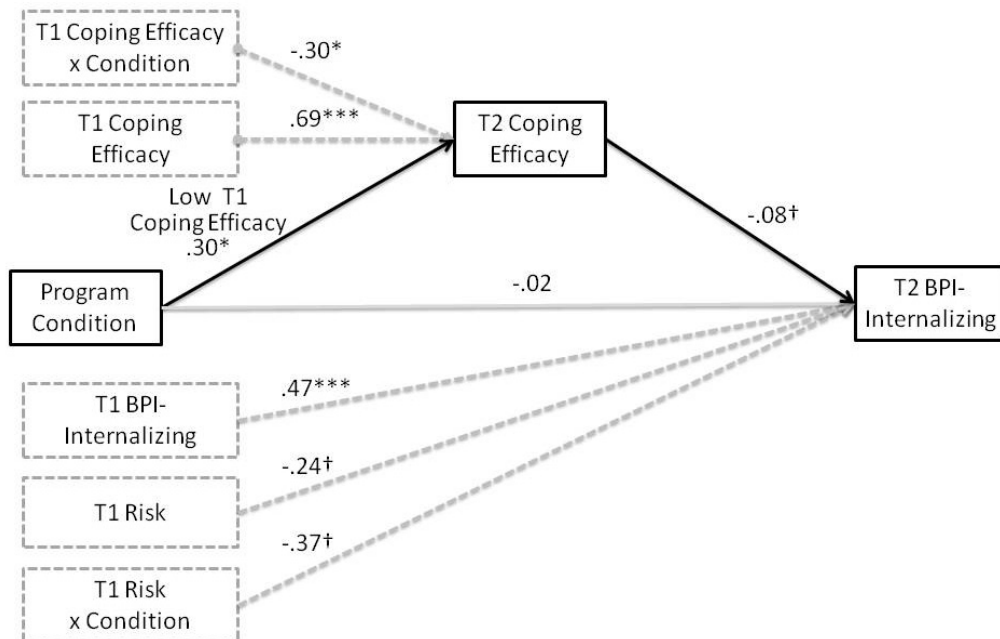


Figure 14. Mediation Model for Program on Coping Efficacy on BPI-Internalizing Problems



Participant Satisfaction

To measure participant satisfaction, child participants used 4-point likert scales to respond to three questions measuring their perceptions of the enjoyability, helpfulness, and overall quality of the program they participated in. CoD-CoD participants gave significantly higher ratings to their program as compared to the BTN group across all three participant satisfaction items. CoD-CoD participants reported that their program was better overall ($p \leq .01$), more enjoyable ($p \leq .01$) and more helpful ($p \leq .001$). Mean user satisfaction was generally fairly high in the CoD-CoD group with all three items having a mean of 3.0 or higher on a 4-point scale (see Appendix E).

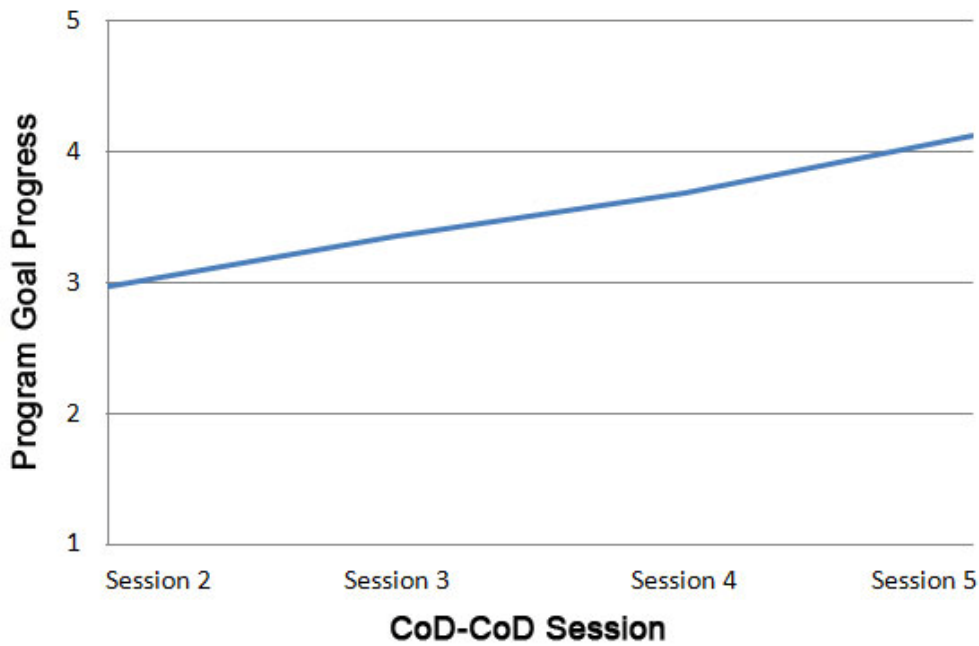
Parents were also asked to report on how helpful and enjoyable the program was for their children on a 4-item likert scale (see Appendix I). There was not a significant difference between conditions on either item though in both cases the mean favored the CoD-CoD program. Parent reported satisfaction with the CoD-CoD program was fairly high for both enjoyableness (mean = 2.8, SD = .86) and helpfulness (mean = 2.8, SD = .88).

In the CoD-CoD program, an additional measure of user satisfaction was gathered through the tracking of participant reports of progress toward the program goal which they set for themselves in the first module. The program goals users created appeared to be highly relevant to their lives. Typical goals were defined by statements such as "I would like to not feel so sad." "For my

parents to stop putting me in the middle of their problems." or "To try not to hide feelings from friends and family."

Users reported on their program goal progress using a 5-point likert response scale with anchors at each point (See Appendix J). Users reported on program goal progress using this scale at the start of sessions 2-5 and their progress history was then displayed from them in graphical form. Average program goal progress rose steadily throughout the program (see Figure 12) with a mean response that rose from just below 3 ("A little better than before") to just above 4 ("Better than before CoD-CoD") at the start of the 5th module.

Figure 15. Mean progress toward program goal by CoD-CoD session.



Discussion

The major finding of this study is that this internet-based coping enhancement program demonstrated positive effects to reduce children's mental health problems and to improve their sense of coping efficacy. These findings are an important contribution to the literature for three reasons. First, this is the first randomized experimental trial of an internet-based prevention or treatment program for children and adolescents which used an active internet-based control condition and established measures of mental health problems. Second, lessons learned from the development and implementation of this intervention have implications for development of future internet-based interventions. Third, the efficacy of this program has significant implications for prevention research. Each of these contributions of the current study will be discussed in turn and then several general limitations of the study will be acknowledged and their implications for interpreting the findings discussed.

Results of The Efficacy Trial: CoD-CoD's Effects

The discussion of the effects of the CoD-CoD program will follow from the small theory underlying the program whereby putative modifiable mediators were identified as the targets of change in order to reduce participants' mental health problems. Thus evaluation of the program hinged on testing three questions based on the theoretical model underlying the program (West & Aiken, 1997):

1. Did the program influence the putative mediators as predicted?

2. Did the program influence the outcome variables as predicted?
3. Do mediation analyses support the program's theoretical model?

This evaluation strategy has the advantage of providing an experimental test of associations identified by generative research.

Question #1: Did the program influence the putative mediators as predicted?

The evaluation of CoD-CoD found support for its positive effects on one of the five putative mediators. This was a conditional effect for coping efficacy whereby the program increased coping efficacy for the 30% of children with the lowest baseline levels of the variable. As discussed previously and reflected in the program's theoretical model, coping efficacy has been found to predict children's mental health in previous correlational studies and has been shown to mediate both active and avoidant coping's relation to children's psychological problems in children of divorce (Sandler, Tein, Mehta, Wolchick, & Ayers, 2000). The effect found in the current study is consistent with research on the Family Bereavement Project (FBP) which has indicated that positive coping is modifiable by a group-based coping skills programs (Tein et al., 2006). It is noteworthy that the current study, which used many of the same strategies as FBP, found that coping efficacy could be successfully promoted by an internet-based program despite it being necessary to modify the components of prior coping enhancement programs which have previously been thought to be important in promoting coping efficacy; particularly exercises using paired role-plays to practice program skills and providing immediate constructive feedback

on participant skill use through a group leader. The program effect found on coping efficacy indicates that efforts to approximate these features in CoD-CoD were successful. In the absence of data speaking directly to the issue, it seems logical to surmise that elements of the program intended to support coping efficacy, such as interactive activities requiring skills practice, automated feedback contingent on user performance, and assigning home practice tasks requiring skill use between modules, did in fact effectively foster increased coping efficacy. However, as discussed in more detail below, understanding how the different components of the internet-based intervention work is a critical issue for future research.

No significant program effect was found on active coping, avoidant coping, or either of our divorce related cognition variables. However it should be noted that the treatment x baseline interaction for both active coping and divorce related positive illusions were marginally significant. It may be that the sample size was too small to detect a significant moderation effect on these two variables. It is also possible that the program did not effectively address these putative mediators or that it takes time for program effects on these variables to manifest.

Question #2: Did the program influence mental health problems in the predicted direction?

Main effects were found for 2 of the 3 child-reported outcomes, including total mental health problems and there was a marginally significant program effect on the third child reported outcome: conduct problems. In all cases the

program reduced mental health problems, and each of the two significant effects had an effect size in the small to moderate range ($d = .37$). The magnitude of these effects are similar to the average effect size for selective preventions targeting children of divorce ($d = .36$) reported by a meta-analytic study of prevention programs for children and adolescents (Durklak & Wells, 1997). This similarity is consistent with meta-analytic data suggesting that the program effects created by internet-based treatments are generally equivalent in size to the effects reported in meta-analysis of comparable treatments delivered in a traditional modality (Barak et al., 2008; Wantland, et al., 2004; Spek et al., 2007). It is notable that the effects are somewhat larger than those reported for stand-alone internet-based interventions in Spek and colleagues (2007) meta-analysis of randomized trials of internet-based programs for depression and anxiety ($d = .26$). The effects of the intervention are particularly important because this evaluation study had multiple methodological strengths not present in prior evaluations of internet based interventions. Meta-analytic data has shown the increased methodological rigor is associated with smaller reported effect sizes trials of computer-assisted programs (Kiluk et al., 2011).

In contrast to the finding for child reported outcomes, no main effects were found for parent-reported mental health problems. One explanation for this discrepancy may be found in research indicating that parents are less sensitive reporters than are children of children's internalizing problems (Sourander, Helstela, & Heleniu, 1999). The scales on which child reported program effects

were found in the current study each included items related to internalizing problems. Parent under-reporting of internalizing problems may have been exacerbated by the relatively short time period (one month) that parents had to notice any changes in behavior produced by the program. A longer term follow-up study would be helpful in delineating the nature of the discrepancy between the effects found on parent and child reported mental health problems.

Conditional effects were found for outcome variables on child reported total mental health problems and parent reports of child total mental health problems and internalizing problems. It is encouraging that the program reduced child reported total mental health problems for the 55% of participants with the greatest initial mental health problems and that the program's effect strengthened as initial mental health problems increased. This indicates that the intervention is helpful to a relatively wide swath of children of divorce and that it is the most effective for children who need it the most.

Probes of the moderated effect of CoD-CoD on parent reported mental health problems indicated that despite the program effect being in the desired direction (i.e. with higher risk children benefitting more from the intervention than lower risk children) it was only for the 5% of children with the highest risk that the effect was marginally significant and that for the 10% of children with lowest risk there was a significant iatrogenic effect. This result was found both for parent reports of both total problems and internalizing problems. It is difficult to make sense of the iatrogenic effects found because they are inconsistent with the

other results of the study which found a positive program benefit. One possible explanation is that it may be that the greater variability in outcomes for those who had higher problems when they entered the program made it more difficult to detect significant program effects for this group as compared to the low risk group.

A second possible explanation for this incongruous result is that the CoD-CoD program somehow sensitized parents of children with the lowest risk to the mental health problems of their children. It may be that the program's emphasis on teaching participants communication skills, particularly avoiding the hiding of feelings and actively discussing conflicts with parents, may have led parents to perceive a smaller reduction in symptoms from pre-test to post-test compared to the BTN group (both conditions experienced a significant reduction in symptoms when comparing pre-test to post-test scores rather than across conditions).

Even if the iatrogenic effect found for the low risk group in the current study is an accurate reflection of the program's effects, the practical implications of the finding are limited in that the effect was slight and while they indicated a decreased reduction in symptoms in COD-COD group as compared to an active control condition, the symptom level for both groups was low, and well-below the clinical range. Regardless of the interpretation of this iatrogenic effect, the conditional effects found on parent reported total problems and internalizing problems provides another indication that CoD-CoD may be better suited for high

risk children, particularly when taken in the context of the other significant moderation analyses which support this same conclusion.

The conditional effects found in the current study on parent and children's reports of child mental health problems are consistent with prior research which has found that prevention programs are often more effective for children with poorer initial functioning (Pillow et al., 1991; Tein et al., 2004). However, this is the first finding from a randomized trial demonstrating that an internet-based coping program is more effective for children at higher risk and with greater baseline symptoms. This is an important finding, particularly for the field of internet-based prevention programs, as some previous literature has suggested that internet-based interventions are typically more effective for participants with lower baseline symptomatology (Andersson, Bergstrom, Hallandare, Ekselius, & Carlbring, 2004; Clarke et al., 2002). In future studies, it will be important to identify the components which allow CoD-CoD to be effective in higher risk groups.

It important to recognize the moderators which did not significantly influence program effects on any of the study variables: gender, age, and divorce latency. This result suggests that the program has similar benefits for both genders and across the range of ages included in the current study. A similar interpretation may apply for divorce latency, however, this interpretation should be made very cautiously because as previously discussed the bimodal distribution of this variable substantially reduced the power to detect its influence on other variables.

However, it should be noted that divorce latency appears to be an important factor to consider in the use of internet based interventions with children from divorcing families. Children who experienced divorce more recently were more likely to sign up for the study. Further research on the effects of divorce latency on use of internet interventions with children following parental divorce is needed and should include a more uniform distribution of latency than was obtained in the current study.

Questions #3: Do mediation analyses support the program's theoretical model?

Mediation analyses supported the hypothesis that program-induced increases in coping efficacy mediate program effects to reduce children's mental health problems as reported by both the parent and the child. This result provides experimental evidence supporting the effects of coping efficacy to reduce children's mental health problems. Although prior research had found that coping efficacy was correlated with a reduction in children's mental health problems (Sandler, Tein, Mehta, Wolchik & Ayers, 2000), the current finding that an experimentally induced change in coping efficacy mediates program effects on mental health problems strengthens the inference of a causal effect of coping efficacy. The mediation analyses indicate that program elements designed to increase coping efficacy should be considered "core" components of the CoD-CoD program which are important to incorporate in future applications of the program.

The current study represents the first evaluation of any coping program for children of divorce which included a mediational analysis. Although previous group based coping enhancement programs for children from divorced families have shown positive effects on children's mental health (Pedro Carroll et al., 2005; Stolberg et al., 1994) these studies did not assess mediators that account for program effects. Thus, the confirmation of coping efficacy as a mediator of the effects of the COD-COD program has implications for other interventions with children from divorced families. Coping efficacy should be considered an important target for future programs created for children of divorce whether using an internet-based or traditional delivery method, and evaluations of such programs should test its effects as a mediator of program effects on children's mental health.

Although the findings from the meditation analysis are important they need to be interpreted in the context of several methodological limitations. One limitation of the mediational analysis is that shared method variance may account for the mediation effects found between child reported coping efficacy and child reported mental health problems. However, these effects occurred when prior levels of child reports of both the mediator and outcome were controlled. This decreases the likelihood that the findings are due to shared method variance because the effect of any trait-like reporter factor should be nullified by controlling for the baseline levels of the variables. The possibility that shared method variance accounts for the presence of mediated effects on child reported

mental health problems is further discounted by fact that the mediation models using child reported outcomes were quite consistent with models in which parent reported outcome variables were used.

A second limitation of the mediation analysis performed in the current study is the lack of time precedence between the mediator and mental health problems. Mediation designs which utilize concurrent measures of the mediator and outcome variables do not allow the ruling out of a reverse direction of causality between the variables, specifically that decreased mental health problems lead to increased coping efficacy for participants with low baseline coping efficacy. However, the direction of effect specified in the current study's mediation model is bolstered by theory (Bandura, 1997) and previous longitudinal research with growth curve models which showed that coping efficacy prospectively predicted child and parent reported mental health in children of divorce (Sandler et al., 2000). In the future, a more direct test of the direction of effects of coping efficacy on children's mental health problems could be achieved through the collection of follow-up assessments which would provide the data needed to probe the prospective effects of coping efficacy at post test to mediate program effects on children's mental health problems at a later time point.

Participant Satisfaction

One of the research questions of the current study that did not fall within the framework of testing small theory was whether the CoD-CoD intervention would provide a more attractive option for children of divorce than the divorce

related information currently available to them on the internet. The control condition was created using the best divorce related websites for children available at the time of the study in part to facilitate this comparison. Our results indicated that CoD-CoD was perceived as being more enjoyable, helpful, and had higher overall quality than the BTN condition. Interestingly this did not translate to higher participation rates in the CoD-CoD program, most likely because of the increased time and attention needed to complete the program. This finding is consistent with previous findings which indicate that time is a primary factor in program attrition (Richardson, Stallard, & Velleman, 2010) and suggests that enjoyability, helpfulness, and quality may be less important than program duration in determining the completion rates of online programs.

Directions For Future Research On Internet-Based Interventions

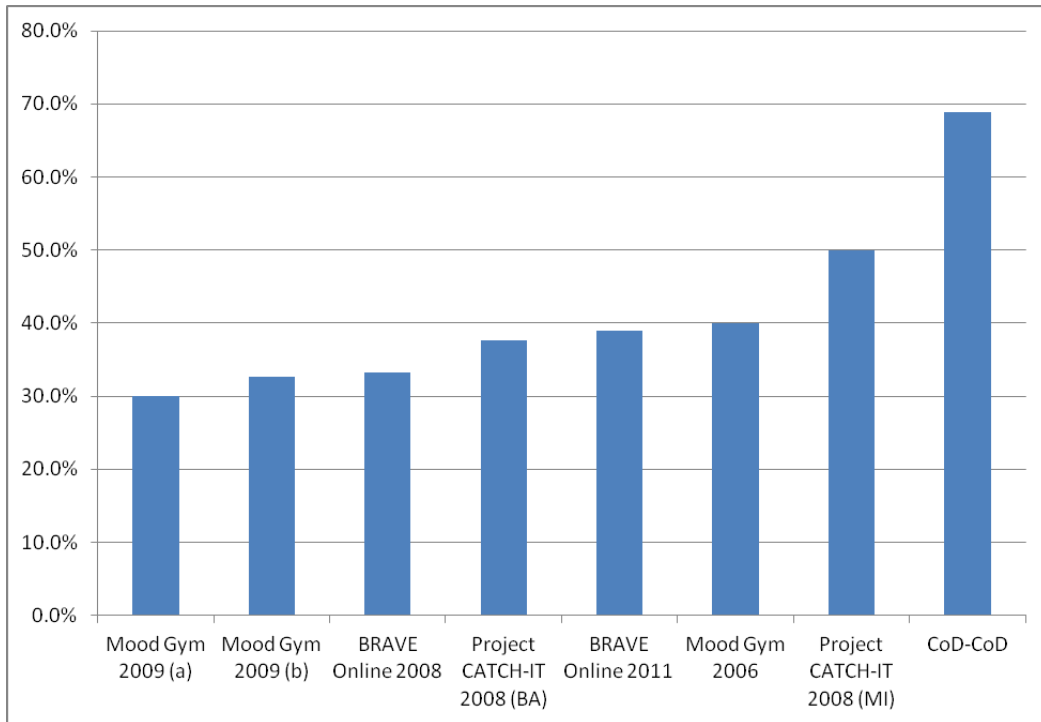
The creation of internet-based interventions, particularly those targeting children and adolescents, is a young and developing field. There are many unanswered questions about how to maximize the effectiveness of such interventions (Barak, 2008; Richardson, Stallard, & Velleman, 2010). Therefore, it seems valuable to comment on what might be learned about the development of internet-based interventions from the CoD-CoD trial.

The low rate of completion common to most internet-based programs is arguably the most serious obstacle to the effectiveness of these interventions (Barak et al., 2008; Richardson, Stallard, & Velleman, 2010; Fridrici, Lohaus, & Glab, 2009; Andersson, et al., 2005). The identification of elements of internet-

based programs that improve completion rates may be the single most important challenge to overcome if internet based interventions are to fulfill their potential as an effective intervention strategy. CoD-CoD was designed with particular attention to finding ways to maximize user engagement in the program in order to minimize program attrition. As previously discussed, multiple strategies were employed to make the program highly engaging by personalizing program content, offering a multitude of entertaining activity modalities, incentivizing development of content knowledge, use of two program leaders to present program activities, and maintaining a personal, informal, and humorous style throughout the program. While the design of the current study does not provide data which speaks directly to the effectiveness of these individual elements, it seems likely that some or all of CoD-CoD's design features were successful. This conclusion is based primarily on the CoD-CoD program's completion rate, which was among the highest achieved thus far in a clinical trial of similar online programs (Richardson, Stallard, & Velleman, 2010) including those which offered completion incentives equal to or greater than those offered in the current study (e.g. Van Voorhees, 2005). An additional indication of the success of CoD-CoD's strategies to increase user engagement is that participants rated it as being more enjoyable, more helpful, and of higher overall quality than the BTN program which was composed of the two websites providing the best divorce-related support for children at the time of CoD-CoD's development. This is a substantial finding given that the CoD-CoD program was much longer than the BTN program

and that program length is often a primary complaint of the users of internet-based programs (Richardson, Stallard, & Velleman, 2010).

Figure 16. Program Completion Rates in Controlled Trials with Children and Adolescents.



Despite CoD-CoD's high rate of program completion relative to similar online programs for children and adolescents (see figure 13), the completion rate in the current trial (68.9%) was suboptimal and likely reduced program effects. This is particularly concerning when considering the number of attrition prevention measures included in the current efficacy trial that were external to the program: providing participant compensation, sending weekly reminder e-mails to parents and children, and contacting parents by phone up to two times when a child was not on pace to complete the program. While each of these elements

could be approximated as part of a dissemination effort, anything done to reduce the need for these strategies (such as programming CoD-CoD to automatically deliver weekly e-mail or SMS text message reminders) will allow more efficient dissemination of the program and thus increase its potential for widespread adoption. In future studies, it will be important to both delineate the program elements which encouraged high rates of program participation and also experiment with new methods for bolstering this program strength. Such research would offer a critical contribution to the current knowledge regarding online program development.

A second area of research is to identify the elements of program delivery that are most responsible for program effectiveness. For example, one program element that may be particularly important is the use of home practice. In narrative feedback regarding the program at post-test, a number of parents from the CoD-CoD condition commented on program related behavior change they noted in their child. For example, one parent wrote "She is able to tell me when I am talking about something that I should only talk about with her father. She stops me to let me know it should be between me and my ex." It seem likely that this type of behavior change is important to the program's positive effects and Home Practice assignments may be an important part of encouraging the translation of program skills to day-to-day life. It would be interesting to see whether program elements which encouraged participants to use program skills (i.e. Home Practice) represent critical components of the intervention. Previous

research on preventive interventions has provided some indication that the use of program skills during home practice is significantly related to later skill development (Schoenfelder et al., 2011). Future research with internet-based interventions might utilize a more intensive assessment of completion of home practice in order to assess the relation between home practice completion and improvements in coping skills or coping efficacy. If home practice completion is a predictor of program efficacy it would suggest that effectively monitoring and reinforcing completion of home practice is an important feature to include in the design of future programs.

A third area of program design that should be studied in future research is the setting of personal program goals. Future research should analyze the relation between user reported progress toward their program goal and improvements in their mental health. If such a relationship is present, it would suggest self-reported goal achievement as a simple method for tracking a program's usefulness. It may be that once an individual has achieved their goal that they have received the major benefit from the program. If so, it may be possible to tailor the program dosage given to an individual to that which is sufficient to achieve their program related goals, thus enabling a reduction in program dosage for many children. Because one of the major sources of dissatisfaction with internet based interventions is program length (Richardson, Stallard, & Velleman, 2010), finding a new way to reduce program length while maintaining program effects would be an important advance in design. It would also be interesting to see if user reported

progress on their program goal is related to their change on coping efficacy, the mediator of program effects on mental health identified in this study. If a relationship is present, it would help inform efforts to bolster CoD-CoD's positive influence on coping efficacy.

A dismantling design is a methodologically strong research design that could be employed to test the effects of different components of the CoD-CoD program. This design could be used to systematically test the contributions of different program components. An internet-based program such as COD-COD is particularly appropriate for a dismantling study because delivery of the program is relatively simple relative to a traditional intervention, making conducting a dismantling study more practical than is typical with a traditional face-to-face intervention. An additional advantage is that internet-based programs can be efficiently revised after initial creation. Once program components are identified as being effective or ineffective using a dismantling study, they can be expanded or eliminated as desired. If ineffective elements of the program are identified, a new streamlined version of the program could be offered. Due to high program attrition rates, stream lining is a critical task for all internet-based programs. In the CoD-CoD program the effects of components such as video modeling, personalized content, animations, humor, goal setting, home practice activities, and interactive games could be systematically studied through a dismantling design to assess their impact on engagement, program attrition, and participants' mental health outcomes.

General Methodological Limitations of the Study

There are several limitations to the current study which are important to consider. One limitation is that the author was responsible for all recruitment phone calls, sending automated reminder e-mails, and contacting parents via phone calls (a maximum of two times) to remind them to encourage their child to participate in their assigned program. The author was not blind as to conditions so it is possible that his awareness might have influenced his communication with participants in a way that could bias the study, particularly by unintentionally creating a greater demand characteristic for parents or children in the intervention condition to show improvements. Although procedures such as scripted phone calls and an automated system to generate e-mail reminders were used to minimize the impact of this limitation, the possibility of subtle differences in communication cannot be fully discounted.

The second limitation of the study is the potential bias created by the combination of the author's role in communicating with study participants and the fact that he was also the primary spokesperson in the videos and narration which are present throughout the CoD-CoD program. The author had no presence in the BTN condition. The author's presence in the COD-COD program may have created a demand characteristic for children in this condition to report positive program effects. This demand characteristic would not be present for children who received the BTN condition. It seems less likely that such a bias would manifest for parent reported variables as parents were not encouraged to

participate in their child's program in any way. Despite this fact, it is still possible that parents of children in the CoD-CoD program experienced an increased demand characteristic from any incidental exposure they had to the program or due to communicating with their child about the program's content.

While the possibility of bias occurring as a result of these first two limitations cannot be fully discounted, the existence of such bias is not consistent with the pattern of findings in the study. If the results were simply due to the participants trying to please the author one would expect positive effects on all study variables, particularly those most evident in the content of the program, such as active and avoidant coping or divorce-related threat appraisals. However, a more selective pattern of program effects was found, that cannot be explained by participants trying to please the author. Additionally, many of the most important program effects were interactions on baseline variable levels and pre-test risk. It is difficult to construct a theory in which an increased demand characteristic due to contact with the principal investigator was present solely for children with greater parent-reported risk scores and baseline symptomatology. Nonetheless, in future studies it will be crucial to eliminate this alternative explanation of the program's effects by removing the author and principal investigator from contact with participants, continuing the use of phone call and e-mail protocols to ensure cross condition equivalence of communication with participants, and keeping study personnel in contact with participants blind to program condition to the

extent logistically possible. This was not possible in the current study which did not have funding to hire other staff to conduct these activities.

A third limitation of the current study is that program effects were less prevalent in parent report measures than in child report measures. It is encouraging that there were some notable exceptions to this including significant mediated program effects on total parent-reported problems and internalizing problems as well the marginally significant program effect on these same variables for children with the highest pre-test risk scores.

A fourth study limitation is that both parents and children were aware of their program condition. The influence of this was likely limited somewhat by the inclusion of an active control condition which addressed divorce-related topics, but participants were aware that the BTN program was likely to take about half as long as the CoD-CoD program. This discrepancy between the amount of effort required to complete the two programs may have influenced participant expectancies about program effects. Similar to concerns regarding demand characteristics, this concern is allayed somewhat by the significant moderated program effects which are difficult to justify through participant expectancies. In addition, parents had little exposure to either condition and so mediated program effects on parent-reported outcomes are difficult to discount on the basis of differential expectancies. In future studies, this concern can be eliminated by including either observational data collected and coded by researchers blind to program condition or by including report measures from informants, such as the

child's teacher, who can be blinded to condition assignment. This concern can also be partially addressed through the inclusion of an established measure of expectancy such as the scale developed by Borkovec and Nau (1972). The measure could then be used to establish the equivalence of expectancy across groups or to control for the effects of expectancy in the event that the groups are not equivalent.

A fourth limitation of the study is that due to the use of exclusion criteria, the results should not be generalized to children who are currently undergoing psychological treatment.

Implications of the Study for Preventive Intervention

Despite the limitations discussed above, the current study has important implications for the field of prevention in that it may represent the most rigorous empirical demonstration of an efficacious online preventive mental health program for children or adolescents to date. Internet interventions are becoming an increasingly important part of prevention efforts because they offer several important advantages over traditional face-to-face interventions including the relative ease of dissemination, client determined access time and location, reduced risk of experiencing stigma for users seeking help, minimal therapist time requirements, high fidelity in program presentation and limited cost to deliver. Taken together, these advantages address some of the most pressing issues in prevention science: how to get the most effective prevention programs to the greatest number of people while expending the fewest resources. For example,

this program provides a relatively inexpensive and readily useable prevention program that may be useful in reducing the risk of negative mental health outcomes for a large percentage of the one million children who experience parental divorce each year.

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

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APPENDIX A
IRB APPROVAL

To: Irwin Sandler
PSYN

From:  Mark Roosa, Chair 
Soc Beh IRB

Date: 06/07/2011

Committee Action: **Renewal**

Renewal Date: 06/07/2011

Review Type: Expedited F9

IRB Protocol #: 0906004116

Study Title: Experimental Study of Online Programs for Children of Divorce

Expiration Date: 06/29/2012

The above-referenced protocol was given renewed approval following Expedited Review by the Institutional Review Board.

It is the Principal Investigator's responsibility to obtain review and continued approval of ongoing research before the expiration noted above. Please allow sufficient time for reapproval. Research activity of any sort may not continue beyond the expiration date without committee approval. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol on the expiration date. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study termination.

This approval by the Soc Beh IRB does not replace or supersede any departmental or oversight committee review that may be required by institutional policy.

Adverse Reactions: If any untoward incidents or severe reactions should develop as a result of this study, you are required to notify the Soc Beh IRB immediately. If necessary a member of the IRB will be assigned to look into the matter. If the problem is serious, approval may be withdrawn pending IRB review.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, or the investigators, please communicate your requested changes to the Soc Beh IRB. The new procedure is not to be initiated until the IRB approval has been given.

APPENDIX B
MEASURES

Strengths and Difficulties Questionnaire

Instructions: For each question please click on the answer that best describes you
IN THE PAST MONTH.

Response options: Not True, Somewhat True, Certainly True.

- 1) I am restless, I cannot stay still for long.
- 2) I get a lot of headaches, stomach-aches or sickness.
- 3) I get very angry and often lose my temper.
- 4) I would rather be alone than with people of my age.
- 5) I usually do as I am told.
- 6) I worry a lot.
- 7) I am constantly fidgeting or squirming.
- 8) I have one good friend or more.
- 9) I fight a lot. I can make other people do what I want.
- 10) I am often unhappy, depressed or tearful.
- 11) Other people my age generally like me.
- 12) I am easily distracted, I find it difficult to concentrate.
- 13) I am nervous in new situations. I easily lose confidence.
- 14) I am often accused of lying or cheating.
- 15) Other children or young people pick on me or bully me.
- 16) I think before I do things.
- 17) I take things that are not mine from home, school or elsewhere.
- 18) I get along better with adults than with people my own age.
- 19) I have many fears, I am easily scared.
- 20) I finish the work I'm doing. My attention is good.

Child Coping Strategies Checklist (CCSC)

Instructions: For each question, please click on the answer that best describes you in the past month.

Response Options: Never, Sometimes, Often, Most of the Time.

- 1) When you had problems you thought about what you could do before you did something.
- 2) When you had problems you told yourself that you could handle these problems.
- 3) When you had problems you tried to ignore them.
- 4) When you had problems you did something to make things better.
- 5) When you had problems you wished that things were better.
- 6) When you had problems you told yourself that things would get better.
- 7) When you had problems you tried to stay away from the problems.
- 8) When you had problems you thought about why it happened.
- 9) When you had problems you tried to notice or think about the only good things in your life.
- 10) When you had problems you considered consequences before you decided what to do.
- 11) When you had problems you told yourself you have taken care of things like this before.
- 12) When you had problems you tried to make things better by changing what you did.
- 13) When you had problems you told yourself that it would be okay.
- 14) When you had problems you daydreamed that everything was okay.
- 15) When you had problems you tried to understand them better by thinking more about them.
- 16) When you had problems you reminded yourself that you are better off than a lot of other young adults.
- 17) When you had problems you avoided the people who made you feel bad.
- 18) When you had problems you thought about which things are best to do to handle the problems.
- 19) When you had problems you tried to put it out of your mind.

- 20) When you had problems you told yourself you could handle whatever happens.
- 21) When you had problems you did something to solve the problems.
- 22) When you had problems you told yourself that in the long run, things would work out for the best.
- 23) When you had problems you imagined how you'd like things to be.
- 24) When you had problems you tried to stay away from things that upset you.
- 25) When you had problems you thought about what you needed to know so you could solve the problems.
- 26) When you had problems you reminded yourself that you knew what to do.
- 27) When you had problems you did something in order to get the most you could out of the situation.
- 28) When you had problems you wished that bad things wouldn't happen.
- 29) When you had problems you didn't think about them.
- 30) When you had problems you told yourself that they would work themselves out.
- 31) When you had problems you tried to figure out why things like this happen.
- 32) When you had problems you avoided problems by going to your room.
- 33) When you had problems you reminded yourself about all the things you have going for you.
- 34) When you had problems you thought about what you could learn from the problems.
- 35) When you had problems you reminded yourself that overall things are pretty good for you.
- 36) When you had problems you just forgot about them.

Coping Efficacy - Child

Instructions: For each question, please click on the answer that best describes you in the past month.

Response Options: Did not work at all, Worked a little, Worked pretty well, Worked very well

- 1) Overall, how well do you think that the things you did during the last month worked to make the situation better?
- 2) Overall, how well do you think that the things you did during the last month worked to make you feel better?
- 3) Overall, how satisfied are you with the way you handled your problems during the last month? Would you say...
- 4) Overall, compared to other kids, how good do you think that you have been in handling your problems during the past month?
- 5) In the future, how good do you think that you will usually be in handling your problems?
- 6) Overall, how good do you think you will be at making things better when problems come up in the future?
- 7) Overall, how good do you think you will be at handling your feelings when problems come up in the future?

Children's Cognitions about Divorce Situations

Instructions: Please read the story and then select the answer that best describes how much each thought is like how you would have thought in the past month.

Response Options: Almost exactly like you would think, A lot like you would think, Somewhat like you would think, Only a little like you would think, Not at all like you would think

PI – Positive Illusions; NE – Negative Errors

- 1) *Your parents have been divorced for about a year. You and your dad spend every Saturday together. One Friday, your dad calls and says he can't get together with you the next day.*
 - PI You think, "Dad and I will have a great time next weekend."
 - NE You think, "Maybe Dad is mad at me about something."
 - PI You think, "I know my dad loves me anyway."
 - NE You think, "I probably won't be able to see my father again."

- 2) *You spend every weekend at your dad's place. This weekend you have a really good time together on Saturday, but on Sunday your dad is feeling down and wants to be left alone.*
 - NE You think, "Next weekend dad will probably be in a sad mood also."
 - NE You think, "What a lousy weekend I had."
 - PI You think, "If I tell Dad that I love him, then he won't be sad anymore."

- 3) *Your mother and father are arguing about money for new clothes that you need.*
 - PI You think, "I know that both my mother and father love me."
 - NE You think, "All the kids at school will laugh at me for having to wear these clothes."
 - NE You think, "I will never again ask my parents for anything that I need. All they will do is fight."

- 4) *Your mom complains to you that your father cannot be trusted.*
 - PI You think, "My parents won't always be so mad at each other."
 - NE You think, "Everything is ruined."
 - NE You think, "Mom is angry at dad because of something I said."

- 5) *On Sunday, your father forgets to take you to the ball game like he had promised. You feel disappointed and upset. You decide to spend the day with your friend Aaron, and the two of you have a good time together.*

PI You think, "Dad won't forget if I remind him."
NE You think, "Dad will always forget about what's important to me."
NE You think, "I had a terrible day today."

- 6) *Your soccer team has an important match tomorrow. Last week you asked your mother to come watch the game but she wasn't able to attend.*

PI You think, "I know my mom loves me whether or not she can come to my games."

PI You think, "Last week Mom had something important she had to do. I'm sure she would love to watch my game this week."

NE You think, "What's the use of my asking her this time. She will never come to any of my games."

NE You think, "Mom doesn't want to spend time with me."

- 7) *You and your dad are having a good time hiking and talking. Your father tells you that he can't stand being around your mother.*

NE You think, "Today was no fun."

PI You think, "If I tell my father I don't like it when he insults my mother, then he'll stop doing it."

NE You think, "I'll probably always be caught in the middle between my parents."

PI You think, "I'm a good person to hang out with."

- 8) *You wake up in the middle of the night and hear your mother crying. You go to her and ask her what's wrong. Your mother hugs you and says, "Everything is okay. Go back to bed."*

NE You think, "She's probably unhappy about something that I did."

PI You think, "Tomorrow will be a better day."

PI You think, "I'm a nice person to show that I care."

NE You think, "One day I may be left alone with no one to take care of me."

- 9) *Today you got an A on your math test. When you get home from school, you heard your mother arguing with your father on the telephone.*

PI You think, "If I tell my mother that it upsets me to hear them fight, then they will stop."

NE You think, "It's my fault that my parents are fighting."

NE You think, "Today was a bad day."

PI You think, "Someday my parents won't fight anymore."

NE You think, "One day my dad will forget he has a child."

10) *You invite your dad to see you act in a play, but your dad is not able to come to its one performance. After the show, a lot of people in the audience tell you what a good performance you gave.*

NE You think, "The play was no fun."

PI You think, "If I call my father and tell him that I miss him, then he'll come to see me."

Consumer Satisfaction - Child

Instructions: For this page, think about the program that you went through. You went through either the Best of The Net Program(BTN) or the Children of Divorce - Coping With Divorce Program (CoD-CoD).

1. Overall what did you think of your program?

Response Options: Pretty Bad, OK, Good, Great

2. How much did you enjoy your program?

Response Options: Not at all, A little, I enjoyed it, I enjoyed it a lot

3. How helpful was your program?

Response Options: Not at all, A little bit, It was helpful, It was very helpful

4. Did you finish the whole program?

Response Options: Yes, No

5. If you didn't finish, what stopped you from finishing the whole program?

Short answer response format.

6. I would have liked the program better if...

Short answer response format.

7. The part that annoyed me about the program was...

Short answer response format.

8. Is there anything else you can tell us to help us make the program better?

Short answer response format.

Risk Index

Instructions: Please place a checkmark next to your response to each question by clicking on it.

Response Options: Never, Sometimes, Always.

1. One or more of your children has difficulty concentrating
2. One or more of your children bullies or is cruel or mean to other children
3. One or more of your children is disobedient at school.
4. One or more of your children feels that others are out to get him or her.
5. One or more of your children feels worthless or inferior.
6. One or more of your children lies or cheats.
7. You and your ex argue about child discipline practices.
8. You or your ex argue about visitation.
9. The parent who does not live with the child(ren) misses many scheduled visits.
10. You have poor appetite.
11. You feel lonely.
12. You worry too much.
13. You see one or more of your children's faults more than their good points.
14. You don't seem to know what one or more of your children wants or needs.
15. You don't have a good time with one or more of your children.

Behavior Problems Index (BPI)

Instructions: For the next set of statements, decide whether they are not true, sometimes true, or often true, of the behavior of your child participating in the C-DOT Trial.

Response Options: Not True, Sometimes True, Often True.

-
- 1) In the past month he/she had sudden changes in mood or feeling.
 - 2) In the past month he/she felt or complained that no one loves him/her.
 - 3) In the past month he/she was rather high strung, tense and nervous.
 - 4) In the past month he/she cheated or told lies.
 - 5) In the past month he/she was too fearful or anxious.
 - 6) In the past month he/she argued too much.
 - 7) In the past month he/she had difficulty concentrating, could not pay attention for long.
 - 8) In the past month he/she was easily confused, seemed to be in a fog.
 - 9) In the past month he/she bullied or was cruel or mean to others.
 - 10) In the past month he/she was disobedient.
 - 11) In the past month he/she did not seem to feel sorry after he/she misbehaved.
 - 12) In the past month he/she had trouble getting along with other people (his/her) age.
 - 13) In the past month he/she was impulsive, or acted without thinking.
 - 14) In the past month he/she felt worthless or inferior.
 - 15) In the past month he/she was not liked by other people (his/her) age.
 - 16) In the past month he/she had a lot of difficulty getting (his/her) mind off certain thoughts.
 - 17) In the past month he/she was restless or overly active, could not sit still.
 - 18) In the past month he/she was stubborn, sullen, or irritable.
 - 19) In the past month he/she had a very strong temper and lost it easily.
 - 20) In the past month he/she was unhappy, sad or depressed.
 - 21) In the past month he/she was withdrawn, did not get involved with others.

- 22) In the past month he/she broke things on purpose or deliberately destroyed (his/her) own or another's things.
- 23) In the past month he/she clung to adults.
- 24) In the past month he/she cried too much.
- 25) In the past month he/she demanded a lot of attention.
- 26) In the past month he/she was too dependent on others.
- 27) In the past month he/she felt others were out to get (him/her).
- 28) In the past month he/she hung around with kids who get into trouble.
- 29) In the past month he/she was secretive, kept things to (himself/herself).
- 30) In the past month he/she worried too much.
- 31) In the past month he/she was disobedient at school.
- 32) In the past month he/she had trouble getting along with teachers.

Coping Efficacy - Parent

Instructions: Please place a checkmark next to the response that best describes your child in the past month.

Response Options: Did not work at all, Worked a little, Worked pretty well, Worked very well

- 1) Overall, how well do you think that the things your child did during the last month worked to make the situation better?
- 2) Overall, how well do you think that the things your child did during the last month worked to make them feel better?
- 3) Overall, how satisfied are you with the way your child handled problems during the last month? Would you say...
- 4) Overall, compared to other kids, how good do you think that your child has been in handling problems during the past month?
- 5) In the future, how good do you think that your child will usually be in handling problems?
- 6) Overall, how good do you think your child will be at making things better when problems come up in the future?
- 7) Overall, how good do you think your child will be at handling feelings when problems come up in the future?

Consumer Satisfaction - Parent

Instructions: It would be helpful for us to get any comments you have about the program your child experienced and how we could improve it.

1. Overall, how much do you think your child enjoyed their program?

Response Options: Not at all, A little, They enjoyed it, They enjoyed it a lot

2. Overall, how much do you think your child's program was helpful to them?

Response Options: Not at all, A little, It was helpful, It was very helpful

3. What do you think was the best part of the program for your child?

Short answer response format.

4. What do you think we could do to improve the program for your child?

Short answer response format.

5. Anything else we should know when we try to improve the program?

Short answer response format.

Measures of Implementation Recorded During Program

User Reports of Progress Toward Their Program Goal

1. Use the scale below to let us know how your program goal is going.

Response Options:

- 1 - Worse Than Ever
- 2 - Same as Before CoD-CoD
- 3 - A Little Better Than Before
- 4 - Better Than Before CoD-CoD
- 5 - A Lot Better Than Before

User Reports of Home Practice Completion

1. Were you able to complete the home practice task?

Response Options: No, Not Completely, Yes.