



Published in final edited form as:

Scand J Psychol. 2013 December ; 54(6): 468–476. doi:10.1111/sjop.12078.

Treatment effectiveness of PMTO for children's behavior problems in Iceland: Assessing parenting practices in a randomized controlled trial

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Abstract

Findings are presented from an Icelandic randomized control trial (RCT) evaluating Parent Management Training – Oregon model (PMTOTM), a parent training intervention designed to improve parenting practices and reduce child behavior problems. In a prior report from this effectiveness study that focused on child outcomes, children in the PMTO condition showed greater reductions in reported child adjustment problems relative to the comparison group. The present report focuses on observed parenting practices as the targeted outcome, with risk by treatment moderators also tested. It was hypothesized that mothers assigned to the PMTO condition would show greater gains in pre-post parenting practices relative to controls. The sample was recruited from five municipalities throughout Iceland and included 102 participating families of children with behavior problems. Cases were referred by community professionals and randomly assigned to either PMTO ($n = 51$) or community services usually offered ($n = 51$). Child age ranged from 5 to 12 years; 73% were boys. Contrary to expectations, findings showed no main effects for changes in maternal parenting. However, evaluation of risk by treatment moderators showed greater gains in parenting practices for mothers who increased in depressed mood within the PMTO group relative to their counterparts in the comparison group. This finding suggests that PMTO prevented the expected damaging effects of depression on maternal parenting. Failure to find hypothesized main effects may indicate that there were some unobserved factors regarding the measurement and a need to further adapt the global observational procedures to Icelandic culture.

Keywords

behavior problems; PMTO; effectiveness study; randomized control trial; direct observation of parenting

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Children with behavior problems can be seriously affected (e.g. Moffitt, Caspi, Rutter, & Silva, 2001) and behavior problems account for at least half of the referrals for specialist services in the United States (e.g., Kazdin, 2005b; Patterson, Reid, & Eddy, 2002) as well as Iceland (Skólaskrifstofa Suðurlands, 2006-2007). However, about 70% of the children who need the services do not receive them and of those who do, only a few receive an intervention that has been empirically validated (Webster-Stratton, 2005).

Methods to treat children's behavior problems have been developed extensively in the last decade. Kazdin (2005) highlights Parent Management Training (PMT) as the most widely evaluated and evidence-based intervention relative to other approaches to treat those problems. Several programs belong to that group, including Parent Management Training - Oregon Model (PMTO™; Forgatch & Patterson, 2010). Implementation of PMTO in Iceland began in the year 2000 within one community and has spread steadily to other communities. This work was initiated in Iceland because behavior problems had become the principal source for referrals to specialist services in the municipalities, clearly establishing a need for a program with both clinical and preventive capacities and PMTO has those qualities (Forgatch & Patterson, 2010).

The theoretical model underlying PMTO is social interaction learning (SIL), reflecting the perspective that the child's adjustment is shaped by factors in their social environment (Forgatch & Patterson, 2010; Patterson & Forgatch, 2005; Patterson, Reid, & Dishion, 1992). Since the underlying theory postulates that intervention effects on positive child outcomes are attained through improved parenting practices, then a key dimension of PMTO is to help parents break out of coercive cycles and to use positive parenting methods. The core PMTO parenting practices consist of five components: *skill encouragement*, *limit setting*, *monitoring*, *problem solving* and *positive involvement*, which in turn lead to healthy child adjustment (Forgatch & DeGarmo, 1999; Forgatch & Patterson, 2010; Patterson & Forgatch, 2005). The early intervention model focused on setting limits and monitoring as the most relevant parenting practices as predictors of behavior problems (Patterson et al., 1992). However, findings for the modern intervention model have shown that all five core components are relevant (Forgatch, DeGarmo, & Beldavs, 2005; Forgatch, Patterson, DeGarmo, & Beldavs, 2009).

Several randomized efficacy trials have demonstrated PMTO effectiveness under differing family risk conditions (e.g., Forgatch & Patterson, 2010; Patterson et al., 2002). For example, the Oregon Divorce Study (ODS) a preventive intervention trial of 238 single mothers and their sons, obtained medium effect sizes for observed parenting practices, which mediated long term healthy child adjustment (DeGarmo, Patterson, & Forgatch, 2004; Forgatch & DeGarmo, 1999; Forgatch et al., 2009; Martinez & Forgatch, 2001). The Marriage and Parenting in Stepfamilies (MAPS) prevention trial of 110 stepfather families replicated those findings (Forgatch et al., 2005; DeGarmo & Forgatch, 2007). Both studies, ODS and MAPS, were conducted under the controlled conditions inherent in efficacy trials using direct observations to measure parenting practices. Observational measures, based on those cited in these earlier trials, will be evaluated in this effectiveness study in a Northern European culture.

The first nationwide PMTO effectiveness trial was conducted in community treatment agencies in Norway, with a sample of 112 children aged four to twelve (Amlund-Hagen, Ogden, & Bjørnebekk, 2011; Ogden & Amlund-Hagen, 2008). PMTO produced improved parental discipline practices as measured with direct observation of parent-child interactions, which in turn mediated the intervention effects on improved child adjustment. Other ESTs originally developed in the U.S., such as the Incredible Years, have also shown to be effective in Europe (Gardner, Burton, & Klimes, 2006). In a randomized controlled trial conducted in the United Kingdom with a sample of 76 young children, Gardner and her colleagues (2006) showed improved positive parenting (with direct observations of parent-child interaction in their home), which mediated change in child problem behavior.

The present nationwide RCT study was conducted in community settings in Iceland with the goal of replicating PMTO findings in the U.S. and Norway. Initial findings from this first Icelandic implementation have shown improved child adjustment in families that received PMTO compared to families receiving general community services, obtaining a modest to medium effect size (Sigmarsdóttir, Thorlaciuss, Guðmundsdóttir, DeGarmo, & Forgatch, 2013). Child adjustment was measured with a latent construct based on teacher, parent, and child reports of externalizing and internalizing problems. Based on these findings, our main hypothesis in the present report was that the PMTO group would show significantly greater improvements in effective parenting practices relative to those in the comparison group. Since maternal depressive symptoms are important clinical contexts particularly for the treatment of children with behavior problems (e.g. DeGarmo, Patterson, & Forgatch, 2004; Garai et al., 2009; Gross, Shaw, Burwell, & Nagin, 2009; Parent et al., 2011; Patterson, DeGarmo, & Forgatch, 2004), we additionally tested risk by treatment interactions as recommended for preventive intervention trials (Brown et al., 2008; Flay et al., 2005). Our goal was to investigate the relation among PMTO, maternal depressive symptoms and parenting practices to address mixed findings for moderating effects of maternal depressive symptoms on treatment (e.g., Gardner, Hutchings, Bywater, & Whitaker, 2010; Hinshaw, 2007).

Method

Participants

Participants were families of 102 referred children with behavior problems, 28 girls and 74 boys (see Figure 1). Children's ages ranged from 5 to 12 years ($M = 8.02$, $SD = 1.91$). Half of the families were randomized to either PMTO ($n = 51$) or services as usual ($n = 51$). Altogether, both biological parents were in half of the households, 21% of the families were blended families, and 27% were single parent households. This distribution is in keeping with Icelandic demographics. The annual income of the majority of the families was below the average for two-parent families in Iceland, which is about 8 million Icelandic kronas per year (approximately \$70,000) (Hagstofa Íslands, 2011). About 28% of the parents had a college degree or a higher university degree, 43% had high school or occupational education, and about 28% had finished elementary or junior high school, which is in keeping with Icelandic national norms (Hagstofa Íslands, 2011). There were no significant between-

group differences in main baseline characteristics such as child age or gender or parent demographics.

Design and procedure

Results were examined using intent-to-treat analysis (ITT). Assessment was conducted at baseline pre-intervention Time 1 (T1), post-intervention Time 2 (T2) ($M = 11.28$ months, $SD = 1.85$) and follow-up at 9 months post treatment termination (T3). Results presented in this paper are the pre/post assessments, measuring parenting practices, as observational data for follow-up data on parenting are not yet available.

Recruitment—Based on an RCT of PMTO in Norway (Ogden & Amlund-Hagen, 2008), we conducted a power analysis and established the necessary sample size at 100 families. Recruitment began in the summer of 2007 following the approval of the National Bioethics Committee in Iceland. Families came from five municipalities located throughout Iceland. Criteria for participation in the study were that the child showed behavioral problems at home and/or school, had no history of sexual abuse, and did not meet diagnostic criteria for autism. Referrals followed standard procedures for children's behavioral problems in each of the five municipalities, mainly coming from schools and other services within the educational system or from social services in the communities that had received a detailed description of the research and the criteria for participation (e.g., school counselors, special aid teachers, school psychologists or social workers). Inclusion criteria were based on clinical judgment rather than formal screening or diagnosis of behavior problems, an efficient approach that was easy to adapt to the referral system already in place and that has been applied in other effectiveness trials (e.g., Hautmann et al., 2009; Ogden & Amlund-Hagen, 2008). The method yielded a mean sample T score close to or within the clinical range for problem behavior on the CBCL. Parents with children meeting the admission criteria received an introduction to the study. Interested families were referred to a treatment site located in the community, where they received a detailed description of the study design and procedures and signed consent forms.

Randomization and participant flow—PMTO therapists administered the battery of pretreatment measures when two families had been referred to treatment. The pair of families was then randomly assigned to PMTO or Services as Usual (SAU) by a person who was blind to the study design (an uncommitted secretary with a witness). Both case numbers were written on separate slips, double folded and placed in a container. The number drawn represented the family assigned to the PMTO group. Figure 1 illustrates the participant flow from T1 to T2 measures. All families agreed to participate after receiving a detailed description of the study. Ninety-five percent of all the participants completed T2 measures, partly or completely. Of the five families that had all T2 measures missing, one (2%) belonged to the PMTO group and four (8%) to the SAU group, thus the overall retention rate was high (95%). For standard attrition analyses, we compared those lost ($n = 5$) and those families retained at post treatment ($n = 97$) on the T1 parenting indicators and control variables. There was no differential rate of attrition by group condition and no differences in the study variables at T1 between those retained and those lost at T2.

The therapist who administered T1 measures also provided PMTO treatment to the family. However, researchers and PMTO therapists did not oversee or influence services given to participants in the SAU group other than to report the group assignment to the referring party to enable them to provide service as usual. Because participants in the SAU group were less connected to the assessment site than the PMTO group, they received a modest monetary reward upon completion of all measures. All families, independent of group assignment, received T2 measures by trained impartial parties at the same site as the T1 measure.

Intervention

PMTO is a theory-based manualized intervention that is readily adapted to the unique characteristics of family contexts. Using role play and other active teaching activities, therapists introduce effective parenting strategies to parents, most specifically the five core PMTO components that are the putative mechanisms of child adjustment (Forgatch & Patterson, 2010; Knutson, Forgatch, Rains, & Sigmarsdóttir, 2009). Manuals and parent materials were translated from English into Icelandic and adapted to Icelandic circumstances. Parents received PMTO as individual family treatment, attending sessions on a weekly basis. The mean number of PMTO therapy sessions was 22.63 ($SD = 6.2$) ranging from 6 to 38.

Sixteen certified PMTO therapists working in community agencies in five municipalities throughout Iceland treated the cases in the experimental group. All therapists had undergone a PMTO certification training, which requires approximately 18 months to complete. Training involves attending workshop seminars, treating cases in community agencies, and receiving coaching based on observations of video-recorded therapy sessions (Sigmarsdóttir, 2011). All therapists held graduate degrees from different disciplines (e.g., psychology, social work) prior to the PMTO training. Twenty cases (39%) in the experimental group received treatment from therapists who were working with their certification families. All therapists received regular ongoing coaching on treatment cases based on direct observation of their therapy sessions. Therapists' fidelity to the method was measured with an observation-based rating system, Fidelity of Implementation rating system (FIMP; Knutson et al., 2009) assessing the quality of adherence to the model and competent delivery. The FIMP gives scores on a 9-point scale; 1-3 reflects *needs work*, 4-6 *acceptable work* and 7-9 *good work*. The mean FIMP score for the therapists in training treating the experimental group was 7.16 ($SD = 0.74$) ranging from 6 to 9. The fully trained therapists came from the first three generations of PMTO therapists in Iceland. A study by Sigmarsdóttir & Guðmundsdóttir (2013) has shown that high levels of fidelity were sustained across those three generations of practitioners. Further analysis of FIMP scores for the whole sample will be published in a future paper.

The SAU group involved a variety of services normally provided for children's behavioral problems in the communities, including: diagnosis and/or counseling from a psychologist, counseling from a school counselor, and/or services offered by social services where parenting advice is given and services provided by the health care system (e.g., psychotherapy on an individual or family level). In about 25% of the cases, parents specified

the kind of therapy they had received; 7% mentioned individual therapy, one said family therapy, and 17% mentioned other unspecified therapy.

Measures

Multiple method data from both parents were obtained including self-report questionnaires (to measure depression), face-to-face interviews (to gather background information), and direct observations (to measure parenting). Only mothers' scores were analyzed as they were always present in the assessments and fathers were often absent.

Parenting practices—We measured mothers' parenting practices through observations of Family Interaction Tasks (FITs) of parents and their children in structured settings. We created a latent variable construct for *parenting practices* consisting of four of the five core PMTO components; *skill encouragement*, *discipline*, *problem solving* and *positive involvement*. Because the indicator for the core component *monitoring* did not significantly load in our latent construct for parenting practices, it was eliminated from the latent variable. FITs are structured tasks for parents and children to engage in and yield observational data relevant to parenting practices. The tasks, originally developed at OSLC, have been used in majority of PMTO outcome research in the U.S. and in Norway with minor adaptations to fit each research condition (Forgatch & DeGarmo, 1999; Gewirtz, DeGarmo, & Medhanie, 2011; Ogden & Amlund-Hagen, 2008; Patterson, Forgatch, & DeGarmo, 2010). We used an adapted version of the FITs. In our version of the FITs families participated in 5 or 6 tasks (5-10 minutes each), depending on whether or not fathers were present. In the first task, parents and children planned a fun activity followed by two or three problem solving tasks (depending on fathers' presence), a teaching task and finally a task designed to assess parental monitoring. The interactions were recorded on DVDs and then coded by using a global coding system; Coder's Impressions (CI; Forgatch, Knutson, & Mayne, 1992; DeGarmo et al., 2004). Improvements in CI pre/post treatment have predictive validity for later out of home placement and police arrests (Patterson & Forgatch, 1995), teacher ratings of delinquency and adaptive functioning (Forgatch & DeGarmo, 2002; Forgatch et al., 2009), and have been shown sensitive to changes in parenting following parent training (Forgatch & DeGarmo, 1999; Bullard et al., 2010). The tool has been used in most PMTO intervention research in combination with micro social coding systems (e.g., Patterson et al., 2010; Amlund-Hagen et al., 2011).

Approximately two months were required to adapt the English version of the CI to Icelandic conditions both in relation to language and culture. The Icelandic coder team participated in the adaption in collaboration with the coding supervisor from OSLC. Following the adaptation, training to reliability required an average of 15 hours. Coders were deemed reliable when they reached at least a 75% coder agreement on three DVDs in a row. In the present study, 20% of the DVDs from T1 and T2 measures were randomly selected and scored for inter-rater agreement. The agreement rate between coders for the CI scales ranged from .80 to .85 at pretreatment measures and from .82 to .88 at post treatment measures. Coders were unaware of families' group assignment.

CI provides ratings of parenting skills on the five core PMTO Components. Items were rated on a 5-point (untrue/very true) or 6-point scale (never/always). *Skill encouragement* was a 13-item scale rating mothers' ability to promote child skill development through contingent encouragement and scaffolding strategies observed during the teaching task specifically as well as overall interactions. Sample items included mother positively reinforced correct responses, encouraged on-task behavior, provided corrections as needed in non-negative ways and used praise. Cronbach's α was .95 and .94 at T1 and T2, respectively. *Problem solving* was a 17-item scale rated after observing the mother and child interactions during two problem solving tasks in which the parent and child attempted to resolve both a parent and a child-selected issue. Sample items included ratings of solution quality, extent of resolution, apparent satisfaction, likelihood of follow through, realistic and feasible solutions, and Cronbach's α was .93 and .94 at T1 and T2, respectively. Mother's *Positive involvement* with the child was based on an 8-item scale rated after the 2 problem solving tasks for mother and focal child. Sample items include mother was positively engaged, was cooperative, seemed to enjoy task, showed physical warmth. Cronbach's α was .92 and .91 at T1 and T2, respectively. *Coercive discipline* was a 10-item scale following viewing all of the interactional tasks. Sample items included mother was overly strict/authoritarian, erratic/inconsistent, used nagging or nattering, expressed anger and hostility, threatened physical punishment. Items were reverse coded to reflect effective parenting. Cronbach's α was .84 and .83 at T1 and T2, respectively.

Depressive symptoms—We measured mothers' self-reported depressive symptoms with the five-item subscale of the General Health Questionnaire (GHQ-30; Goldberg & Williams, 2006) rated from 0 (*better than usual*) to 3 (*much worse than usual*). Items included ratings of worthlessness, hopelessness, and depressed mood. The GHQ-30 is well validated (Goldberg & Williams, 2006) and has been validated specifically in Iceland and Norway (Dale, Sævareid, & Söderhamn, 2009; Goldberg & Williams, 2006; Stefánsson & Kristjánsson, 1985). Although the instrument is widely used as a one-dimensional instrument to measure mental well-being, it has also been used to measure depressive symptoms (Abdul Kadir, & Bifulco, 2010). Factor analysis studies suggest that the measure contains more than one dimension with depression consistently identified as a dimension (Goldberg & Williams, 2006). The Icelandic version has been back-translated and tested on an Icelandic clinical sample showing good assessment qualities (Stefánsson & Kristjánsson, 1985). Cronbach's α was .81 and .80 for T1 and T2.

Control Variables—*Child's Sex* was coded 1 for boys and 2 for girls, *child's age* was measured in years, *single parent* status was coded 1 for yes or 0 for no, and *Assessment Interval* was time in months between baseline (T1) and post-treatment termination assessment (T2).

Analytic Strategy

We employed structural equation path modeling (SEM) to evaluate the main study hypothesis testing pre-post changes in parenting using the AMOS program (Arbuckle, 2005). SEM is a latent variable regression technique that simultaneously combines factor analyses with path analyses under the assumptions of multivariate normality. SEM is

particularly suited for multi-method multi-source covariance matrices used in the current study because of its ability to partial measurement error of constructs and, more specifically, to specify error between same source indicators or across time. Structural models were specified as auto-regressive latent variables, analogous to a pre-post treatment analysis of covariance approach. We also specified across time error covariance's for each respective pre-post indicator as recommended for repeated measures and correlated error (Byrne, 2009; Farrell, 1994). Among the predictors, maternal depressive symptoms were the only time varying covariate. Because change in maternal depressive symptoms were a single manifest scale score (i.e., not a multiple indicator latent variable), we entered maternal depressive symptoms at Time 1 and the change score providing advantages over auto-regressive predictors. The implications do not statistically affect the interpretation of a change predictor whether entered as auto-regressive or as a change score as they are identical (See Stoolmiller & Bank, 1995). The advantage comes with interpreting the effect of initial status controlling for change as would be interpreted in a growth model with initial status and growth slope.

In addition to the standard univariate attrition analyses stated above, we also evaluated missing data patterns by comparing partial data and complete data participants across all variables in the SEM covariance matrix. Little's test of missing data revealed the data were missing completely at random (MCAR), Little's MCAR Chi-Square (58) = 44.45, $p = .91$. Therefore, models were estimated using full-information maximum likelihood. Full information estimates are computed by maximizing the likelihood of a missing value based on observed values in the data and is recommended for data that is MCAR (Jelić, Phelps, & Lerner, 2009).

Results

Means, standard deviations, and bivariate correlations among the key study variables in the SEM covariance analysis are presented in Table 1. The delta (Δ) for variable 6 in Table 1 indicates the change in depressive symptoms computed as a difference score. The means and standard deviations by randomized group condition are presented in Table 2. To test the main intent-to-treat (ITT) study hypothesis, we specified the SEM prediction model for change in mothers' parenting by entering the first order main effects of the ITT PMTO group contrast and the control covariates predicting T2 mothers' parenting controlling for T1. Results are shown in Figure 2 in the form of standardized path coefficients. The model obtained good measurement factor loadings and adequate fit to the data [$\chi^2(71) = 114.16$, $p = .001$, CFI = .92, $\chi^2/df = 1.61$; RMSEA = .00]. Although the chi-square minimization p value was less than .05, the comparative fit index was high ($> .90$), the chi-square ratio (χ^2/df) was less than 2.0, and the root mean square error of approximation (RMSEA) was below .08, each representing acceptable fit (Byrne, 2009; McDonald & Ho 2002).

Results indicated that the main ITT hypothesis was not supported. Controlling for age and gender of the child and single parent status, the PMTO group contrast was not a significant predictor of change in mothers' parenting. Mothers of girls showed marginal improvements in effective parenting relative to mothers of boys ($\beta = -.15$, $p < .10$). No other predictors contributed significant variance to change in mothers' parenting. Baseline depressive symptoms were associated with lower levels of effective parenting ($r = -.19$, $p < .05$).

Thirty-five percent of the variance was explained largely by the T1 parenting score ($\beta = .54$, $p < .001$). Among the control variable associations, maternal parenting was inversely associated with depressive symptoms at baseline, consistent with prior research (Patterson & Forgatch, 1990). Initial status depressive symptoms were inversely related to change as is typically found with initial status and change (Duncan, Duncan, & Stryker, 2006; Stoolmiller & Bank, 1995).

Given no main effects, in the next step of the analyses we tested the effect of PMTO as a moderator of maternal depressive symptoms. To test intervention by risk we followed methods by Cohen, Cohen, West, & Aiken (2003). We entered PMTO as an effect coded contrast (-1 = controls, 1 = PMTO), entered centered scores for T1 maternal depressive symptoms and change in depressive symptoms, and finally the PMTO by change in depressive symptoms multiplicative interaction term. The model obtained acceptable fit [$\chi^2(96) = 172.39$, $p = .00$, CFI = .86, $\chi^2/df = 1.79$; RMSEA = .00]. Findings supported a significant intervention group by risk factor interaction (Change in Depressive symptoms \times PMTO $\beta = .18$, $p < .05$). The significant positive coefficient is interpreted as the detrimental effect of changes in depressive symptoms on changes in effective parenting were buffered in the PMTO condition relative to the negative impact of depressive symptoms in the control condition. This represented a small effect contributing another two percent of explained variance.

To understand the clinical significance, the 95th confidence band for the *region of significance* for change in depressive symptoms as a moderator was examined (Preacher, Curran, & Bauer, 2006). Values for change in depressive symptoms become a significant moderator of PMTO for mothers who increased in depressive symptoms at values 1.05 SD and above. So while there were no main effects of PMTO on parenting, there were beneficial effects of PMTO for mothers exhibiting increases in depressive symptoms, a common risk factor for parents of problem behavior children. In this sample, 28% of the mothers in the PMTO group showed an increase in depressive symptoms.

Discussion

Prior results from this Icelandic RCT have shown ITT reductions in child adjustment problems in the PMTO group relative to the SAU comparison group (Sigmarsdóttir et al., 2013). In the present study, we hypothesized that mothers in the PMTO group would show significantly greater improvements in effective parenting practices relative to controls. Our findings showed no main effects on changes in maternal parenting. This was surprising to us for two main reasons: 1) Earlier PMTO studies have shown main effects on parenting (e.g., Forgatch & DeGarmo, 1999; Forgatch et al., 2005; Ogden & Amlund-Hagen, 2008; Patterson et al., 2010) and 2) Parenting practices are the presumed mechanism of change in child adjustment (Patterson, 2005).

This study was a replication in treatment and observational measurement of the PMTO-based intervention across cultures in the U.S. and Norway, so the unexpected lack of a main effect on observed parenting behaviors left us to speculate why this might be the case. We think several factors might account for this. An important element may have to do with how

the interaction tasks were coded in the present study. In other studies (e.g., Forgatch & DeGarmo, 1999; Forgatch et al., 2005; Ogden & Amlund-Hagen, 2008), interactions were first coded with a microsocial system that scores discrete behaviors; then global ratings were made. In the Icelandic study, global ratings were made without scoring the interactions on a microsocial basis. Coder drift is another factor that may explain this failure to replicate. Although the Icelandic coding trainer was trained by the coding trainer from OSLC, where the measures were developed, the Icelandic coders may have rated the behaviors they observed differently from how American coding teams might rate them. Recommendations for future studies would be to do cross-cultural coding on a regular basis with emphasis on rating the Icelandic assessments with an English transcript. Yet another explanation for failure to replicate could involve the effectiveness of the structured tasks used in this study to sample relevant parent and child behavior. In our study, the coders rated the children as exhibiting very low levels of problematic behavior. This was not in keeping with ratings made by parents, teachers, and the children themselves, all of whom indicated high levels of problem behavior (Sigmarsdóttir et al., 2013). Perhaps the tasks must be adapted for Icelandic families to elicit problem behaviors. In other studies, these tasks elicited negative child behavior. Parents cannot be observed while managing difficult behavior if there is no such behavior to address. Tasks that increase the likelihood for noncompliance are ideal, such as having parents direct their child to clean-up or follow rules. Finally, it may be the case that the tasks need to last longer to elicit child's problem behaviors and offer the parents an opportunity to manage them. Is the problem with the coding procedures, with the family interaction tasks, or some other measurement problems, or with cultural issues? This leads to a discussion about culture.

Iceland is an island nation in the North Atlantic Ocean, the Scandinavian nation with the smallest population—320,000 people. Although the country is modern and well integrated in the international community, the nation's relative isolation has enabled the Icelandic language to remain relatively free from external influences. An important fact regarding culture is that multicultural normative samples for the CBCL have indicated that in Iceland, parents rate their children one standard deviation lower on problem behaviors than do parents in the U. S. (Achenbach & Rescorla, 2007). That could indicate that Icelandic parents allow their children to behave in ways that would not be acceptable to parents in the U.S. These issues as well as the fact that Icelandic parents are less expressive and more silent than American parents may preclude scoring parenting skills with a global coding system, raising questions regarding the use of this assessment procedure in diverse cultures. As shown by Yasui and Dishion (2008), global ratings appear to be sensitive to the coders' ethnicity, highlighting the need for researchers to be sensitive to cultural adaptation when using global ratings to score observational data. This principle is in keeping with issues on cultural adaptation discussed by Domenech Rodríguez and colleagues (2011) and although we piloted the assessment situations with many Icelandic families, we did not pre-code and analyze any of the interactions. More pilot work with the assessment procedure and application of the coding system might have yielded findings more in keeping with the hypothesis. We could also have extended the observational measures with a self-report parenting questionnaire or used other more cost effective, time saving and valid global

measures like the Family Affective Attitude Rating Scale (FAARS; Waller, Gardner, Dishion, Shawn, & Wilson, 2012).

Although no main effects were obtained, we examined risk by treatment moderators. Results indicated that PMTO benefitted mothers who increased in maternal depressive symptoms, a known risk factor for parenting behaviors and for treatment efficacy. This indicates that parenting practices was buffered in the PMTO condition relative to the negative impact of depressive symptoms on parenting in the comparison group which is in keeping with earlier studies where parent training has been shown to decrease the damaging impacts of depression on parenting (DeGarmo et al., 2004; Garai et al., 2009; Parent et al., 2011; Patterson et al., 2004) which emphasizes the importance of providing PMTO to mothers with depressive symptoms with children experiencing adjustment problems, an important implication for future practice. It is important to note that the measurement tool used to measure depressive symptoms in this study could have been stronger; a more homogeneous tool could have provided more valid outcomes which leads to further discussions about Limitations.

Limitations and Conclusion

A limitation to mention in this study is that an empirically validated behavior intervention consonant with PMTO principles, Positive Behavior Support (PBS; Sprague, Sugai, Horner, & Walker, 1999), was in effect in more than half of the schools, equally so for both groups. Therefore, it cannot be ruled out that some families in the SAU group were influenced by methods similar to PMTO. In addition, most Icelandic professionals treating children with behavioral problems are acquainted with principles underlying the PMTO model. Since there was no control over what services families from the SAU group received, this could have had similar effects on the SAU group as the PBS work.

In conclusion, in spite of the aforementioned conditions, it is likely that parenting was still the valid transmitter of the intervention effects on children's adjustment. We presume this since the focus of the intervention was with the parents and their parenting practices and no treatment was done with the children. When the follow up data are available, we will be able to assess whether we get a main effect on parenting practices and to assess the extent to which the effects of PMTO will sustain mothers showing more depressive symptoms.

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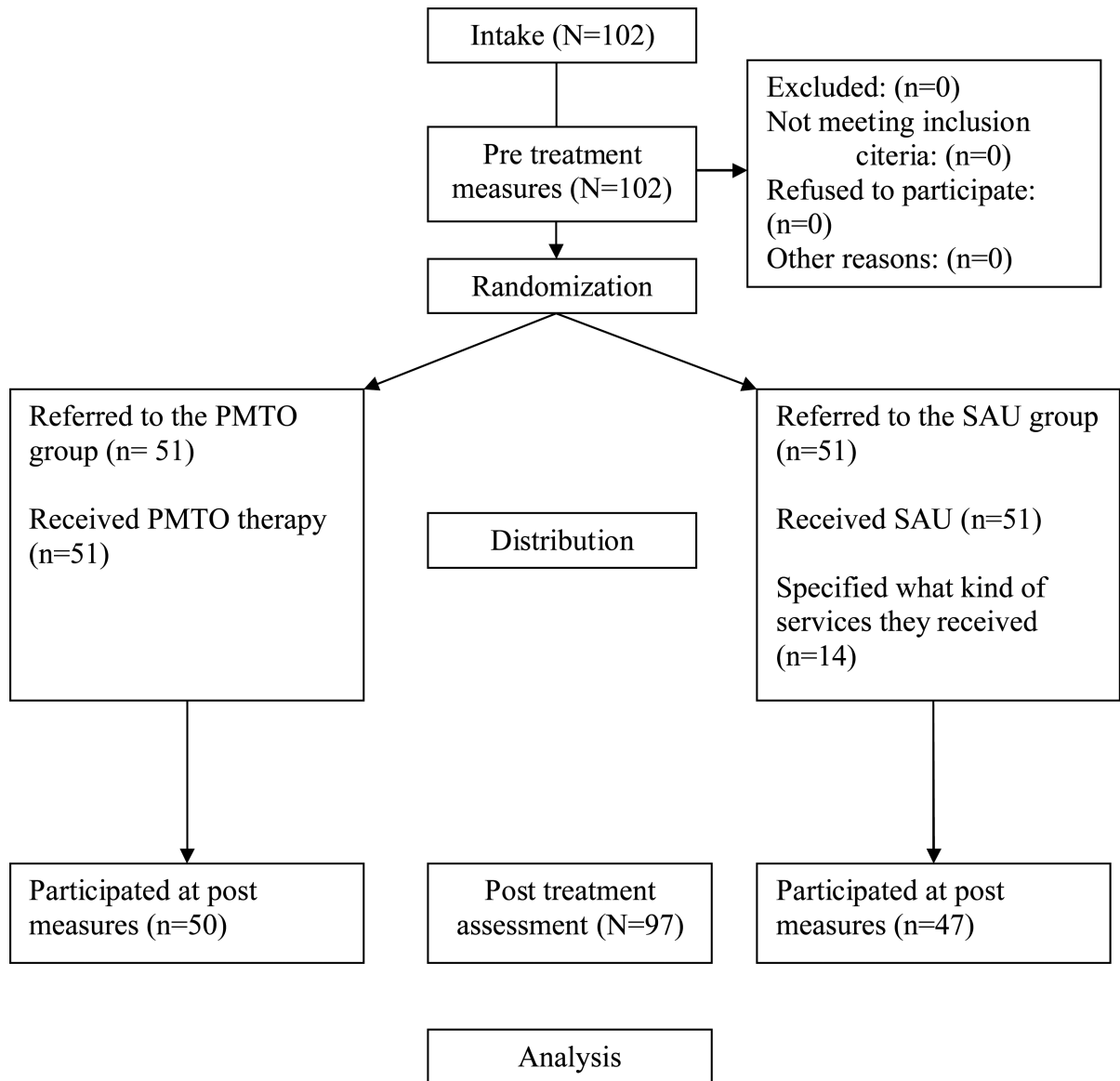


Figure 1. Flowchart: Sampling and flow of subjects in a PMTO treated group and in a service as usual group (SAU).

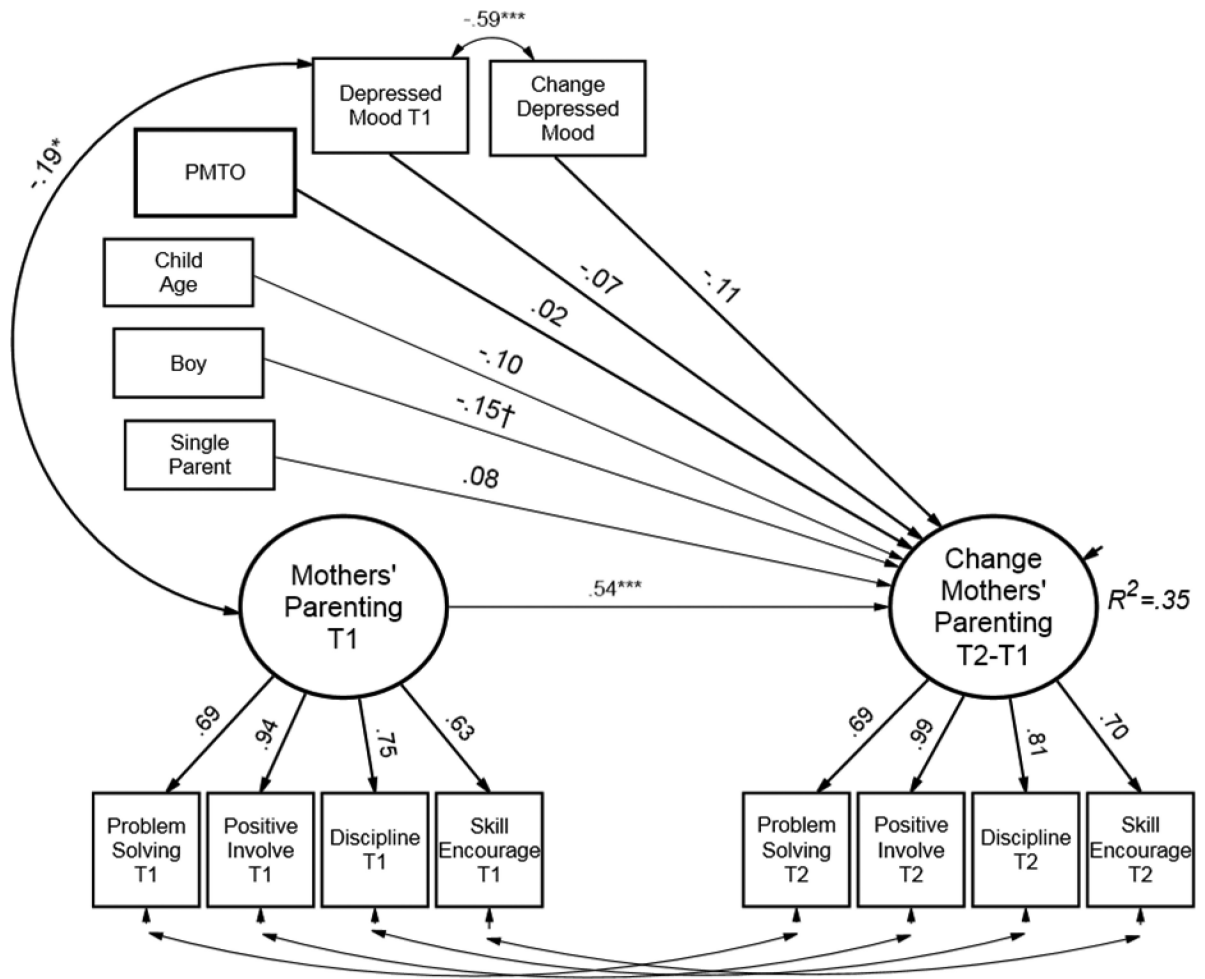


Figure 2. Structural equation model test of intent to treat hypothesis for effect of PMTO on change in mothers' parenting latent variable construct. Paths are standardized coefficients. $\chi^2(71) = 114.16, p = .001, CFI = .92, RMSEA = .00; \chi^2/df = 1.61. ***p < .001; **p < .001; *p < .05; \dagger p < .10$

Table 1

Means, Standard Deviations and Bivariate Correlations Among Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Child Age	---													
2 Sex (Boy)	.09	---												
3 Single Parent	.01	-.02	---											
4 Depressed Mood T1	-.02	-.16	.15	---										
5 Depressed Mood T2	-.01	-.20	.02	.48	---									
6 Depressed Mood	-.01	-.08	-.14	-.57	.44	---								
7 Problem Solving T1	-.02	-.00	-.20	-.07	-.29	-.21	---							
8 Problem Solving T2	-.08	-.21	-.07	-.10	-.18	-.07	.46	---						
9 Positive Involve T1	-.15	-.04	-.13	-.12	-.26	-.08	.68	.40	---					
10 Positive Involve T2	-.16	-.15	.01	-.06	-.20	-.12	.39	.69	.52	---				
11 Good Discipline T1	-.08	-.01	-.04	-.13	-.20	-.03	.48	.37	.69	.50	---			
12 Good Discipline T2	-.16	-.01	-.07	-.06	-.13	-.06	.36	.48	.37	.81	.45	---		
13 Skill Encourage T1	-.52	.02	-.01	-.06	-.20	-.11	.36	.31	.59	.44	.52	.32	---	
14 Skill Encourage T2	-.41	-.12	.01	-.05	-.21	-.15	.27	.46	.36	.71	.33	.65	.55	---
<i>M</i>	8.02	.73	.27	2.60	2.41	-.13	3.13	3.44	4.28	4.35	4.88	4.97	4.27	4.43
<i>SD</i>	1.91	.45	.45	2.55	2.32	2.48	.74	.75	.72	.65	.78	.76	1.09	.97

Note: = change computed as Time 1 and Time 2 difference score

Table 2

Means and Standard Deviations for Key Study Variables by Time and Group Condition

	SAU Controls		PMTO Intervention	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Depressed Mood T1	2.82	2.80	2.38	2.28
Depressed Mood T2	2.53	2.70	2.29	1.89
Change Depressed Mood	-0.34	2.75	0.08	2.20
Problem Solving T1	0.52	0.16	0.54	0.14
Problem Solving T2	0.57	0.16	0.57	0.14
Positive Involvement T1	0.77	0.08	0.77	0.07
Positive Involvement T2	0.78	0.07	0.78	0.06
Good Discipline T1	0.78	0.08	0.77	0.09
Good Discipline T2	0.79	0.07	0.78	0.09
Skill Encouragement T1	0.71	0.19	0.69	0.19
Skill Encouragement T2	0.73	0.19	0.72	0.16

Note: Change was computed as Time 1 and Time 2 difference score