Author(s)/Höf.:, Sigmarsdóttir, Magrét

Forgatch, Marion S.

Guðmundsdóttir, Edda Vikar

Thorlacius, Örnólfur

Svendsen, Gøye Thorn

Tjaden, Jolle

Gewirtz, Abigail H.

Title/Titill: **Implementing an Evidence-Based Intervention for Children in Europe: Evaluating the Full-Transfer Approach**

Year/Útgáfuár: 2019

Version/Útgáfa: Accepted version

Margrét Sigmarsdóttir, Marion S. Forgatch, Edda Vikar Guðmundsdóttir,Örnólfur Thorlacius, Gøye Thorn Svendsen, Jolle Tjaden & Abigail H. Gewirtz. (2019). Implementing an Evidence-Based Intervention for Children in Europe: Evaluating the Full-Transfer Approach, Journal of Clinical Child & Adolescent Psychology, 48:sup1, S312-S325, DOI:10.1080/15374416.2018.1466305

Implementing an Evidence-Based Intervention for Children in Europe: Evaluating the Full-Transfer Approach

Journal:	*Journal of Clinical Child and Adolescent Psychology*
Manuscript ID	JCCAP-2017-0309.R2
Manuscript Type:	Empirical Article
Keywords:	implementation, fidelity, sustainability, GenerationPMTO, Parenting

Abstract

Objectives—This study evaluated implementation outcomes in three European countries of GenerationPMTO, an evidence-based parenting intervention for child and adolescent behavior problems.

Method—The implementation approach was full transfer, in which purveyors train a first generation (G1) of practitioners; adopting sites assume oversight, training, certification, and fidelity assessment for subsequent generations (Forgatch & DeGarmo, 2011; Forgatch & Gewirtz, 2017). Three hundred therapists participated in trainings in GenerationPMTO in Iceland, Denmark, and the Netherlands. Data are from the implementation's initiation in each country through 2016, resulting in six generations in Iceland, eight in Denmark, and four in the Netherlands. Therapist fidelity was measured at certification with an observation-based tool, Fidelity of Implementation Rating System (FIMP; Knutson, Forgatch, Rains, & Sigmarsdóttir, 2009).

Results—Candidates in all generations achieved fidelity scores at or above the required standard. Certification fidelity scores were evaluated for G1 candidates, who were trained by the purveyor, and subsequent generations trained by the adopting implementation site. In each country, certification fidelity scores declined for G2 candidates compared with G1 and recovered to G1 levels for subsequent generations, partially replicating findings from a previous Norwegian study (Forgatch & DeGarmo, 2011). Recovery to G1 levels of fidelity scores was obtained in Iceland and the Netherlands by G3; in Denmark, the recovery was obtained by G5. The mean percentage of certification in each country was more than 80%; approximately 70% of certified therapists remained active in 2017.

Conclusions—Findings support full transfer as an effective implementation approach with long-term sustainability and fidelity.

Keywords:

implementation, fidelity, sustainability, GenerationPMTO, parenting

Implementing an Evidence-Based Intervention for Children in Europe: Evaluating the Full-Transfer Approach

An international awakening recognizes the need to install evidence-based interventions (EBIs) in community service agencies to prevent and treat child and adolescent behavioral problems. Unfortunately, approximately 70% of the people in need of special services do not receive them, and of those who do, only a few obtain an EBI (Kazdin & Blase, 2011). Because of parents' role in socializing their children, particularly in pre- and elementary schools, the most effective programs for youngsters' behavior problems intervene with parents to strengthen their parenting practices (Kazdin, 2005). Many parenting programs that meet EBI standards today were developed and tested in the second half of the last century. Meeting those standards includes manual-based specification of program details, careful descriptions of client samples, demonstrated efficacy in randomized controlled trials, follow-up assessments, and replications by independent investigators (Chambless & Hollon, 1998; Flay et al., 2005; Gottfredson et al., 2015). Although the science for evaluating these interventions is now well established, the study of implementation as a special field of research is relatively new, with little understanding of how to ensure that EBIs survive in community practice with fidelity (Dearing & Kee, 2012; Proctor et al., 2011). This paper evaluates outcomes of nationwide implementations of GenerationPMTO using the *full transfer* approach in three European countries: Iceland, Denmark, and the Netherlands.

The GenerationPMTO program

Parent Management Training – Oregon Model (PMTO®) meets standards of an EBI (Chambless & Hollon, 1998). It was originally introduced in the mid-1960s (Patterson & Brodsky, 1966) and is a progenitor of parent training programs. Fifty years later, the program is widely recognized as an effective program for child and adolescent behavior problems (see Dishion, Forgatch, Chamberlain, & Pelham, 2016; Forehand, Lafko, Parent, & Burt, 2014; Forgatch & Gewirtz, 2017). Recently, PMTO was rebranded as GenerationPMTO.

GenerationPMTO is based on the Social Interaction Learning (SIL) model in which therapists intervene with parents to reduce coercive family processes (i.e., aversive behaviors, negative reciprocity,

escalation, and negative reinforcement) and to increase the positive parenting practices of skill encouragement, limit setting, monitoring, problem solving and positive involvement (Patterson, 2005). Support for the hypotheses that coercive and positive parenting practices serve as mechanisms of change for children's behavior has been reported in several studies, thereby supporting the theoretical model (Forehand et al., 2014; Forgatch & Kjøbli, 2016; Forgatch, Patterson, DeGarmo, & Beldavs, 2009; Ogden & Amlund-Hagen, 2008; Patterson, Forgatch, & DeGarmo, 2010).

GenerationPMTO has been tested with samples of families with youngsters between ages 2 and 18 producing benefits to problems that include noncompliance, internalizing and externalizing behaviors, deviant peer association, delinquency, police arrests, substance abuse, out-of-home placement, and poor academic performance (Dishion et al., 2016; Forgatch & Gewirtz, 2017; Forgatch & Patterson, 2010). Positive outcomes have been obtained with samples ranging from prevention with at-risk families to treatment with clinically referred cases. The program has the flexibility of being offered in many formats, including parent groups, individual families served in their homes or in agencies, or through telehealth or web-based programs (Forgatch & Domenech Rodríguez, 2016; Forgatch & Gewirtz, 2017; Gewirtz, DeGarmo, & Zamir, 2016; Patterson et al., 2010). Further reading about the program, its theoretical background, research, practice, and implementation can be found in a set of recent publications: Dishion and colleagues (2016); Forgatch and Domenech Rodríguez (2016); Forgatch and Gewirtz (2017); Forgatch and Patterson, (2010); Forgatch, Rains, and Sigmarsdóttir (2016); Sigmarsdóttir, Rains, and Forgatch (2016).

Implementing GenerationPMTO

Once a program survives the rigorous tests to be designated an EBI, it is time to take it to the community. Implementation research builds a bridge between outcomes obtained in the scientific environment in which programs are developed and the challenging community contexts in which they are practiced. The process is complex, requiring many steps to build the infrastructure necessary to support initiation and maintenance of the program with fidelity to the model (Fixsen, Naoom, Blase, Friedmen, & Wallace, 2005; Forgatch, Patterson, & Gewirtz, 2013; Saldana, 2014; Weisz, Ng, & Bearman, 2014). The

first *full transfer* approach to implementation by GenerationPMTO was initiated in Norway in 1999 in a nationwide program that has continued to grow and develop (Forgatch & Kjøbli, 2016; Ogden & Amlund-Hagan, 2008; Ogden, Forgatch, Askeland, Patterson, & Bullock, 2005; Tømmeraas & Ogden 2017). Since then, the full transfer approach to implementation of GenerationPMTO has been carried out in several locations in North America, including Michigan and Kansas in the USA, and British Colombia in Canada, and in Europe (see Forgatch & Domenech Rodríguez, 2016; Forgatch & Gewirtz, 2017; Forgatch et al., 2016).

As in the Norway implementation, the three European nations in the present study have used the *full transfer* approach that is offered by GenerationPMTO. Full transfer entails establishing a governing authority that assumes responsibility for ensuring that all aspects of the program are carried out with fidelity, including training, coaching, fidelity rating, certification, and recertification of their practitioners. When training is completed and a document specifying the roles and responsibilities for leadership positions is accepted, then the reins of program leadership are turned over to the site. A key requirement is for the fidelity team of the adopting site to pass an annual reliability test (Forgatch & DeGarmo, 2011). The full transfer approach is similar to the Cascading Implementation Model developed by Chamberlain and colleagues (Chamberlain, Price, Reid, & Landsverk, 2008; Chamberlain & Saldana, 2014). An important difference is that in the Cascading Model, responsibility for certification remains in the hands of the purveyor.

In full transfer, the purveyor and site leaders collaborate to select certified G1 practitioners to become progenitors of future generations throughout their community. Some become certified to train future generations of specialists, some are certified as coaches, and some become fidelity raters. Typically, these roles are shared in the first generation. As the team expands over subsequent generations, the roles become more specialized. Once the full transfer process has been completed, the site is able to shift expenditures from the purveyor to their own staff, who are now qualified to carry the program forward. Further details in carrying out the full transfer approach can be found in the following papers and chapters: Forgatch and DeGarmo (2011); Forgatch and Gewirtz (2017); Forgatch and colleagues (2013, 2016).

When evidence-based interventions are practiced in the community, it is important to identify characteristics of those who may be well served and those who may not. Findings from prevention and clinical trials suggest that dosage and sample characteristics may be relevant factors. Maternal depression is a common concern for parenting interventions. In a randomized controlled trial (RCT) with a prevention sample of single mothers, GenerationPMTO produced reductions in maternal depression in a double-mediated longitudinal analysis. Intervention improvements in parenting from baseline to 12 months mediated reductions in boys' externalizing behavior at 30 months, which in turn mediated a reduction in maternal depression at 30 months (DeGarmo, Patterson, & Forgatch, 2004). In an Icelandic effectiveness RCT with a clinical sample, GenerationPMTO led to greater reductions in behavior problems with children aged 5-12 relative to the comparison group receiving service as usual (Sigmarsdóttir, Thorlacius, Guðmundsdóttir, & DeGarmo, 2015) and was found to prevent expected damaging effects of depression on maternal parenting (Sigmarsdóttir, DeGarmo, Forgatch, & Guðmundsdóttir, 2013). However, in a Norwegian RCT of an adaptation that abbreviated the program, maternal mental distress was negatively associated with positive outcomes for children, suggesting that brief parent training may not be an appropriate mode for depressed mothers (Kjøbli, Naerde, Bjornebekk, & Askeland, 2013). Other sample characteristics also appear to be relevant predictors of positive outcomes. In a non-randomized Norwegian implementation study, girls, children with higher symptom scores and lower social skills before intervention, and therapists' satisfaction with the intervention were significant predictors of positive child outcomes (Amlund-Hagen & Ogden, 2016). Taken together, these findings suggest that dosage and sample characteristics may play important roles in outcomes.

An important implementation goal is to increase a program's reach by growing the pool of certified practitioners who can offer services within the community (Forgatch et al., 2013). This involves training therapists to certification and supporting their continued practice of the program with high fidelity. Unfortunately, many candidates do not complete training, and even when they do, they fail to practice the program. One example is an ambitious program that was carried out in the United Kingdom in which more than 3000 community professionals were trained in ten evidence-based parenting programs. Subsequently,

only 42% of the practitioners delivered a single session based on their training (Asmussen, Matthews, Weizel, Bebiroglu, & Scott, 2012). In contrast, 85% of the first generation Norwegian candidates who began training, completed with certification in 2001, and 91% of these practitioners were still certified and practicing eight years later (Forgatch & DeGarmo, 2011; Forgatch et al., 2013). Today, 17 years later, 64% of all trained Norwegian therapists continue to provide the intervention post certification, with an average of 7.0 years, ranging from 1 to 16 years (NUBU: Norwegian Center for Child Behavioral Development, 2017). Based on these findings, we expect to find that therapists continue practicing the program long after their certification. Anecdotal information regarding reasons therapists leave the practice include relocation, retiring, illness, pregnancy, and promotions.

Weisz and colleagues identified a critical concern for implementation outcomes: Effect sizes for outcomes decrease as EBIs are scaled up (Weisz et al., 2014). In a follow-up evaluation of the Norwegian nationwide implementation, Tømmeraas and Ogden (2017) found no such decline in effect size for child outcomes. These findings are of particular note since there was a change in professional background and reduction in the amount of practitioner training over generations. The first generation of Norwegian practitioners were primarily psychologists with a minimum of 6 years of higher education (70%). Generations 2 and 3 were mostly trained as social workers and educators (≥70%) with a minimum of 3 years of education. This suggests that educational background may not be a concern following full transfer. Furthermore, the nationwide scale-up of the intervention did not result in diminishing effect sizes.

Fidelity in Implementation

The importance of regular measurement of core implementation outcomes and program fidelity, including evaluation of practitioners' fidelity during standard practice, has been highlighted as essential implementation components (Fixsen & Ogden, 2014; Proctor et al., 2011). Competent adherence to the method during community delivery promotes replication of the outcomes that were obtained during efficacy trials tested under controlled conditions (Forgatch et al., 2013). It is well documented that when low fidelity is unnoticed, precious time and money are wasted and the problems targeted by the intervention may increase rather than decrease (Flay et al., 2005; Gottfredson et al., 2015; Schoenwald et

al., 2011). Not all EBI programs on the market today provide information about the reliability and predictive validity of their fidelity measures. Some popular parent training EBIs use client, peer and self-evaluation ratings to evaluate fidelity, but the existing literature yields little information regarding how such measures are evaluated (Schoenwald et al., 2011). GenerationPMTO developers invest considerable resources and research in the evaluation of the validity and reliability of fidelity and its sustainability following implementation (Forgatch & DeGarmo, 2011). The fidelity measurement tool, Fidelity of Implementation (FIMP; Knutson et al., 2009), which evaluates both model adherence and competent delivery, is assessed during regular practice, using video recordings that provide information about the intervention's delivery in the field. FIMP has predictive validity for pre/post changes in observed parenting practices and parent reported child outcomes (Forgatch & DeGarmo, 2011; Forgatch, Patterson, & DeGarmo, 2005; Hukkelberg & Ogden, 2014; Thijssen, Albrecht, Muris, & de Ruiter, 2017).

Previous research in Norway has demonstrated that high GenerationPMTO fidelity at certification was maintained for the first three generations of therapists (Forgatch & DeGarmo, 2011). There was a small but significant drop in fidelity scores from G1, trained by the program purveyor, to G2 who were trained by the adopting community. However, the G3 practitioners achieved scores equivalent to those attained by G1. In this paper, we will elaborate on these results by evaluating the implementation in three European countries that are the focus of this study in Iceland, Denmark, and the Netherlands. We examine each country's ability to sustain fidelity for up to 14 years and across as many as eight generations.

This Study

This study evaluates the full transfer approach to implementation in Iceland, Denmark, and the Netherlands. Results from the earlier study in Norway led us to test the following hypotheses in three European countries. We expect to find:

1. Acceptable levels of fidelity (mean fidelity score of 6 and above) are sustained at certification following transfer from purveyor to community oversight;

2. Replication of the trend found in an earlier Norwegian study in which a dip in fidelity from G1 to G2 was followed by recovery in subsequent generations;

3. Cohorts of matriculating trainees complete with certification at a 70% or higher proportion; and

4. An increased pool of certified practitioners provide community services using the method.

Method

Participants

Participants were 300 therapists, which includes all candidates who initiated participation in GenerationPMTO trainings to become specialists in Iceland, Denmark, and the Netherlands, starting with Generation 1 (G1), trained by the developer/purveyor, and subsequent generations trained by each implementation site through 2016 (See Table 1.). During the time of this study's data gathering, the sample comprises all generations trained to the level of a specialist in each of the three nations: six from Iceland, eight from Denmark, and four from the Netherlands. The fidelity data are from the 255 practitioners who achieved certification in GenerationPMTO. We do not have data on therapists who did not achieve certification.

The candidates who certified held degrees from different disciplines with academic backgrounds primarily in psychology, social work, and family or school counselling. Years of experience prior to GenerationPMTO training ranged from 1-20 years; the majority were female, 90% in Iceland, 89% in Denmark, and 96% in the Netherlands. This group of therapists reflects the *community* of mental health professionals in their respective countries. There were approximately 16 therapists per 100,000 population in Iceland, two in Denmark, and one in the Netherlands.

Training Procedures

Some flexibility in the training structure is permitted; thus, the specifics of training procedures varied slightly across the three nations.

Training practitioners to certification takes about 12-24 months in which candidates attend workshop seminars (between 11 and 18 days), treat cases in community agencies, and receive coaching on recorded intervention sessions throughout the training period. During training, candidates carry a reduced caseload, although they treat families from their caseloads and receive coaching approximately twice monthly. The coaching uses video examples from candidates' practice. Coaches provide a secure learning

environment with emphasis on modeling active teaching strategies including role play, problem solving, and effective questioning processes. Trainees must apply the procedures with a minimum of five families. To achieve certification, candidates must achieve a mean FIMP score of 6 or above on four sessions covering the following GenerationPMTO core components: introducing encouragement, troubleshooting encouragement, introducing discipline, and troubleshooting discipline. A general GenerationPMTO criteria is that at least 70% of candidates must complete training with certification before a new cohort of practitioner training can be started, including drop outs.

Trainers, coaches, and fidelity raters are all certified GenerationPMTO therapists. Training of trainers and coaches requires that practitioners attend workshop days and receive coaching based on video samples of their work. They submit two training or coaching sessions, which must achieve a FIMP score of 6 or higher for certification.

Each nation has established its own reliable FIMP team, all of whom are certified GenerationPMTO therapists. The training of fidelity raters takes up to 40 hours of training and requires that candidates pass a reliability test. The first set of FIMP raters in each nation was trained, supervised, and monitored by the purveyors. Each site then selected a FIMP leader who continued following the standard procedures set by the purveyor. FIMP raters maintained their reliability status by participating in monthly reliability activities within their sites. All sites participated in an annual FIMP reliability test provided by the purveyors.

For the present study, each site scored portions of the certification sessions for inter-rater reliability. FIMP raters never scored their own data. In Denmark and the Netherlands, about 12% of the material was scored by two reliable FIMP coders and 25% of the material in the Icelandic project. The intra-class correlation coefficient (ICC, average measures for FIMP scale score) were as follows: .72 in Iceland, .87 in Denmark, and .81 in the Netherlands.

Measures

The Fidelity of Implementation tool (FIMP; Knutson et al., 2009) was used to evaluate fidelity at certification for each generation in each nation in the present study. The measure has shown predictive

validity within several RCTs. In an efficacy RCT with a prevention sample, high FIMP scores predicted greater improvement in parenting practices observed before and after intervention (Forgatch et al., 2005). In the nationwide Norwegian RCT, high FIMP ratings were associated with improved observed parental discipline (Ogden & Amlund-Hagen, 2008). In more recent implementation studies in Norway, results found high FIMP scores to predict improved observed parenting practices (Forgatch & DeGarmo, 2011) as well as improvements in parent reports of child outcome (Hukkelberg & Ogden, 2013). Similar findings have been reported in the Netherlands where higher FIMP scores at certification were associated with larger improvements in externalizing behavior, parenting practices, and parental psychopathology 18 months post treatment (Thijssen et al., 2017).

The FIMP measure assesses competent adherence to GenerationPMTO on five dimensions: *Knowledge*, *Structure*, *Teaching*, *Process Skills*, and *Overall Development*. Each dimension is rated on a 9-point scale where 1-3 reflects *needs work*, 4-6 *acceptable work,* and 7-9 *good work. Knowledge* evaluates therapists' understanding of the model and principles, including accuracy of technical details, integration of core and supportive components, and appropriate application of the model. *Structure* measures use of an agenda followed with relevant phasing and timing while, at the same time, being responsive to families' needs. *Teaching* assesses therapists' ways of balancing didactic instructional strategies with more active approaches, such as role play to practice procedures and problem solving strategies that engage participants in the learning process. *Process Skills* include sophisticated clinical techniques that create a safe and balanced environment for learning, including support, managing resistance, and effective use of the questioning process. *Overall Development* measures the relationship between therapists and families, and the extent to which parents show growth, engagement and satisfaction.

Implementation procedures

The *full transfer* approach as described earlier, was followed in all nations. The transfer takes place in several stages over a period up to three years with extensive collaboration between the program purveyor and the adopting community. More detailed description about the development and application of this approach can be found in Forgatch and colleagues (2013) and Gewirtz and colleagues (2018).

Stage 1 is the *Preparation Stage*, for both community and purveyor teams. The community engages relevant stake holders, establishes a governing authority to be responsible for the project, gathers resources, and negotiates contracts; the purveyor provides information, assesses readiness, and prepares training and training materials specific to the implementation. Stage 2 is *Early Adoption* during which the two teams work together on matters such as managing logistics, adapting materials, training the G1 professionals, creating a database, and ensuring a smooth referral process. Stage 3 is the *Implementation Phase* when the purveyors conduct further training and families receive services, all while the community infrastructure develops and grows. In this phase community coaches, trainers and fidelity raters are trained. Finally, in Stage 4, the *Sustainability Phase,* the purveyors support the community as they sustain fidelity and measure program processes and outcomes. In this phase a document is developed that specifies roles, rights and responsibilities within the adopting site. Long-term agreements are made to secure systematic future communications (Forgatch et al., 2013; 2016).

The basic implementation process followed in this study is described for the Icelandic project. Many details are comparable for the other two nations; key differences will be explained. The GenerationPMTO governing authority in Iceland is the Government Agency for Child Protection. Professionals from that department implement the program in Iceland. The department oversees several primary roles: (1) training, coaching and certification of new practitioners; (2) sustaining fidelity among certified practitioners with ongoing coaching and training; (3) conducting annual recertification based on FIMP ratings of video recordings of intervention sessions; (4) maintaining interrater reliability of the FIMP coding team; (5) designing, adapting, and updating professional and parental materials, and (6) maintaining the database and webpage.

The relevant GenerationPMTO governing authorities in Denmark and the Netherlands provide services similar to those in Iceland. In Denmark, the government agency *Socialstyrelsen* under The Ministry of Social Affairs was responsible for the project through 2017, and today VIA University College has the governing authority. In the Netherlands, the governing authority is *PI Research,* which is a national research and implementation center hosting educational and treatment innovations for children, youth and

adults. In each country, the governing authorities for GenerationPMTO had limited resources for implementation and sustainability activities.

The Icelandic implementation followed a multi-stage process, beginning in 2000 in a small city with 26,000 inhabitants located on the southwest coast of Iceland close to the capital, Reykjavik. The process was initiated because of a need for an EBI to prevent and decrease children's behavioral problems. A quasi-experimental study carried out by Sigmarsdóttir and Björnsdóttir (2012) showed that the number of referrals to specialist services decreased in that community while referrals increased in two comparison communities not implementing the method. The positive effects from that study led to extending the reach of GenerationPMTO. Today the program has morphed from one community to rolling out the program to other sites nationwide. The first generation of therapists (G1) was trained by the purveyors from the USA. The second generation (G2) was trained by Icelandic G1 GenerationPMTO specialists with coaching from the purveyors, and further generations were trained by Icelandic specialists with some consultation from the purveyors. A new generation is in training and will be certified in 2018.

The implementation process in Denmark and the Netherlands was nationwide from the beginning, which accelerated progress. The implementation in Denmark, which began in 2004, differed from the process in Iceland. The Danish G1 practitioners were trained in Norway by Norwegian trainers and the Danish G2 practitioners were trained by Norwegian and Danish GenerationPMTO specialists in Denmark. Generations G3 and G4 were trained by Danish GenerationPMTO specialists with some coaching from Norway; since G5 started training there has been some involvement from the program developers. The process in the Netherlands, which began in 2006, was similar to the one in Iceland: The purveyors trained G1, then selected Dutch GenerationPMTO specialists trained G2 with coaching from the purveyors, and further generations were trained by Dutch specialists. A portion of the G5 candidates are certified and more generations are in training; certification is expected in 2018.

All three nations adhere to the core components of GenerationPMTO, incorporating minor adaptations as necessary to adjust to cultural and contextual circumstances (see e.g., Domenech Rodríguez, Baumann, & Schwartz, 2011). In Iceland, manuals and parent materials were translated from English into

Icelandic and adapted by G1 professionals with support from linguistic and graphical experts. A similar process was followed in the Netherlands. The process differed in Denmark, where G1 was trained by Norwegian PMTO trainers using Norwegian materials. Danish materials were later developed based on Norwegian and American PMTO manuals and used in training starting with G7.

Research Procedures and Analytical Strategy

Fidelity results were based on the FIMP scores of candidates submitting certification sessions. Reliable FIMP coders rated the certification sessions, which for each therapist consisted of four video-recorded sessions of individual family therapy. Data were available for six generations in Iceland, eight in Denmark, and four in the Netherlands. Information about the number of therapists who started, completed, and their duration of practice in the program was gathered from national databases for the programs and yearly reports.

We used descriptive and inferential statistics to analyze the data. Inferential statistics were used to evaluate the sustainability of fidelity scores across generations and countries. Due to the nested nature of the data (i.e., therapist fidelity scores nested within generations within countries), we first examined whether multilevel modeling (MLM) was needed. MLM is regarded as an appropriate and advantageous method for examining nested data as it accounts for within-cluster homogeneity in outcomes and produces unbiased standard error estimates (Raudenbush & Bryk, 2002). ICCs based on the unconditional 3-level baseline models for each of the outcome variables revealed minimal country-level clustering; for instance, only 1.7% of the variance in mean FIMP scores (the average score from the five FIMP dimensions together: Knowledge, Structure, Teaching, Process Skills, and Overall Development) was attributable to level 3. Accordingly, the outcomes were analyzed separately for each country, using the General Linear Model (GLM) analysis of variance (ANOVA). All statistical analyses were conducted in SPSS version 22 (IBM Corp., 2013). Statistical tests were two-tailed and the significance level was set at $p<0.05$. Descriptive statistics were used to analyze the scope and sustainability of GenerationPMTO practice from the first to the last certified generation in each country.

Results

The first step in our analysis was to evaluate levels of fidelity by country across generations. Scores, along with means and standard deviations, are provided in Table 2 for the four certification sessions per candidate, including the mean FIMP score as well as scores for each of the five subcategories. Candidates were required to achieve a mean FIMP total score of 6.0 or higher on each certification session. Across the three nations, candidates in all generations achieved scores at or above the required minimum. Taken together, findings indicate that acceptable fidelity was sustained at certification across all nations following transfer to community oversight, supporting our first hypothesis.

In keeping with earlier findings, we hypothesized that G2 scores would show a decline from G1 scores followed by recovery in subsequent generations. Figure 1 illustrates the pattern of mean FIMP scores across generations. A visible drop in G2 scores occurs for each of the three nations. In spite of this drop, scores fall within the acceptable range both in Iceland and Denmark. A quick recovery to the *good work* range can be seen in Iceland whereas Denmark shows a longer recovery period and reaches the *good work* range in the fifth generation. In the Netherlands, the drop for G2 remains within the *good work* range.

The next step was to analyze the trend in fidelity between the generations for each nation. We start with the Netherlands data since their results are most similar to the earlier findings from Norway. As can be seen in Table 2, all generations in the Netherlands had mean fidelity scores in the *good work* category, ranging from 7.0 to 7.4. According to the analysis of variance, there was a significant difference in mean FIMP scores between generations, $F(3,91)=3.16$, $p<.05$, $d=6.32$. As expected, *Post-hoc* analysis using Bonferroni contrasts revealed a significant drop ($p<0.05$) in mean FIMP scores from G1 ($M=7.4$, $SD=0.7$) to G2 ($M=7.0$, $SD=0.4$), suggesting an early but temporary drop in fidelity. By G4, the mean FIMP score sustained at the same value as G1 (7.4). With regard to the subcategories, significant between-generation differences were observed on *Structure* ($F(3,91)=5.85$, $p<0.01$), $d=11.7$, and *Overall* ($F(3,91)=4.96$, $p<.01$), $d=9.92$. On both categories, scores for G2 ($M=6.7$, $SD=0.4$, and $M=7.0$, $SD=0.5$, respectively) were significantly lower ($p<.001$) than for G1 ($M=7.4$, $SD=0.7$, and $M=7.5$, $SD=0.6$, respectively), again suggesting an early but temporary drop in fidelity.

As shown in Figure 1 and Table 2, a comparable pattern of fidelity was found in Iceland. With the exception of G2 (which scored in the *acceptable* range), all generations had a mean fidelity score that fell in the *good work* range. The analysis of variance showed that there was a marginally significant difference in mean FIMP scores across generations, $F(5,45)=2.23$, $p=.068$, $d=4.46$. As the overall ANOVA model was not significant (likely because of power issues due to sample size), post-hoc contrasts were not interpreted. However, similarly as in the case of Netherlands, a visible trend could be seen in the data that suggested a temporary drop in fidelity at G2, which sustained across subsequent generations (Figure 1). Regarding the subcategories, significant between-generation differences were found on *Knowledge*, $F(5,45)=5.10$, $p<.001$, , $d=10.2$, and *Overall*, $F(5,45)=2.72$, $p<.01$, $d=5.44$. *Post-hoc* contrasts showed that G2 ($M=6.3$, $SD=0.4$) scored significantly lower ($p<0.01$) on *Knowledge* compared to G4 ($M=7.1$, $SD=0.4$), G5 ($M=7.4$, $SD=0.4$) and G6 ($M=7.3$, $SD=0.7$). Similarly, G2 scores on *Overall* ($M=6.4$, $SD=0.3$) were significantly lower ($p<0.05$) than those of G5 ($M=7.3$, $SD=0.5$) and G6 ($M=7.3$, $SD=0.7$).

In Denmark, the mean fidelity scores for the first and last generations (i.e., G1 and G8) fell in the *good work* range, while scores for the other generations were in the *acceptable* range. (see Table 3). Although the fidelity scores did not differ significantly between generations (p=0.298, $d=2.44$), a visible trend was noticeable (Figure 1) suggesting a temporary drop in fidelity at G2 that sustained across later generations; the findings should therefore be viewed as partial evidence to support our second hypothesis.

Our next step was to look at descriptive data by country, year and generation for professionals who completed the training program with certification, and those still practicing GenerationPMTO in their respective communities in 2016. Table 3 summarizes these data.

As Table 3 indicates, data were available for six generations in Iceland, eight in Denmark, and four in the Netherlands. The total certification completion rates were 82-84% across the three nations, supporting the third hypothesis that each practitioner training cohort achieve 70% completion. Within-country variations across generations were evident. Thus, in Iceland, completion rates ranged from 66% in G1, to 100% in G5, whereas in Denmark, G1 completion was 100%, and G4 completion 75%, and in the Netherlands 90% of G1 completed, compared with 80% in G4. The mean number of certified therapists

from each generation was 8.7 (*SD*=4.6), 12.9 (*SD*=4.0), and 23.8 (*SD*=5.8) and the number rose from 2 to 52 (a 26-fold increase), 4 to 108 (a 27-fold increase), and 26 to 95 (a 3.7-fold increase) respectively for Iceland, Denmark, and the Netherlands. In Iceland, certifications by generation took place approximately every three years and the numbers of practitioners trained per generation doubled from those in G2 and G3 from G4 trainings forward. In Denmark, trainings for new generations took place at a high rate, sometimes two sets within a single year (i.e., 2012) and the longest interval between certifications was 4 years. This was different in the Netherlands where G2 was certified one year following G1; G3 and G4 were two years apart, and no new generations have completed training since 2012.

According to the relevant national databases, the full transfer approach has led to continued practice in GenerationPMTO (PI Research, 2017 in the Netherlands; Sigmarsdóttir, Gudmundsdóttir, & Frímannsdóttir, 2016 in Iceland; Socialstyrelsen, 2017 in Denmark). As shown in Table 3, 78% certified therapists in Iceland were still active following certification in 2016 (Mean=4.0 years; *SD*=3; range 1 to 14 years). In Denmark, 73% of certified practitioners were still active (Mean=3.4; *SD*=2.3; range 1-10 years). In the Netherlands, 64% were still active (Mean=7.5 years; *SD*=1.9; range 4-9 years). This provides good support for our fourth hypothesis.

Discussion

This paper presented findings from a naturalistic experiment in which GenerationPMTO, an evidence-based intervention developed in the USA, was implemented in three European countries: Iceland, Denmark, and the Netherlands. Data evaluated the full transfer approach to implementation in which the program developer/purveyor trains the first generation of practitioners (G1) and subsequent generations are trained by the adopting community (see Forgatch et al., 2013). The four hypotheses of this study were supported: (1) acceptable levels of fidelity (i.e., FIMP scores of 6 or above) were sustained following transfer of program oversight and training activities to the communities; (2) a dip in fidelity scores from G1 to G2 with subsequent recovery was observed; (3) more than 70% of matriculating trainees, the percentage required to initiate further trainings, completed training with certification; and (4) the pool of certified practitioners within communities increased steadily over the years. Findings replicate and extend

previous reports that fidelity can be sustained following model transfer from the program purveyor to the adopting community (Forgatch & DeGarmo, 2011).

With regard to Hypothesis 1: Each generation in each nation achieved acceptable levels of fidelity at certification, replicating earlier findings (Forgatch et al., 2013). Sustained fidelity is a core component of implementation success (Fixsen & Ogden, 2014; Flay et al., 2005; Gottfredson et al., 2015; Proctor et al., 2011). In this study, the number of certified generations ranged between four in the Netherlands and eight in Denmark, covering a time span up to 14 years. Thus, findings extended earlier reports for three generations in Norway and showed that each implementation site was able to sustain fidelity across multiple generations over many years.

With regard to Hypothesis 2: All nations showed significant declines in certification fidelity scores, or a trend in that direction, for the G2 trainees, with eventual recovery to G1 levels. In Iceland and the Netherlands, the dip in fidelity scores recovered to G1 levels by G3. In Denmark, where the G1 scores were exceptionally high, recovery was not obtained until G5. It should be noted that although Iceland dipped from the *good work* range into *acceptable* for G2, the difference for the total FIMP score was not statistically significant, most likely because of power issues.

Several plausible interpretations can be offered for the pattern in which fidelity drops and then recovers. One involves a struggle/work-through phase in which the change process requires an adjustment period before the intervention effect is established, a process that has been observed in prior GenerationPMTO studies (see Forgatch & DeGarmo, 1999; Stoolmiller, Duncan, Bank, & Patterson, 1993). In the present case, as sites assume responsibility for implementation activities, many challenges must be addressed. Material is translated from English to the local language and cultural adaptations are made to the materials including use of relevant metaphors and images, as recommended (Domenech Rodríguez et al., 2011). Extra support from the purveyors may be needed as the site teams develop training and coaching skills. Additional training in other delivery formats (e.g., from individual to group versions or vice versa) may contribute to recovery. In Denmark, a possible reason for the longer recovery period could be that G1 training was provided by Norwegian purveyors, not the developer, although high

certification scores were obtained for G1. Follow-up training from the developer came later. The training of fidelity raters within implementation sites may have contributed to improvement of certification scores; fidelity training took place during the recovery period in both Iceland and the Netherlands. The nonsignificant drop in fidelity for G2 in Denmark remained stable for the next two generations. The recovery in Denmark took place between G4 and G5 following training of a team of fidelity raters who were certified in 2010. The Danish team also received additional training by the program developer in training and coaching their therapists and delivering the method in a group format. Future studies are needed to better understand this process.

Regarding Hypotheses 3 and 4: The high completion rate in all participating nations and the increased numbers of practitioners are in keeping with findings in Norway, where 85% of the G1 candidates completed training (Forgatch et al., 2013). Today, 16 years later, 64% of all trained Norwegian therapists (more than 300) continue to provide the intervention (NUBU, 2017). In the present study, more than 80% of the therapists certified across countries, 72% of those continue to be active, and there was about 20-fold increase in number of therapists from the first to the last generation trained. To our best knowledge, the existing literature yields scarce information about growth in number of therapists and their maintenance of certification in the EBIs over years and across nations. One factor that may play a role in the high certification and maintenance rates in GenerationPMTO may be the requirement to video record intervention sessions, which ensures that practitioners are indeed providing the intervention.

The interval between years for certification varied across the three nations. Factors influencing these activities include availability of financial resources, governmental support and resources, and changes within the structure of special services, which are considered critical for successful implementation (Fixsen et al., 2005; Proctor et al., 2011). The Icelandic implementation, which began in a single community, later spread around the country with a stable number of therapists certified every second year since 2012. Growth in number of therapists in Denmark took place regularly, with an increasing rate beginning in 2011. In the Netherlands, certifications took place on an annual or biannual basis during the

first five years of the program and then slowed down. Their fifth generation is currently completing training and a sixth generation has just started.

The full transfer approach may be an antidote for the decay in effect sizes frequently found following the scaling up of implementations (Weisz et al., 2014). A study of the Norwegian implementation of GenerationPMTO failed to find such a scale-up penalty (Tømmeraas & Ogden, 2017). The authors attributed the ongoing positive outcomes in part to the strong leadership within the local GenerationPMTO infrastructure and the support of Norwegian Center for Child Behavioral Development (NUBU), the national implementation research center. Although data in the present study do not directly address effect sizes in child outcomes, findings indicate that community sites using the full transfer approach, even with small resources, can sustain practitioner fidelity across multiple generations of trainings and even when relatively independent of the program developer. The full transfer approach empowers sites offering GenerationPMTO to provide stable services with fully trained leadership, therapists/specialists, coaches, trainers, and fidelity raters. Once a site has this infrastructure in place, the high costs expended on the purveyor are transferred to the local community, reducing costs that can then be spent within the implementation site.

Limitations

A valid and reliable measure of fidelity and positive intervention outcomes are core measures for evaluating the success of an implementation (Proctor et al., 2011). Assessment of fidelity should take place on a regular basis to ensure that fidelity to the method is sustained. Drift from the model or decline in fidelity could lead to diminished effectiveness of outcomes, or even worse, iatrogenic effects (Chambers, Glasgow, & Stagne, 2013; Flay et al., 2005; Gottfredson et al., 2015; Schoenwald et al., 2011). In the present study, fidelity was assessed at certification only. One study conducted by the Norwegian site during implementation found that high FIMP scores measured during intervention predicted parents' reports of improved child behavior pre/post intervention (Hukkelberg & Ogden, 2013). Nevertheless, future studies should assess the predictive validity of therapist fidelity during practice after certification. Another concern in the present study is the low number of therapists in some generations and low number

of groups, which may have affected the accuracy of model estimates. Finally, future studies should evaluate mechanisms of change in the recovery of fidelity from G1 to G2. It required decades to provide such mediational tests of the mechanisms presumed to affect outcomes in the parent training literature (Forehand et al., 2014). Hopefully, it will not take so long to achieve this goal in implementation research.

Conclusions

This study presents data evaluating the full transfer approach to implementation as carried out by the GenerationPMTO program. Practitioners were trained in the method in three European nations. In each case, the first generation of practitioners was trained by the developer or a program purveyor. Subsequent generations were trained by the adopting implementation site. Although in some cases, there was a significant short-term decline in fidelity, the scores recovered. These data indicate that the program can be turned over to an adopting community across nations and continents, given an effective community infrastructure that supports the program. The infrastructure includes a governing authority that maintains a team of trainers, coaches and reliable fidelity raters who are able to certify and recertify practitioners.

Results indicate that the full transfer implementation of GenerationPMTO can successfully be carried out in sites with varying levels of financial resources, different program structures, and population size. Successful implementation using the full transfer approach had been shown earlier in the resource rich country of Norway and is now shown in countries without the same level of resources and with differing governments. It is important to mention that sites with lower populations seemed to disseminate faster than sites with larger populations; nevertheless a steady increase of GenerationPMTO therapists was found in all three nations. It can be said that the full transfer approach saves funds over the long-run as sites operate independently, without needing to pay for long-term and sometimes costly supervision contracts with a program purveyor's organization. Cost effective analyses have been completed for GenerationPMTO showing beneficial financial savings for the adopting sites (Rambøll Management Consulting 2013; Washington State Institute for Public Policy, 2017).

The findings reported above are relevant to other nations implementing evidence-based interventions. However, for sites that have neither the financial resources to invest upfront nor the dedication to use the full transfer approach, purveyors must be flexible in their level of support and implementation strategy. By amassing the evidence regarding what constitutes a successful implementation, EBIs may be sustainably transferred across cultures and settings becoming accessible to more families, increasing their reach.

References

Amlund-Hagen K., & Ogden, T. (2016). Predictors of changes in child behaviour following parent management training: Child, context, and therapy factors. *International Journal of Psychology*. doi: 10.1002/ijop.12365

Asmussen, K. A., Matthews, T., Weizel, K., Bebiroglu, N., Scott, S. (2012) *Evaluation of the National Academy of Parenting Practitioners' Training Offer in evidence based parenting programmes*.UK: Department for Education.

Chamberlain, P., Price, J., Reid, J., & Landsverk, J. (2008). Cascading implementation of a foster and kinship parent intervention. *Child Welfare, 87*, 27-48.

Chamberlain, P., & Saldana, L. (2014). Practice-research partnerships that scale-up, attain fidelity, and sustain evidence-based practices. In R. S. Beidas & P. C. Kendall (Eds.), *Dissemination and implementation of evidence-based practices in child and adolescent mental health.* (pp. 127-142). New York: Oxford University Press.

Chambers, D. A., Glasgow, R.E., & Stange, K.C, (2013). The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. *Implementation Science, 8*, 117. doi: 10.1186/1748-5908-8-117.

Chambless, D. L., & Hollon, S. D. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology, 66,* 7-18. Doi:10.1037/0022-006X.66.1.7

Dearing, J. W., & Kee, K. F (2012). Historical roots of dissemination and implementation science. In R. C. Brownson, G. A. Colditz & E. K. Cohen (Eds.), *Dissemination and implementation research in health: Translating science to practice* (pp. 55-72). New York: Oxford University Press.

DeGarmo, D. S., Patterson, G. R., Forgatch, M. S. (2004). How do outcomes in a specified parent training intervention maintain or wane over time? *Prevention Science, 5,* 73-89.

Dishion, T. J., Forgatch, M. S., Chamberlain, P., & Pelham W. E. (2016). The Oregon model

of behavior family therapy: From intervention design to promoting large-scale system change. *Behavior Therapy (Special issue), 47,* 812-837. doi:10.1016/j.beth.2016.02.002

Domenech Rodríguez, M. M., Baumann, A. A., & Schwartz, A. L. (2011). Cultural adaption of an evidence based intervention: From theory to practice in a Latino/a community context. *American Journal of Community Psychology, 47*, 170-186. doi:10.1007/s10464-010-9371-4

Fixsen, D. L., Naoom, S. F., Blase, K. A., Freidman, R. M. & Wallace, F. (2005). *Implementation Research: A synthesis of the literature.* Tampa, FL: University of South Florida.

Fixsen, D. L., & Ogden, T. (2014). Implementation science: A brief overview and a look ahead. *Zeitschrift für Psychologie, 222*, 4-11. doi:10.1027/2151-2604/a000160

Flay, B. R., Biglan, A., Boruch, R. F., Castro, F. G., Gottfredson, D., Kellam, S. G., ... Ji, P. (2005). Standards of evidence: Criteria for efficacy, effectiveness and dissemination. *Prevention Science, 6,* 151-175. doi:10.1007/s11121-005-5553-y

Forehand, R., Lafko, N., Parent, J., Burt, K. B. (2014). Is parenting the mediator of change in behavioral parent training for externalizing problems of youth? *Clinical Psychology Review, 34,* 608-19. doi:10.1016/j.cpr.2014.10.001

Forgatch, M. S., & DeGarmo, D. S. (1999). Parenting through change. An effective prevention program for single mothers. *Journal of Consulting and Clinical Psychology, 67*, 711–724. doi: 10.1037/0022-006X.67.5.711

Forgatch, M. S., & DeGarmo, D. S. (2011). Sustaining fidelity following the nationwide PMTO™ implementation in Norway. *Prevention Science, 12*, 235-246. doi:10.1007/s11121-011-0225-6

Forgatch, M. S., & Domenech Rodríguez, M. M. (2016). Interrupting coercion: The iterative loops among theory, science, and practice. In T.J. Dishion & J. Snyder (Eds.), *Handbook of coercive relationship dynamics.* New York; Oxford University Press.

Forgatch, M. S., & Gewirtz, A. H. (2017). The evolution of the Oregon Model of Parent

Management Training: An intervention for antisocial behavior in children and adolescents. In J. R. Weisz & A. E. Kazdin (Eds.), *Evidence based psychotherapies for children and adolescents* (3rd ed.). New York: Guilford Press.

Forgatch M. S., & Kjøbli J. (2016). Parent Management Training – Oregon Model: Adapting intervention with rigorous research. *Family Process, 55,* 500-513. doi:10.1111/famp.12224

Forgatch, M. S., & Patterson, G. R. (2010). Parent Management Training – Oregon Model: An intervention for antisocial behavior in children and adolescents. In J. R. Weisz & A. E. Kazdin (Eds.), *Evidence-based psychotherapies for children and adolescents* (2nd ed., pp. 159-178). New York: Guilford.

Forgatch, M. S., Patterson, G. R., & DeGarmo, D. S. (2005). Evaluating fidelity: Predictive validity for a measure of competent adherence to the Oregon model of parent management training. *Behavior Therapy, 36,* 3–13.

Forgatch, M. S., Patterson, G. R., DeGarmo, D. S., & Beldavs, Z. G. (2009). Testing the Oregon delinquency model with nine-year follow-up of the Oregon Divorce Study. *Development and Psychopathology, 21*, 637-660. doi: 10.1017/S0954579409000340

Forgatch, M. S., Patterson, G. R., & Gewirtz, A. H. (2013). Looking forward: The promise of widespread implementation of parent training programs. *Perspectives on Psychological Science: A Journal of the Association for Psychological Science, 8*, 682-94. doi:10.1177/1745691613503478

Forgatch, M. S., Rains, L. A., & Sigmarsdóttir, M. (2016). Early results from implementing PMTO: Full transfer on a grand scale. In Van Ryzin, K. L. Kumpfer, G. M. Fosco & M. T. Greenberg (Eds.), *Family-based prevention programs for children and adolescents: Theory, research, and large-scale dissemination* (pp. 113-133). New York: Taylor & Francis/Psychology Press.

Gewirtz, A. H., DeGarmo, D.S., & Zamir, O. (2016). Effects of a military parenting program on parental distress and suicidal ideation: After Deployment Adaptive Parenting Tools. *Suicide & Life-threatening Behavior, 46,* 23-31. doi:10.1111/sltb.12255

Gewirtz, A. H., Forgatch, M. S., Albrecht, G., Askeland, E., Gray, L., Sigmarsdottir, M., & Tjaden, J., (2018). *Creating and sustaining science-based delivery systems for psychological interventions: The widespread implementation of a parent training intervention*. Manuscript in preparation.

Gottfredson, D. C., Cook, T. D., Gardner, F. E. M., Gorman-Smith, D., Howe, G. W., Sandler, I. N., & Zafft, K. M. (2015). Standards of evidence for efficacy, effectiveness, and scale-up research in prevention science: Next generation. *Prevention Science, 16,* 893-926. doi:10.1007/s11121-015-0555-x

Hukkelberg, S. S., & Ogden, T. (2013). Working alliance and treatment fidelity as predictors of externalizing problem behaviors in parent management training. *Journal of Consulting and Clinical Psychology, 81,* 1010-1020. doi:10.1037/a0033825

IBM Corp., (2013). Maintenance and Service Management User Guide. IBM Corporation: USA. Retrieved from https://www.ibm.com/support/knowledgecenter/SSFCZ3_10.4.1/com.ibm.tri.doc/pdfs/pdf_tri_maint_service_mng.pdf

Kazdin, A. E. (2005). Child, parent, and family-based treatment of aggressive and antisocial child behavior. In E. D. Hibbs & P. S. Jensen In E. D. Hibbs & P. S. Jensen (Eds.), *Psychological treatments for child and adolescent disorders: Empirically based strategies for clinical practice* (2nd ed., pp. 445–476). Washington: American Psychological Association.

Kazdin, A. E., & Blase S. L. (2011). Interventions and models of their delivery to reduce the burden of mental illness: Reply to commentaries. *Perspectives on Psychological science: A Journal of the Association for Psychological Science, 6,* 507-10. doi:10.1177/1745691611418241

Kjøbli, J., Naerde, A., Bjornebekk, G., & Askeland, E. (2013). Maternal mental distress influences child outcomes in brief parent training. *Child and Adolescent Mental Health, 19,* 171-177.

Knutson, N., Forgatch, M., Rains, L., & Sigmarsdóttir, M. (2009). *Fidelity of implementation rating system (FIMP): The manual for PMTO* [TM]. Implementation Sciences International, Inc. Eugene OR.

NUBU: Norwegian Center for Child Behavior Development. (2017). The quality assurance database [Database]. Retrieved from https://www.pmto.no/

Ogden, T., & Amlund-Hagen, K. (2008). Treatment effectiveness of parent management training in Norway: A randomized controlled trial of children with conduct problems. *Journal of Consulting and Clinical Psychology, 76*, 607-621. doi:10.1037/0022-006X.76.4.607

Ogden, T., Forgatch, M. S., Askeland, E., Patterson, G. R., & Bullock, B. M. (2005). Implementation of parent management training at the national level: The case of Norway. *Journal of Social Work Practice, 19*, 317-329. doi:10.1080/02650530500291518

Patterson, G. R. (2005). The next generation of PMTO models. *Behavior Therapist, 28*, 25-32.

Patterson, G. R., & Brodsky, G. (1966). A behaviour modification programme for a child with multiple problem behaviours. *Journal of Child Psychology and Psychiatry, 7,* 277-295. doi:10.1111/j.1469-7610.

Patterson, G. R., Forgatch, M. S., & DeGarmo, D. S. (2010). Cascading effects following intervention. *Development & Psychopathology, 22,* 949 -970. doi:10.1017/S0954579410000568

PI Research. (2017). Sessiedatabase [Database]. Retrieved from https://pmto.sessiedatabase.nl/

Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health and Mental Health Services Research, 38,* 65-76. doi:10.1007/s10488-010-0319-7

Rambøll Management Consulting (2013). *Analysis of the economic impact of the Parent Management Training – Oregon (PMTO)* [Analyse af de økonomiske konsekvenser: Parent Management Training – Oregon (PMTO)]. Copenhagen, DK: The National Board. Retrieved from (in Danish) https://www.bufdir.no/nn/Bibliotek/Dokumentside/?docId=BUF00002168

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.

Saldana, L. (2014). The stages of implementation completion for evidence-based practice: Protocol for a mixed methods study. *Implementation Science, 9,* 43. doi:10.1186/1748-5908-9-43

Schoenwald, S. K., Garland, A. F., Chapman, J. E., Frazier, S. L., Sheidow, A. J. & Southam-Gerow, M. A. (2011). Towards the effective and efficient measurement of implementation fidelity. *Administration and Policy in Mental Health and Mental Health Service Research, 38,* 32-43. doi:10.1007/s10488-010-0321-0

Sigmarsdóttir, M., & Björnsdóttir, A. (2012). Community implementation of PMTO: Impacts on referrals to specialist services and schools. *Scandinavian Journal of Psychology, 53,* 506-511. doi:10.1111/j.1545-5300.2012.01421.x

Sigmarsdóttir, M., DeGarmo, D. S., Forgatch, M. S., & Guðmundsdóttir, E. V. (2013). Treatment effectiveness of PMTO for children's behavior problems in Iceland: Assessing parenting practices in a randomized controlled trial. *Scandinavian Journal of Psychology, 54,* 468–476. doi: 10.1111/sjop.12078

Sigmarsdóttir, M., Gudmundsdóttir, E., & Frímannsdóttir, A. M. (2016, January 15). Parent Management Training – Oregon Model (PMTO): Implementation and effects in Iceland. [Annual report]. The Ministry of Welfare in Iceland, Reykjavik, Iceland.

Sigmarsdóttir, M., Rains, L. A., & Forgatch, M. S. (2016). Parent Management Training – Oregon Model (PMTO): A program to treat children's behavior problems. In J. J. Ponzetti (Ed.), *Evidence-based parenting education: A global perspective* (pp. 192-205). New York: Taylor & Francis/Psychology Press.

Sigmarsdóttir, M., Thorlacius, O., Guðmundsdóttir, E. V., & DeGarmo, D. S. (2015). Treatment effectiveness of PMTO for children's behavior problems in Iceland: Child outcomes in a nationwide randomized controlled trial. *Family Process, 54,* 498-517. doi:10.1111/famp.12109

Socialstyrelsen (2017). Socialstyrelsen vidioportal [Database]. Retrieved from

http://socialstyrelsenbuwebu.videoportal.dk

Stoolmiller, M., Duncan, T., Bank, L., & Patterson, G. R. (1993). Some problems and solutions in the study of change: significant patterns in client resistance. *Journal of consulting and clinical psychology, 61,* 920-928. doi:10.1037/0022-006X.61.6.920

Thijssen, J., Albrecht, G., Muris, P., & de Ruiter, C. (2017). Treatment fidelity during therapist initial training is related to subsequent effectiveness of Parent Management Training—Oregon Model. *Journal of Child and Family Studies, 26*, 1991-1999. doi:10.1007/s10826-017-0706-8

Tømmeraas, T., & Ogden, T. (2017). Is there a scale-up penalty? Testing behavioral change in the scaling up of Parent Management Training in Norway. *Administration and Policy in Mental Health, 44,* 203–216. doi:10.1007/s10488-015-0712-3

Washington State Institute for Public Policy. (2017). *Parent Management Training—Oregon Model (treatment population). Children's Mental Health: Disruptive Behavior*. Retrieved from institute@wsipp.wa.gov

Weisz, J. R., Yi Ng, M., & Bearman, S. K. (2014). Odd Couple? Reenvisioning the relation between science and practice in the dissemination-implementation era. *Clinical Psychological Science, 2,* 58–74. doi:10.1177/2167702613501307

Table 1

Professional fields of therapists that started PMTO therapist training for each generation in Iceland, Denmark, and the Netherlands

Iceland (population 333.557)

	Professional field					
	Psychology		Social Work		Other	
G	n	%	n	%	n	%
G1	1	33	1	33	1	33
G2	5	83	0	0	1	16
G3	4	57	3	43	0	0
G4	8	50	7	44	1	6
G5	6	40	6	40	3	20
G6	4	25	8	50	4	25
Total	**28 / 44**		**25 / 40**		**10 / 16**	

Denmark (population 5.705.617)

	Professional field					
	Psychology		Social Work		Other	
G	n	%	n	%	n	%
G1	0	0	4	100	0	0
G2	4	22	12	66	2	11
G3	1	7	14	93	0	0
G4	2	13	13	81	1	6
G5	1	5	19	86	2	9
G6	3	21	10	72	1	7
G7	0	0	16	100	0	0
G8	3	19	13	81	0	0
Total	**14 / 12**		**101 / 83**		**6 / 5**	

The Netherlands (population 17.01718)

	Professional field					
	Psychology		Social Work		Other	
G	n	%	n	%	n	%
G1	9	31	20	68	0	0
G2	9	23	30	77	0	0
G3	5	22	18	78	0	0
G4	6	24	19	76	0	0
Total	**29 / 25**		**87 / 75**		**0**	**0**

Note: G = Generation; Other = Other professional fields such as family therapists, counsellors, registered nurses or medical doctors; Total = Total number/percentage for all generations.

Table 2

Mean FIMP scores at certification by categories for each generation in the Netherlands, Iceland and Denmark, and F tests for therapist fidelity.

	FIMP scores																		
	G1		G2		G3		G4		G5		G6		G7		G8				
Country	*M [95% CI]*	*SD*	*M [95% CI]*	*SD*	*M [95% CI]*	*SD*	*M [95% CI]*	*SD*	*M [95% CI]*	*SD*	*M [95% CI]*	*SD*	*M [95% CI]*	*SD*	*M [95% CI]*	*SD*			
The Netherlands																	*F*(3,91)	*ES*	*Significant simple contrast*
Mean	**7.4 [7.2, 7.6]**	**0.7**	**7.0 [6.8, 7.1]**	**0.4**	**7.2 [6.9, 7.4]**	**0.5**	**7.4 [7.2, 7.6]**	**0.4**	–	–	–	–	–	–	–	–	**3.16***	**6.32**	**2 < 1, 4**
Knowledge	7.2 [6.8, 7.5]	0.8	6.9 [6.7, 7.1]	0.6	7.1 [6.9, 7.4]	0.5	7.5 [7.3, 7.7]	0.5	–	–	–	–	–	–	–	–	2.21		
Structure	7.4 [7.1, 7.3]	0.7	6.7 [6.6, 6.9]	0.4	7.0 [6.7, 7.4]	0.6	7.2 [7.0, 7.5]	0.5	–	–	–	–	–	–	–	–	5.85**	11.7	2 < 1, 4
Teach	7.2 [6.9, 7.5]	0.7	6.7 [6.5, 6.9]	0.5	7.0 [6.6, 7.3]	0.6	7.0 [6.7, 7.2]	0.5	–	–	–	–	–	–	–	–	2.47		
Process	7.5 [7.2, 7.8]	0.7	7.3 [7.1, 7.5]	0.4	7.4 [7.2, 7.7]	0.5	7.7 [7.4, 7.9]	0.5	–	–	–	–	–	–	–	–	1.23		
Overall	7.5 [7.3, 7.7]	0.6	7.0 [6.7, 7.2]	0.5	7.1 [6.9, 7.4]	0.5	7.4 [7.2, 7.6]	0.5	–	–	–	–	–	–	–	–	4.96**	9.92	2 < 1, 4
Iceland																	*F*(5,45)		
Mean	**7.3 [5.3, 9.2]**	**0.2**	**6.5 [6.1, 6.7]**	**0.2**	**7.1 [6.6, 7.6]**	**0.4**	**7.1 [6.9, 7.4]**	**0.4**	**7.3 [7.1, 7.6]**	**0.4**	**7.2 [6.7, 7.7]**	**0.7**	–	–	–	–	**2.23**		
Knowledge	6.9 [5.3, 8.5]	0.2	6.3 [5.8, 6.7]	0.4	7.2 [6.8, 7.5]	0.3	7.1 [6.9, 7.4]	0.4	7.4 [7.2, 7.7]	0.4	7.3 [6.8, 7.8]	0.7	–	–	–	–	5.10***	10.2	2 < 4, 5 , 6
Structure	7.5 [6.8, 8.2]	0.4	6.6 [6.1, 7.1]	0.4	6.9 [6.5, 7.3]	0.3	6.9 [6.7, 7.2]	0.5	7.1 [6.8, 7.4]	0.5	6.9 [6.4, 7.4]	0.7	–	–	–	–	1.8		
Teach	6.9 [5.3, 8.5]	0.2	6.3 [5.8, 6.8]	0.4	6.7 [6.0, 7.3]	0.6	6.9 [6.6, 7.2]	0.5	7.1 [6.7, 7.4	0.5	6.8 [6.3, 7.3]	0.8	–	–	–	–	1.39		
Process	7.5 [6.6, 8.4]	0.7	6.6 [6.2, 7.0]	0.3	7.6 [6.8, 8.3]	0.6	7.4 [7.0, 7.8]	0.7	7.6 [7.4, 7.8]	0.4	7.4 [6.9, 8.0]	0.9	–	–	–	–	1.95		
Overall	7.3 [6.5, 8.0]	0.4	6.4 [6.0, 6.8]	0.3	7.2 [6.8, 7.6]	0.3	7.2 [6.9, 7.5]	0.5	7.3 [7.1, 7.6]	0.5	7.3 [6.8, 7.8]	0.7	–	–	–	–	2.72*	5.44	2 < 5 , 6
Denmark																	*F*(7,101)		
Mean	**7.6 [6.5, 8.6]**	**0.7**	**6.9 [6.6, 7.3]**	**0.7**	**6.9 [6.5, 7.3]**	**0.7**	**6.9 [6.5, 7.2]**	**0.6**	**7.2 [6.9, 7.4]**	**0.4**	**7.1 [6.8, 7.4]**	**0.4**	**7.2 [7.0, 7.5]**	**0.4**	**7.1 [6.7, 7.5]**	**0.7**	**1.22**		
Knowledge	7.6 [6.7, 8.4]	0.5	7.2 [6.9, 7.6]	0.7	6.9 [6.5, 7.3]	0.7	6.9 [6.5, 7.3]	0.7	7.2 [7.0, 7.45	0.4	7.2 [7.0, 7.45	0.4	7.0 [6.7, 7.3]	0.6	7.1 [6.6, 7.5]	0.7	0.89		
Structure	7.6 [6.2, 8.9]	0.9	6.9 [6.6, 7.3]	0.6	7.0 [6.7, 7.4]	0.6	6.9 [6.5, 7.3]	0.7	7.1 [6.8, 7.3]	0.5	7.0 [6.7, 7.4]	0.6	7.2 [6.9, 7.5]	0.5	7.1 [6.7, 7.4]	0.6	1.74		
Teach	7.3 [6.1, 8.4]	0.7	6.6 [6.2, 7.0]	0.8	6.5 [5.9, 7.0]	1.0	6.7 [6.3, 7.0]	0.6	7.0 [6.8, 7.2]	0.5	7.0 [6.7, 7.3]	0.5	7.1 [6.9, 7.3]	0.4	6.8 [6.4, 7.2]	0.7	1.18		
Process	7.6 [6.6, 8.6]	0.6	6.9 [6.4, 7.3]	0.8	7.1 [6.6, 7.6]	0.9	6.9 [6.6, 7.1]	0.4	7.2 [6.9, 7.5]	0.6	7.1 [6.8, 7.4]	0.6	7.4 [7.1, 7.7]	0.5	7.3 [7.0, 7.7]	0.7	1.81		
Overall	7.6 [6.3, 8.8]	0.8	7.0 [6.6, 7.4]	0.7	6.8 [6.5, 7.2]	0.6	6.9 [6.5, 7.3]	0.7	7.2 [7.0, 7.4]	0.5	7.1 [6.8, 7.3]	0.4	7.3 [7.1, 7.4]	0.4	6.9 [6.5, 7.3]	0.7	1.45		

Note: G = Generation; CI = Confidence interval; ES = Effect size (Cohen's d); * = Significant at the 0.05 level; ** = Significant at the 0.01 level; *** = Significant at the 0.001 level.

Table 3

Certification year with number/percentage of professionals that finished PMTO therapist training and number/ percentage still active in 2016 *for each generation in the Netherlands, Iceland and Denmark.*

The Netherlands						**Iceland**						**Denmark**					
Y	G	n	%	A	%	Y	G	n	%	A	%	Y	G	n	%	A	%
´07	G1	26	90	9	34	´02	G1	2	66	1	50	´06	G1	4	100	1	25
´08	G2	32	82	18	56	´05	G2	5	83	3	60	´07	G2	16	89	7	44
´10	G3	17	74	13	76	´08	G3	6	86	6	100	´11	G3	14	93	12	79
´12	G4	20	80	16	80	´12	G4	13	81	9	69	´12	G4	12	75	6	50
Total		**95 / 82**		**61 / 64**		´14	G5	15	100	12	80	´12	G5	19	86	11	58
						´16	G6	11	69	10	90	´14	G6	13	81	13	100
						Total		**52 / 83**		**41 / 78**		´15	G7	15	94	15	100
												´16	G8	15	81	15	100
												Total		**108 / 84**		**79**	**/ 73**

Note: Y = Year of certification; G = Generation; n = Number of therapists who finished training; A = Number of active therapists in 2016; Total = Total number/percentage.

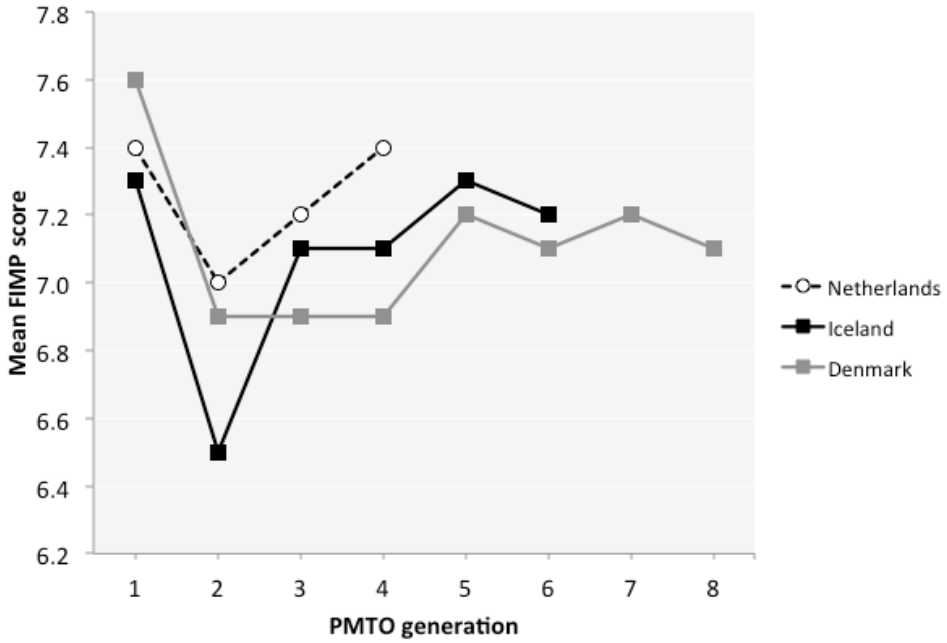

Figure 1. Mean FIMP scores by generation in the Netherlands, Iceland and Denmark.