Published in final edited form as:

J Child Fam Stud. 2018 February ; 27(2): 535–546. doi:10.1007/s10826-017-0886-2.

Braiding Two Evidence-based Programs for Families at-risk: Results of a Cluster Randomized Trial

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Abstract

Child maltreatment is a significant public health problem best addressed through evidence-based parent-support programs. There is a wide range of programs with different strengths offering a variety of options for families. Choosing one single evidence-based program often limits the range of services available to meet the unique needs of families. This paper presents findings from a study to examine the systematic braiding of two evidence-based programs, Parents as Teachers and

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Conflict of Interest: J.R. Lutzker is the developer of SafeCare. All authors report no conflict of interest.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Georgia State University Institute Review Board provided approval for this study.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Author contributions

KG: designed and executed the study, oversaw and assisted with data analyses, and wrote the manuscript. BSL: analyzed the data and wrote the results section of the manuscript. KM: executed the study and assisted in writing the manuscript. JSC, DJW and SSB: collaborated with the design of the study and assisted with writing and editing the final manuscript. AK: collaborated in the editing of the final manuscript. JRL: designed and oversaw the execution of the study and collaborated in the editing of the final manuscript.

SafeCare at Home (PATSch), with the goal to provide a more robust intervention for higher risk families. A cluster randomized effectiveness trial was conducted to examine if PATSch improved parenting behaviors known to decrease the risk for child maltreatment compared to Parents as Teachers (PAT) Alone. Parents ($N=159$; 92 PAT Alone; 67 PATSch) were enrolled to complete a baseline, 6-month and 12-month assessment. Results indicate the groups did not differ on number of environmental hazards in the home, parents' health care decision-making abilities, child abuse potential, and physical assault over time. However, with regard to the potential for child abuse, the PATSch group showed a decrease in nonviolence discipline and increase in psychological aggression compared to the PAT group. Further research is needed to better examine this concept and its implications for the field.

Keywords

systematic braiding; evidence-based programs; child maltreatment; parenting; intervention

Child maltreatment is a significant public health problem (Currie & Widom, 2010; Fang, Brown, Florence, & Mercy, 2012; Norman et al., 2012; Springer, Sheridan, Kuo, & Carnes, 2007). In 2015, an estimated 4 million referrals were made to child protective service (CPS) agencies in the United States, indicating concern about the well-being of over 7.2 million children. Of these children, 683,000 were determined to be victims of maltreatment (9.2 victims per 1,000 children), which was largely perpetrated by parents or primary caregivers (U.S. Department of Health & Human Services [DHHS], 2017). However, these estimates do not account for the number of children who experience maltreatment without being brought to the attention of CPS. The cumulative prevalence of child maltreatment is estimated to occur in 1 in 8 children under the age of 18 (Wildeman et al., 2014). Though there is variation in the estimation of prevalence, it is clear that a high number of children are experiencing maltreatment annually in the US.

Intervening early, especially prior to any maltreatment, can reduce the impact of adverse experiences throughout the life course and reduce the economic burden of these adverse outcomes (Astuto & Allen, 2009; Mercy & Saul, 2009). Home-based parent-support programs (also known as home visiting programs) are the most widely used early prevention approach in the US (Astuto & Allen, 2009; Avellar & Supplee, 2013; Chen & Chan, 2016). Yet, programs differ with regard to several important factors including: provider education requirements (e.g., paraprofessional or registered nurse); eligibility criteria (e.g., first time mother, age of child); frequency of visits (e.g., weekly or monthly); duration of intervention (e.g., 18-sessions up to multiple years); and, content focus (e.g., parent-child interaction, home safety, academic readiness; Astuto & Allen, 2009; Casillas, Fauchier, Derkash, & Garrido, 2016). Parent-support programs target a constellation of risk factors for maltreatment including parenting skills, parent mental health, and child social, emotional, and cognitive development (Astuto & Allen, 2009; Guastaferrero & Lutzker, 2017).

Parents most often receive parent-support programs when referred by CPS. Of the 3.4 million children that received a CPS investigation in 2015, only one-third (1.2 million) received post-response services in which the safety of the child was addressed via some

method of intervention (DHHS, 2017). These secondary prevention efforts (i.e., after the first report) are critical. However, there are considerable opportunities for primary prevention (i.e., before any report) efforts (Klevens & Whitaker, 2007; Solomon & Åsberg, 2012). Additionally, the prevention of repeat involvement in the child welfare system is an important problem that needs to be addressed. Repeat involvement with CPS agencies may strain precious resources that could be directed to other families (Connell, Bergeron, Katz, Saunders, & Tebes, 2007).

There is a wide range of evidence-based parent support programs offering a menu of options for families and providers. Programs differ, however, in the focus of the intervention (child development vs. parenting skill vs. maternal health), populations served, and delivery features such as duration of services and frequency of visits. Any single program will not necessarily fit all families in terms of service needs or desired delivery features. As a result, parents may receive multiple parent-support models (Aarons & Palinkas, 2007). One solution to this problem is to understand what programs work best for which clients, but another solution is to combine programs with complementary strengths to better address a range of family needs.

One way to address the need for innovative intervention strategies that address multiple parent risk factors is to use a *systematic braiding* approach. Systematic braiding is a nascent practice in which two (or potentially more) models with complementary foci are combined while maintaining fidelity to the curriculum for each model and integration of the programs' implementation infrastructures (Guastaferrero, Miller, Shanley Chatham, et al., 2017). Systematic braiding involves not only content integration, but also incorporation of the implementation paradigms for each of the interventions braided. The goal of systematic braiding is to streamline the implementation of curricula simultaneously rather than simply tacking one intervention on to another while sacrificing fidelity and potentially burdening the family. The value of integrating the two models is optimizing the strengths of each program together, while areas lacking in one model may be facilitated by the other.

Parents as Teachers and SafeCare at Home (PATSCH) is a systemically braided curriculum of two evidence-based in-home parent-support models: Parents as Teachers (Albritton, Klotz, & Roberson, 2003) and SafeCare® (Chaffin, Hecht, Bard, Silovsky, & Beasley, 2012; Guastaferrero, Lutzker, Graham, Shanley, & Whitaker, 2012; Lutzker & Chaffin, 2012). The two models share a broad common goal in improving parent-child relationships, but as Guastaferrero and colleagues (2017) previously discussed, the two models differ with regard to pedagogical approach (parent education vs. skills based learning), theoretical underpinnings (empowerment vs. social learning theory), and intended outcomes (school readiness vs. reduction in risk for maltreatment). The PATSCH curriculum focuses on including content from SafeCare (parent-child interaction, home safety, and child health) in 12 braided sessions that are embedded into the delivery of PAT which focuses on parent-child interaction, development-centered parenting, and family well-being (Albritton et al., 2003; Guastaferrero, Miller, Shanley Chatham, et al., 2017).

The braiding of the PAT and SafeCare curricula is an example of practice-to-research. A PAT State Leader approached the National SafeCare Training and Research Center with the

observation that at some PAT sites, parents were struggling with basic parenting skills and were not 'ready' for some of the PAT activities. We considered that perhaps attaining the more basic parenting skills targeted by SafeCare might help these parents be more ready for PAT content. The notion of systematic braiding is that it could be any two curricula braided together; the present paper focuses specifically on PAT and SafeCare. A braided curriculum is innovative in its ability to address potentially lacking areas in either of the original curricula and the braided implementation infrastructures reduces the risk for poor fidelity to either original model. In PATSCH, the parent skills targeted in the home safety and child health modules of SafeCare filled a void in the PAT curriculum.

The process by which PAT and SafeCare were braided is described elsewhere (Guastaferrero, Miller, Shanley Chatham, et al., 2017), but briefly, the braiding process involved five phases. First, following training in the SafeCare and PAT models, the research team introduced the rationale and proposed implementation to a convenience sample of extant PAT sites. Based on their feedback, in the second phase the SafeCare curriculum was reduced from six sessions to four. Phase 3 consisted of a pilot of the braided curriculum in which current PAT providers (i.e., parent educators) were trained to deliver SafeCare, but were not provided any guidelines regarding braiding, as we wanted to allow braiding of content to happen organically. The pilot included individual interviews with parents and providers, from which the curriculum was greatly modified during Phase 4. Explicit braiding instructions (e.g., when and what) and infrastructure (e.g., fidelity) was built directly into the braided curriculum and in Phase 5 was rolled in an effectiveness trial.

The present study discusses the results of the cluster randomized effectiveness trial examining if PATSCH improved parenting behaviors known to decrease the risk for child maltreatment compared to PAT Alone. We hypothesized that parents who received the braided curriculum, PATSCH, in comparison to PAT Alone, would have improved parenting behaviors that would reduce risk factors for maltreatment. Specifically, parents who received PATSCH were hypothesized to have reduced potential for abuse, reduced hazards in the home, and increased ability to correctly identify symptoms and illnesses and the best option for care.

Method

Participants

This study was implemented through partnerships with PAT agencies across three southeastern states. During the recruitment period, PAT parent educators described potential participation in the study to eligible parents on their caseload to explain the project. Eligible parents were those enrolled in PAT who had completed at least the first five program visits, had a child under four-years old, and met at least two of the following potential risk factors for maltreatment: low income home, low educational attainment, teen parent, single parent, or non-native English speaking. The first five PAT visits are essential in developing a provider-parent relationship and, as such, the research team decided that all families should have this minimum level of contact; however, we did not limit participation of families who had received more than the first five visits. In families with multiple children under age four,

the parent educator identified a target child about whom participating parents would answer assessment questions and intervention would be focused if in the PATSCH group.

Parent educators completed an enrollment form detailing which risk factors a family met, identified the target child, and sent the form to the research team upon enrollment. On this form, parent educators selected all potential risk factors; the most common risk factors identified were low-income homes ($n=144$), low educational attainment ($n=82$), and non-native English speaking homes ($n=64$). If a family was eligible and indicated interest, the parent educator scheduled a visit with the data collector where upon the data collector consented and enrolled the family in the trial. A total of 159 participants were enrolled and completed the baseline assessment (67 in the PATSCH group, 92 in the PAT Alone group). Figure 1 describes the participant flow and retention for the study: 126 participants (79%) completed both baseline and 6-month follow-up assessments (47 (70%) in the PATSCH group, 79 (86%) in the PAT Alone group); 93 (58%) participants completed all three assessments (36 (54%) in the PATSCH group, 57 (62%) in the PAT Alone group). There was no difference in the proportion of participants who were lost to follow-up across the PAT Alone and PATSCH groups at the final time point, $RR = 1.22$, 95%CI (.84, 1.76).

Procedures

The effectiveness trial began at 23 existing PAT sites in three states. Randomization occurred at the site level to avoid intra-site contamination: 11 sites were randomized to continue to provide PAT and 12 sites were randomized to provide PATSCH (Figure 1). Due to funding cuts and staff turnover that affected the providers who initially had agreed to participate and recruit for the study, four PATSCH and four PAT Alone sites dropped-out from the research study; ultimately, eight sites delivered PATSCH and eight PAT Alone sites served as comparison (see Guastaferrero, Miller, Shanley Chatham, et al., 2017). Parent educators recruited eligible and interested participants and worked with local data collectors to schedule enrollment visits during which the data collector reviewed the study protocol, obtained informed consent, and conducted the baseline assessment.

Assessments occurred at three time points: baseline (T0), 6-months post-enrollment (T1), and 12-months post-enrollment (T2). The assessment protocol was the same for both groups all time points: administration of an audio-computer assisted self-interview (ACASI) on a netbook, a brief video recording of a parent-child interaction in a play activity, and a video recording scan of two rooms in the home to assess for safety hazards. Participants were incentivized at each visit: \$40 at baseline, \$50 at the 6-month follow-up, and \$60 at the 12-month follow-up. The Georgia State University Institutional Review Board approved the research protocol.

PAT Alone Intervention—Parent educators implemented PAT in accordance with standards specified by the National PAT Office including bi-weekly or monthly home visits, developmental/health screenings, and provided referrals to families for community resources as needed (Albritton et al., 2003). The total number of visits conducted by parent educators is determined by each site and is dependent upon the frequency of visit deemed necessary for varying risk criteria. Session level data were not collected for the PAT Alone group.

PATSCH Intervention—Participants began the PATSCH curriculum after completing the baseline assessment. The order of delivery of the three PATSCH modules (i.e., PCI/PII, Safety, Health) was at the discretion of the parent educator. Parent educators were strongly encouraged to visit PATSCH families once per week or biweekly. However, we could not mandate the frequency of visit for two reasons: (1) for some providers, caseloads were too high to allow for weekly visits for some families, and (2) because families were used to being seen bi-weekly or monthly, some were not open to more frequent visits. Additionally, the frequency of typical PAT visits varies by site, often depending on funding requirements and dictated by the assessed level of risk for a family (i.e., higher-risk families are seen more frequently). The sites in this trial typically visited families between two to four times per month; thus, many providers had to increase visits in order to deliver PATSCH. Depending on the frequency of visits, as well as unanticipated family events, there was considerable variation in the duration of PATSCH. If delivered weekly, PATSCH could be completed in 12 weeks, and if delivered biweekly, PATSCH could be completed in 24 weeks. Assessments occurred 6- and 12-months after baseline regardless of curriculum completion; that is, parents who did not complete PATSCH still had the opportunity to complete the research assessments (Guastaferro, Miller, Lutzker, et al., 2017).

Parents receiving PATSCH received four sessions of each of the three modules (12 sessions total). Two of the sessions in each module were braided; that is, the aspects of a typical PAT visit were also included into the PATSCH session: parent-child interaction, development-centered parenting, and family well-being (Guastaferro, Miller, Shanley Chatham, et al., 2017). In so doing, this assured that all braided visits met fidelity requirements as stipulated by the PAT National Office. Following PATSCH, parents continued their PAT visits as usual.

Measures

Demographic Information—Basic demographic information was collected for all participants including gender, age, race, marital status, level of education completed, income, and number of children in the home as part of the ACASI interview. These descriptive data are presented in Table 1.

Home Accident Prevention Inventory (HAPI)—The HAPI is an assessment measure designed for use by SafeCare providers to assess home hazards that are accessible to children (Tertinger, Greene, & Lutzker, 1984). Hazards in 10 categories are assessed: poisons, choking hazards, suffocation hazards, drowning hazards, fire/electrical hazards, fall hazards/activity restrictions, sharp objects, firearms, crush hazards, and allergen/organic hazards. To assess hazards for this study, local data collectors created video recordings of two rooms in the participants' homes. Data collectors were instructed to stand in the center of the room and slowly turn, capturing floor to ceiling of every wall. All videos were sent to the research team and two members of the research team (1st and 3rd author) jointly reviewed each video and counted the number of hazards across both rooms at each time point. Variations in the quality of the videos affected scoring. These variations included: speed (i.e., turning around room too quickly); lighting (i.e., lack of light in the room to make out details); and completeness (i.e., not filming the entire room). Though all data collectors were instructed to film the living room and kitchen, there was also variability in the

consistency of selecting these rooms for a variety of reasons depending on where the family spent most of their time, and participant preference. Additionally, many participants changed residences during the course of the 12-month study, and thus different rooms were recorded. Occasionally, only one room in the family's home was recorded and/or able to be scored. Therefore, the average number of hazards across all rooms recorded and scored was used for the present analysis.

Sick and Injured Child Checklist (SICC)—The SICC is used to assess parents' skills in identifying their children's symptoms and illnesses and their ability to decide the most appropriate treatment (Bigelow & Lutzker, 2000; Delgado & Lutzker, 1988). Scenarios result in one of three actions/decisions: going to the emergency department, making a doctor's appointment, or caring for the child at home. Parents were presented with a scenario, such as: "*Over the past few hours, your child has become more and more cranky and seems to be sleeping a lot. He is complaining of a stiff neck and headache. You feel his head and it is very hot.*" The parents must then identify the symptoms and determine if it is an emergency. If it is not, parents must describe the steps they would then take resulting in either making a doctor's appointment or caring for their child at home. Nine health scenarios were modified for delivery via the ACASI. A decision score was calculated indicating whether the parent made the correct decision about treating their child in each scenario (e.g., emergency, doctor's appointment, or care at home). If parents' made the correct decision on their own (such as identifying an emergency in the scenario described above), they received a point. Three scenarios were presented per scenario type, a maximum score of three per scenario type. A total decision score for all scenario types was then summed, for a maximum potential score of nine.

Brief Child Abuse Potential Inventory (BCAP)—The BCAP (Ondersma, Chaffin, Mullins, & LeBreton, 2005) is the brief version of the Child Abuse Potential Inventory (Milner, 1994), a validated actuarial assessment measure indicating the potential for child abuse. Parents indicated agreement or disagreement for items. Items were scored 1 for each positive endorsement on the 34-item assessment. The BCAP total score is a summary score of 7 domains: distress, unhappiness, persecution, loneliness, family conflict, rigidity, and poverty, (i.e., the lie scale is not included in the total score). Scores may range from 0 to 28. Higher scores indicate greater child abuse potential.

Parent-Child Conflict Tactic Scale (CTS-PC)—The CTS-PC Short Form is a 10-item assessment of the frequency of nonviolent and/or abusive modes of discipline used by parents in the past three months (Straus, Hamby, Finkelhor, Moore, & Runyan, 1998; Straus & Mattingly, 2007). Items are rated on an ordinal scale about frequency of behavior in the past 3 months (0 = never; 1 = once; 2 = twice; 3 = 3–5 times; 4 = 6–10 times; 5 = 11–12; and 6 = 20+ times) that is then recoded to match average occurrence for the range in the ordinal scale (e.g., 3 to 5 times is recoded as "4"), per the manual for the measure. Parents who indicated that the behavior had happened before, but not in the last 3 months, were coded as never (0). Results are presented for chronicity in the past three months for three subscales: non-violent discipline (e.g., "explained why something was wrong", "Put him/her

in time out”), physical assault (e.g., “spanked him/her on the bottom with your bare hand”), and psychological aggression (e.g., “swore or cursed and him/her”).

Results

Preliminary Analyses

Characteristics of families—At baseline (Table 1), the mean age of parents was 28.02 years ($SD = 7.81$), the mean age of children was 12.83 months ($SD = 7.79$), on average, there were 2.08 ($SD = 1.25$) children in the home, 35% of families were headed by a single parent, and 73% of parents reported that they were from ethnic/racial minority groups: 42 (26%) Non-Hispanic White, 49 (31%) African American, 55 Hispanic (35%), 9 (6%) Asian, and 4 Other/Missing (<3%).

The differences between families who completed PATSCH (42% of $n = 67$) and those who did not complete PATSCH (58% of $n = 67$) were examined. Completers did not differ from non-completers in terms of parent age, child age, single status, or racial/ethnic minority status. Families with fewer children were more likely to complete PATSCH (M number of children = 1.68, $SD = 0.86$ versus M number of children = 2.34, $SD = 1.47$ for noncompleters), $t(56.35) = 2.23$, $p = .03$. Families who completed PATSCH did not differ from families who did not complete PATSCH with regard to baseline levels of parenting behaviors. Of note, of families enrolled in PATSCH, 42% completed all 3 modules of PATSCH, 24% completed two modules of PATSCH, 18% completed 1 module, and 15% did not complete any modules.

PAT Alone Family Characteristics—At baseline, the mean age of parents in the PAT Alone group was 29.20 years ($SD = 8.47$), the mean age of children was 13.38 months ($SD = 7.76$). On average, there were 2.11 ($SD = 1.24$) children in the home, 37% of families were headed by a single parent, and 80% of parents reported that they were from racial/ethnic minority groups (Table 1).

Comparison of the PATSCH and PAT Alone groups—Preliminary analyses examined baseline differences between the PATSCH and PAT Alone groups on demographic indicators and parenting behaviors (Table 1). The PATSCH and PAT Alone group did not differ with regard to child age, number of children in the home, low-income status, limited English, teen parent status or single status at baseline. Parents in the PATSCH condition were younger than parents in the PAT Alone condition, $t(145.2) = 2.41$, $p = .02$, and they were less likely to be racial/ethnic minorities, 63% minority versus 80%, $\chi^2(1) = 5.47$, $p = .02$, respectively. Parents in the PATSCH condition were also more likely to have graduated from high school, 59% versus 31%, $\chi^2(1) = 9.74$, $p < .01$.

Baseline parenting behaviors were examined for group differences (i.e., main study outcomes of hazards in the home, health care decisions, child abuse potential, and parent-child conflict tactics). The PATSCH group reported higher average levels of home hazards at baseline, $M = 12.70$ ($SD = 6.63$), than the PAT Alone group, $M = 9.48$ ($SD = 5.23$), $t(122.33) = 3.20$, $p < .01$. The PATSCH and PAT Alone group did not differ in terms of baseline levels of any other parenting behaviors.

Main analyses: comparing PATSCH and PAT Alone on primary outcomes

Analyses were conducted with SAS 9.4 Software (SAS Institute Inc., 2011). The primary models examined the differences between PATSCH and PAT Alone families, analyzing parenting behaviors (i.e., for hazards in home, health care decisions, child abuse potential, and parent-child conflict tactics) across baseline, 6-month, and 12-month assessments. Mean scores on parenting behaviors is reported by group over time in Table 2. SAS Proc GLIMMIX was used to estimate a series of linear repeated measures multilevel models that used all available data for each parent to estimate the degree to which condition was associated with parenting behaviors. The response distribution was modeled as a normal distribution whereas child abuse potential, nonviolent discipline, physical assault, and psychological aggression were log transformed as this data was right skewed. The covariance structure used for this analysis was unstructured covariance (un). Based on recommendations from Littell and colleagues (2006), covariance structure was chosen after examining covariance and correlation matrices as well as estimates for model fit (e.g., AIC, BIC, $-2\text{Res Log Likelihood}$). Models examined the overall effect of condition on parenting behaviors. Analyses controlled for parent age, ethnicity, and education status, based on baseline comparisons and based on literature linking parenting behaviors with these variables (Belsky, 1980; Brown, Cohen, Johnson, & Salzinger, 1998; Hussey, Chang, & Kotch, 2006). Models are presented in Table 3.

Hazards in the Home—There was a main effect for treatment group. The PATSCH group reported more hazards in the home than the PAT Alone group, 2.89 ($SE = 1.36$), $p = .04$. No other significant effects were identified (i.e., no main effect of time, no interaction between treatment group and time).

Health Care Decisions—Health care decisions improved over time, $.35$ ($SE = .13$), $p < .01$. No other significant effects were identified.

Child Abuse Potential—The means for the seven subscales are reported for each group over time in Table 4. There was a significant time by treatment group interaction, $.23$ ($SE = .08$), $p < .01$. For the PATSCH group, BCAP scores did not change over time $F(2, 171) = .09$, $p = .91$, while the PAT Alone group scores decreased over time, $F(2, 171) = 11.33$, $p < .0001$, decreasing from T0 to T1, $t(171) = -3.62$, $p < .001$ and T0 to T2, $t(171) = -4.36$, $p < .0001$. Looking at the subscale means in Table 4, the reductions for the PAT alone group appear most prominent in the distress, loneliness, and rigidity subscales (note that formal analyses of subscales was not done).

Parent-Child Conflict Tactics

Nonviolent Discipline: There was a significant time by treatment group interaction, $.34$ ($SE = .14$), $p = .01$. The PATSCH group reported increasing use of nonviolent discipline (e.g., time out, explaining) over time, $F(2, 169) = 12.58$, $p < .0001$, with increases observed from T0 to T1, $t(169) = 3.84$, $p < .001$ and T0 to T2, $t(169) = 4.59$, $p < .0001$. The PAT Alone group also reported an increase in nonviolent discipline over time, $F(2, 169) = 3.35$, $p = .04$, increasing from T0 to T1, $t(169) = 2.49$, $p = .01$. As seen in Figure 2, the change in non-violent discipline was greater for the PATSCH group than PAT alone. Further, parents of

minority status were more likely to report lower levels of nonviolent aggression, $-.47$ ($SE = .21$), $p = .03$.

Physical Assault: There were no significant time, treatment, or time by treatment group effects for physical assault. However, the PATSCH group reported a nominal increase in physical assault from T0 ($M = 1.05$; $SD = 2.44$) to T2 ($M = 2.43$; $SD = 5.03$) with the highest reported behaviors at T1 ($M = 2.86$; $SD = 6.44$). The PAT Alone group also reported a nominal increase from T0 ($M = 1.11$; $SD = 2.37$) to T1 ($M = 1.47$; $SD = 3.48$), but decreased to nearly T0 levels at T2 ($M = 1.09$; $SD = 1.78$).

Psychological Aggression: For psychological aggression, there were no main effects for condition or time, but there was a significant time by treatment group interaction, $.20$ ($SE = .08$), $p < .01$ (Figure 2). The PATSCH group reported an increase in psychological aggression over time, $F(2, 165) = 6.89$, $p < .01$, with a statistically significant increase from T0 to T2, $t(165) = 3.71$, $p < .001$. The PAT Alone group reported no change in psychological aggression over time, $F(2, 165) = .45$, $p = .64$.

Discussion

The present research sought to evaluate an innovative intervention strategy, the systematic braiding of two evidence-based parent-support curricula, to target parent behaviors related to the risk of maltreatment. Two in-home programs were braided – PAT and SafeCare, and the resulting program, PATSCH, was delivered to families and compared to PAT alone.

Overall, there were a few significant differences between parents in the PATSCH and PAT Alone groups, not consistently favoring either group. Interestingly, no differences were found on the direct targets of SafeCare that are not directly covered in PAT: healthcare skills and home hazards. No differences were found for either health care decisions or home hazards. For health care decisions, both groups improved over time, and it is possible that repeated exposure to the questions resulted in a practice effect.

The number of home hazards also did not change over time for either group. It is possible the video recording and the noted variations in quality affected this outcome or that the video was insufficient to capture all accessible hazards (typically, a hazard assessment includes looking in drawers, cabinets, closets, etc.). The number of hazards observed in this study was much lower than numbers reported in other studies with child protective service referred families (Barone, Greene, & Lutzker, 1986; Cordon, Lutzker, Bigelow, & Doctor, 1998; Jabaley, Lutzker, Whitaker, & Self-Brown, 2011; Mandel, Bigelow, & Lutzker, 1998; Tertinger et al., 1984). Gershater-Molko and colleagues (2003) reported a 70% mean percent reduction in an at-risk sample (e.g., not reported for maltreatment) and a recent program evaluation found an 84% reduction in the number of hazards post-SafeCare (Whitaker & Glasheen, 2017). In the current study, the PATSCH group showed only a 9.4% reduction from T0 to at T1 and 6.6 reduction from T0 to T2. Though it could be that families enrolled in PATSCH had fewer hazards overall, this seems unlikely in light of prior research. Therefore, data collectors should be trained to count hazards in home with fidelity as part of the assessment as is typically done with SafeCare.

There was an intervention effect on child abuse potential favoring the PAT alone group. Child abuse potential did not change for the PATSCH group, but decreased for the PAT alone group. Intervention effects were found for two subscales of the parent-child conflict tactic scales, one favoring the PATSCH group and one favoring the PAT Alone group. PATSCH parents increased their use of positive, nonviolent discipline tactics relatively to PAT Alone parents, such as explaining why something was wrong, and using time out. The decrease in reported behaviors from T1 to T2 is greater than T0 to T1 in the PAT Alone group, which signals that any gains at T1 regressed below the baseline (T0). The PATSCH group also showed an increase in psychological aggression over time, whereas PAT Alone group did not. It could be that the increase in the use of more positive discipline techniques led to some frustration as new techniques were adopted and resulted in an increase in psychologically abusive behaviors, such as yelling and shouting. It could be considered that these findings would correspond to a decrease in physical assault, but no intervention effect on physical assault was found.

There are notable limitations to these findings. The sample is small and comprised of families voluntarily receiving PAT to varying degrees (i.e., different length of exposure to parent-support curricula prior to PATSCH). The rate of attrition is also a concern, particularly in the PATSCH group (46%), however, is not unusual in these kind of studies (Damashek, Doughty, Ware, & Silovsky, 2011; Duggan & Windham, 2000; Gomby, 2007; McGuigan, Katzev, & Pratt, 2003). The lack of a true baseline should be noted: the baseline assessment of this effectiveness trial occurred after the family received at least the first five foundational visits and perhaps many more visits (i.e., participants were not required to be newly enrolled in PAT). This introduces the possibility that treatment gains may be limited (or unequal between and within groups). This may also explain the difference observed between the groups at baseline. Future research might consider using families not previously enrolled in a parent-support program. Finally, the fidelity of PATSCH implementation was not a primary outcome in the effectiveness trial. Variation in implementation time and across PATSCH sites may have affected the mastery or maintenance of trained skills evaluated through the research assessment.

The findings that PATSCH had no effect or perhaps even an iatrogenic effect on some parenting behaviors raise the question: is it necessary to address all or multiple parental risk factors if one program alone is having a positive effect? In other words, is less more? A body of parenting-related research data indicate that multiple interventions may detract from program effectiveness (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; Kaminski, Valle, Filene, & Boyle, 2008), and recent recommendations suggest triage and sequencing of interventions (Berliner et al., 2015). The findings presented here, specifically the reductions in distress and unhappiness observed among parents in the PAT Alone group, potentially indicate that learning to parent and bonding with a child may be sufficient. Further, the treatment package approach of this study does not make it possible to parse out if any of the components that comprise PATSCH directly affected outcomes. An emerging framework that could provide that empirical evidence is the multiphase optimization strategy (MOST). MOST is an engineering inspired framework that seeks to optimize behavioral interventions that are efficient, effective, economical, and scalable (Collins, Kugler, & Gwadz, 2016; Collins, Nahum-Shani, & Almirall, 2014). The optimized intervention designed using the

MOST framework meets predetermined standards (expressed as an optimization criterion), is efficient (i.e., makes good use of only available resources), and is immediately scalable with demonstrated effect on outcomes of interest. Candidate components of an intervention are evaluated using efficient experimental designs (e.g., factorial or fractional factorial) such that any components that detract from the predetermined standard are not included in the optimized intervention. It is this optimized intervention that is then evaluated using a randomized controlled trial. Future research on systematic braiding should consider applying the MOST framework to identify which components produce the desired effect on outcomes of interest. Further, experimental data collected during the experiment examining candidate components under the MOST framework could be useful in ascertaining if all participants require all of the components or if certain participants may benefit from only a subset of the components.

Anecdotally, families who received and providers who delivered PATSCH expressed great enthusiasm for the curriculum, particularly the home safety and child health modules. Taken in consideration with the results presented here, future research should continue to refine the braided curriculum components and continue to explore the controversial tension between the parsimony principle and comprehensive services. A second trial of a revised PATSCH is currently underway and those results will be presented in a future publication.

The use of evidence-based programs has increased in the past several years. It is important to explore creative solutions to the practical application of evidence-based program implementation, such as systematic braiding. To date, limited research has examined the systematic braiding of two-evidence-based programs. Braiding has implications for supporting families, especially in the field of child maltreatment prevention, such as alleviating the burden of receiving multiple parent-support programs in succession. Thus, data presented here from a multi-year study examining the effectiveness of the braided approach makes an important contribution. This work may serve as a model for future research, with the goal of trying to find flexible, programmatic best fits for families. This research, despite some “curious” and even paradoxical results, is unique and potentially opens the door to a new line of research that will benefit the field.

Acknowledgments

Funding: This research was supported by a grant from the Annie E. Casey Foundation, PI: J.R. Lutzker. K. Guastaferrero was supported by the National Institute on Drug Abuse of the National Institutes of Health under award number T32DA017629. The content is solely the responsibility of the authors and does not necessarily represent the official views of NIDA or the National Institutes of Health.

The authors would like to sincerely thank Hazel Shah for her assistance in cleaning and formatting the data.

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Figure 1.
Participant Flow Diagram (CONSORT).

Figure 2.
Parent-Child Conflict Tactic Scale: Nonviolent Discipline

Figure 3.
Parent-Child Conflict Tactic Scale: Psychological Aggression

Table 1

Family Characteristics and Parenting Behavior Characteristics of Full Sample at Baseline

	Full Sample	PATSCH (N=67)	PAT Only (N=92)	<i>p</i> value
Family Characteristics	<i>M (SD)</i>		<i>M (SD)</i>	
Parent Age	28.02 (7.81)	26.27 (6.4)	29.20 (8.47)	.02 *
Child Age (months)	12.83 (7.79)	12.07 (7.9)	13.38 (7.76)	.40
Number of Children	2.08 (1.25)	2.03 (1.3)	2.11 (1.24)	.70
	<i>n (%)</i>		<i>n (%)</i>	
Marital Status				.72
Single	55 (35)	22 (34)	33 (37)	
Married	100 (65)	43 (66)	57 (63)	
Racial/Ethnic Minority Status				.02 *
Minority	113 (73)	41 (63)	72 (80)	
Non-minority	42 (27)	24 (37)	18 (20)	
Parenting Behaviors	<i>M (SD)</i>		<i>M (SD)</i>	
Average # Hazards	10.93 (6.10)	12.70 (6.63)	9.48 (5.23)	<.01 *
Health Care Decision	3.16 (1.61)	2.95 (1.45)	3.31 (1.72)	0.16
Child Abuse Potential (BCAP)	4.25 (3.51)	4.36 (3.55)	4.15 (3.50)	0.72
Parent-Child Conflict Tactic Scale				
Non-violent Discipline	9.85 (11.31)	8.45 (11.38)	10.90 (11.21)	0.21
Physical Assault	1.08 (2.39)	1.05 (2.45)	1.11 (2.37)	0.88
Psychological Control	1.17 (2.73)	1.26 (3.63)	1.11 (1.82)	0.76

Note.

* *p* value is less than .05. Percentages are listed as portions of participants with complete data.

Table 2

Parenting behaviors over time, by group, Mean (SD)

	PATSCH Group			PAT Alone Group		
	T0	T1	T2	T0	T1	T2
Hazards	12.70 (6.63)	11.57 (6.54)	11.91 (8.38)	9.48 (5.23)	11.06 (6.95)	10.19 (4.58)
Health Care Decision	2.95 (1.45)	3.80 (1.80)	3.43 (2.06)	3.31 (1.72)	4.00 (1.73)	3.91 (1.52)
BCAP	4.36 (3.54)	4.11 (4.49)	4.69 (5.53)	4.15 (3.49)	2.89 (3.53)	2.30 (2.29)
Non-violent Discipline	8.45 (11.38)	13.96 (14.33)	15.11 (13.21)	10.90 (11.21)	12.07 (12.36)	10.21 (11.32)
Physical Assault	1.05 (2.45)	2.86 (6.44)	2.43 (5.03)	1.11 (2.37)	1.47 (3.48)	1.09 (1.78)
Psychological Aggression	1.26 (3.63)	2.59 (6.28)	4.03 (10.04)	1.11 (1.82)	0.94 (1.60)	0.89 (2.10)

Note. T0 = Baseline; T1 = 6-months postenrollment; T2 = 12-months postenrollment; BCAP = Brief Child Abuse Potential Inventory

Table 3

Model results examining parenting behaviors over time.

Effects Estimates (SE)	Hazards in the Home	Health Care Decisions	Child Abuse Potential	Nonviolent Discipline	Physical assault	Psychological Aggression
Intercept	10.45 (1.42)***	3.90 (.33)***	1.53 (.15)***	2.06 (.24)***	.51 (.14)***	.50 (.14)***
Treatment	2.89 (1.36)*	-.30 (.33)	-.01 (.14)	-.53 (.23)*	-.02 (.14)	.03 (.14)
Time	.71 (.44)	.35 (.13)**	-.22 (.05)***	.16 (.09)	.04 (0.05)	-.05 (.05)
Time * Treatment	-.94 (.71)	-.20 (.20)	.23 (.08)*	.34 (.14)*	.09 (.09)	.20 (.08)**
Minority	-1.36 (1.24)	-.55 (.29)	-.19 (.13)	-.47 (.21)*	-.12 (.12)	-.21 (.12)
Parent Age	-.01 (.07)	-.01 (.02)	0.00 (.01)	.01 (.01)	.00 (.01)	.01 (.01)
Low Income	.50 (1.16)	-.21 (.27)	.06 (.12)	-.02 (.19)	-.06 (.11)	.10 (.11)

Note.

* $p < .05$,** $p < .01$,*** $p < .001$

Table 4
Brief Child Abuse Potential Inventory (BCAP) Subscale Means (SD) for the PATSCH and PAT Alone Groups Overtime

	PATSCH Group			PAT Alone Group		
	T0	T1	T2	T0	T1	T2
Distress	0.48 (0.90)	0.61 (1.36)	0.91 (1.84)	0.49 (1.11)	0.36 (1.05)	0.13 (0.38)
Unhappiness	0.03 (0.17)	0.15 (0.42)	0.11 (0.53)	0.15 (0.48)	0.11 (0.36)	0.07 (0.32)
Persecution	0.55 (0.97)	0.61 (0.93)	0.55 (1.04)	0.77 (1.07)	0.63 (1.04)	0.55 (0.97)
Loneliness	0.23 (0.71)	0.52 (1.13)	0.57 (1.29)	0.52 (1.11)	0.28 (0.81)	0.23 (0.71)
Family Conflict	0.36 (0.82)	0.43 (0.93)	0.46 (1.01)	0.17 (0.58)	0.13 (0.37)	0.11 (0.37)
Rigidity	1.68 (1.13)	1.52 (1.17)	1.63 (1.33)	1.63 (1.18)	1.15 (1.22)	0.91 (0.99)
Poverty	0.42 (0.61)	0.26 (0.57)	0.46 (0.66)	0.46 (0.65)	0.22 (0.45)	0.32 (0.51)