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PTSD as a moderator of a parenting intervention for military families

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Abstract

The stress of multiple deployments and exposure to combat places service members at risk for posttraumatic stress disorder (PTSD), which may detrimentally affect parenting. Evidence-based parenting programs have been successful in promoting adaptive parenting practices among families exposed to stress. However, the effects of preventive interventions on parenting may vary by military parent's PTSD. The current study includes families who participated in a randomized controlled trial of a parenting intervention for military families known as After Deployment, Adaptive Parenting Tools (ADAPT). Families were randomized to either a 14-week, group-based parenting program or a comparison group. Participants included families with 4–12-year-old children in which at least one parent deployed to Iraq or Afghanistan ($N=336$; 945 individuals). Structural equation modeling was used to examine parent self-reported PTSD as a potential moderator of the relationship between intent-to-treat status and effective parenting practices 12-months post-baseline, while accounting for baseline effective parenting, length and number of deployments, and family demographics. Father PTSD was a significant moderator, such that the intervention was less effective for fathers who met clinical levels of PTSD. No significant moderation effects were found among mothers. These findings may have important implications for the development of future evidence-based parenting programs.

Keywords

Deployment; Parenting; Military; PTSD; Family-Based Intervention

Roughly 40% of the two million United States service members who have deployed to Iraq and Afghanistan since 2001 are parents (Defense of Manpower Data Center, 2015). Due to combat exposure and the stress of multiple deployments, military parents and their families may exhibit elevated levels of posttraumatic stress disorder (PTSD; Polusny et al., 2011). PTSD occurs after experiencing and/or witnessing a traumatic event and is often characterized by re-experiencing the traumatic event (e.g., flashbacks), avoidance of traumatic reminders of the event, numbing, and hyperarousal (American Psychiatric

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Association, 2013). Although PTSD often co-occurs with other mental health problems (e.g., substance abuse, depression), it is the primary diagnosis associated with combat exposure among deployed service members. PTSD prevalence rates tend to be higher than depression rates among National Guard service members (Thomas et al., 2010). While poor parental mental health is commonly associated with parenting challenges (Borre & Kliwer, 2014; Cummings, Keller, & Davies, 2005); military parents suffering from combat-related PTSD may especially be at-risk for compromised parenting (Riggs, Byrne, Weathers, & Litz, 1998). In turn, these parenting impairments may engender emotional and behavioral problems among military children (Alfano, Lau, Balderas, Bunnell, & Beidel, 2016). Fortunately, evidence-based parent management training programs have shown positive child outcomes through improved parenting (Gewirtz, Erbes, Polusny, Forgatch, & DeGarmo, 2011). Few studies, however, have examined how the effects of parenting programs may vary based on military parents' PTSD.

PTSD and Parenting

It is well documented that deployment and combat-related stressors are associated with family distress and poor child adjustment (Card et al., 2011; Cozza et al., 2010). During wartime deployment, many families experience repeated cycles of separation and are often left feeling anxious and fearful for the safety of their loved one. Families must also adjust to transitions in roles and responsibilities within the family system and readjust upon the service member's reintegration into civilian life. Due to the stressful context of wartime deployment, it is not surprising that service members and their family may experience higher levels of PTSD. Although prevalence estimates vary somewhat, a recent study found that PTSD is estimated to occur in about 21.8% of service members returning home from Iraq and/or Afghanistan (Seal et al., 2009), in comparison to roughly 8.3% of the general population (Kilpatrick et al., 2013). PTSD may also affect the spouse or partner of the service member. As partners offer comfort and support to their service member, they are also likely to be exposed to narratives of traumatic events and the service member's own traumatic symptoms. This may result in the spouse or partner experiencing considerable distress themselves and displaying PTSD-like symptoms, as studies have found that partners of service members with elevated levels of PTSD symptoms also tend to exhibit increased levels of distress including PTSD symptoms (Dekel, Levinstein, Siegel, Fridkin, & Svetitzky, 2015; Renshaw, Blais, & Caska, 2011).

Many military families show resilience in the face of military deployment in that they exhibit positive adjustment during and after the deployment cycle (Peterson, Park, & Castro, 2011). PTSD, however, may disrupt and/or impair military parents' parenting. In a review of 72 studies across a range of populations, parent PTSD was associated with impaired parent-child relationships, decreased maternal sensitivity, and decreased emotional availability (Van Ee, Kleber, & Jongmans, 2015). Parent PTSD has also been found to be related to parenting difficulties among military families, including decreased parenting satisfaction (Samper, Taft, King, & King, 2004) and increased parenting stress (Blow et al., 2013). Notably, one study examined the impact of parent PTSD symptoms on self-reported parenting behaviors during the current conflicts in Iraq and Afghanistan. In a sample of 468 male National Guard soldiers, growth in PTSD symptoms was associated with self-reported poorer parenting

practices (i.e., greater use of harsh discipline; Gewirtz, Polusny, DeGarmo, Khaylis, & Erbes, 2010).

PTSD as a Moderator of a Parenting Intervention

Although parent management training programs have shown improvements in parenting practices and family outcomes across a range of populations (Forgatch & Patterson, 2010; Thomas & Zimmer-Gembeck, 2007), it remains unclear who is most or least likely to benefit. Variables that specify for whom a treatment is more or less effective are known as moderators. Theoretical models that consider moderation effects of parenting interventions are rare. Rather, researchers have focused on personal characteristics that consistently predict poor parenting and/or child behavioral outcomes (Gardner, Hutchings, Bywater, & Whitaker, 2010). The Family Stress Model may be one valuable framework for understanding how PTSD may affect treatment response. The model describes the negative impact that family stressors (e.g., wartime deployment) can have on parents' psychological distress and parenting (Conger, Patterson, & Ge, 1995). Consistent with this model, parents' PTSD symptoms may interfere with parents' ability to learn and fully engage in a program. Some empirical work supports this theory, as two meta-analyses have found that response to parent training is less effective when parents report higher levels of stress and depression compared with families reporting lower levels of risk (Lundahl, Risser, & Lovejoy, 2006; Reyno & McGrath, 2006). Because military families experience increased rates of PTSD, examination of parent PTSD as a moderator is crucial for understanding whether parents with and without PTSD equally benefit from parenting programs.

Given the adverse consequences associated with combat-exposure and multiple deployments, one might expect to find evidence-based interventions designed to ameliorate the negative impact of deployment-related factors on parenting among military families. Although many evidence-based programs designed to improve parenting practices exist, few have targeted and demonstrated effectiveness specifically for military families (Gewirtz et al., 2011). After Deployment, Adaptive Parenting Tools (ADAPT), is the only evidence-based parenting intervention designed for military families with school-aged children and tested in a randomized controlled trial (RCT). ADAPT is a modification of the Parent Management Training: Oregon Model (PMTO), which aims to improve parenting by targeting five parenting practices: positive involvement, skill encouragement, problem-solving, monitoring, and effective discipline (Forgatch & Patterson, 2010). Data from a RCT of ADAPT showed that the program improved parental efficacy and observed parenting practices six-months and 12-months post-baseline (Gewirtz, DeGarmo, & Zamir, in press; Piehler, Ausherbauer, Gewirtz, & Gliske, 2016).

The current study sought to examine the moderating impact of mothers' and fathers' PTSD on the effectiveness of ADAPT (program mentioned above) on parenting among 336 military families. Consistent with the Family Stress Model, we hypothesized that parents with PTSD may benefit the least, which may provide support for altering program components to explicitly address parents' mental health and improve intervention effectiveness. Because more fathers among the 336 families were deployed and had higher rates of PTSD than their partners (i.e., mothers), we chose to examine individual PTSD

diagnoses as moderators of intervention response among mothers and fathers within a simple randomization design, such that mothers and fathers from the same family were randomized to the same condition (i.e., intervention or control group). Some research suggests that PTSD symptoms may present differently among males and females (King, Street, Gradus, Vogt, & Resick, 2013), potentially affecting mothers' and fathers' response to intervention.

This study contributes to the current literature on parenting interventions in several ways. First, we assess parenting using videotaped observations of parent-child interactions. Most prior work has relied on self-report of both the parent's psychological symptoms and parenting, which may result in spurious findings due to shared method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Second, much of the research on military parents' PTSD focuses solely on individual effects of PTSD on parenting. Because it is likely that mothers' and fathers' parenting are affected by their own PTSD (i.e., actor effects) and the PTSD of one's spouse or partner (partner effects; Kenny, Kashy, & Cook, 2006), we assessed both actor and partner effects of PTSD on parenting. Third, examining the moderating role of PTSD will provide valuable information that may help us better understand how to modify and/or personalize preventive interventions for parents meeting clinical levels of PTSD.

Method

Participants

The current sample included 336 military families located in a Midwestern state who were recruited for a RCT of a parenting intervention known as ADAPT. Families were eligible for participation in the study if they had a least one child living with them between the ages of four and 12, and at least one parent who was deployed to the conflicts in Iraq or Afghanistan (Operations Iraqi and Enduring Freedom, and Operation New Dawn; OIF, OEF, OND).

Of the 336 families (i.e., 314 mothers, 294 fathers, 336 children) who met eligibility criteria and completed the baseline assessment, 272 families had both parents participating in the study. Of the 64 families who had only one parent participating in the study, 41 of these families included only a mother and 23 included only a father in the study. Fathers had deployed in 95% of families; mothers had deployed in 18.2%, and both parents had deployed in 13.3% of families.

Among the 336 families, 84.2% were married (i.e., two parent household) and 15.8% were single parents (3.6% never married, 8.3% were divorced; 3.6% were separated, and .3% were widowed). Couples were married on average 9.4 to 9.75 years (mothers and fathers, respectively). Families were, on average, considered middle-class, as most families reported a household income between \$40,000 and \$79,999 (43.5%) or \$80,000 to \$119,999 (28.2%), and roughly half of the sample completed at least a Bachelor's degree (47.7% of fathers and 51.9% of mothers). Parents identified as predominantly European American/White (88.4% of fathers and 92.7% of mothers). Mothers reported a mean age of 35.67 ($SD = 5.89$) and fathers, a mean age of 37.75 ($SD = 6.54$).

Over half of the children identified as female (53.3%); mean child age was 8.3 years ($SD = 2.5$) at study entry. Parents reported that children were predominantly European American/White (86.4%), 5.1% were biracial or multiracial, 2.1% were African-American/Black, 1.8% were Asian/Asian-American, 1.8% were Native American/Native Alaskan, 0.6% were Native Hawaiian/Pacific Islander, and 9.5% had a parent who preferred to not answer or were missing.

Procedures

Potential participants were recruited in many ways including outreach to military organizations, media outlets, mailings from the local Veteran's Administration Medical Center to veterans, and word-of-mouth by fellow military parents and stakeholders. Interested families entered the study by completing a brief screener, and, if eligible, informed consent via a confidential online portal. Participant data were then collected through an online survey and in families' homes. The current study used data collected at baseline and 12 months following baseline (about 6 months following the end of the intervention). At each assessment, families completed an online assessment and an in-home assessment at the family's residence. Parents were each paid \$25 for the completion of each online assessment (up to two parents per family) and each family received \$50 for the completion of an in-home assessment. Children were given a small gift (approximately \$1 to \$5 in value) for their participation in the in-home assessment. The investigators' university institutional review board approved all the described procedures.

Intervention

After the completion of the baseline assessment, 60% of families were randomized to participate in ADAPT and 40% were randomized to the control condition (i.e., web and print resources). We oversampled for the intervention group to ensure sufficient power to detect intervention effects; for most designs fewer control cases are required for detecting intervention effects. Simulations have shown that the loss of sensitivity or statistical power is less than 5% for allocation ratios approximately between 2:1 and 3:2 or one-half to two-thirds (Brittain & Schlesselman, 1982). Eighty-five percent of families were retained at the 12-month follow-up (see Figure 1 for consort diagram). There were no differences in rates of retention between families randomized to the intervention (80%) relative to families randomized to the control condition (88%; $\chi^2(1) = 2.33, p > .05$). Of the 207 families randomized to the intervention, a total of 75.4% ($n = 156$ families) attended at least one parenting session; of those, average attendance was ten out of the fourteen sessions (Doty, Rudi, Pinna, Hanson, & Gewirtz, 2016).

ADAPT is a selective prevention program targeting military families in which a parent has deployed to conflict. Modifications to the original PMTO model included additional components training parents in mindfulness and emotion coaching (i.e. emotion socialization) and attention to military culture (see Gewirtz, Pinna, Hanson, & Brockberg, 2014). We provided additional emotion skills training because deployment often involves exposure to traumatic events associated with combat, which can disrupt emotion regulation skills, regardless of whether the individual exposed suffers from PTSD. Over the course of 14 weekly 2-hour group sessions, parents practice the core parenting practices (i.e., skill

encouragement, effective discipline, monitoring, positive involvement, problem-solving, and emotion socialization) through role-play, observation, and discussion in small groups with other parents.

Measures

Intervention status—Intervention status was used to index whether parents were randomly assigned to the control or intervention condition. All families randomized to the intervention condition, regardless of whether they completed the ADAPT parenting program, were included in intent-to-treat analyses.

Family demographics—Child age and gender were assessed at the in-home baseline assessment. Child age was measured in years since birth and gender was scored as 1 (*female*) and 2 (*male*). Household income at the time of the baseline assessment was assessed and coded in 10,000 dollar increments ranging from 1 (*less than \$10,000 per year*) to 17 (*\$150,000 or more*). Dual vs. single-parent household at baseline was assessed and scored as 1 (*two-parent family*) and 0 (*single-parent family*).

Deployment—Fathers and mothers self-reported the total number of months that they were deployed by answering the following question, “For the number of deployments that you indicated, what is the total number of months that you were deployed?” Responses were scored on a 6-point scale ranging from 0 (*None, I have not been deployed in the current conflict*) to 7 (*37 months or more*). Fathers and mothers self-reported the number of times that they have been deployed by answering the question, “What is the total number of times you have been deployed in the current conflicts (since 2001)?”

Child behavioral symptom index—Teacher report of child behavior was assessed using the behavioral symptom index (BSI) on the widely-administered Behavior Assessment System for Children-2 (BASC-2; Reynolds & Kamphaus, 2004). The BSI is an overall score, which measures children’s overall level of behavioral problems. Items were scored on a Likert-scale ranging from 1 (*never*) to 4 (*almost always*). Mean raw scores were obtained, with higher scores indicating greater symptoms.

PTSD—The Post-Traumatic Stress Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993) is a 17-item measure that assesses PTSD symptoms as defined by the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (APA, 1994). Deployed parents completed the PCL-M (military version), which asks about symptoms in response to stressful military experiences and non-deployed parents completed the PCL-C (civilian version), which asks about symptoms in response to stressful life experiences. Items on both scales were rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*extremely*). Items were summed to create a total symptom severity score; such that higher scores indicate greater PTSD symptoms ($\alpha = .914$ and $\alpha = .948$ for mothers and fathers, respectively). A dichotomous variable was then created by assigning parents who met clinical cutoff criteria a value of 1 and those parents who did not meet clinical cutoff criteria a value of 0. Clinical cutoff criteria were determined using a symptom clustering method consistent with DSM criteria. Participants met clinical criteria if they endorsed one or more

intrusion items, three or more avoidance items, and two or more hyperarousal items. A dichotomous variable was selected to best represent real world practice settings in which diagnostic status (rather than a more complicated measure of symptom severity) may be the most readily available information to guide treatment planning (APA, 2013). Fifteen percent of fathers and 6.9% of mothers met clinical cutoff criteria for PTSD.

Effective parenting practices—Effective parenting was measured at baseline and 12-months post-baseline with five indicators: (1) problem solving, (2) encouragement, (3) monitoring, (4) positive involvement, and (5) harsh discipline. Scores on each indicator are obtained from observation of parent-child interactions during structured family interaction tasks (FITs). The FITs include seven videotaped parent-child interactions regarding activities centered on problem solving, discussion of conflicts, monitoring, and teaching. Combined, all interaction tasks take about 40 minutes to complete. Immediately after reviewing video footage of each interaction task, trained coders, who were blind to the intervention condition, scored the FITs using the Coder Impressions System (Forgatch, Knutson, & Mayne, 1992). Prior studies indicate that the FITs scales demonstrate good construct validity and are sensitive to change (Forgatch & DeGarmo, 1999). Interrater reliability was assessed with intraclass correlation coefficients (ICCs).

Problem solving evaluated the quality of parent and child solution, likelihood of the family putting the solution to use, and extent of resolution (9 items; $\alpha = .87$; ICC = .88 – .94). Skill encouragement evaluated parents' ability to promote children's skills development through encouragement and scaffolding strategies, especially during challenging activities (8 items; $\alpha = .83$; ICC = .72 – .76). Monitoring evaluated parents' supervision and knowledge about the child's activities (4 items; $\alpha = .71$; ICC = .64 – .74). Items for all three scales were rated on a 5-point Likert scale from 1 (*untrue*) to 5 (*very true*). Harsh discipline evaluated parent's use of overly strict, coercive, authoritarian, and/or inconsistent parenting (8 items; $\alpha = .75$; ICC = .58 – .78). Positive involvement evaluated parents' level of warmth, affection, and empathy towards the child (10 items; $\alpha = .75$; ICC = .76 – .84). For the last two scales, items were rated on a 6-point Likert scale ranging from 1 (*never*) to 6 (*always*). Items for each scale were then averaged together separately for mothers and fathers. All five scales were used to create a latent construct of effective parenting.

Analytic Strategy

Preliminary analysis examined study variable distributions and descriptive statistics. An initial confirmatory factor analysis (CFA) measurement model was created with four latent constructs (baseline and 12-months post-baseline mother and father effective parenting). Following a measurement model, a main effects model was estimated. Intervention status, using an intent-to-treat approach, served as a predictor variable and mother and father effective parenting at 12-months post-baseline served as the dependent variables. The model controlled for baseline mother and father effective parenting, child gender, child age, child behavioral symptoms, household income, single-parent family status, number of times mothers and fathers were deployed, and number of months mothers and fathers were deployed. Because it is likely that spouses' mental health (i.e., PTSD) and deployment experiences may affect their partners' effective parenting practices, partner effects were also

examined. For example, fathers' PTSD was used to predict both fathers' effective parenting practices (i.e., actor effect) and mothers' effective parenting practices (i.e., partner effect). In the final model, two interaction terms were added: intervention status by mothers' PTSD and intervention status by fathers' PTSD. All variables were centered at the mean. The Johnson-Neyman technique was utilized to assess significant interaction effects (Johnson & Fay, 1950). This approach was used over the more common approach, in which the researcher arbitrarily selects values, typically one standard deviation above and below the mean, and tests the significance of the simple slopes at these values (Aiken, West, & Reyno, 1991). Rather than selecting arbitrary values, the Johnson-Neyman technique yields exact values of the moderator where the simple slope of the independent variable (i.e., focal predictor) is statistically different from zero (Bauer & Curran, 2005). Because mother and father effects were included as distinct effects within the model, significant pathways were subsequently tested for invariance by parent gender. This was evaluated using a Wald test of parameter constraints comparing parent pathways constrained to be equal with parent pathways that were estimated separately (Muthén & Muthén, 2010). All analyses were completed using Mplus 7.31.

Based on several recommendations, the following fit indices were used to evaluate model fit: (1) chi-square ratio (χ^2/df) below 2.0, (2) comparative fit index (CFI) greater than .95; (3) root mean square error of approximation (RMSEA) below .06, and (4) standardized root mean square residual (SRMR), below .08 indicate good fit (Hu & Bentler, 1999).

Models were estimated using full information maximum likelihood (FIML), which uses all available information from the observed data in the SEM analyses. Although 85% of families were retained in the study at 12-month follow-up, only 249 (74.1%) families had complete/codable FITs. Some FITs were discarded due to poor quality, in some cases families had moved away or were unable/unwilling to schedule a home visit, and in other cases, families chose to complete other study measures but did not want to be videotaped.

Results

Attrition analysis using a series of t-tests indicated that there were no significant differences between parents who remained in the study and those who dropped out (but participated in the baseline assessment) on child gender, child behavioral symptoms, household income, single-parent family status, number of months and times mothers and fathers were deployed, and mother and father PTSD. Parents who remained in the study at 12-months had younger children on average ($M = 8.20$, $SD = 2.43$) than parents who dropped out ($M = 9.0$, $SD = 2.70$) as measured at baseline, $t(334) = -2.52$, $p < .05$. T-tests also revealed no significant differences on the baseline levels of the family interaction tasks, apart from mothers' skill encouragement, mothers' positive involvement, and mothers' and fathers' monitoring. Mothers who remained in the study at 12-months had greater skill encouragement, $t(254) = 2.98$, $p < .01$, greater positive involvement skills, $t(254) = 3.77$, $p < .001$, and greater monitoring skills, $t(245) = 2.74$, $p < .01$, than mothers who dropped out. Fathers who remained in the study at 12-months also had greater monitoring skills, $t(254) = 2.77$, $p < .01$. T-tests were also used to examine whether there were significant group differences between those participants assigned to the ADAPT intervention and those assigned to the control

condition. No significant differences on any of the study variables were found between conditions.

Table 1 presents correlations, means, and standard deviations of variables. Of the demographic variables, child age, child behavioral symptoms, single-parent status, and household income were correlated with effective parenting at 12-months post-baseline. Both mothers and fathers with older children were observed to exhibit less skill encouragement. Greater child behavioral symptoms were correlated with greater use of harsh discipline by both mothers and fathers and less parental monitoring by fathers. Single-parent status was correlated with less use of harsh discipline by mothers. Household income was correlated with less harsh discipline and greater parental monitoring by fathers. Father PTSD was positively correlated with fathers' use of harsh discipline and negatively correlated with mother's monitoring. Mothers' PTSD was negatively correlated with mothers' monitoring at 12-months post-baseline.

We first estimated a CFA and examined the fit of the four latent constructs (baseline and 12-months post-baseline mother and father effective parenting). The baseline and 12-months post-baseline effective parenting latent constructs each included five indicators: problem solving, skill encouragement, monitoring, positive involvement, and harsh discipline. All factor indicators were significantly related to the latent construct to which they were assigned. Ranges of r 's for each indicator were as follows: problem solving (.47 to .50, $p < .001$), positive involvement (.93 to .98, $p < .001$), encouragement (.50 to .60, $p < .001$), harsh discipline (−.32 to −.54, $p < .001$), and monitoring (.19 to .42, $p < .01$). The CFA met several of our fit indices including the chi-square ratio $\chi^2/df = 578.27/322 = 1.79$, RMSEA = 0.05, and SRMR = 0.09. The CFI indicated a marginal fitting model (CFI = 0.90).

Model Results

A main effects path model was specified to assess the contribution of the intervention condition on mothers' and fathers' effective parenting at 12-months post-baseline in the context of military experiences and family demographics. The main effects model had an acceptable to marginal fit: $\chi^2/df = 596.55/340 = 1.75$, CFI = 0.87, SRMR = 0.08, and RMSEA = 0.05. Baseline effective parenting was significantly associated with the same construct measured at 12-months post-baseline for both mothers and fathers (mother: $r = 0.51$, $p < .001$; father: $r = 0.51$, $p < .001$). There was a significant treatment effect on mothers' effective parenting ($\beta = .18$, $p < .01$) and on fathers' effective parenting 12-months post-baseline ($\beta = .14$, $p < .05$). Of the covariates, older child age was associated with less effective parenting for mothers ($\beta = -.18$, $p < .01$). No significant actor-partner effects were found.

An interaction model was estimated by adding two interaction terms to the main effects model: intervention condition by mothers' PTSD and intervention condition by fathers' PTSD (see Figure 2). The model had acceptable fit: $\chi^2/df = 630.23/374 = 1.69$, CFI = 0.87, SRMR = 0.08, and RMSEA = 0.05. In the context of these interaction terms, the significant treatment effects on both mothers' and fathers' effective parenting practices at 12-month follow-up remained. There was not a significant interaction effect found for mothers. Figure 3 shows the significant interaction effect found for fathers. The intervention was less

effective for fathers who met criteria for PTSD relative to fathers who did not meet clinical cutoff criteria for PTSD. The regions of significance of the interaction effect was calculated using the Johnson-Neyman Technique (Johnson & Neyman, 1950). The test confirmed a significant difference in parenting outcomes in the intervention group between fathers with and without PTSD. Fathers in the control group demonstrated equivalent outcomes irrespective of their PTSD status. While fathers' interaction pathway attained significance and mothers' interaction pathway did not, further analysis was required to determine whether this represented a significance difference between the two pathways. A Wald test (pathway comparison option available in Mplus) was used to evaluate mothers' and fathers' interaction pathways by comparing these pathways constrained to be equivalent with unconstrained pathways. The Wald test indicated that the unconstrained pathways did not result in a significant improvement in fit when compared to the constrained pathways, consistent with a nonsignificant difference between the interaction pathways for mothers and fathers, (Wald χ^2 ($df=1$) = .42, $p > .05$). Mothers' interaction pathway, while not attaining significance, was statistically equivalent to fathers' interaction pathway.

Discussion

The current study examined the role of mother and father PTSD in moderating the effects of a parenting intervention on effective parenting practices. Our findings demonstrate significant intervention effects for mothers and fathers. Fathers not meeting clinical levels of PTSD made greater improvements in effective parenting practices 12-months post-baseline than did fathers with PTSD. There was not a significant moderation effect found on mothers' effective parenting practices. This finding suggests that mothers both with and without PTSD equally benefited (i.e., improved parenting practices) from the parenting intervention.

It is unclear why fathers with PTSD did more poorly in the intervention relative to fathers without PTSD. Fathers with PTSD may have been less likely to engage in the parenting program. Prior research, for example, shows that greater parental psychopathology is often associated with less program attendance and greater dropout (Nix, Bierman, & McMahon, 2009). Although attendance was not broken down by PTSD status, fathers, on average, attended fewer sessions than mothers in ADAPT. However, this difference was only marginally significant (Doty et al., 2016). Alternatively, it may be that fathers with PTSD are less likely to practice the skills learned in ADAPT. In an examination of a subset of ADAPT baseline data focusing on only deployed fathers with non-deployed spouses, and using a different coding scheme focused on emotional communication, Brockman et al. (2016) found that fathers' experiential avoidance partially mediated associations between fathers' PTSD symptoms and their negative interactions with their children. It is not difficult to imagine that fathers with PTSD may avoid managing child emotional and behavioral problems (Snyder et al., 2016), as it is these interactions that parents often find the most emotion-eliciting and difficult to manage. Emotion regulation, which is disrupted in PTSD, is crucial to effective parenting.

It may simply take fathers with PTSD longer to improve parenting practices relative to fathers without PTSD; thus, we may see improvements in parenting for fathers with PTSD over time. Indeed, findings from prior PMTO intervention studies have found that parenting

effects tend to grow over time (Patterson, Forgatch, & DeGarmo, 2010). Moreover, other findings from ADAPT demonstrated that, for fathers with higher baseline levels of self-reported experiential avoidance, the ADAPT intervention reduced their observed distress avoidance (i.e. the program improved emotional communication with their children) at 12-months post-baseline; this improvement, in turn, was associated with improvements in observed parenting practices (Snyder et al., under review). We speculate that, for fathers who report PTSD symptoms in the clinical range, change may simply be slower to come – first, via improvements in emotional communication with children, with those improvements mediating changes in observed parenting practices. Pending analyses with data at 24 months post-baseline (18 months following the end of the program) will establish whether and how parenting practices change over the longer term as a function of the ADAPT program.

It remains unclear why there was a significant moderation effect for fathers but not mothers. However, there was not a significant difference between this pathway by parent gender. Thus, it is important to be cautious in our interpretation of the present findings. Future research should examine whether mothers' PTSD affects response to a parenting intervention among a larger sample of deployed mothers. It is possible that a significant moderation effect was not found in the present sample due to the small number of mothers who were deployed ($n = 57$; 18%) and met clinical levels for PTSD ($n = 21$; 6.9%). Far more fathers in the current sample were deployed ($n = 282$; 95%) and met clinical levels for PTSD ($n = 44$; 15%), thus there may have been more power to detect a significant moderation effect among fathers.

Several features of military families may be important to consider in understanding the current mixed findings related to gender differences in the impact of PTSD on intervention response. Although female and male veterans demonstrate similar profiles for PTSD symptoms, some research shows that women tend to report more difficulties with concentration and distress, whereas men tend to report more frequent nightmares, emotional numbness, and hypervigilance (King et al., 2013). Another study found that men are more likely to report avoidance and re-experiencing at lower levels of PTSD severity relative to women (Palm, Strong, & MacPherson, 2009). It is possible that specific sex differences in PTSD symptomology (e.g., avoidance), may impact fathers' ability to fully engage and benefit from the parenting intervention.

Although deployed mothers are also exposed to wartime stressors, mothers (whether deployed or civilian) traditionally tend to parent and serve as the primary caregiver more often than fathers. It is likely that there are different societal expectations for mother and father roles and division of household labor. Still spending about two more times the amount of time caring for their children than fathers (Hicks, Santacreu-Vasut, & Shoham, 2015), mothers are often expected to adopt an active role in raising their children. Thus, their level of involvement in the parenting program and in parenting their child in general may differ. It is likely that mothers may have practiced the parenting skills learned in ADAPT more than fathers. Because of this familiar role, mothers may have more experience in compartmentalizing their emotional distress following reintegration. Previous findings from ADAPT found that although deployed mothers reported significantly higher PTSD symptoms than non-deployed mothers, there were no differences in reported parenting

practices and child adjustment (Gewirtz, McMorris, Hanson, & Davis, 2014). It is possible that deployed mothers may be better able to separate their distress from their parenting role. Clearly, more research is needed to elucidate the complex dynamics related to parent gender, PTSD, and intervention response.

A few limitations should be noted. First, there was some attrition at the 12-month follow-up. This level of attrition is consistent with other studies of parenting interventions (Hagen, Ogden, & Bjornebekk, 2011). There were some differences between parents who completed the family interaction tasks and those families who either dropped out of the study or chose not to complete the observations tasks. While the use of FIML allowed for the use of all available information to account for missing data, this data analytic approach assumes that data are missing at random. Our findings suggest that data are not missing at random, which may bias findings. Second, although the 5-indicator model of parenting was conceptually precise, one fit index reflected only an adequate fitting model. Poor fit may be an indicator of a misspecified model. We suspect the observed adequate fit on this index may relate to the relatively modest loading of parental monitoring on the latent parenting construct. While inclusion of monitoring is consistent with existing theoretical models of key parenting domains (Patterson, Reid, & Dishion, 1992), it may be that this aspect of parenting was more difficult to capture in the observational tasks than other domains. Due to the frequent comorbidity of PTSD and depression and other anxiety disorders (Lockwood & Forbes, 2014), future research should also examine the effects of the ADAPT intervention on parent depression and anxiety symptoms and whether parents might differentially respond based on their clinical levels of these disorders.

Our findings suggest that fathers with clinical levels of PTSD may require extra therapeutic treatment to boost their response to a parenting intervention such as ADAPT. Treatments such as prolonged exposure and cognitive-processing therapy (Steenkamp, Brett, Litz, Hoge, & Marmar, 2015) could potentially be provided to symptomatic fathers prior to, or simultaneous with parenting interventions. Although participation in these types of therapies may reduce some military fathers' symptoms, enabling fathers to benefit more from parent training, these treatments also tend to have high nonresponse and dropout rates (Steenkamp et al., 2015). Rather than adding additional components to ADAPT, it may be more valuable to strengthen current components that may be beneficial for PTSD and associated symptoms. Some evidence suggests that mindfulness interventions may reduce PTSD symptoms (Jha, Morrison, Parker, & Stanley, 2016; King et al., 2013). The ADAPT parenting sessions included some mindfulness exercises, as it was hypothesized that practicing mindfulness would improve parents' ability to regulate emotions that may otherwise be hindered by PTSD (Gewirtz et al., 2014). Further examination of fathers' engagement in the mindfulness exercises and whether this participation was associated with improvements in PTSD symptoms and/or parenting practices may provide information about how parenting program components can be improved for fathers with PTSD.

The current study provides information about who is most likely to benefit from a parenting intervention designed for military parents. Fathers with PTSD may be slower to respond, or less responsive to prevention programming. Although further research is needed to understand through what mechanisms PTSD may affect fathers' response to a parenting

program, findings suggest that it may be important to target PTSD symptoms prior to, or along with additional programming. Unfortunately, individuals with psychopathology often do not seek treatment, even when they recognize the need (Mojtabai, Olfson, & Mechanic, 2002). For example, one study found that veterans reported concerns about how they would be perceived by peers and by leadership for seeking help (Hoge et al., 2004). Reducing the perceptions of stigma and barriers to care among military personnel should be a priority for policymakers and clinicians. Clinicians may also consider how combat trauma affects fathers and mothers differently. Some research shows that males are more affected than females by traumatic events they cannot discuss (Vrana & Lauterbach, 1994); manifesting as a moral injury (Maguen & Litz, 2012). Some deployed fathers may feel that they cannot talk about the trauma they endured, due to gendered norms and societal expectations. Clinicians should find ways to support fathers by encouraging them to speak and write about their experiences overseas. This study provides a first step in identifying how best to adapt a parenting intervention for military parents to ensure that all parents benefit.

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Figure 1.
CONSORT Flow Chart of ADAPT Randomized Control Trial

Figure 2.

Intervention Condition and Interaction Terms Predicting Mother and Father Effective Parenting Practices (N = 336 families)

Note. ITT = Intent-to-treat status; Standardized values are shown. Only significant parameters are shown. The model controlled for baseline parenting practices, child age, child gender, child behavioral symptoms, household income, single-parent status, number of times mothers and fathers were deployed, and number of months mothers and fathers were deployed.

Figure 3.
Interaction between Intervention Status and Fathers' PTSD Predicting Fathers' Effective Parenting Practices (N = 336 families)

Table 1

Means, Standard Deviations, and Bivariate Correlations of Study Variables (N = 336 families)

Measure	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1. BL PS (m)	2.57	.65	-																														
2. BL PS (f)	2.50	.62	.70	***	-																												
3. BL HD (m)	1.33	.38	***	***	-																												
4. BL HD (f)	1.30	.36	***	***	***	-																											
5. BL PI (m)	3.51	.44	***	***	***	***	-																										
6. BL PI (f)	3.39	.53	***	***	***	***	***	-																									
7. BL Mon (m)	3.72	.78	.03	.05	***	***	***	.08	-																								
8. BL Mon (f)	3.15	.94	.06	.10	***	***	***	***	***	-																							
9. BL Enc (m)	2.65	.69	.19	***	***	***	***	***	***	***	-																						
10. BL Enc (f)	2.70	.77	.16	***	***	***	***	***	***	***	***	***	-																				
11. 12M PS (m)	2.98	.67	.35	***	***	***	***	***	.04	.17	***	.18	***	-																			
12. 12M PS (f)	2.81	.66	.27	***	***	***	***	***	.02	.16	.06	.16	***	***	***	-																	
13. 12M HD (m)	1.23	.37	.27	***	***	***	***	***	.13	.05	-.10	-.13	***	***	***	***	-																
14. 12M HD (f)	1.23	.38	-.20	***	***	***	***	***	.05	-.07	-.18	***	***	***	***	***	***	-															
15. 12M PI (m)	3.67	.47	.29	***	***	***	***	***	.02	.10	.30	.23	***	***	***	***	***	***	-														
16. 12M PI (f)	3.54	.53	.19	***	***	***	***	***	-.02	.29	.26	.34	***	***	***	***	***	***	***	-													
17. 12M Mon (m)	3.61	.74	-.02	-.01	-.02	-.08	.07	.03	.16	.06	.18	.06	***	***	***	***	.07	.09	***	***	-												
18. 12M Mon (f)	3.20	.84	.09	.05	.02	-.11	.06	***	.09	***	.17	.18	***	***	***	***	.08	.11	***	***	***	***	-										
19. 12M Enc (m)	2.61	.67	.03	.08	.03	.03	.15	.02	.12	.06	.35	.19	***	***	***	***	.09	.16	***	***	***	***	***	***	-								
20. 12M Enc (f)	2.64	.64	.01	.03	.05	.01	.10	***	.07	***	.33	.47	***	***	***	***	.12	.28	***	***	***	***	***	***	***	-							
21. Male child	1.53	.50	.08	.07	-.01	***	.03	.03	-.04	-.06	-.03	-.02	.04	-.01	-.01	-.10	.04	-.01	-.05	-.04	.05	-.01	-										
22. Child age	8.40	2.52	.17	***	***	-.08	***	***	-.12	-.04	-.25	-.17	***	-.02	.05	-.01	-.06	-.02	-.13	-.08	***	***	***	***	***	***	***	-					
23. BSI	28.2	21.0	-.05	-.03	-.03	-.03	-.03	-.03	.05	.01	-.01	.10	-.05	-.07	.18	.24	-.05	-.07	.05	-.16	***	***	***	***	***	***	***	***	***	***	***	***	***
24. Single	0.84	.37	.21	***	***	.12	***	.01	-.02	-.09	.02	-.07	.10	.05	-.16	***	.10	.05	-.04	.03	-.03	-.03	-.03	-.02	-.15	***	***	***	***	***	***	***	***
25. Income	8.37	3.67	.13	***	-.05	***	***	.16	.03	.06	.10	.14	***	.01	-.12	***	-.01	-.05	-.05	.14	***	***	***	***	***	***	***	***	***	***	***	***	***
26. M Deploy (m)	0.49	1.21	-.01	.07	.01	.02	.00	.02	.05	.09	.05	-.03	.09	.06	-.01	-.02	.09	.06	-.01	-.05	.05	.01	.01	-.01	.10	***	***	***	***	***	***	***	***
27. M Deploy (f)	3.66	1.95	-.05	-.09	.02	.07	-.08	-.09	.03	.02	-.04	.06	.01	.00	.00	.06	.01	.00	.03	.03	.02	.06	.00	.09	.15	***	***	***	***	***	***	***	***
28. T Deploy (m)	0.25	0.62	.00	-.08	.00	.05	-.09	-.06	.03	-.01	-.02	.01	.05	.04	-.06	-.05	.03	.02	-.12	-.06	.07	.04	.05	-.09	-.11	***	***	***	***	***	***	***	***

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Measure	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
29. T Display (°)	1.88	1.18	-.03	.06	-.02	-.02	.05	.03	.08	.09	.11 $\frac{1}{2}$	.02	.01	.00	.00	.03	.05	.04	.01	-.06	-.02	.01	.01	.13	.12 $\frac{1}{2}$	.07	.01	.01	.01	.01	.01	.01	
30. PTSD (m)	0.07	0.25	.04	.00	.04	.06	.01	-.03	.13	.06	-.05	-.08	-.08	.01	.08	.10	-.08	.01	.15	.06	-.06	.02	.06	.11 $\frac{1}{2}$	.03	.10	-.04	.10 $\frac{1}{2}$	.01	.01	.10	.04	-
31. PTSD (°)	0.15	0.36	.07	.08	-.05	-.10	.02	-.01	-.04	.00	-.07	-.03	-.01	-.01	.10	.15	-.01	-.01	.15	-.08	.05	.05	.13 $\frac{1}{2}$	.03	.01	.08	.16	.04	.05	.01	-.04	.07	

Note. BL = Baseline; 12M = 12-months post-baseline; PS = Problem-solving; HD = Harsh discipline; PI = Positive involvement; Mon = Monitoring; Enc = encouragement; Single = single-parent status; BSI = Behavioral symptoms index; T = times; M = months; (m) = Mother-report; (f) = Father-report;

[†]p < .10;
*p < .05;
**p < .01;
***p < .001