

Mothers with a Dual Identity: Examining Treatment Outcomes and Risk Pathways for
Deployed Mothers in the ADAPT and ADAPT4U Studies

A Dissertation

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Abstract

There has been growing interest in understanding the post-deployment outcomes of deployed mothers, a growing subgroup within the military population. Despite growing research on military families in the last two decades, limited research has been conducted on mothers who deploy. Prior qualitative literature has suggested elevated risk encountered by deployed mothers, due to their dual identities of being a mother and a service member, but few quantitative studies have been conducted to support the qualitative findings. Also, no research has investigated the effectiveness of parenting interventions for deployed mothers. Study 1 employed a multiple regression approach to examine intervention outcomes (observed parenting and self-reported parental efficacy) at one-year follow up of After Deployment, Adaptive Parenting Tools/ADAPT among deployed mothers. Results showed that deployed mothers showed improvement in observed positive parenting but no significant reductions in coercive parenting and no increases in parental efficacy. Study 2 explored the deployment risk pathways, based on the Military Family Stress Model, among deployed fathers, deployed mothers, and non-deployed mothers. Using a multi-group analytical approach, deployed fathers were compared with deployed mothers, while non-deployed mothers were compared with deployed fathers. Indirect pathways from Post-traumatic Stress Disorder (PTSD) symptoms to child outcomes via parenting were examined and compared among groups. Results showed that risk pathways were significant among deployed fathers and non-deployed mothers, but not deployed mothers. Group differences on indirect pathways were found, indicating that deployed fathers and non-deployed mothers had higher magnitude risk pathways than deployed mothers. Post-hoc analyses identified that among

deployed mothers, military sexual trauma (MST), rather than PTSD symptoms, had indirect effect on child outcomes via parental efficacy. These findings highlight the importance of examining coercive discipline in providing interventions among deployed mothers. The second study highlighted the importance of military sexual trauma in affecting post-deployment adjustment among deployed mothers.

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General Introduction

The largest mobilization of US forces in support of the Middle East conflicts has occurred in the last two decades. Of the two million service members deployed, women accounted for 15.1% of active-duty components and 18.8% of Reserve and Guard components (NG/R; U.S. Department of Defense, 2014). In a recent report, women accounted for 17.2% of the active-duty component and 21.1% o NG/R, about a 3% increase compared to 2010 demographics (Department of Defense, 2020). Approximately 29% of women in active-duty components and 34.6% in NG/R components have children (Department of Defense, 2020). However, most military research has focused on male service members and their non-deployed female spouses (Gewirtz et al., 2014a). Little is known about deployed mothers.

Aside from increasing numbers of deployed mothers, there has been an increase in combat exposure among deployed mothers (Street et al., 2009). Using a combined sample of female service members who were being single or mother, prior studies also found the impact of combat exposure from the overseas deployments in the Middle East on individual and family adjustment (Smith et al., 2017; Vogt et al., 2017). In previous major warfare (e.g., the Vietnam War), women primarily served as nurses or in clerical roles. Recently, however, changing roles for women have led to more exposure to combat experience in the Middle East, thereby increasing their risk for post-traumatic stress disorder (PTSD) (Hoge et al., 2007; Katz et al., 2007). Particularly, the constant threat of improvised explosive devices (IEDs) in the recent conflicts in the Middle East exposed many non-front-line service members to combat trauma (Seal et al., 2009). Given the

known impact of combat exposure, there is a need to develop a better understanding on the impact of military mothers.

Aside from elevated risk of combat exposure caused by deployments on family functioning (e.g., Allen et al., 2010), conflicting roles between being a mother and being a service member is another key rationale for understanding post-deployment adjustments of military mothers. Mothers have been widely viewed as being the primary caregiver in families (O'Laughlin & Bischoff, 2005). In contrast to the nurturing and caring role of being a caregiver, being a service member associated with the image of toughness, physical strength, and masculine (Barnes et al., 2016; Hall, 2011). Hence, the dual identities of being a mother and a servicewoman appear to bring emotional demands for military mothers (Barnes et al., 2016). Particularly, greater parental role conflicts were experienced by military mothers, mainly caused by childcare concerns, long-term separations, and compatibility between military roles and husband roles (Kelty & Segal, 2013; Taber, 2011). Mothers also reported experiencing maternal separation anxiety across deployment cycles.

Furthermore, transitioning between civilian and military identities with different gender expectations from society also may present additional stress to military mothers. A recent qualitative study found the predominant role of practicing masculinity while service members perceived femininity as threat to military effectiveness (Van Gilder, 2019). Studies showed that women felt the need to adopt masculine behaviors to show their competence in being a soldier (Brown et al., 2021; Nevo & Shur-Shmueli, 2003). In another qualitative study, results showed the unique stress experienced by female veterans across military cycles (Burkhart, & Hogan, 2015). Therefore, it is important to

investigate how we can support military mothers, especially in intervening on the impact of deployments on military mothers' parenting adjustment (Drummet et al., 2003).

Post-deployment adjustment of military mothers has also rarely been studied. However, there is a growing body of literature in understanding gender differences between male service members and female service members, such as higher prevalence of positive screenings for depression and military sexual trauma among women (e.g., Haskell et al., 2010; Kimerling et al., 2010; Maguen et al., 2012). In addition, there is a growing interest in understanding military fathers across deployment phases (e.g., Allen et al., 2010). These studies have shown that different risk factors and adverse impacts are encountered by mothers and fathers in the military. In particular, studies have found gender differences in PTSD symptom presentation(s). Female service members appeared more likely to meet screening criteria of PTSD and report higher scores on self-reported measures than male service members across the majority of PTSD symptoms except hypervigilance (Hourani et al., 2015). Findings on gender differences in mental health symptoms suggested the need to examine group differences among military parents.

There is a dearth of studies focused on how combat exposure and parental stress interact among each other, and how these impact military mothers (Creech et al., 2017). Given potential cumulative risks on this growing population, it is important to investigate how parenting programming can help to better support military mothers post-deployment. Studies also have reported adverse impacts of deployment on military parents' parenting practices and child outcomes (Creech et al. 2014; Gewirtz et al., 2010). Although the majority of research is focused on fathers (Creech & Misca, 2017), it shows that an increase in frequency and duration of deployments appears associated with greater levels

of parental stress, poorer family functioning (Allen et al., 2010), and greater mental health service utilization by non-deployed spouses (Larson et al., 2012). Child attachment behaviors were found to be associated with deployment duration, number of deployments, and stressors faced by parents (Barker & Berry, 2009).

Taken together, studies examining gender differences of post-deployment adjustment suggested a need for more research focused on military mothers. Previous research showed that deeper knowledge of deployed mothers and their well-being could lead to a better understanding of the unique challenges and protective factors encountered by them (Street et al., 2009). Examining treatment effects of parenting programming for military mothers will pave the way for future research examining tailored prevention-focused programs for this growing population upon reintegration from deployments.

Military Family Stress Model

The theory that guides the current studies is the Military Family Stress model (Gewirtz et al., 2018a). In the last two decades, emerging military research on the impact of deployment on family functioning and child outcomes has supported theory development for the military population (Creech & Misca, 2017; Dekel & Monson, 2010). Prior research suggested that deployment-related risks to children seem to occur primarily through parents' parenting practices and parent-child relationships (Palmer, 2008; Snyder et al., 2016). In response to the increasing need for theoretical model among military families (Dekel & Monson, 2010), Gewirtz et al. (2018a) empirically tested the Military Family Stress model to understand the impact of the parental deployment-related stressor on parenting practices, dyadic adjustment, and child adjustment. Specifically, the model conceptualized traumatic stress due to combat

exposure during deployment as a family stressor impairing family functioning (Gewirtz et al., 2018a). This suggested that programming targeting stress reduction and parenting support can enhance both parents' and children's adjustment.

Similar to other military studies (e.g., Creech & Misca, 2017), the Military Family Stress Model was tested on a military population that was mainly comprised of the majority composition of military families – i.e. those with mostly deployed fathers and non-deployed mothers (Gewirtz et al., 2018a). The present study used the theorized risk pathway as an anchor to understand the influence of deployment on *deployed mothers* and children.

Intervention Effects on Deployed Mothers' Parenting

To the best of our knowledge, there are no other studies that have exclusively examined treatment outcomes of parenting programming for deployed mothers. Qualitative studies described the experience of existing veteran services encountered by deployed mothers (Creech et al., 2019b; Turchik et al., 2013). These researchers have proposed specialized program content to cater to deployed mothers' unique needs (e.g., Creech et al., 2019b). For instance, studies discussed barriers such as childcare that prevent women from accessing veteran health care services (Creech et al., 2019b), female veteran support groups (Leslie & Koblinsky, 2017), or military sexual trauma treatment (Koblinsky et al., 2017; Turchik et al., 2013). Regarding reintegration challenges, studies described the difficulties in re-assuming parental roles or sharing their deployment experience with their family members (Mattock et al., 2012; Riggs & Riggs, 2011).

Despite these qualitative findings that suggest a need for quantitative research, intervention studies in neither civilian nor military populations have examined sub-group

heterogeneity (Danan et al., 2019). Hence, the current study aims to address this literature gap by providing an initial examination of parenting program treatment outcomes among deployed mothers. In particular, adapted from the Oregon Model of Parent Management Training (now known as GenerationPMTO), After Deployment, Adaptive Parenting Tool was developed to support military families after deployment (ADAPT; Gewirtz et al., 2014b). In a 14-week group-based randomized controlled trial program, the program teaches parents parenting skills and emotion socialization strategies. Studies showed that the ADAPT parenting program directly improved observed parenting practices at 1-year follow up among fathers and mothers (Chesmore et al., 2018b; Gewirtz et al., 2018b). The present study aims to examine the treatment effect of ADAPT among deployed mothers.

Comparison of Risk Pathways between Deployed Fathers and Deployed Mothers

There is a dearth of studies examining group differences between deployed fathers and deployed mothers. Ample research has focused on gender differences between service members in mental health distress (Vogt et al., 2011), PTSD (Jacobson et al., 2015), suicidal ideation (Gradus et al., 2017), and VA service utilization (Hourani et al., 2016; Maguen et al., 2012). Limited research has started to explore gender differences between deployed parents. Vogt et al. (2017) explored the impact of veterans' PTSD on work and family quality of life, which revealed the overall negative impacts of PTSD on broader aspects of family functioning (e.g., parenting functioning, or parenting satisfaction) and primarily poorer work experiences among female veterans. In another study, Darawshy et al. (under review) did not find gender differences in the mediation pathway from combat exposure to parental self-efficacy through PTSD. Taken together,

findings from studies comparing deployed fathers and mothers appear to be mixed, particularly on post-deployment parenting and child outcomes. Hence, the present study aims to fill the literature gap by empirically examining the severity of risk pathway between deployed fathers and deployed mothers, overcoming the methodological limitations of prior investigations that combined the two genders, or including only one gender.

Comparison of Risk Pathways between Deployed Mothers and Non-Deployed

Mothers

Regarding group comparisons between deployed mothers and non-deployed mothers, prior literature has treated deployment status as an additional stressor on top of motherhood (e.g., Barnes, 2016; Kelley et al., 2002). Yet, there appears to be a transition of the theoretical focus of understanding of deployment stressors from parent-child separation to traumatic combat exposure (Cheng, 2020). Studies in earlier times conceptualized deployment as parent-child separation, which adhered to attachment theory of the loss of attachment figure due to deployment (e.g., Kelley et al., 2001; 2002). On the other hand, recent literature conceptualized deployment as traumatic exposure due to the change of the nature of warfare (e.g., Gewirtz et al., 2014b). The latter approach adhered to the family stress model perspective, which focused on the role of traumatic combat exposure. This conceptual approach appeared to be more flexible in capturing females who transition to motherhood before or after deployment, while the attachment theoretical approach applied to motherhood before deployment. Regarding child outcomes, children of deployed Navy mothers exhibited higher levels of internalizing behavior than children with non-deployed Navy mothers (Kelley et al., 2001), but a study

of primarily Army National Guard mothers showed no differences between deployed and non-deployed mothers on measures of child functioning (Gewirtz et al., 2014a).

Regarding parenting outcomes, no differences were found between deployed mothers and nondeployed mothers on self-report measures of parenting (Gewirtz et al., 2014a).

Nevertheless, regarding psychological distress, studies found out that deployment(s) is associated with more negative outcomes for mothers compared to non-deployed mothers, such as level of anxiety (Kelley et al., 2002) and depression (Gewirtz et al., 2014a).

Hence, the current study hypothesized group differences on risk pathway between deployed and non-deployed mothers.

Research Gaps and General Research Questions

Currently, there is a dearth of quantitative research about post-deployment outcomes of deployed mothers in this field (Creech, & Misca, 2017; Cheng, 2020). Interestingly, there appears to be a discrepancy between findings from qualitative studies and quantitative studies: qualitative studies suggested additional unique vulnerability encountered by deployed mothers (Barnes et al., 2016; Strong et al., 2018), while quantitative studies have yet to provide evidence of this. Additionally, findings from literature examining broader gender differences between male and female veterans do not suggest additional vulnerability in mental health distress (Jacobson et al., 2015; Vogt et al., 2011) and parenting functioning (Creech et al., 2016).

Nevertheless, the lack of such discrepancies should be interpreted with caution. Current quantitative studies on deployed mothers are limited by methodological considerations, including small sample sizes alongside cross-sectional and descriptive study designs (see, for example, the review by Creech & Misca, 2017). Deployed

mothers were often embedded within dual military families in single-group designs in which sub-group descriptive information was not necessarily reported (see review by Danan et al., 2019). Another drawback is that potential sub-group differences may have been obscured due to low statistical power. Potential sub-group differences within military populations remain unclear.

Therefore, several questions warrant investigation. First, is ADAPT effective among deployed mothers? Second, do deployed mothers have greater risk for post-deployment adjustment difficulties when compared with deployed fathers and non-deployed mothers? The studies seek to: (a) examine treatment response from an existing parenting program among deployed mothers; and (b) examine group differences in risk pathways between deployed mothers and deployed father, as well as between deployed mothers and non-deployed mothers.

Study 1: An Examination of Intervention Effects of ADAPT on Parenting Outcomes and Child Outcomes among Deployed Mothers at 1-year Post-baseline

Large scale mobilizations of US forces in support of the post-9/11 Middle East conflicts have occurred in the last two decades. In a recent report, women accounted for 17.2% of the active-duty component and 21.1% of NG/R, about a 3% increase compared to 2010 demographics (Department of Defense, 2020). Approximately 29% of women in active-duty components and 34.6% in NG/R components have children (Department of Defense, 2020). Aside from the increasing number of deployed women, there has been an increase of combat exposure among deployed women (Hoge et al., 2007; Street et al., 2009). Further, despite the ample literature on the impact(s) of deployment upon family relationships and functioning (e.g., Gewirtz et al., 2014b; Lester et al., 2016), a majority of extant research has focused on male service members and their non-deployed female spouses (Gewirtz, et al., 2014b; Creech et al., 2014). Deployed mothers remain underrepresented in research.

One key rationale for understanding and supporting the post-deployment adjustment of military mothers relates to the conflicting roles of being a mother and a service member. The dual identities of being a mother and a servicewoman can be emotionally demanding for military mothers (Barnes et al., 2016). Mothers are typically primary caregivers for children, providing nurturing and support (O'Laughlin & Bischoff, 2005). Military obligations such as the military and combat environment, and overseas deployments present new challenges to mothers. For example, mothers need to be physically ready despite potential postpartum health complications (Barnes et al., 2016). In terms of the male dominated military environment, studies from the UK showed that

women displayed more male traits such as aggression and reduced their femininity to gain achievements in the military environment (Locke, 2013). Studies from Israel indicated that women felt the need to adopt masculine behaviors to show their competence in being a soldier (Nevo & Shur-Shmueli, 2003). In terms of overseas deployments, military mothers experienced greater parental conflicts, mainly caused by childcare concerns, long-term separations, and compatibility between a military role and a maternal role (Kelty & Segal, 2013; Taber, 2005). Mothers also reported experiencing anxiety relating to separation from children across deployment cycles (Drummet et al., 2003).

Deployment and Parenting

There is a significant body of evidence examining associations between deployment-related stressors such as combat exposure and family separation with reduced family functioning and well-being in military populations (e.g., Gewirtz et al., 2010; Lester et al., 2016). Primarily focusing on majority composition of military families, which consist of deployed husbands and their civilian spouses, these deployment-related stressors have been associated with post-deployment PTSD, depression, and anxiety, and their detrimental effects can last well beyond the immediate reunion period (e.g., Gewirtz et al., 2018a; Lester et al., 2016). Risks for PTSD experienced post-deployment have been shown to negatively impact parenting practices, dyadic adjustment, and child well-being (Campbell & Renshaw, 2018; Creech et al., 2014; 2017).

Despite ample evidence of associations between deployment and parenting, studies show conflicting findings among deployed mothers. Berz et al. (2008) found that

only hyperarousal symptoms were negatively associated with parenting satisfaction among deployed mothers who participated in the Vietnam War. Nevertheless, Creech et al. (2016) did not find associations between either PTSD symptoms or alcohol use with parenting satisfaction or parenting confidence among women deployed to recent Middle East conflicts. The study also did not find indirect associations from combat exposure to parenting confidence and parenting satisfaction through PTSD symptoms among previously deployed mothers. This gave rise to possible alternative explanations, such as different warfare or the use of different measures (Creech et al., 2016). In particular, mothers served in positions with little combat exposure in Vietnam warfare, compared with women who served in Iraq or Afghanistan (Cheng, 2020). The use of

Treatment Effects on Parenting in Military Populations

Advances in our understanding of the impact of military deployment on family functioning through empirical studies also have contributed to theory development. In particular, the Military Family Stress Model theorized how PTSD affected child functioning via parenting practices and marital adjustment (Gewirtz et al., 2018a). To provide support to the growing numbers of returning service members and their family members, prevention-focused parenting programs have been developed (Gewirtz et al., 2018b; 2020). For instance, adapted from the Oregon Model of Parent Management Training (now known as GenerationPMTO), After Deployment, Adaptive Parenting Tool was developed to support military families after deployment (ADAPT; Gewirtz et al., 2014b). ADAPT teaches parents parenting skills and emotion socialization strategies in a 14-week group-based program, which is now available in multiple program formats. Randomized controlled trial data showed that the ADAPT parenting program directly

improved observed parenting practices at 1-year follow up among fathers and mothers (Chesmore et al., 2018b; Gewirtz et al., 2018b). ADAPT also improved self-reported parental efficacy at 6-months follow up for both mothers and fathers (Piehler et al., 2018). Indirect treatment effects of ADAPT on child outcomes, reported by multiple informants, via observed parenting practices at one-year follow-up were found in a sample of 336 military families (Gewirtz et al., 2018b). Gewirtz et al. (2019) also found an indirect moderated treatment effect of ADAPT and emotion regulation difficulties on child internalizing behaviors at two-year follow-up via parenting practices and parental emotion regulation among military fathers. Taken together, prior effectiveness studies have provided empirical evidence of the ADAPT program in improving proximal variables of parenting and distal variables of child outcomes among military families.

Positive and Negative Parenting

Prior Generation PMTO studies have shown that the intervention has been successful in promoting positive parenting practices and reducing negative parenting practices (e.g., Forgatch & Patterson, 2010; Forgatch, & Kjøbli, 2016). Based on the Social Interaction Learning Model (SIL; Patterson, 1982), the model theorizes that behaviors are shaped by social interactions and parents are primary socializers and treatment agents for their children. Hence, this theory postulates that intervening on parenting practices will improve child outcomes by breaking the vicious cycle of coercive interactions and promoting positive parenting. Five core components of parenting practices were introduced to parents: skill encouragement, limit setting, monitoring, problem solving, and positive involvement (Forgatch & Patterson, 2010; Forgatch, & Kjøbli, 2016). GenPMTO relied on coded observations of parenting practices that served

as the foundation of the measurement of parenting practices (Dishion et al., 1998; Forgatch et al., 1992). Hence, as described in the method section, positive parenting was specified and measured by skill encouragement, problem solving, monitoring, and positive involvement. Negative parenting was specified and measured by harsh discipline (DeGarmo & Jones, 2019; Hukkelberg & Ogden, 2021; Patterson & Fisher, 2002).

GenPMTO has been adapted into different contexts to support families (Baumann et al., 2015; Forgatch & Kjøbli, 2016). For instance, GenPMTO was evident in improving parenting practices and child adjustment among specific populations, such as divorced mothers, or delinquent boys and girls (e.g., Dishion et al., 2016; Forgatch & Patterson, 2010). GenPMTO studies theorized – and showed – the sequential order in which negative parenting come first, followed by positive (Forgatch et al., 2008; Patterson et al., 2010). Other studies have found differences between growth trajectories among positive parenting, negative parenting, and monitoring (Holtrop et al., 2022; Reed et al., 2013). Therefore, examining the nuances of treatment effects of positive and negative parenting may shed light on improving treatment among specific and particularly underrepresented populations.

In the prior treatment effectiveness studies of ADAPT, the five domains of observed parenting practices were viewed collectively by either using average summed score (Gewirtz et al., 2019) or latent variable approach (Chesmore et al., 2018b; Gewirtz et al., 2018b). ADAPT studies examining confirmatory factor analysis on the five parenting practices showed that the factor loading of positive involvement was above .90, which indicated almost all of the variance of the indicator variable were loaded onto the latent variable (Chesmore et al., 2018b; Gewirtz et al., 2018b). The monitoring and harsh

discipline loadings were about .30, which met the minimum requirement to be considered as an indicator variable (Chesmore et al., 2018b; Gewirtz et al., 2018b). The numerical difference of the factor loadings among positive involvement, harsh discipline, and monitoring suggested small covariance among these variables in loading onto the latent variable. This observation suggested variances in positive parenting and negative parenting may also be viewed separately to account for the variance in each variable. The latent factor approach or the average score approach will result in lost of information due to the small covariance. Since the current study focuses on treatment effects among subgroup, focusing on dimensions of parenting would help to explore unique treatment effects. Therefore, examining the treatment effects for both positive parenting and negative parenting will contribute to unfold potential unique treatment affects among deployed mothers.

Research Gaps

To the best of our knowledge, there are no other studies examining parenting intervention outcomes for deployed mothers. Meanwhile, studies spoke to the need to examine increasing catered supports among deployed mothers upon post-deployment. Prior qualitative studies have described the experiences of deployed mothers with services for military veterans (Creech et al., 2019b; Street et al., 2009; Turchik et al., 2013). These studies have suggested that program content might be needed to cater to deployed mothers' unique needs (Creech et al., 2019b; Street et al., 2009). Currently, military mothers rely on existing services that primarily focus on military families with deployed fathers and their civilian spouses (Goodman et al., 2013). Programs including maternal support program target women living in military installation (Goodman et al.,

2013), most of whom are civilian spouses. Multiple qualitative studies also suggest barriers in access to female-focused veteran health care services such as the provision of childcare (Creech et al., 2019b) or setting up of female veteran support groups (Koblinsky et al., 2017). In sum, these findings spoke to the research gap in examining intervention among deployed mothers. Given findings of the effectiveness of GenPMTO among diverse population (e.g., Forgatch & Kjøbli, 2016), the present study aims to test the treatment effect of ADAPT among deployed mothers. This will provide an initial examination of the impact of a parenting prevention program among this underrepresented population.

The Present Study

Using an intent-to-treat approach, the current study examines the effect of ADAPT on parenting outcomes. I hypothesize that deployed mothers in the ADAPT intervention group will show greater 1-year pre-post change in the outcome of effective parenting practices and parenting efficacy relative to deployed mothers in the control condition. I also hypothesize that deployed mothers in the ADAPT intervention group will show greater 1-year pre-post change in the outcome of positive and negative effective parenting practices relative to deployed mothers in the control condition.

Method

Participants

The original sample included 336 military families comprising 314 mothers, 294 fathers, and 336 children, residing in a Midwestern state. A subsample of families was analyzed in the study (56 deployed mothers). Among the 56 deployed mothers, their average age was 34.57 years old (S.D. = 5.47) and 75% were married or cohabitating.

More than half (55.4%) of the sample of deployed mothers completed at least a bachelor's degree. 54.5% of them deployed less than 13 months, 36.4% deployed between 13 to 24 months and 9.1% deployed more than 24 months. The average number of months since the most recent overseas deployment was 48.96 months (S.D.= 36.53 months).

Study Design

The ADAPT program is a 14-week 2-hour face-to-face group-based preventive intervention program. The program aims to improve parenting by targeting six core parenting practices (five of them from GenPTMO: skill encouragement, positive involvement, problem solving, monitoring, effective discipline) and one new component: emotion socialization. Emotion socialization refers to emotion regulation with mindfulness exercises, emotion coaching skills, and education about unique military family stressors (e.g., family separations) (Gewirtz et al. 2014b).

Parenting skills were taught each week with new skills building upon earlier ones. Mindfulness exercises were incorporated into each session. All sessions were video-recorded to measure fidelity of implementation. In addition to group sessions, online resources were accessible, which included videos demonstrating parenting principles, handouts summarizing each session, and mindfulness exercises.

Procedures

All participants in the ADAPT study were residing in a Midwestern state. Participants were recruited through multiple strategies, such as media coverage, outreach to military organizations, or word of mouth. Eligibility of participants was determined through an online screener and informed consent. To be eligible, at least one parent must

have deployed to recent conflicts (e.g., Operation Iraqi Freedom, Operation Enduring Freedom, Operation New Dawn) with at least one child between the ages of 4 and 12 living in the home. Parents were given a gift card for each online assessment and for each in-home assessment. Children were also given a small gift for their participation. The study target child was randomly selected when there was more than one eligible child in the family. Following the baseline assessment, 60% of parents were randomized to the intervention/ADAPT condition and 40% to a services-as-usual condition, which consisted of “tip sheets” and online parenting resources. The study was approved by the Institutional Review Board.

After the completion of the baseline assessment, 60% of families were randomized to the ADAPT group format and 40% were randomized to the control condition. Control families received services as usual, including online resources. ADAPT was delivered weekly in groups of 6 to 15 parents. Each group was led by 2–3 trained facilitators, who were military (NG/R and veterans) or nonmilitary professional service providers (e.g., social workers). Trainers received 11 days of workshop training and biweekly ongoing supervision to ensure implementation fidelity.

Measures

PTSD

PTSD was measured with the Posttraumatic Stress Disorder Checklist (PCL; Weathers et al., 1993), a 17-item standardized, clinically validated self-report scale measuring PTSD symptoms based on the Diagnostic and Statistical Manual of Mental Disorders-IV (American Psychiatric Association, 1994). Respondents rated PTSD symptoms in the past month using a 5-point scale ranging from 1 (not at all) to 5

(extremely). Deployed mothers completed the military version (PCL-M), which asked about symptoms in response to “stressful military experiences”. Psychometric properties and screening properties of the scale were established in prior studies (Blanchard et al., 1996; Wilkins et al., 2011). A composite score was calculated such that higher scores indicate greater symptom severity. In the current study, PCL demonstrated good internal consistency ($\alpha = .92$).

Observed Parenting Practices

Parenting practices were measured through direction observation of parent-child interactions during structured family interaction tasks (FITs). Modified from the parent-child interaction task developed by Patterson, Forgatch, and colleagues (e.g., Dishion et al., 1992), there were a series of 5-minute tasks in which parents and children (i.e., mother-child, father-child, mother-father-child) were asked to: (a) identify and solve a list of everyday conflicts, e.g., cleaning, homework, etc.); (b) discuss deployment-related concerns (e.g., missing a child’s birthday); (c) plan a fun family activity. FITs also included tasks that assessed teaching and monitoring. In the teaching task, parents were told to provide assistance for children to engage in games. In the monitoring task, parents were told to gather information from the child about a time when the child was unsupervised by adults.

Based on the GenPMTO literature (e.g., Forgatch & DeGarmo 1999; Forgatch & Kjøbli, 2016), FITs measured five parenting practices: (a) problem-solving, (b) harsh discipline, (c) positive involvement, (d) skill encouragement, and (e) monitoring. FITs coded demonstrated validity and sensitivity to change with at-risk families (Forgatch & DeGarmo 1999; Gewirtz et al., 2009). After each task, trained coders used the Coder

Impressions system to score FITs (Forgatch et al., 1992). Intraclass correlation coefficients (ICCs) were computed for randomly selected coder teams to evaluate inter-rater reliability. Values between .67 and .80 indicated moderate reliability, and values above .80 indicated good reliability (Hallgren, 2012).

Problem-solving included nine items that assessed the quality of parent and child solution, likelihood of the family putting the solution to use, and extent of resolution (full sample: $\alpha = .87 - .89$; ICC = .88 - .94). Items were rated on a 5-point Likert scale from 1 (untrue) to 5 (very true). Harsh discipline measured overly strict, authoritarian, erratic, inconsistent, or haphazard parenting practices. This 8-item subscale were rated on a 6-point Likert scale ranging from 1 (*never*) to 6 (*always*) (full sample: $\alpha = .75$; ICC = .58 - .78). *Positive involvement* assessed parent's warmth, empathy, encouragement, and affection (full sample: $\alpha = .75 - .76$; ICC = .76 - .84). This 10-item subscale were rated on a 6-point Likert scale ranging from 1 (*never*) to 6 (*always*). Skill encouragement included eight items that measured parent's ability to promote children's skill development through encouragement and scaffolding strategies (full sample: $\alpha = .76 - .83$; ICC = .72 - .76). A 5-point Likert scale was used ranging from 1 (*untrue*) to 5 (*very true*). Monitoring (4-item) measured parents' supervision and knowledge of their child's daily activities (full sample: $\alpha = .60 - .71$; ICC = .74 - .64). A 5-point Likert scale was used ranging from 1 (*untrue*) to 5 (*very true*). Monitoring was not included in deriving the average score for positive parenting, due to the low factor loading among five parenting constructs located in prior ADAPT literature (i.e., Chesmore et al., 2018b; Gewirtz et al., 2018b)

Parental Efficacy

The Parental Locus of Control-Short Form Revised was adopted to measure the variable (PLO-SFR; Hassall et al., 2005). This scale is a shortened form of the Parental Locus of Control Scale (PLOC; Campis et al., 1986). Using a 5-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree), the 24-item self-report scale measured parenting control orientation in four dimensions: parental efficacy, parental responsibility, child control of parents' life, and parental control of child's behavior. The parental responsibility scale measures the degree to which parents do not feel responsible for their children's behavior. An example item is "Children's behavior problems are often due to mistakes their parents made" (reversed). The child control scale reflects the degree to which parents feel that their child's demands control their lives and engage in excessive gratification of children's needs. An example item is "My life is chiefly controlled by my child." The parental control scale measures the degree to which parents feel unable to control their child's behavior. An example item is "It is often easier to let my child have his/her way than to put up with a tantrum". A total mean score was obtained, with higher score indicating stronger sense of parental locus of control. Cronbach's alpha for the scale was .71.

Covariates

Marital status, child's age, intervention condition (ITT), and combat exposure were entered as covariates. Regarding marital status, participants who were married or cohabitated were coded as 1. For the ITT, participants in the control group were coded as 0, while participants in the treatment group were coded as 1. Child's age was reported by fathers and mothers in the ADAPT full data set and was derived by averaging the

responses from both parents. Combat exposure was measured using the Deployment Risk and Resilience Inventory (DRRI; King et al., 2006).

Analytical Strategy

Descriptive analyses were used to examine the distributional qualities of all variables and unadjusted bivariate associations in SPSS 25.0. The main analyses was estimated in *Mplus* 8 (Muthen & Muthen, 1998–2017).

As regards hypothesis 1, multiple regression was conducted to examine the intervention effects of the ADAPT program on observed parenting practices and self-reported parental efficacy. Specifically, the impact of ADAPT on positive parenting (average of problem solving, positive involvement, and encouragement), and negative parenting (harsh discipline) at one-year follow up was tested. An intent-to-treat approach (ITT) will be adopted here, by coding intervention membership as a binary variable. Parental adjustment at 1-year follow up was treated as the dependent variable, and intervention group status was treated as the independent variable, controlling for covariates and outcome variable at baseline.

Data were analyzed using full-information maximum likelihood (FIML), which used all available information from the dataset. Several recommended model fit indices were adopted for model fit evaluation (Byrne, 2013; Hu, & Bentler, 1999). Good model fit is indicated with a chi-square minimization *p* value above .05, a comparative fit index (CFI) close to .95, a root mean square error of approximation (RMSEA) below .06, a standard root mean squared residual (SRMR) below .08, and a chi-square ratio (χ^2/df) equals to or less than 2.0.

Missing Data

The missing data strategy is FIML. The current study conducted Little's chi-square test of missing completely at random (MCAR) to evaluate the randomness of missing data. Little's test showed that $\chi^2(118) = 137.976, p = .101, \chi^2/df = 1.16$, which provided evidence to support MCAR.

Results

Sample descriptives are shown in Table 1. Means, standard deviations, and bivariate correlations among key study variables for deployed mothers are shown in Table 2. Study findings were shown in Table 3. Models were saturated ($df = 0$). There was no significant treatment effect on observed parenting, derived from average score among five parenting practices ($\beta = .19, p > .05$). There was no significant treatment effect on parental efficacy at one-year ($\beta = .01, p > .05$).

Regarding positive parenting (average score among positive involvement, problem-solving, and encouragement), a significant treatment effect was found ($\beta = .26, p < .05$). Regarding negative parenting (defined as harsh discipline), no treatment effect was found ($\beta = .23, p > .05$). In the harsh discipline model, combat exposure was positively associated with harsh discipline at one-year ($\beta = .02, p < .05$). Findings in the models remain statistically significant without controlling for covariates.

Post-hoc Analyses

The small sample size of 56 mothers raises power concerns (i.e. inability to detect significant differences). To test this potential concern, the study combined the deployed mothers with the deployed mothers from a later ADAPT study known as ADAPT4U (ADAPT4U; Gewirtz, 2020). Sample descriptive are shown in Table 1 and more information about ADAPT4U can be found in the Methods section in Study 2. This post-

hoc analysis serves as a supplementary analysis since ADAPT4U was not a randomized control trial. In brief, ADAPT4U tested the effectiveness of three ADAPT intervention modalities: group, tele-health, and online self-help. Including all deployed mothers from ADAPT4U as the treatment group, similar analyses to test intervention effectiveness on key study variables were conducted. Study membership was entered as a covariate to account for between-study influence (Hussong et al., 2013). Models were saturated ($df = 0$). We did not find a treatment effect on observed parenting, derived from the average score among the five parenting practices ($\beta = .19, p > .05$). We also did not find a treatment effect on parental efficacy at one-year ($\beta = -.02, p > .05$).

Regarding positive parenting (average score among positive involvement, problem-solving, and encouragement), a marginally significant treatment effect was found ($\beta = .25, p < .10$). Regarding negative parenting (defined as harsh discipline), a non-significant treatment effect was found ($\beta = .19, p > .05$). Therefore, the post-hoc analyses showed similar findings to the primary analyses.

Discussion

To our knowledge, this is the first study to examine parenting intervention outcomes on deployed mothers' parenting. Even with a small sample, the findings from the present study provide evidence for some benefits of the ADAPT program on deployed mothers' parenting.

Treatment Effect on Overall Observed Parenting

Counter to expectations, there was no statistically significant treatment effect on overall parenting among deployed mothers at one-year follow-up. The first hypothesis was not supported. In contrast, prior studies have shown ADAPT treatment effects among

larger samples of fathers and mothers from military families (i.e., Gewirtz et al., 2018b; Chesmore et al., 2018b). However, these studies combined deployed mothers and non-deployed mothers (Chesmore et al., 2018b). Combining samples may mask sub-group differences due to the small number of deployed mothers within the larger mother sample. In addition, prior studies examined intervention effects on global parenting practices (i.e. across the five parenting domains). Among the five parenting domains, some parenting practices showed significant changes at one-year follow-up. Hence, using an average score of parenting practices may overlook the details of which domains change and which do not.

Treatment Effects on Positive and Negative Parenting

The second hypothesis was partially supported. There was a statistically significant improvement in positive parenting but no significant reduction in negative parenting (specified as harsh discipline) at one-year follow-up among deployed mothers. Prior findings from both ADAPT and GenPMTO have indicated reductions in negative parenting and improvements in positive parenting, which lead to improvement in child outcomes (e.g., Forgatch & Kjøbli, 2016). Positive parenting practices are crucial in attaining positive child outcomes by replacing the vicious cycle of parent-child coercive behaviors (Forgatch & Patterson, 2010; Forgatch & Kjøbli, 2016; Patterson et al., 2010).

On the other hand, there was no significant treatment effect on negative parenting, specified as harsh discipline, after accounting for the baseline harsh discipline. Different from other GenPMTO studies, the present study presented different treatment outcomes on dimensions of parenting practices. Other GenPMTO studies found reduction on negative parenting, followed by increase of positive parenting (Forgatch & Kjøbli, 2016;

Patterson et al., 2010). A study also suggested cascade effects among positive parenting, and negative parenting (Reed et al., 2013). However, the present findings suggested non-significant effect on harsh discipline. In GenPMTO, focusing on the five dimensions of parenting practices (problem solving, positive involvement, limit setting, encouragement, and monitoring), parents were taught positive parenting strategies (Forgatch & Kjøbli, 2016). The parenting program focuses on the parenting strategies that parents want to encourage in their children. Indeed, the treatment effect on positive parenting is consistent with other prior ADAPT literature on intervention efficacy (Forgatch et al., 2016; Forgatch & Kjøbli, 2016). Nevertheless, limit setting, which was measured by harsh discipline, did not change. Interestingly, a marginally significant reduction in harsh discipline was found among the control group (Table 3). This raises an important question: do deployed mothers have a different perception of what is effective discipline? That is, do they view harsh disciplines as valuable, and are thus more resistant to change?

As noted in prior literature, military culture upholds discipline, which serves as the backbone of the population (Hall, 2011). The military disciplinary culture, which is not often found in civilian populations, may carry over to parenting styles (Speck & Riggs, 2016). Military parents may be socialized to military culture, values and norms (Bradley, 2007). Spillover effects have been proposed as an explanation for how cultural practices, such as work environment, influence other domains of family relationships (Bradley, 2007). After deployment, deployed mothers have to renegotiate the parenting role and reconnect with their children (Gewirtz et al., 2014a). For example, one mother in the ADAPT study described how, when her husband returned home from deployment, all that was expected from him was to come home and play with their kids, while now she

has “to take care of the kids. It wasn’t that they (husband) were going back into a caregiver role” (Gewirtz et al., 2014a). Hence, the potential adjustment difficulty in shifting between military and child-nurturing roles likely induce stress on mothers. This may create an identity crisis that mothers need to negotiate between these two seemingly incompatible cultures, an issue that has been encountered by female veterans (Burkhart & Hogan, 2015; Demers, 2013). This may explain the nonsignificant treatment effect on harsh discipline.

Deployed mothers may view the deployment process as fulfillment of service, instead of purely a “stress” process (Gewirtz et al., 2014a). One mother recalled joking with another female officer in Afghanistan to see “if they could get child-size protective vests and (they) could bring them (the child) over. Because other than that, I think (we) both loved being on deployment.” It remains unknown if deployed mothers internalize the disciplinary military culture into parenting because of their sense of fulfillment in their service. If mothers perceive military culture as part of their personal values, values upheld by military culture such as conformity or discipline may become part of their identity (Burkhart & Hogan, 2015; Demers, 2013), and this may add complexity in viewing discipline. This would probably increase difficulty in intervening on harsh discipline, given the connection to personal values. This may warrant future research on how military parents conceptualize discipline in the context of parenting.

Additionally, differential treatment effects on positive and negative parenting may provide further insights into the findings from prior ADAPT and ADAPT4U (second wave of ADAPT) literature with larger samples, in which the constructs of discipline and monitoring obtained low factor loadings, ranging between .19 to .54 (Chesmore et al.,

2018b; Gewirtz et al., 2018b; Cheng et al., 2021, June). The low factor loadings likely indicated a substantial portion of variance in those indicators was not accounted for in the process model. Low factor loadings of the harsh discipline and monitoring domains could be attributed to measurement issues. For example, in the FITs there were few opportunities for parents to show discipline or to elicit good examples of monitoring because misbehavior rarely occurred in the short FIT tasks, and because many children, particularly younger ones, are rarely unsupervised. In addition to measurement issue as one alternate explanation, prior findings on different trajectories of the five GenPMTO constructs may shed light on the present findings of differential treatment effects in positive and negative parenting (Akin et al., 2017; Holtrop et al., 2022; Patterson, 2010; Reed et al., 2013). For example, Akin et al. (2017) found that positive and negative parenting may involve non-linear treatment trajectories across a 20-week period in a sample of parents of children in foster care. Reed et al. (2013) found cascade effects among positive and negative parenting over a 30-week period among recently separated mothers. All these studies revealed relationships between and within positive and negative parenting across time. The present study only examined the mean difference between baseline and one-year follow-up. Studies with two time-points limit the ability to unpack the relationship between positive and negative parenting beyond one year. This suggests the importance of examining trajectories of positive and negative parenting, rather than simply assuming homogeneity.

Treatment Effects on Parental Efficacy

The finding of no intervention effect on parental efficacy for this deployed mother sample differs from findings in prior ADAPT studies in which the intervention

strengthened parental efficacy for the full sample of mothers and fathers (Gewirtz et al., 2016). Examination of means showed that deployed mothers' parental efficacy in both treatment and control group increased significantly at 1-year compared to baseline (Table 3). Based on the conceptualization of dual-identities of deployed mothers (Street et al., 2009), there is a general consensus that multiple vulnerabilities should be negatively associated with parental efficacy. In other words, a decrease in parental efficacy should be observed among deployed mothers in the control group. One alternate explanation is that being exposed to multiple traumatic stressors may have a reverse effect on efficacy, because mothers are motivated to seek meaning in parenting amid adversity (McKenzie et al., 2021). Child-rearing becomes part of their purpose in life and mothers report wanting to provide the best parenting for their children (McKenzie et al., 2021). This compensatory effect was also found among civilian single mothers (Nelson et al., 2009). Further investigation is indicated regarding what led to the increase of parental efficacy among deployed mothers in the control group.

Limitations and Future Directions

In the present study, one limitation is the small sample size. The total sample consisted of only 56 deployed mothers. The control group had less than 30 participants at both baseline and one-year follow-up. The small sample size constrained us from using a latent variable approach to test the overall treatment effect of parenting constructs (Wolf et al., 2013). The small sample size in the present sample also prevented testing a complex model, such as a longitudinal mediation model. Consistent with the GenPMTO literature (Gewirtz et al., 2018b), the ADAPT program showed direct treatment effects on parenting, and indirect treatment effect on child outcomes. Thus, the small sample size

prevented us from examining this empirically established indirect treatment effect among deployed mothers only. Another limitation is the lack of knowledge on deployed military mothers- for example, the impact of risk factors such as prolonged separation on mothers' mental health and parenting (e.g., Walsh, 2017). Another limitation related to the participants' demographics. The majority of the current sample identified as Caucasians. This may limit the findings in generalizing to other ethnic groups in the military population.

Study 2: Examining Military Risk Pathways on Parenting and Child adjustment among Deployed Fathers, Deployed Mothers, and Non-Deployed Mothers

Introduction

Impacts of Military Deployment on Family Functioning

There is ample evidence showing negative impacts of military deployments on family functioning (e.g., Allen et al., 2010), parenting (e.g., Gewirtz et al., 2010), marital adjustment (e.g., Campbell & Renshaw, 2018), and child outcomes (e.g., Creech, & Misca, 2017). In the last two decades, studies showed evidence on risk pathways in how military deployments negatively impacted families (i.e., Dekel & Monson, 2010). Generally speaking, military deployments negatively impact mental health symptoms of service members, which then impact marital adjustment, parenting adjustment, and child outcomes (Gewirtz et al., 2018a; Trautmann et al., 2015). In view of the emergent research, multiple review studies called for theory development specific to military families (e.g., Dekel & Monson, 2010; Gewirtz, 2018). With the progression of literature, research foci regarding deployments on family functioning appeared to shift from analyzing military population collectively to investigating sub-group differences (e.g., Creech et al., 2019a, Vogt et al., 2017).

Military Deployment as a Family Stressor

Thus far, the military literature has been primarily focusing on the majority composition of military family: deployed fathers and their civilian spouses (see review: Creech & Misca, 2017). One of the rationales for studying military families was due to the largest mobilization of NG/R forces to Middle East Conflicts, which is distinguished by the nature of how previous warfare utilized primarily active-duty units. NG/R units are

comprised of “citizen soldiers”, whose members do not live on military installations or receive the same level of pre-deployment training for combat in comparison to active-duty counterparts (Griffith, 2010). This has made NG/R service members potentially more vulnerable to poor mental health adjustment upon reintegration (Griffith, 2010; Milliken et al., 2007). Research on post-deployment conceptualized the combat experience during deployment as a traumatic exposure, which induced stress on personal mental health adjustment and spill-over to family functioning (e.g., Allen et al., 2010; Gewirtz et al., 2010; Dekel & Monson, 2010). Facing with elevated risk for developing PTSD from combat, studies found negative association of PTSD symptoms with parenting practices, and subsequently with child outcomes (e.g., Gewirtz et al., 2010; Lester et al., 2016). Specific mechanisms such as how individual emotion regulatory difficulties or emotional avoidance among deployed service members, impaired by PTSD symptoms, affected parenting and child outcomes were studied (Gewirtz et al., 2018a; Creech & Misca, 2017). Theories have been proposed to conceptualize this risk pathway in how deployments affected families at the family level (Gewirtz et al., 2018a; Riggs & Riggs, 2011), couple level (Campbell & Renshaw, 2018; Goff & Smith, 2005), and parenting level (Creech & Misca, 2017), by studying the deployed father/husband service members.

Based on this conceptualization of combat exposure as a stressor, literature also showed the impact of deployments on mental health, parenting, and child adjustment among deployed service members’ civilian spouses. Review studies identified other unique stressors encountered by civilian spouses across deployment cycles (Bommarito et al., 2017; Riggs & Riggs, 2011; Verdelli et al., 2011). Civilian spouses mainly became the

primary caregivers across the deployment phase. Parental stress, long-term separation due to deployments, financial burden, or deployed service members' PTSS was associated with mental health issues among civilian spouses (Verdeli et al., 2011). Civilian spouses were found to have elevated risks in developing depression or PTSD (Donoho et al., 2018), which would negatively impact their parenting and child outcomes (Bommarito et al., 2017; Lester et al., 2010). Taken together, the military literature identified the important role of civilian spouses' mental health issues in affecting parenting and child outcomes upon reintegration.

Based upon the conceptualization of risk pathways on family functioning among deployed fathers and non-deployed spouses, a certain number of studies began to extend the understanding to deployed mothers (e.g., Berz et al., 2008; Kelley et al., 2001). One conceptualization viewed the separation due to deployment as stressor (e.g., Kelly et al., 2001; 2002). Viewed through the lens of an attachment framework, studies suggested the parent-child separation due to deployment would disrupt parent-child relationships. A systematic review study showed that studies focusing on the attachment framework approach were sampled from deployed mothers who came from military units with low combat exposure and who were being mothers before deployments (Cheng, 2020).

Another conceptualization, aligned with the aforementioned studies on conventional military families, views traumatic combat exposure as family stressor (e.g., Creech et al., 2014; Gewirtz et al., 2011). A number of qualitative studies suggested common themes related to post-deployment adjustment encountered by deployed mothers (e.g., Leslie & Koblinsky, 2017). Quantitative studies also revealed elevated risks of psychopathology (Hoge et al., 2006; Gewirtz et al., 2014a). Negative associations

between PTSD and parenting satisfaction were found (Berz et al., 2008). Furthermore, female service members were far more likely than men to experience military sexual trauma (MST; Haskell et al., 2010), a problem exacerbated by a male dominated military insensitive to sexual harassment and assault (Mattocks et al., 2012). The experience of MST has also been identified a key risk for PTSD (Maguen et al., 2012).

Group Differences on Mental Health, Parenting and Child Outcomes

Comparisons Between Deployed Men/Fathers and Deployed Women/Mothers

With the abundance of literature on military families as a whole, studies moved to studying group differences upon post-deployment adjustment, without assuming homogeneity of risk pathways among sub-groups. Regarding the gender differences between male and female service members, studies found that there were higher prevalence of positive screenings for depression and the impact of exposure to military sexual trauma in female service members (e.g., Haskell et al., 2010; Kimerling et al., 2010). Compared with male service members, female service members were more likely to meet screening criteria for PTSD, except the symptom cluster of hypervigilance (Hourani et al., 2015). There were gender differences in PTSD presentations (Kimerling et al., 2010; Woodhead et al., 2012). In terms of comparisons between deployed fathers and deployed mothers, limited research was found. Darawshy et al. (in press) did not find gender differences using a three-factor symptom cluster of PTSD in a cross-sectional subsample of NG/R service members. In a military sample where more than 50% of women and 70% of men were parents, Smith et al. (2017) did not find gender differences in PTSD nor depression symptom severity.

Regarding gender differences on parenting adjustment and child adjustment, few studies were found. In a NG/R sample that contained mainly deployed fathers and civilian mothers, Cheng et al. (2021, June) did not find any group differences for both parenting practices and child outcomes, except mothers have a higher mean scores on observed parenting practices than fathers. Regarding the association between PTSD and parenting, Chesmore et al. (2018b) did not find gender differences in the ADAPT sample. Cheng et al. (2021, June) did not find gender differences in associations among PTSD, parenting, and child outcomes, using the ADAPT4U sample. In relation to gender differences between deployed parents, the few studies that identified these provided inconclusive results: Smith et al. (2017), for example, found that associations between PTSD and family functioning were significant among male veterans and also female veterans. Alongside this, Vogt et al. (2017) showed that the association between PTSD symptoms with family functioning or satisfaction is similar between male and female veterans.

In sum, aside from comparisons between deployed fathers/husbands and civilian/non-deployed mothers/wives, comparisons between deployed parents are scant, particularly on post-deployment parenting and child outcomes. Hence, the present study aims to fill the literature gap by empirically examining the magnitude of risk pathway between deployed fathers and deployed mothers instead of either separate or combined investigation.

Comparisons Between Deployed Women/Mothers and Non-Deployed Women/Mothers

In relation to the comparisons between deployed and non-deployed mothers, prior literature treated deployment status as an additional stressor onto motherhood.

Regarding psychological distress, studies found out that deployment(s) is associated with more negative outcomes for deployed mothers compared to non-deployed groups, such as level of anxiety (Kelley et al., 2002) and depression (Gewirtz et al., 2014a). Regarding parenting outcomes, no differences were found between deployed mothers and non-deployed mothers on self-report measures of parenting (Gewirtz et al., 2014a). Regarding child outcomes, children of deployed Navy mothers exhibited higher levels of internalizing behavior than children with non-deployed Navy mothers (Kelley et al., 2001), but a study of primarily Army National Guard mothers showed no differences between deployed and non-deployed mothers on measures of child functioning (Gewirtz et al., 2014a). Taken together, studies were scattered in focusing on disparate constructs among parenting, child outcomes, and their associations with PTSD. Therefore, the present study aims to fill the literature gap.

Self-reported and Observed Parenting

In measuring parenting adjustment, studies pointed out potential methodological concerns in operationalizing this variable. A review study argued that the frequent use of self-reported measures in studying parent functioning would not be able to rule out the self-report bias (Trautmann et al., 2015). Another review study also found contrasting results in associations between different parenting measures and PTSD (Creech & Miska, 2017). Using self-reported measures may suffer from social desirability concerns or other biases due to parental stress (Moens et al., 2019). A meta-analysis study showed that there was a small yet significant correlation between observed and self-reported parenting measures (Hendriks et al., 2018). Review studies suggested the importance in using multi-method approach to capture the spectrum of the parenting construct and association with

PTSS/PTSD, without concluding the superiority of specific format (Hendriks et al., 2018; Kritikos et al., 2019). In the present study, aside from using the observed measures, self-reported parental efficacy was also measured to operationalize parental adjustment. Parental efficacy refers to the extent that parents felt confident with parenting effectively (Hagekull, et al., 2001). High parental efficacy was associated with parenting competence and positive child outcomes (Albanese et al., 2019; Kokkinos & Panayiotou, 2007). Prior ADAPT studies reported treatment effects on parental efficacy (Gewirtz et al., 2016), and association with PTSS (DeGarmo & Gewirtz, 2018), and child adjustment (Piehler et al., 2018). The present study, therefore, incorporated a multi-method approach in measuring the parenting variable.

Informant Characteristics on Child Outcomes

In reporting child outcomes, operationalized as externalizing and internalizing behaviors, informant discrepancies were reported in prior literature (e.g., Card et al., 2011; Chesmore et al., 2018a; Connell & Goodman, 2002; Moens et al., 2019). As children's closest observers, parent-reported child measures were often used. Using fathers, mothers, teachers, or children as informants of children's behaviors may result in inconsistent findings depending on the informant(s) (Card et al., 2011; Connell & Goodman, 2002; De Los Reyes, & Kazdin, 2005). In military literature, using solely single parent-reported child measure may subject to parents' cognitive bias, probably related to psychopathology from traumatic stressor, on the likelihood for reporting children's problematic behaviors (Card et al., 2011; Kritikos et al., 2019). This may inflate children's problematic behaviors. Hence, incorporating other informants may account for the potential pitfall. In the present study, both parent-reported and teacher-

reported child measures were used. Additionally, regarding specification of child outcomes, the present study compared the risk pathway on children's externalizing behaviors among fathers and children's internalizing behaviors among mothers. The justification was that fathers' parenting adjustment tended to associate with children's externalizing behaviors, while mothers' parenting adjustment tend to associate with children's internalizing behaviors (Connell & Goodman, 2002). Literature also discussed the differences in using internalizing and externalizing behaviors for child outcomes (Card et al., 2011). This approach also aligned to the focus of the present study in comparing risk pathway from PTSD to child outcomes via parenting, instead of focusing onto specific dimensions of child outcomes.

Integrative Data Analysis (IDA)

The investigation pooled two datasets, ADAPT and ADAPT4U, to study deployed mothers, under the framework of integrative data analysis (IDA; Curran & Hussong, 2009). IDA is referred to as pooling multiple datasets into a single dataset for simultaneous analysis (Curran & Hussong, 2009). Existing literature has pointed out the importance of pooling multiple datasets to enhance statistical power and, therefore, improve the generalizability of findings (Hussong et al., 2013). Recent methodological advancement supported IDA in scaling data to common scales to address the use of different measures in different studies. One key difference between IDA and meta-analysis is that the former conducts analysis at the individual level while the latter focuses on the study level. Meta-analysis produces a weighted average effect size based on summary statistics from each study, limiting topics of inquiry to those questions already addressed within individual studies. In the current study, the use of the IDA

framework increased the sample size of deployed mothers. In addition, this approach supported more complex statistical models in drawing inferences, which could not be conducted in an individual study. Thus, the IDA approach provided an opportunity to overcome one of the significant hurdles in studying deployed mothers: low sample size due to underrepresentation in the current military population (Creech & Misca, 2017).

Research Gaps

To the best of my knowledge, there are no other studies that directly compare risk pathways between deployed fathers and deployed mothers, and between deployed mothers and non-deployed mothers. Comparison among these three groups will extend our understanding on the growing interest in providing intervention for the military families. The multi-group comparisons will also help to provide treatment implications for the growing population of deployed mothers. Following the conceptualization of combat exposure as stressor (i.e., Allen et al., 2010; Gewirtz et al., 2018a), the present study examined if the findings from the qualitative studies, which suggested elevated risks due to the dual identities of being a mother and a soldier, would result in stronger associations among PTSD, parenting, and child outcome in comparison to majority groups in the military population. Findings from the present study imply the needs for tailor-made existing parenting interventions for deployed mothers. Since the comparisons between deployed fathers and non-deployed mothers were conducted with a similar data set in a prior study (Cheng et al., 2021, June), such comparisons were not repeated in the present study. In addition, the small sample size of civilian fathers from pooled data sets ($n = 23$) restrained the current study to conduct the conventional four-group comparison by constructing an interaction model embedded within a multi-group analysis.

The Present Study

The present study compared the indirect risk pathway from PTSD to child outcomes via parenting outcomes with two multi-group comparisons (Figure 1): (a) deployed fathers and deployed mothers; (b) deployed mothers and non-deployed mothers. First, the study hypothesized that there would be significant differences in the magnitude of the indirect risk pathway between deployed mothers and deployed fathers. Due to the additional stressor due to dual identities, indirect risk pathways among deployed mothers was hypothesized to be more severe than that of deployed fathers. Second, the study hypothesized that there would be significant differences in the magnitude of indirect risk pathway between deployed mothers and non-deployed mothers. Due to the additional deployment stressor, indirect risk pathway among deployed mothers was hypothesized to have greater magnitude more severe than that of non-deployed mothers.

Methods

Participants

After Deployment Adaptive Parenting Tools (ADAPT)

The original sample included 336 military families comprising 314 mothers, 294 fathers, and 336 children, residing in a Midwestern state. A subsample of families was analyzed in the study described here (56 deployed mothers, 258 non-deployed mothers, 282 deployed fathers). The majority of fathers was deployed overseas (95.9%). Among 282 deployed fathers, their average age were 37.73 years old (S.D.= 6.62). The majority of them were married or cohabitated (94.6%). 48% of them completed at least a bachelor's degree. 34.2% of them deployed less than 13 months. 32.1% of them deployed between 13 to 24 months. 33.8% of them deployed more than 24 months. The average

number of months since the most recent overseas deployment was 33.16 months (S.D.= 30.72 months).

Among 56 deployed mothers, their average age were 34.57 years old (S.D. = 5.47). 75% of them were married or cohabitated. 55.4% of deployed mothers completed at least a bachelor's degree. 54.5% of them deployed less than 13 months. 36.4% of them deployed between 13 to 24 months. 9.1% of them deployed more than 24 months. The average number of months since the most recent overseas deployment was 48.96 months (S.D.= 36.53 months). Among 258 non-deployed mothers, their average age was 35.94 years old (S.D. = 5.91). The majority of them were married or cohabitated (95.7%). 51.4% non-deployed mothers completed at least a bachelor's degree.

ADAPT4U

The original sample included 244 military families comprising 223 mothers, 193 fathers, and 244 children. A subsample of families was analyzed in the study described here (61 deployed mothers, 162 non-deployed mothers, 182 deployed fathers). The majority of fathers were deployed overseas (94.3%). Among 182 deployed fathers, their average age was 37.59 years old (S.D. = 5.83). Majority of them were married or cohabitated (91.8%). Many (61.7%) of the deployed fathers had completed at least a bachelor's degree. The average number of months deployed since 2001 was 19.57 months (S.D. = 11.86 months). The average number of months since the most recent overseas deployment was 66.57 months (S.D.= 49.35 months).

Among 61 deployed mothers, their average age was 35.23 years old (S.D. = 5.36). 73.8% of them were married or cohabitated. More than half (52.46%) of them completed at least a bachelor's degree. The average number of months deployed since 2001 was

13.28 months (S.D. = 8.54 months). The average number of months since the most recent overseas deployment was 88.61 months (S.D.= 51.54 months). Among 162 non-deployed mothers, their average age was 36.18 years old (S.D. = 5.78). 96.8% of them were married or cohabitated. 54.5% of them completed at least a bachelor's degree.

Study

ADAPT

The ADAPT program is a 14-week 2-hour face-to-face group-based preventive intervention program, modified from evidence-based GenerationPMTO (Forgatch & Patterson, 2010). The program aims to improve parenting by targeting the five core GenPMTO parenting practices: skill encouragement, positive involvement, problem solving, monitoring, and effective discipline. One additional component, emotion socialization, was added into the ADAPT. Emotion socialization refers to emotion regulation with mindfulness exercises, emotion coaching skills and education about unique military family stressors (e.g., family separations). See Gewirtz et al. (2014b) for a thorough description.

ADAPT4U: Comparing Delivery Format of ADAPT Parenting Program

ADAPT4U compares the effectiveness of three delivery formats of the ADAPT program: ADAPT group-based, ADAPT individualized web-facilitated (telehealth), and ADAPT self-directed online (Gewirtz, 2020). After the completion of the baseline assessment, families were randomly assigned to one of the aforementioned delivery modalities. Each delivery modality contained about one-third of the sample. Delivery format of group-based approach was similar to the ADAPT program. As for the telehealth approach, curriculum was modified in a multi-stage process from in-person

group-based to individual family web-based to ensure implementation fidelity. In the ADAPT4U study, each facilitator received 8-11 days of training. Facilitators came with a range of military and mental health experience, such as social workers, military liaisons, etc.

Procedures

In the ADAPT study, the original sample included 336 military families comprising 314 mothers, 294 fathers, and 336 children, residing in a Midwestern state. Participants were recruited through multiple strategies, such as presentations at military-sponsored events, targeted mailings from the local Veterans Affairs Medical Center, or word of mouth. Online screener and informed consent were required to determine if any interested participants were eligible. Families were eligible to participate in the study if at least one parent had deployed to recent conflicts (e.g., Operation Iraqi Freedom, Operation Enduring Freedom, Operation New Dawn) and at least one child between the ages of 4 and 12 years was living in the home. The study target child was randomly selected when there was more than one eligible child in the family. The study was approved by the Institutional Review Board.

In the ADAPT4U study, military families were recruited from two Midwestern states. To be eligible, families were required to have (a) at least one parent who returned from deployment to OEF/OIF or from stateside mobilization in support of the Global War on Terrorism, and (b) at least one child between the ages of 5 and 12 years who was living in the home. Compared with ADAPT, similar recruitment strategies and procedure in determining participants' eligibility were adopted in the ADAPT4U study. The study was approved by the Institutional Review Board.

Measures

Posttraumatic Stress Disorder (PTSD) Symptoms

The PTSD Checklist (PCL; Weathers et al., 1993) is a 17-item self-report that assesses the severity of PTSD symptoms outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (American Psychiatric Association, 2000). In both the ADAPT and ADAPT4U study, respondents rated the extent to which they are bothered by each of the 17 items in the past month using a 5-point scale ranging from 1 = “not at all” to 5 = “extremely”. Summed scores were derived from items to yield a total PTSD symptom severity score. Previously deployed overseas parents completed the military version, in which the items refer to a traumatic military experience; non-deployed parents completed the civilian version, in which the items refer to any past traumatic experience. Prior studies established psychometric properties for this measure (McDonald & Calhoun, 2010), $\alpha = .92$ in ADAPT and $\alpha = .95$ in ADPT4U.

Depression symptoms

HSCL-25. The Hopkins Symptoms Checklist-25 (HSCL-25; Hesbacher et al., 1980) was completed by each participant in the ADAPT study. The full checklist consists of two scales: a 10-item anxiety scale and a 15-item depression scale assessing depression symptoms. Items were rated on a 4-point scale: 1 (“not at all”), 2 (“a little”), 3 (“quite a bit”), and 4 (“extremely”). Only the depression symptoms scale score was used for the current study. The concordance rate between symptom screening and structured diagnostic interviews was empirically validated for HSCL-25 (Sandanger et al., 1998). Fifteen (15) item scores were summed and averaged to derive the total symptom severity score. A cut-off score of 1.75 or greater was used to screen for possible clinical

depression. This cut-off point is widely used and has demonstrated validity across cross-cultural research (Mollica, et al., 1987; Mollica et al., 2004). In addition, the HSCL-25 was used as a screening tool in different settings, including primary care settings, or cross-cultural settings (Kaaya et al., 2002). Cronbach's alpha is .91, which indicated excellent reliability in the current study.

CES-D. The Center for Epidemiologic Studies- Depression scale was used in the ADAPT4U study (Radloff, 1977). The scale contained 20 items. Respondents rated depression symptoms during the past week. Items were rated on a 4-point likert scale: 0 ("rarely or none of the time"), 1 ("some or a little of the time"), 2 ("occasionally or a moderate amount of time"), and 4 ("most or all of the time"). Twenty (20) item scores were summed to derive the total symptom severity score. A cut-off score of 16 or greater was widely used to screen for possible clinical depression (Radloff, 1977; Weissman, et al., 1977). The CES-D has demonstrated high internal consistency, good sensitivity and specificity for identifying individuals at risk for clinical depression (Lewinsohn et al., 1997). Cronbach's alpha is .94, which indicated excellent reliability in the present study.

Observed Parenting Practices

Direct observations of parent-child interactions were obtained during structured family interaction tasks (FITs). FITs included a series of 5-minute tasks in which parents and children were asked to solve a source of everyday conflict and plan a fun family activity. Other tasks included a parental monitoring task (children were told of a time when parents were not present, and parents were instructed to gather information from the child) and teaching tasks (games in which parents provided children with the help they needed; Forgatch et al., 1992). Effective parenting practices were measured with

five previously validated indicators: (a) problem-solving outcome, (b) harsh discipline, (c) positive involvement, (d) skill encouragement, and (e) monitoring. Monitoring was not included in the present analysis because of the low number of incidences where children reported they had a time when parents were not present, which contributed to poor model fit. The FIT codes demonstrated ecological validity, construct validity, and sensitivity to change with at-risk families (Gewirtz et al., 2018). Trained coders reviewed video footage of each task and coded verbal and nonverbal parenting behaviors using the Coder Impressions system (Forgatch et al., 1992). Interrater reliability was assessed for 32% of the videos.

Problem solving outcome was scored with a 9-item scale evaluating the quality of parents' and children's solution, extent of resolution, satisfaction with the outcome of the discussion, and likelihood the family would put this solution to use. Items were rated using a 5-point Likert scale ranging from 1 (untrue) to 5 (very true) (ADAPT: $\alpha = .87-.89$, ICC = .88-.94; ADAPT4U: $\alpha = .86 - .88$, ICC = .79 - .86). *Harsh discipline* was measured by an 8-item scale assessing overly strict, authoritarian, erratic, inconsistent, or haphazard parenting practices (ADAPT: $\alpha = .75$, ICC = .58-.78; ADAPT4U: $\alpha = .68 - .79$, ICC = .61 - .65). Items were rated on a 6-point Likert scale ranging from 1 (*never*) to 6 (*always*). *Positive involvement* was derived from a 10-item scale evaluating parent's warmth, empathy, encouragement, and affection ($\alpha = .75 - .76$, ICC = .76-.84; ADAPT4U: $\alpha = .77 - .80$; ICC = .74 - .83) Items were rated on a 6-point Likert scale ranging from 1 (*never*) to 6 (*always*). *Skill encouragement* (8-items) assessed parent's ability to promote children's skill development through encouragement and scaffolding strategies (ADAPT: $\alpha = .76 - .83$; ICC = .72-.76; ADAPT4U: $\alpha = .81$; ICC

= .75 - .77). A 5-point Likert scale was used ranging from 1 (*untrue*) to 5 (*very true*). *Monitoring* (4-item) measured parents' supervision and knowledge of their child's daily activities (ADAPT: $\alpha = .60-.71$; ICC = .64 - .74; ADAPT4U; $\alpha = .58$, ICC = .62 - .73). A 5-point Likert scale was used ranging from 1 (*untrue*) to 5 (*very true*). All scales were averaged to create summary scores.

In both deployed fathers' and deployed mothers' model, and deployed mother and non-deployed mothers' model, the conceptualization of positive and negative parenting was adopted to create the latent variable for observed parenting practices (DeGarmo & Jones, 2019; Forgatch & Patterson, 2010; Hukkelberg & Ogden, 2021). By not using the overall observed parenting scores, this two-dimensional approach helped to evaluate constructs without creating too many variables for the study sample size. Here, scores from positive involvement, problem solving, and encouragement were summed to derive the positive parenting score. Harsh discipline was used to represent the negative parenting score. Although monitoring was considered as one dimension of positive parenting, low factor loadings found in present study and prior study led to the drop of this variable (Chesmore et al., 2018b; Gewirtz et al., 2018b).

Parental Efficacy

The Parental Locus of Control Short Form Revised/PLOC – SFR (Hassall et al., 2005) was a shortened form of the Parental Locus of Control Scale (Campis et al., 1986). The 24-item SRF self-report questionnaire measured parenting control orientation (i.e., internal vs. external) in four dimensions on a five-point Likert scale from 1 (strongly agree) to 5 (strongly disagree): parental efficacy, parental responsibility, child control of parents' life, and parental control of child's behavior. Total average score was used, with

high scores indicating high sense of control, efficacy, or internality and low scores indicating low efficacy.

Child Adjustment

The Behavioral Assessment System for Children (BASC-2; Reynolds & Kempfous, 2004) is a behavioral rating instrument used for assessing dimensions of externalizing, internalizing, and adaptive behaviors in children and young adults. The measure has three versions: parent rating scales, teacher rating scale, and child self-report. Rated on a 4-point Likert scale from 0 (never) to 3 (almost always), the 30-item Externalizing Symptoms scale includes three subscales, including aggression (e.g., “Seeks revenge on others.”), conduct problems (e.g., “Deceives others.”), and hyperactivity (e.g., “Acts out of control.”). Rated on a 4-point Likert scale from 0 (never) to 3 (almost always), the 30-item Externalizing Symptoms scale includes three subscales, including depression (e.g., “cries easily”), anxiety (e.g., “worries”), and somatization (e.g., “complains of pain”). Age- and gender-specific normative T scores were derived with higher scores indicating greater externalizing problems. In the present study, father-reported, mother-reported, and teacher-reported measures were used.

In the deployed fathers’ and mothers’ model, the correlation between fathers’ and mothers’ reported externalizing behaviors at baseline and at two-year were .778 and .551, respectively. The correlation between fathers’ and mothers’ reported internalizing behaviors at baseline and at two-year were .478 and .450 respectively.

In the deployed mothers’ and non-deployed mothers’ model, the correlation between fathers’ and mothers’ reported externalizing behaviors at baseline and at two-year were .771 and .553 respectively. The correlation between fathers’ and mothers’

reported internalizing behaviors at baseline and at two-year were .498 and .456 respectively. Because of the high correlation between father-reported and mother-reported measures, they were averaged to create as an indicator variable of child internalizing and externalizing symptoms at each assessment point.

Military Sexual Trauma

The measure of MST differed between ADAPT and ADAPT4U. In ADAPT, MST was measured with a shortened version of the Section G - Relationships Within Unit subscale of the Deployment Risk and Resilience Inventory (DRRI; King et al., 2006). This questionnaire contained 7 items on a Likert scale of 1= Never, 2= Once or twice, 3= Sometimes, 4= Many times ($\alpha = .85$). In ADAPT4U, MST was measured by the Section K2 - Relationships During Deployment subscale on the Deployment Risk and Resilience Inventory-2 (DRRI-2; Vogt et al., 2013). This subscale included 8 items (e.g., used a position of authority to pressure me into unwanted sexual activity). The measure was scored on a Likert scale of 1= Never, 2= Once or twice, 3= Sometimes, 4= Many times ($\alpha = .93$). In both measures, a higher total score represents greater military sexual trauma. Average scores from both measures were derived for the analyses.

Covariates

Study membership, treatment membership (ITT), marital status, and child gender were entered as covariates in both SEM models. Across ADAPT and ADAPT4U study, participants in the control group from the ADAPT study were coded as 0, while participants in the treatment group from the ADAPT study and all participants in the ADAPT4U study were coded as 1. Participants who were married or cohabitated were coded as 1. Regarding child gender, boys were coded as 0 and girls were coded as 1.

In the deployed fathers' and mothers' model, post-deployment duration was entered as a covariate. In the ADAPT study, the variable was computed by counting the time difference in months between the return date from the most recent overseas deployment and the in-home assessment date (fathers: $M = 33.16$, $S.D. = 30.72$; mothers: $M = 48.96$, $S.D. = 36.53$). In the ADAPT4U study, the variable was recorded by self-reported time since most recent overseas deployment in months (fathers: $M = 66.57$, $S.D. = 49.35$; mothers: $M = 88.61$, $S.D. = 51.54$).

Analytical Strategy

I conducted multi-group structural equation modeling for the two hypothesized multi-group models in *Mplus 8* (Muthén & Muthén, 2018). One model directly compared deployed fathers and deployed mothers, and the other model compared deployed mothers and non-deployed mothers. In each model, the hypothesized prediction parameters among study variables between the two groups were compared (Figure 1). Measurements of parenting and child adjustment were specified as separate latent variables. As depicted in Figure 2, I tested the hypothesized group differences by establishing measurement invariance, then evaluated structural invariance between fathers' and mothers' models (Putnick, & Bornstein, 2016). Configural invariance, metric invariance, scalar invariance, and group mean comparison were compared by checking model fit indices and conducting chi-square difference tests. Configural invariance refers to the equivalence in factor structures. Metric invariance refers to the equivalence in factor loadings, plus configural invariance. Scalar invariance refers to the equivalence in intercepts, in addition to configural and metric invariance. Scalar invariance was required to establish full

measurement invariance. After scalar invariance was established, factorial group means were compared between fathers and mothers.

In sum, evaluation of measurement invariance was conducted for each latent variable separately prior to evaluation of structural invariance as a whole model. Similarly, I compared structural models with variant structural pathways and invariant indirect structural pathways by checking model fit indices and conducting chi-square difference tests. Evaluation of structural invariance tests the group differences of hypothesized indirect structural parameters among variables.

The present study examined indirect effects from PTSD symptom severity to child adjustment through observed parenting practices and from PTSD symptoms severity to child adjustment via parental locus of control. Recommended by MacKinnon and Fairchild (2009) and Rucker et al. (2011), indirect effects were tested by computing bias-corrected bootstrap standard errors and confidence intervals with 5000 replications to address the asymptotic distribution of the multiplicative indirect term (Preacher & Hayes, 2008). Final model parameters were also estimated with bias-corrected bootstrap standard errors and confidence intervals due to plausible violation of multivariate normality among variables (Asparouhov & Muthén 2020; Cain et al., 2017). Multivariate normality was also tested by using the MVN R package (Korkmaz et al., 2014).

Several recommended model fit indices were evaluated (Byrne, 2013; Hu, & Bentler, 1999). Good model fit is indicated with a chi-square minimization p value above .05, a comparative fit index (CFI) above .90, a root mean square error of approximation (RMSEA) below .06, a standard root mean squared residual (SRMR) below .08, and a chi-square ratio (χ^2/df) equals to or less than 2.0. In the present study,

standardized path estimates were reported. Due to the setting of *Mplus*, different group variances, instead of pooled group variances, were used to calculate standardized parameter estimates and factor loadings. Therefore, varying of standardized parameter estimates and factor loadings between groups would be observed, regardless of testing structural invariance by imposing equality constraint on the parameter estimates or not.

Missing Data

Data were analyzed using full-information maximum likelihood (FIML), which used all available information from the dataset. The study adopted Little's chi-square test of missing completely at random (MCAR) to evaluate the randomness of missing data. For the deployed and non-deployed mothers' model, Little's test showed that $\chi^2(427) = 596.280, p < .001, \chi^2/df = 1.39$. For the deployed fathers' and mothers' model, Little's test showed that $\chi^2(546) = 687.401, p < .001, \chi^2/df = 1.26$. In both models, the *p* value was significant. However, the χ^2/df value was examined since the χ^2 value could be overly sensitive to small model misfit with large sample size (e.g., sample size larger than 500). A χ^2/df value below 2 is considered acceptable (Sun, 2005). In addition, the study also examined the missing patterns via SPSS. In both models, the missing-data patterns that account for more than 10% of total missing cases related to longitudinal data attrition: 11.03% in deployed mothers' and nondeployed mothers' model, and 13.12% in deployed fathers' and mothers' model. Based on the above procedures, the data were considered missing at random.

Results

Sample descriptive is shown in Table 1. Means, standard deviations, and bivariate correlations among key study variables for deployed fathers, non-deployed mothers and deployed mothers, are shown in Table 4, 5, and 6 respectively.

Measurement Invariance

Measurement invariance was established by testing multi-group confirmatory factor analysis models before testing multi-group SEM model (Table 7). In deployed fathers' and deployed mothers' model, configural, metric, and scalar models attained satisfactory model fit for child internalizing behaviors. Based on principle of parsimony, model with more degrees of freedom will be preferred if model comparisons test showed non-significant differences. In the current study, model comparisons test suggested the use of the scalar model, which indicated that factor structure, factor loading, and item intercepts were invariant across groups. Regarding observed parenting practices, satisfactory model fit was obtained for configural and metric models. Poor model fit was obtained for the scalar model. Model comparisons test showed significant differences between the metric and scalar models, but not the configural and metric models. According to the principle of parsimony, the metric invariance model was preferred, which indicated invariant factor structure and factor loading across groups.

In the deployed mothers' vs. non-deployed mothers' model, configural, metric, and scalar models attained satisfactory model fit for child internalizing behaviors. Model comparisons test suggested the use of the scalar model, which indicated that factor structure, factor loading, and item intercepts were invariant across groups. Regarding observed parenting practices, satisfactory model fit was obtained for the configural, metric, and scalar models. Model comparison tests showed significant differences

between metric and scalar models, vs. configural and metric model. Metric invariance model was preferred, which indicated invariant factor structure and factor loading across groups. In both models, partial metric invariance was not available because of the limited number of indicator variables, which had two indicator variables for each latent variable.

Deployed Fathers' and Deployed Mothers' Model

Next, the full SEM models were tested. In deployed fathers' and deployed mothers' model (Figure 3), acceptable model fit was obtained for the full SEM model. The latent variables of child outcomes and parenting practices obtained adequate factor loadings, ranging from .34 to 1.00. Generally, we found higher factor loadings for parent-reported child outcomes and for positive parenting (range from .62 to 1.00). We found lower factor loadings for teacher-reported child outcomes and harsh discipline (range from .34 to -.62).

Regarding within-group findings, among deployed fathers, PTSD symptoms were negatively associated with observed parenting at one-year ($\beta_{\text{deployed fathers}} = -.28, p < .05$). Observed parenting at one-year was negatively associated with child externalizing at two-years ($\beta_{\text{deployed fathers}} = -.26, p < .05$). Parental efficacy at one-year was negatively associated with child externalizing at two-year ($\beta_{\text{deployed fathers}} = -.18, p < .01$). Indirect effects are shown in Table 9. The indirect effect from PTSD symptoms to child externalizing through observed parenting was significant based on the 95% CI ($\beta_{\text{nondeployed mothers}} = .07, p > .05$, unstandardized 95% C.I. [0.005, 0.115]).

Contrary to expectations, among deployed mothers, only significant negative association between parental efficacy at one-year and child externalizing at two-year ($\beta_{\text{deployed mothers}} = -.43, p < .01$) was found.

Regarding group comparison findings, in Table 8, a significant difference was found between the indirect pathway from PTSD symptoms to child externalizing through observed parenting between deployed fathers' and deployed mothers: $\chi^2(1) = 3.91, p < .05$.

Deployed Mothers' and Non-deployed Mothers' Model

In deployed mothers' and nondeployed mothers' model (Figure 4), acceptable model fit was obtained for the full SEM model. The latent variables of child outcomes and parenting practices obtained adequate factor loadings, ranging from .21 to 1.00. Similarly, we found higher factor loadings for parent-reported child outcomes and for positive parenting (range from .73 to 1.00). We found lower factor loadings for teacher-reported child outcomes and harsh discipline (range from .21 to -.41).

Regarding within-group findings, among non-deployed mothers, PTSD was negatively associated with parental efficacy at one-year ($\beta_{\text{nondeployed mothers}} = -.10, p < .05$). Parental efficacy at one-year was negatively associated with child internalizing at two-year ($\beta_{\text{nondeployed mothers}} = -.17, p < .01$). Observed parenting at one-year was negatively associated with child externalizing at two-year ($\beta_{\text{nondeployed mothers}} = -.16, p > .05$, unstandardized 95% C.I. [-21.72, -0.19]). We also found treatment effects for both observed parenting and parental efficacy at one-year. Since ADAPT4U did not include no-treatment control and the research questions focused on risk pathways, the present study kept treatment condition as a covariate. Indirect effects were shown in Table 9. the indirect effect from PTSD symptoms to child internalizing through parental efficacy was significant based on the 95% CI ($\beta_{\text{nondeployed mothers}} = .02, p < .10$, unstandardized 95% C.I. [0.003, 0.043]). Following Asparouhov, & Muthén (2020), we took a conservative

approach to establish significance. If there was a discrepancy in significance between p -values and bootstrapped 95% CI, the latter was adopted to justify the statistical significance conclusion. The justification is that p -values were computed by a symmetric method in Mplus; the robustness of p -values depends on the assumption of multivariate normality (Asparouhov, & Muthén, 2020). Conversely, bias-corrected bootstrap CIs did not require normality assumption; CIs provide the range of parameter estimates with more information than symmetric p -values (e.g., Lai, 2018). The use of bootstrap CIs is recommended when contradictory statistical conclusions are obtained (Asparouhov, & Muthén, 2020).

Counter to expectations, among deployed mothers, we did not find significant associations among key variables.

Regarding group comparison findings, in Table 8, a significant effect was found between the indirect pathway from PTSD symptoms to child internalizing through parental efficacy between deployed mothers and non-deployed mothers: $\chi^2(1) = 7.21, p < .01$.

In both models, the key findings in the final model remained statistically significant without controlling for covariates.

Post-hoc Analyses

Post-hoc analyses were conducted to replace PTSD symptoms with depression symptoms severity in the SEM models. The justification is to thoroughly test the relationship between mental health symptoms and parenting. Studies have revealed a high comorbidity rate of around 50% between PTSD and depression, in military populations (Armenta et al., 2019; Stander et al., 2014). In addition to the well-established elevated

risk of depression in women compared with men, prior studies have found an elevated depression prevalence among deployed mothers (Haskell et al., 2010), and military spouses, compare with male veterans (Verdeli et al., 2011). In the present study, mean depression symptom severity was significantly higher among deployed mothers, compared with deployed fathers and non-deployed mothers (Table 1). Hence, aligned with the theorized risk pathways, the post-hoc analyses aimed to test if the manifestation of mental health symptoms across gender would differ in their association with parenting variables.

Since different depression measures were used in ADAPT and ADAPT4U, the present study adopted the linked scores for these two measures from a prior study by using item response theory in the same data set (Cheng et al., under review). The linked depression scores were set with mean = 50, and S.D. = 10. In the deployed fathers' and deployed mothers' model, acceptable model fit was obtained (Figure 5). Summary of parameter estimates were also reported (Figure 5). In short, statistical significance of findings were similar to the PTSD model between deployed fathers' and deployed mothers'. Also, the indirect effect from depression to child externalizing through observed parenting was marginal significant among deployed fathers ($\beta_{\text{deployed fathers}} = .03$, $p > .05$, unstandardized 95% C.I. [0.000 0.102]), but not deployed mothers ($\beta_{\text{deployed mothers}} = -.02$, $p > .05$, unstandardized 95% C.I. [-0.427 0.014]). However, the indirect effects from depression to child externalizing through observed parenting was not significantly different between deployed fathers and deployed mothers ($b_{\text{diff}} = .04$, $p > .05$, unstandardized 95% C.I. [-0.007 0.389]).

In the deployed mothers' and non-deployed mothers' model, acceptable model fit was obtained (Figure 6). A summary of parameter estimates was also reported (Figure 6). In short, statistical significance of findings were similar to the PTSD model between deployed mothers' and non-deployed mothers. Also, the indirect effect from depression to child internalizing through parental efficacy was significant among non-deployed mothers ($\beta_{\text{nondeployed mothers}} = .02, p < .05$, unstandardized 95% C.I. [0.008 0.046]), but not deployed mothers ($\beta_{\text{deployed mothers}} = -.01, p > .05$, unstandardized 95% C.I. [-0.060 0.006]). The indirect effect from depression to child externalizing through parental efficacy was significantly different between deployed mothers and non-deployed mothers ($b_{\text{diff}} = .03, p = .08$, unstandardized 95% C.I. [0.004 0.008]). Taken together, the findings in the two depression symptoms models were similar to the two PTSD symptoms model in the primary analysis. However, two differences on findings in the depression models were identified compared to the two PTSD models: the indirect pathway from depression to child internalizing through observed parenting among deployed fathers became marginally significant; and no significant difference on indirect pathway between deployed fathers and deployed mothers was identified.

To further understand the risk pathway among deployed mothers, a post-hoc analysis was conducted to examine the role of military sexual trauma on parental adjustment and child outcomes. Prior literature has discussed this unique traumatic stressor commonly encountered by female veteran (i.e., Polusny et al., 2014; Street et al., 2009). As shown in Figure 7, MST was added as one of the predictors in the model, while PTSD symptoms were controlled for as a covariate. Due to the restriction of sample size ($n = 117$), this post-hoc model was simplified by reducing the use of latent variables,

compared with the original hypothesized model. Parental efficacy, instead of observed parenting, was selected into the model based on the findings from the primary analysis. In this model, MST was measured by the sex harassment subscale from the DRRI in ADAPT and the DRRI-2 in ADAPT4U. A similar approach was conducted to use the average score from each measure, followed by establishing conceptual and functional equivalence (Lucke et al., under review). Conceptual equivalence refers to sharing the same meaning of a construct across measures and was established by reviewing the psychometric literature on the DRRI and DRRI-2. Functional equivalence refers to similarity in how measures relate to other concepts and was established by testing the equivalence of structural paths across groups in associations with outcome variables (Adamsons & Buehler, 2007; Harachi et al., 2006). Model comparisons to attain functional equivalence were reported in Table 8.

In contrast to the primary analysis, there was no multi-group comparison in testing the association of MST. This decision was made for several reasons. First, non-deployed mothers were not administered the MST measures. Second, the missing data rate of MST was more than 50% among deployed fathers because collection of MST measures in the ADAPT dataset occurred at 2-year follow-up. The missing data rate of MST among deployed mothers was close to 25%. These high rates of missing data would increase modeling complexity and power issues because of the requirement of functional equivalence, necessitating multi-group comparisons between the two MST measures in each gender group. Third, this post-hoc analysis aimed to test the association between deployment-related stressors and parenting among deployed mothers, as hypothesized in the Military Family Stress model. Testing a multi-group comparison of the association

between MST and parenting variables between genders was beyond the scope of the present study. Therefore, the post-hoc analysis evaluated the hypothesized model within deployed mothers only.

In Figure 7, MST was positively associated with parental efficacy at one-year ($\beta = .34, p < .01$). Parental efficacy at one-year was negatively associated with child externalizing at two-year ($\beta = -.26, p < .01$). PTSD was not significantly associated with parental efficacy at one-year ($\beta = .04, p > .05$). In Table 9, the indirect effect from MST to child externalizing at two-year via parental efficacy at one-year was significant ($\beta = -.09, p < .10$, unstandardized 95% C.I. [-.2707 -.0159]).

Discussion

To the best of our knowledge, this is the first study that directly compared theorized risk pathways among three military subgroups: deployed fathers, deployed mothers, and non-deployed mothers. The study extended the understanding of risk pathways, based on the Military Family Stress model, applied to different military subgroups. More importantly, the multi-group longitudinal analyses approach not only extended prior literature on examining deployed mothers only; it also contributes to the growing interest in understanding potential differences among the three groups.

Results replicated previous findings on theorized risk pathways among deployed fathers and non-deployed mothers. In contrast, there were no significant indirect effects among deployed mothers. The present findings also revealed nuances in risk pathways among military sub-groups, which are discussed focusing on deployed mothers' risk pathway and on a measurement perspective, below.

Primary Analysis

The hypothesis of significant group difference of risk pathway between deployed mothers and non-deployed mothers was not supported. The finding of the longitudinal indirect effect from PTSD to child internalizing behaviors via parental adjustment among non-deployed mothers was congruent with prior studies (see review by Creech & Misca, 2017). On the other hand, among deployed mothers, it was surprising to find both the indirect risk pathway and the direct pathway were not significant. Inconsistent with the other limited literature studying military women (Berz et al., 2008; Kelley et al., 2001), PTSD was not associated with parental adjustment nor with child internalizing behaviors. Parental adjustment was also not associated with child internalizing behaviors. In contrast to the literature on elevated risk due to deployed mothers' dual identities (Kelley et al., 2001; 2002; Street et al., 2009), the present finding seemed to suggest non-deployed mothers had a higher magnitude of risk. The findings here suggest that the theorized risk pathway was not applicable to this subgroup of deployed mothers. The results suggested another important question: whether the risk pathway among deployed mothers was the same in terms of the stressor/mental health distress as the non-deployed mothers. Hence, a post-hoc analysis was conducted to examine this question.

Similarly, the hypothesis of significant group differences of risk pathways between deployed fathers and deployed mothers was not supported. Again, the findings on the significant indirect effect from PTSD to child externalizing behaviors via parental adjustment among deployed fathers were congruent with prior studies (Creech et al., 2014; Creech & Misca, 2017). Among deployed mothers, there was no significant indirect pathway in the process model. There was no significant association between PTSD and parental adjustment. The findings in the deployed fathers' and deployed

mothers' model were similar to the deployed mothers' and non-deployed mothers' model: group differences on indirect pathways were found. There was evidence to support that deployed fathers had a higher magnitude of risk.

Post-hoc Analyses

Depression Symptoms Severity

Due to the similar findings from the two models, an exploratory post-hoc analysis was conducted to examine if there were variations in risk pathways among deployed mothers. First, depression symptom severity was included in both models to replace PTSD. One of the justifications was that female veterans had higher risk for being diagnosed with depression (Haskell et al., 2010). Another justification was the high comorbidity between PTSD and depression (Stander et al., 2014), which suggested the role of mood disorder symptoms in impairing post-deployment adjustment. This was also supported by the proportion of women meeting the clinical cutoff for PTSD or depression symptoms in the measures. Both deployed mothers and non-deployed mothers had numerically higher percentages than that of deployed fathers on meeting clinical cutoffs for depression, but not PTSD. Nevertheless, results from the two models using depression symptoms severity were similar to the original SEM models. The nonsignificant relationship between depression symptoms and parenting adjustment were incongruent with prior literature, which showed longitudinal association between mental health symptoms and parenting adjustment (i.e., Creech et al., 2017).

Military Sexual Trauma (MST)

An exploratory analysis was conducted to examine if the unique deployment-related stressor, MST, was associated with parental adjustment or child adjustment.

Unexpectedly, an indirect pathway from MST to child externalizing via parental efficacy was found. The finding suggested the importance of MST, the stressor but not the trauma symptoms, in associating with parental adjustment and child adjustment. The finding was interesting because MST was also positively associated with PTSD and depression symptom severity at baseline. The finding was congruent with prior studies in associating with MST and trauma symptoms (Maguen et al., 2012; Suris & Lind, 2008).

It is unclear why MST, as a stressor primarily experienced by women service members, would be associated with parental adjustment and child adjustment, when posttraumatic stress symptoms were not. Only a few similar studies on MST and family functioning have shown indirect associations: (a) from MST to maternal bonding via maternal depression (Creech et al., 2021); (b) from MST to postnatal depression via prenatal depression (Gross et al., 2020); and (c) indirect association from sexual harassment to family functioning via PTSD (Smith et al., 2017). The risk pathway among stressor, trauma symptoms, and family adjustment appear to be complex and may require further research to examine potential existence of confounding variables. Regardless, the present study contributed to the literature of identifying the importance of MST among deployed mothers.

Moreover, the identification of the stressor, instead of the mental health symptoms, in the deployed mothers' model provided an insight on connecting findings between qualitative and quantitative studies. Although additional unique vulnerabilities among deployed mothers were identified (e.g., Street et al., 2009), quantitative studies have yet to provide evidence on group differences in risk pathways from PTSD to family functioning between male and female veterans (Vogt et al., 2017). Creech et al. (2016)

also could not find gender differences between indirect effects of combat exposure on family functioning via PTSD symptoms. Similarly, Darawshy et al. (in press) found no significant group differences between indirect effects of combat exposure to parental efficacy via PTSD symptoms between deployed fathers and deployed mothers. Indeed, examining group differences with a larger sample size of deployed mothers was also the focus of the present study. However, present findings from the post-hoc analyses would have complemented the multi-group comparison if the risk pathways were different. Interpretations solely based on the primary analyses would appear to contradict findings from qualitative studies, suggesting no significant risk pathways among deployed mothers. Interestingly, the Darawshy et al. (in press), Vogt et al. (2017), and Creech et al. (2016) studies did not include military sexual trauma into their analyses, which may limit the findings in comparing risk pathways between genders. The primary traumatic stressor among deployed service members is combat exposure. Yet, the relative high prevalence of encountering military sexual trauma among deployed mothers or deployed female service members may imply a different pathway for women. This raises an important question of comparing the same theory-based risk pathways, without comparing between apples and oranges. Therefore, the present findings echoed the implications from the qualitative studies on the importance of examining military sexual trauma among deployed mothers.

In addition, the finding from the post-hoc analysis indicated a positive association between MST and parental efficacy. This showed that more military sexual trauma was associated with greater parental efficacy at one-year follow-up. This is an interesting finding since the majority of studies showed the opposite direction (e.g., Creech & Miska,

2017; DeVoe et al., 2017). However, a few studies reported similar findings, especially among populations with additional vulnerability (i.e., single mothers), and attributed this phenomenon to a kind of compensatory effect (Nelson et al., 2009). Studies speculated that being exposed to multiple traumatic stressors may have a reverse effect on efficacy, in which case mothers are motivated to raise their children effectively despite their own adversity and trauma (McKenzie et al., 2021). Qualitative studies have found that mothers find purpose in life and meaning in parenting (McKenzie et al., 2021). Other studies speculated contextual or personal protective factors, particularly social support (Blais et al., 2021; Tsai et al., 2012), or resilience (Gavidia-Payne et al., 2015; Masten, 2018), buffered the impact of a traumatic stressor on social and family functioning. In fact, in another study utilizing the same dataset at baseline (ADAPT and ADAPT4U), a positive direct association between combat exposure and parental efficacy was found (Darawshy et al., under review). Despite the positive association between MST and parental efficacy, in the present study, negative associations between MST and observed parenting practices were found. This spoke to the discrepancy between observed parenting and self-reported parenting. More importantly, the seemingly appropriate directionality of association of MST with PTSD and observed parenting helped to justify the model. This warrants future research to clarify the potential moderation role of personal protective factors or contextual protective factors. Particularly, parenting support was found to be helpful in managing stressors and strains associated with deployment among military spouses (Verdeli et al., 2011). Resilience also moderated the relationship between number of deployments and parent functioning among military fathers (Karre et al., 2022).

Findings from the post hoc analysis also suggested the resilience of the deployed mothers in the present sample. A positive association between parental efficacy and military sexual trauma, as well as a positive indirect effect from military sexual trauma to child externalizing behaviors via parental efficacy were found. This contradicted the findings on the negative associations between traumatic events and parent/child outcomes in broader military family studies (e.g., Creech et al., 2017). Only one study was identified from the literature that examined the indirect effects of deployment stressors on family functioning via trauma-related symptoms among deployed male and female veterans (Smith et al., 2017). Although there were no direct group comparisons between gender being conducted, Smith et al. (2017) found a negative indirect effect of military sexual trauma to parenting satisfaction via depression symptoms among women veterans. The study also found a positive indirect effect of military sexual trauma to parental functioning impairment via PTSD symptoms (Smith et al., 2017). While Smith et al. (2017) reports a negative association between parenting satisfaction and MST, the present study reports a positive association between MST and parental self-efficacy at 1-year follow up was identified (Table 1). The different outcomes between the current study and Smith et al.'s (2017) study likely stems from the resilience of the deployed mothers in the present sample. As shown in literature, protective factors such as social and parenting support also buffered development of PTSD symptoms (Blais et al., 2021; DeGarmo & Gewirtz, 2014), and parenting functioning (Karre et al., 2022). Protective factors may confound the association between MST and parent/child outcomes among deployed mothers in the present study. Nevertheless, the present study did not examine protective factors such as parenting support. The justification for not including parenting support

was the use of completely different measures in both ADAPT and ADAPT4U studies: parenting support was measured in the ADAPT study, while general support was measured in the ADAPT4U study. Hence, the current findings pointed to future research directions in studying the importance of social support as protective factors among deployed mothers.

Observed and Self-reported Parenting

In the present study, correlation coefficients between observed and self-reported parenting in each group were low. Generating latent variables for both observed and self-reported parenting were not possible due to the poor model fits in both multi-group comparisons.

Based on recommendations from two previous studies (Hendriks et al., 2018; Kritikos et al., 2019), this study included both observed and self-reported parenting as separate variables. Findings were consistent with another recent study that showed a significant yet low correlation between observed and self-reported parenting (Hendriks et al., 2018). More importantly, separating the two parenting measures showed the nuances of the risk pathways between genders: PTSD at baseline was associated with self-reported parenting among mothers and PTSD was associated with observed parenting among fathers. Thus, the significant indirect pathways in both models operated through different parenting measures. Both parenting measures at one-year following intervention were found to be associated with child adjustment at two-year following treatment.

This study's findings echoed a prior review study that reported inconsistent findings on the selection of different parenting measurement modalities and spoke to the importance of a multi-method approach (Christie et al., 2019). The current study's

findings suggest future research directions that focus on understanding the different associations between PTSD symptoms and parenting measure modalities based on gender.

Mean Differences on Harsh Discipline among Parents

Mean differences on harsh discipline measures were found among the three groups of parents; deployed mothers had higher mean scores on harsh discipline measures. This observation was found during the process of establishing measurement invariance, a step required for multi-group analysis. The present study could only attain metric invariance, referred to as invariant factor loadings and variant intercepts across groups, for observed parenting practices (Table 7). Optimally, scalar invariance, which required both factor loadings and intercepts to be invariant across group, should be attained in establishing measurement invariance. Variant intercepts of indicator variables of observed parenting across groups showed the mean differences of harsh discipline among three groups.

Additionally, by examining the descriptive statistics of the indicator variables (Table 1), deployed mothers had the highest mean of harsh discipline among three groups at baseline, namely, deployed fathers, deployed mothers, and nondeployed mothers. Regarding positive parenting at baseline, deployed mothers averaged higher than that of deployed fathers. This finding showed the importance of investigating harsh discipline among deployed mothers, in associating with child outcomes. This result likely stems from the military culture of harsh discipline (Hall, 2011), which emphasizes beliefs such as conformity, and obedience (Hall, 2011; Parker, 2019). Deployed mothers may incorporate those values into their parenting styles, which would lead them to practice

more disciplinary parenting behaviors (Speck & Riggs, 2016).

When deployed mothers navigated between the warrior identity and mother identity (Barnes et al., 2016; McKenzie et al., 2021), which was identified as a unique stressor, there may be spillover of the harsh disciplinary culture into parenting. However, two interesting findings were noted. First, there was no significant mean difference of harsh discipline between deployed fathers and non-deployed mothers. Second, there was a significant mean difference of harsh discipline between deployed fathers and deployed mothers. An alternative explanation could be attributed to the potential elevated risk encountered by deployed mothers. In civilian populations, harsh discipline was observed among single mothers or mothers with parenting stress (Pereira et al., 2015; Pinderhughes et al., 2000). Being single, which was associated with higher parenting stress, was predicted to present a risk factor for parental adjustment (Pereira et al., 2015; Pinderhughes et al., 2000). In the current study's sample, 12.6% of non-deployed mothers were single, 7.5% of deployed fathers were single, and 24.8% of deployed mothers were single. It is unclear how the influence of military culture influenced deployed mothers' versus deployed fathers' conceptualizations of harsh discipline. Future research comparing profiles of military parents' sub-groups would lead to the discovery of specific risk mechanisms related to harsh discipline.

Treatment Implications

Finally, significant associations of MST with parenting measures among deployed mothers suggest implications for intervention programs. Conventionally, intervention programs have been designed to target trauma symptoms (Banneyer et al., 2017), or parenting adjustment (e.g., Beardslee et al., 2011; DeVoe et al., 2017; Gewirtz et al.,

2014b) to enhance post-deployment adjustment among military families. For deployed mothers, the current study's findings identified the importance of assessing MST and the importance of intervening in specific family function domains such as parenting. The nonsignificant association between trauma-related symptoms and parenting adjustment suggests a need for a more comprehensive approach, including attention to MST, in addition to the current focus on trauma symptom alleviation and parenting adjustment in promoting well-being among deployed mothers.

Limitations and Future Directions

Several limitations should be noted. First, marital adjustment was not included in both SEM models, other than accounting for marital status. Although prior ADAPT and ADAPT4U studies showed that trauma-related symptoms impacted parenting adjustment via marital adjustment (Cheng et al., 2021, June; Gewirtz et al., 2018a), those studies excluded single-parent families in the analyses. Particularly among deployed mothers, the proportion of being single was significantly higher than that of non-deployed mothers and deployed fathers. The present study included single-parent families as single parents in ADAPT and ADAPT4U studies were not being administered with marital adjustment measures. Another limitation is the administration time-point of the MST measure. In the ADAPT study, the MST measure was administered at the two-year follow-up. Respondents' memories of the military sexual traumatic event could be distorted by the time duration since their last deployments.

In Study 2, different child outcomes were examined in the two multi-group comparisons, which created differences in specifying child outcomes across the two multi-group comparisons. Specifically, child externalizing behaviors were examined in

the deployed fathers' and deployed mothers' model, while child externalizing behaviors were examined in the deployed mothers' and non-deployed mothers' model. During the analysis stage, both child internalizing behaviors and child externalizing behaviors were tested with the hypothesized SEM models in each multi-group comparison. In summary, measurement invariance was established with child internalizing behaviors in the deployed fathers' and deployed mothers' model, and with child externalizing behaviors in the deployed mothers' and non-deployed mothers' model. Scalar invariance models were established in both multi-group comparisons.

Regarding the hypothesized SEM models, in the deployed fathers' and deployed mothers' model, acceptable model fit was obtained. The indirect effect from PTSD to child internalizing behaviors via parenting variables was not statistically significant in each gender group. In the deployed mothers' and non-deployed mothers' model, acceptable model fit was obtained. The indirect effect from PTSD to child externalizing behaviors via parenting variables was not statistically significant in each group.

Regarding the cross-group findings, in deployed fathers' and deployed mothers' model, the indirect effects from PTSD to child internalizing behaviors via observed parenting were not significantly different across groups. In the deployed mothers' and non-deployed mothers' model, the indirect effects from PTSD to child externalizing behaviors via parental efficacy were not significantly different across groups. Since the focus of the present study was to examine the group differences of hypothesized risk pathways from stressor to parenting via child outcomes, examining differential associations between parenting variables and child internalizing/externalizing behaviors goes beyond the scope of the current study. Future studies could examine such associations with larger sample

size to better understand how parenting affect specific domains of child outcomes across military sub-groups.

Additionally, statistical power issues should be noted when interpreting null findings relating to deployed mothers' model. In the current study, study samples were pooled to enhance the sample size of deployed mothers. Power analyses were conducted for both multi-group SEM models by using the *semPower* R package (Moshagen & Erdfelder, 2016), which indicated the sample size of the overall SEM model was adequate. Nevertheless, regarding the deployed mothers' model in the SEM models, the null findings should be interpreted with caution. Multiple standardized regression coefficients between variables found in deployed mothers' model were similar or even higher compared to the deployed fathers or non-deployed mothers' model, yet the statistical significances indicated the opposite conclusion. For instance, the associations between the observed parenting and child externalizing behaviors in the deployed fathers' and deployed mothers' model were $-.26$ ($p < .01$) and $.23$ ($p > .05$) respectively (Figure 3). The associations between the observed parenting and child internalizing behaviors in the deployed mothers' and non-deployed mothers' model were $-.16$ ($p > .05$) and $.35$ ($p > .05$) respectively (Figure 4). Therefore, the interpretations on the null findings between observed parenting and child outcomes, and relationship between parental efficacy and child outcomes in deployed mothers' model should be interpreted with caution. Future research with a larger sample size would allow for more statistical power to investigate the current statistical findings more rigorously.

Regarding the final SEM models, the number of indicator variables was less than three for both latent variables of observed parenting practices and child adjustment due to

the sample size restrictions. Normally, a latent variable should have at least three indicator variables. Hence, the factor structure models in both SEM models were less specified than other prior ADAPT and ADAPT4U studies (e.g., Cheng et al., 2021, June; Gewirtz et al., 2017; 2018). Statistical concerns resulting from the tradeoff between the model specificity and the sample size restrictions in the present study could be addressed in future research with a larger sample size.

The lack of ethnic and racial diversity in the sample is another limitation. In both ADAPT and ADAPT4U samples, most participants were Caucasian. This limits the generalizability considerably. Future research is needed to be able to generalize the findings beyond Caucasian parents to parents from a range of ethnic and racial groups who are also represented in military populations.

A final limitation is that the present study pooled the ADAPT and ADAPT4U datasets indicating the use of fixed-effects IDA (Hussong et al., 2013). Fixed-effect IDA controls for between-study heterogeneity. However, such an approach is inferior to random-effects IDA which is required to pool at least 10 studies and be able to draw inferences on the wider population.

General Discussion

This dissertation aimed to contribute to the literature by testing the treatment efficacy of ADAPT on parenting among deployed mothers. Additionally, the dissertation aimed to bridge the gap between qualitative and quantitative studies by testing theory-based deployment risk pathways among deployed mothers, alongside a multi-group comparison of the risk pathways with deployed fathers and non-deployed mothers.

Results from Study 1 and Study 2 yield important implications. First, there is a

need to further examine the role of harsh discipline among deployed mothers. Study 1 found a non-significant treatment effect of harsh discipline at one-year following intervention among deployed mothers, whereas Study 2 found that deployed mothers reported using more harsh discipline than deployed fathers and non-deployed mothers. Moreover, factor loadings of harsh discipline in the SEM models in Study 2 were low to medium among deployed mothers, indicating that a substantial amount of variance did not account for the latent variable of observed parenting in the examined risk pathway. Hence, these two studies suggested the importance of examining how deployed mothers perceive harsh discipline, given what we know about ways that military culture influences ideas about discipline. It may be that there are different conceptualizations of how parenting, particularly harsh discipline, is impacted by deployment; this would need to be tested in future research.

According to the Family Stress model (Conger et al., 1992), which was also the foundation of the Military Family Stress model (Gewirtz et al., 2018), one potentially different conceptualization of harsh discipline is that parents turn to less positive and more punitive control-oriented parenting practices post-deployment. This may be caused by psychological distress from external stressors. In the Family Stress Model (Conger et al., 1992), economic hardship is identified as an external stressor. In the post-deployment period, previous traumatic combat exposure was considered as an external stressor (Gewirtz et al., 2018). Hence, parenting practices may be disrupted due to psychological distress such as parental PTSD (i.e., Creech et al., 2017). This hypothesis is supported by a previous study that found that deployed fathers' emotion regulation, impaired by combat exposure, was related to child adjustment via coercive parenting (Zhang et al.,

2020). Symptom features of PTSD such as avoidance or numbing have also been shown to be associated with poor parenting (Allen et al., 2010; Creech et al., 2017). Taken together, a conceptual framework used to guide research aimed at understanding how combat exposure affects parenting must recognize that this relationship is tied deeply to PTSD symptoms and emotion regulation processes related to PTSD.

As mentioned earlier, military culture, which upholds the values of conformity, discipline and rigidity, may influence parenting beliefs (Hall, 2011). It is plausible that military parents under psychological distress, especially deployed mothers, may behave with their children in accordance with the cultural values that have been inculcated during their military training. As a result, they may show more punitive and less positive parenting behaviors. Hence, the cause of the adoption of harsh discipline parenting behaviors could be a combination of psychological distress and inculcated military cultural values. If this is the case, treatment programs for military families would need to recognize the role of values and perhaps the existence of conflict between military culture values and personal values as they apply to parenting.

Currently, the tailored components of ADAPT and ADAPT4U programs (e.g., emotion coaching, mindfulness) build on the conceptualization of how traumatic stressors affect psychological distress (Gewirtz et al., 2011; 2014b). As highlighted in the previous section, more research is needed on the connection or disconnection between personal values, military culture values, and parenting beliefs. Such connections go beyond adaptation of the military context into parenting in parenting programs (e.g., addressing unique parental challenges upon post-deployment). If deployed parents also uphold military values such as conformity or discipline, intervention components focusing on

parenting disrupted by PTSD symptoms may fall short in addressing the beliefs stemming from military culture. This speaks to the need to further investigate, through qualitative and quantitative approaches, the influences of beliefs and values when aiming to understand harsh discipline among military parents, particularly deployed mothers. This indicates the need to investigate the association between military identity and parental identity among deployed mothers, extended from the investigations on dual identities between being a service member and being female (Strong et al., 2018).

From a treatment perspective, behavioral parenting training programs may be challenged to alter values relating to personal identity. Nevertheless, one potential treatment implication is to focus on managing mental health distress caused by adjusting dual identities among deployed mothers, in addition to PTSD symptoms. Another potential treatment implication is the evaluation of limit setting (opposite of harsh discipline), which is considered as one of the five parenting dimensions in GenPMTO. In doing so, future research can seek feedback from participants to study the relationship between limit setting and military culture. This also suggests that future research on associations between harsh discipline with coercive parenting, and the impact of harsh discipline on child outcomes among military parents is indicated.

The nature of perception towards discipline influenced by military culture among deployed mothers remains unknown. The spillover process could be influenced by risk factors (e.g., parenting stress; Parker, 2019), and protective factors (e.g., parenting support; DeGarmo & Gewirtz, 2016). It should be noted that the current study did not examine moderation effects of parenting support and marital adjustment. Moreover, despite the unknown nature of perception of discipline among military parents, harsh

discipline has been shown to be detrimental towards child outcomes (Patterson et al., 2010). A similar conclusion was also found in the findings reported in the correlation matrix in the current Study 2; there was a positive association between harsh discipline and child externalizing behaviors at baseline reported by parents and teacher, yet the latter association was considered as non-significant (Table 6). Further investigations should examine the moderating role of risk and protective factors in the relationship between risk pathway processes and parenting adjustment. More importantly, the present study aimed to raise a discussion about other factors that might contribute to the maintenance of harsh discipline to understand the complex nature of parenting adjustment; the ultimate goal is to help military parents build effective skills in discipline.

Findings from both Study 1 and Study 2 highlighted the importance of studying self-reported parental efficacy among deployed mothers. In Study 1, there was no significant treatment efficacy of ADAPT on parental efficacy. A further examination showed that both treatment and control showed an increase in parental efficacy across one-year following treatment. In Study 2, seemingly different from military literature (i.e., Creech & Misca, 2017; DeVoe et al., 2017), parental efficacy at one-year was positively associated with MST. However, aligned with expectations on directionality, MST was positively associated with PTSD symptoms, and marginally positively associated with harsh discipline at one-year. These findings raise the interest in examining deployed mothers' parental efficacy, given the elevated risks they are encountering. What drives deployed mothers to effectively adjust in post-deployment life regarding parental efficacy, despite their elevated vulnerability?

Finally, findings from both Study 1 and Study 2 suggest the importance of

measurement differences in drawing inferences in group comparisons. Study 1 found insignificant treatment efficacy on self-reported parenting efficacy at one-year, but significant treatment efficacy at observed positive parenting at one-year. Study 2 found differences of risk pathways operating through parental efficacy and observed parenting differently among deployed fathers, deployed mothers, and non-deployed mothers. Both studies showed that observed parenting and self-reported parenting result in different findings. This also relates to selecting informants for child behaviors. The findings suggest the need for future studies on measurement modality and understanding risk mechanisms through a theoretical lens using different measurement modalities.

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Appendix

Table 1. Sample Descriptive Statistics from ADAPT and ADAPT4U

ADAPT	Deployed Fathers n = 282		Deployed Mothers n = 56		Non-deployed Mothers n = 258			
Variable	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Age	37.73	6.62	34.57	5.74	35.94	5.91		
Child Age	8.49	2.56	7.91	2.31	8.43	2.51		
DRRI	9.49	7.70	6.83	6.53	n/a	n/a		
Depression T1	48.35	9.57	52.69	9.95	48.28	9.01		
PTSD T1	30.09	12.44	30.53	13.28	26.52	8.43		
PLOC T1	3.66	.40	3.58	.42	3.63	.42		
FITs - Harsh Discipline T1	1.31	.36	1.46	.60	1.34	.39		
FITs - Pos T1	2.86	.51	2.87	.55	2.91	.46		
ADAPT4U	Deployed Fathers n = 182		Deployed Mothers n = 61		Non-deployed Mothers n = 162			
Variable	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Age	37.61	5.84	35.23	5.36	36.18	5.78		
Child Age	7.80	2.32	7.14	2.22	7.74	2.22		
DRRI	12.91	8.91	6.89	7.03	n/a	n/a		
Depression	53.64	10.32	53.14	10.67	50.58	10.79		
PTSD	36.11	16.69	31.82	11.87	27.55	10.25		
PLOC T1	3.74	.45	3.71	.45	3.73	.42		
FITs - Harsh Discipline T1	1.29	.43	1.32	.31	1.22	.31		
FITs - Pos T1	3.10	.46	3.26	.47	3.25	.46		
Demographic Difference	1. Deployed Fathers		2. Deployed Mothers		3. Non-deployed Mothers		<i>t</i> (1 vs 2)	<i>t</i> (2 vs 3)
Age	37.68	6.32	34.92	5.53	36.03	5.85	<i>t</i> (198.64) = 4.66***	<i>t</i> (523) = 1.83†
DRRI	10.83	8.35	6.84	6.74	n/a	n/a	<i>t</i> (199.48) = 5.30***	
Depression	50.05	10.08	52.92	10.29	49.76	9.78	<i>t</i> (566) = -2.74**	<i>t</i> (521) = -3.63***
PTSD	32.45	14.54	31.19	12.54	26.91	9.17	<i>t</i> (564) = .84	<i>t</i> (145.37) = -3.37***
PLOC T1	3.69	.42	3.63	.44	3.66	.42	<i>t</i> (495) = 1.12	<i>t</i> (456) = .593
FITs - Harsh Discipline T1	1.30	.39	1.39	.47	1.30	.36	<i>t</i> (554) = -2.25*	<i>t</i> (153.6) = -1.91†

Demographic Difference							<i>t</i> (1 vs 2)	<i>t</i> (2 vs 3)
FITs - Pos T1	2.96	.50	3.07	.54	3.04	.49	<i>t</i> (554) = -2.25*	<i>t</i> (513) = -.68

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. PLOC = Parental Efficacy. Parenting =

Observed Parenting Practices. FITs pos = Observed Positive parenting (average score

among positive involvement, problem solving, and encouragement). Comparison of 1 vs

2: deployed fathers were coded as 0, deployed mothers were coded as 1. Comparison of 2

vs 3: non-deployed mothers were coded 0, deployed mothers were coded as 1.

Table 2. Correlation among Key Study Variables in Study 1

	1	2	3	4	5	6	7	8	9	10	11	12
1. FITs Pos T1	-											
2. FITs Harsh Discipline T1	-.41***	-										
3. FITs avg	.84***	-.70***	-									
4. PLOC T1	0.13	0.00	0.06	-								
5. FITs Pos T2	.37*	-0.23	0.29†	-0.05	-							
6. FITs Harsh Discipline T2	-.44**	.37*	-.49**	-0.09	-.43**	-						
7. FITs avg	0.31†	-0.09	0.22	-0.06	.93***	-.48**	-					
8. PLOC T2	0.09	-0.10	0.06	.79***	0.03	-0.03	0.01	-				
9. Treatment	0.01	-0.27†	0.11	-0.13	0.27†	0.03	0.22	-0.12	-			
10. Child Age	-0.14	-0.26†	0.10	0.16	-0.18	0.06	-0.22	.38*	-0.04	-		
11. Marital	-0.08	.36**	-.23†	-0.21	-0.05	0.06	0.03	-0.15	-0.10	-0.18	-	
12. DRRRI	-0.05	-0.23	0.04	-0.21	-0.05	0.29	-0.04	0.02	0.07	0.05	-0.04	-
<i>M</i>	2.87	1.46	2.33	3.58	3.17	1.28	2.56	3.73	0.59	7.91	0.25	6.83
<i>SD</i>	0.55	0.60	0.48	0.42	0.57	0.39	0.46	0.44	0.50	2.31	0.44	6.53

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. PLOC = Parental Efficacy. Parenting = Observed Parenting Practices. FITs pos = Observed Positive parenting (average score among positive involvement, problem solving, and encouragement).

Table 3. Parameter Estimates of Multiple Regression Models in Study 1

Variable	Group	Mean (baseline)	SD	Mean (one-year)	SD	β	SE
FITs (average)	Treatment	2.38	.50	2.65	.39	.19	.13
	Control	2.27	.45	2.45	.53		
FITs Pos	Treatment	2.88	.61	3.30	.52	.26*	.12
	Control	2.87	.46	2.99	.60		
FITs Harsh Discipline	Treatment	1.33	.46	1.29	.43	.23	.15
	Control	1.65	.71	1.26	.33		
PLOC	Treatment	3.54	.40	3.69	.44	.01	.08
	Control	3.64	.46	3.80	.45		

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. PLOC = Parental Efficacy. Parenting =

Observed Parenting Practices. FITs pos = Observed Positive parenting (average score among positive involvement, problem solving, and encouragement).

Table 4. Correlation among Key Study Variables for Deployed fathers in Study 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Child Ext. (Parent Reported) T1	-																
2. Child Ext. (Teacher reported) T1	.29***	-															
3. Child Ext. (Parent Reported) T3	.52***	.37***	-														
4. Child Ext. (Teacher reported) T3	.27***	.53***	.42***	-													
5. FITs Positive Parenting T1	-.054	0.04	-.06	-.0013	-												
6. FITs Harsh Discipline T1	.16***	0.01†	.11†	.17**	-.27***	-											
7. FITs Positive Parenting T2	.00	.04	-.14*	-.05	.44***	-.10	-										
8. FITs Harsh Discipline T2	.03	.13*	.16**	.11†	-.22***	.29***	-.38***	-									
9. PLOC T1	-.22***	-.04	-.27***	-.05	.16***	-.08	.16***	-.08	-								
10. PLOC T2	-.15**	-.10†	-.30***	-.08	.17**	-.04	.22***	-.06	.67***	-							
11. PTSD T1	.13**	.02	.25***	.18**	-.04	.06	-.14*	.17**	-.26***	-.15**	-						
12. Depression T1	.09†	.05	.20***	.10†	-.06	.01	-.13*	.07	-.27***	-.17**	.75***	-					
13. Study	-.17***	.01	.06	.08	.23***	-.02	.09	-.13*	.08†	-.02	.20***	.21***	-				
14. Treatment	-.08†	.03	-.02	.11*	.06	-.01	.08	-.05	.04	.06	.12*	.10*	.44***	-			
15. Child Gender	-.09†	-.19***	-.15**	-.31***	-.02	-.11*	-.01	-.07	.04	.01	.04	.09*	-.05	-.02	-		
16. Post-Deployment Duration	-.13**	-.04	.07	.08	.02	.02	.04	.00	-.02	.01	.34***	.27***	.39***	.21***	-.04	-	
17. Marital Status (binary)	-.05	.00	.01	.09	-.06	.00	-.06	.08	.07	.08	.03	.10*	.01	.02	-.07	.08	-
<i>M</i>	56.03	50.41	51.48	49.34	2.96	1.30	3.03	1.20	3.69	3.73	32.45	50.05	0.39	0.77	0.52	46.29	0.08
<i>SD</i>	12.55	9.62	8.96	9.26	0.50	0.39	0.46	0.34	0.42	0.45	14.54	10.08	0.49	0.42	0.50	42.34	0.26

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. PTSD = Post-traumatic Stress Disorder.

PLOC = Parental Efficacy. Parenting = Observed Parenting Practices.

Table 5. Correlation among Key Study Variables for Non-deployed Mothers in Study 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Child Int. (Parent Reported) T1	-															
2. Child Int. (Teacher reported) T1	.32***	-														
3. Child Int. (Parent Reported) T3	.57***	.10†	-													
4. Child Int. (Teacher reported) T3	.19**	.32***	.26***	-												
5. FITs Positive Parenting T1	.06	.10†	-.01	.05	-											
6. FITs Harsh Discipline T1	-.04	-.07	.01	-.02	-.34***	-										
7. FITs Positive Parenting T2	.04	.14*	-.14*	.02	.37***	-.14*	-									
8. FITs Harsh Discipline T2	-.05	.05	.07	.03	-.21**	.33***	-.24**	-								
9. PLOC T1	-.17**	.02	-.23***	-.09	.10†	-.10†	.03	-.21**	-							
10. PLOC T2	-.08	.03	-.20***	-.05	.07	-.03	.10†	-.10†	.59***	-						
11. PTSD T1	.21***	.01	.14**	-.06	-.04	.12*	-.06	.03	-.17**	-.21***	-					
12. Depression T1	.28***	.08	.24***	.02	.06	-.05	.06	-.02	-.14**	-.26***	.56***	-				
13. Study	.04	.01	-.05	.03	.34***	-.17**	.16**	-.14*	.10†	.01	.05	.11*	-			
14. Treatment	-.05	.05	-.07	.04	.11*	-.04	.17**	-.07	.12†	.15**	.00	-.01	.45***	-		
15. Child Gender	.17***	.01	.22***	-.01	-.02	-.02	-.04	-.01	-.01	.06	.06	.06	-.06	-.02	-	
16. Marital Status (binary)	-.01	-.04	-.02	.01	-.03	-.02	-.06	.31***	-.07	-.11*	.05	.13***	.03	-.07	.01	-
<i>M</i>	51.68	50.08	50.50	49.99	3.04	1.30	3.12	1.21	3.66	3.71	26.91	49.16	0.39	0.76	0.53	0.04
<i>SD</i>	9.62	10.65	9.69	11.26	0.49	0.36	0.42	0.32	0.42	0.41	9.17	9.78	0.49	0.43	0.50	0.20

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. PTSD = Post-traumatic Stress Disorder.

PLOC = Parental Efficacy. FITs = Observed Parenting Practices.

Table 6. Correlation among Key Study Variables for Deployed Mothers in Study 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1. Child Ext. (Parent) T1	-																						
2. Child Ext. (Teacher) T1	.37***	-																					
3. Child Ext. (Parent) T3	.52***	.21†	-																				
4. Child Ext. (Teacher) T3	.40***	.41***	.37***	-																			
5. Child Int. (Parent) T1	.23*	-.05	.31**	.00	-																		
6. Child Int. (Teacher) T1	.16	.44**	.07	.18	.28**	-																	
7. Child Int. (Parent) T3	.15	.05	.39***	-.02	.63***	.19†	-																
8. Child Int. (Teacher) T3	.41**	.20	.19†	.33**	.09	.19	.23*	-															
9. FITs Positive Parenting T1	-.26**	-.09	.05	.08	.02	-.13	.14	.02	-														
10. FITs Harsh Discipline T1	.27**	.15	.02	.19†	-.14	-.03	-.09	.21†	-.41**	-													
11. FITs Positive Parenting T2	-.08	-.11	.07	.01	.13	.05	.34**	.15	.41***	-.27*	-												
12. FITs Harsh Discipline T2	.14	.04	.05	-.06	-.04	-.03	-.05	-.16	-.34**	.39***	-.43***	-											
13. PLOC T1	-.39***	-.13	-.35**	-.24*	-.11	-.07	-.21†	-.29*	.13	-.02	-.04	-.05	-										
14. PLOC T2	-.43***	-.15	-.47***	-.35**	-.08	-.15	-.14	-.10	.10	-.14	.05	-.02	.70***	-									
15. PTSD T1	.10	.04	.14	-.09	.28**	.14	.19†	-.01	-.04	-.06	.02	.16	-.18†	.02	-								
16. Depression T1	.17†	.14	.11	.01	.33***	.14	.23*	.10	-.02	.05	-.06	.11	-.23*	-.04	.66***	-							
17. Study	-.22*	-.07	.05	-.08	.01	-.20†	-.11	-.27*	.35***	-.15	.01	-.12	.15	-.07	.05	.02	-						
18. Treatment	-.13	-.16	.05	-.17	.12	-.08	-.04	.20*	-.28**	.20†	-.04	-.01	-.11	.14	.06	.52***	-						
19. Child Gender	-.11	-.14	-.06	-.26*	.10	.01	.06	.11	-.19*	.02	-.03	-.20†	.13	.01	-.07	-.08	-.04	-.09	-				
20. Post-Deployment Duration	-.12	-.10	.03	-.10	-.13	-.21*	-.15	-.12	.12	-.09	.03	-.05	-.01	-.10	.10	.06	.41***	.31**	.11	-			
21. Marital Status (binary)	.12	.17†	.07	.16	.00	.01	.04	.18†	-.04	.19*	-.06	.14	-.03	-.04	.23*	.28**	.00	-.06	.01	-.12	-		
22. MST	-.05	-.20	-.05	-.25*	.10	-.01	-.05	.00	.11	-.11	-.08	.24†	-.16	.19	.34**	.20†	.25*	.20†	.01	.24*	.05	-	
M	56.08	50.80	50.29	50.35	53.10	51.81	50.68	53.33	3.08	1.39	3.17	1.24	3.63	3.70	31.19	52.92	0.52	0.80	0.51	69.63	0.25	1.55	
SD	14.07	9.36	8.80	8.12	11.00	11.71	11.00	16.66	0.54	0.47	0.48	0.33	0.44	0.42	12.54	10.29	0.50	0.40	0.50	49.01	0.43	0.70	

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. PTSD = Post-traumatic Stress Disorder.

PLOC = Parental Efficacy. FITs = Observed Parenting Practices.

Table 7. Summary of Model Fit Indices and Models Comparisons for Measurement

Invariance

	CFI	SRMR	RMSEA	χ^2	df	χ^2/df	χ^2_{diff}	df_{diff}
Deployed Mothers' and Non-deployed Mothers' model								
M1. Configural Measurement Model (Child Internalizing) +	1.00	0	0	0	0	0		
M2. Metric Measurement Model (Child Internalizing)	1.00	.01	0	.63	2	0.317		
M3. Scalar Measurement Model (Child Internalizing)	1.00	.04	0	3.93	4	0.982		
M1 & M2							.63	2
M2 & M3							3.30	2
M4. Configural Measurement Model (Parenting Practices) +	1.00	0	0	0	0	0		
M5. Metric Measurement Model (Parenting Practices)	1.00	.02	0	1.36	2			
M6. Scalar Measurement Model (Parenting Practices)	.98	.03	.06	7.96*	4			

	CFI	SRMR	RMSEA	χ^2	<i>df</i>	χ^2/df	χ^2_{diff}	<i>df</i> _{diff}
M4 & M5							1.36	2
M5 & M6							6.61*	2
Deployed Fathers' and Deployed Mothers' model								
M7. Configural Measurement Model (Child Externalizing) +	1.00	0	0	0	0	0		
M8. Metric Measurement Model (Child Externalizing)	1.00	.04	.05	3.63	2	1.82		
M9. Scalar Measurement Model (Child Externalizing)	.99	.04	.05	6.81	4	1.70		
M7 & M8							3.63	2
M8 & M9							3.17	2
M10. Configural Measurement Model (Parenting Practices) +	1.00	0	0	0	0	0		
M11. Metric Measurement Model (Parenting Practices)	1.00	.02	0	1.31	2	0.65		
M12. Scalar Measurement Model (Parenting Practices)	.95	.06	.10	14.67**	4	3.67		
M10 & M11							1.31	2

	CFI	SRMR	RMSEA	χ^2	<i>df</i>	χ^2/df	χ^2_{diff}	<i>df</i> _{diff}
M11 & M12							13.37**	2

Note: *** $p < .001$; ** $p < .01$; * $p < .05$. + saturated model.

Table 8. Summary of Model Fit Indices and Models Comparisons for Structural Invariance

	CFI	SRMR	RMSEA	χ^2	df	χ^2/df	χ^2_{diff}	df_{diff}
Deployed Fathers' and Deployed Mothers' model								
M1. Full Structural Model (Variant pathways)	.94	.05	.05	171.79***	104	1.65		
Indirect pathway: PTSD → FITs → Child Ext.	.93	.05	.05	175.69***	105		3.91*	1
Deployed Mothers' and Non-deployed Mothers' model								
M2. Full Structural Model (Variant pathways)	.91	.05	.05	178.64***	102	1.78		
Indirect pathway: PTSD → PLOC → Child Int.	.90	.06	.06	185.85***	103		7.21**	1
Deployed Mothers' Model								
M3. Variant Pathway Model	1.00	.01	.00	1.69	2	.85		
M4. Partial Invariant Pathway Model	1.00	.03	.03	5.28	5	1.06		
M3 vs M4							3.59	3

Note: *** $p < .001$; ** $p < .01$; * $p < .05$. PTSD = Post-traumatic Stress Disorder. PLOC =

Parental Efficacy. FITs = Observed Parenting Practices. Child Int. = Child Internalizing

Behaviors. Child Ext. = Child Externalizing Behaviors.

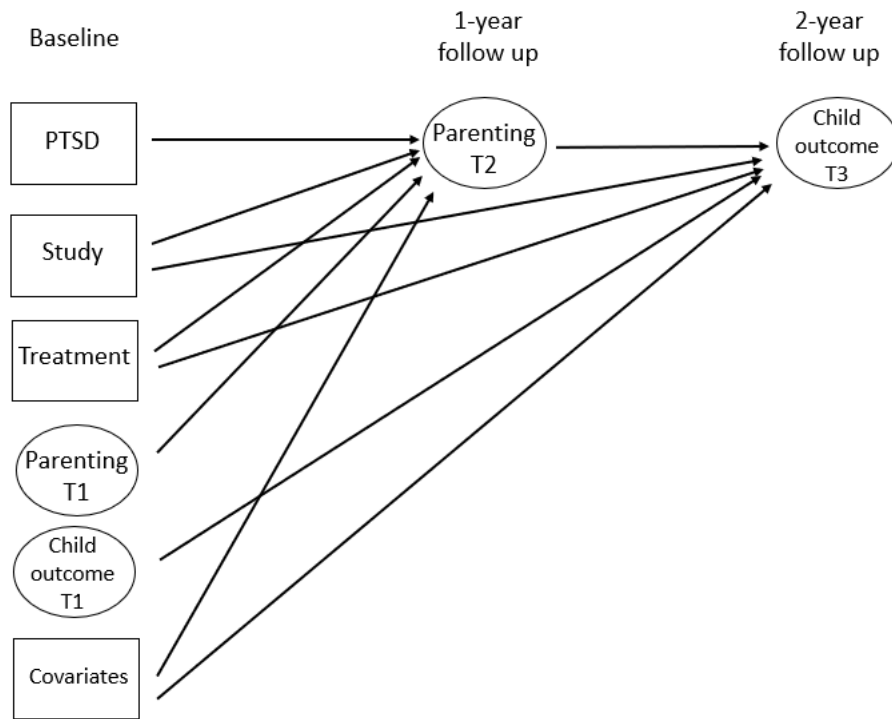
Table 9. *Indirect Pathways Coefficients among Models*

	β	SE	95% CI
Deployed Fathers' and Deployed Mothers' Model			
Deployed Fathers: PTSD → Parenting → Child Ext.	.07	.05	(0.005 0.115)
Deployed Mothers: PTSD → Parenting → Child Ext.	-.02	.15	(-0.298 0.017)
Deployed Mothers' and Non-Deployed Mothers' Model			
Non-Deployed Mothers: PTSD → PLOC → Child Int.	.02†	.01	(0.003 0.043)
Deployed Mothers: PTSD → PLOC → Child Int.	-.02	.03	(-0.137 0.007)
Deployed Mothers' Model			
MST → PLOC → Child Ext.	-.09†	.05	(-2.707 -0.159)

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. PTSD = Post-traumatic Stress Disorder.

PLOC = Parental Efficacy. Parenting = Observed Parenting Practices.

Figure 1. Conceptual Model for the SEM model.



Note. PTSD = Post-traumatic Stress Disorder.

Figure 2. Conceptual Models for Measurement Invariance of Parenting and Child Outcomes

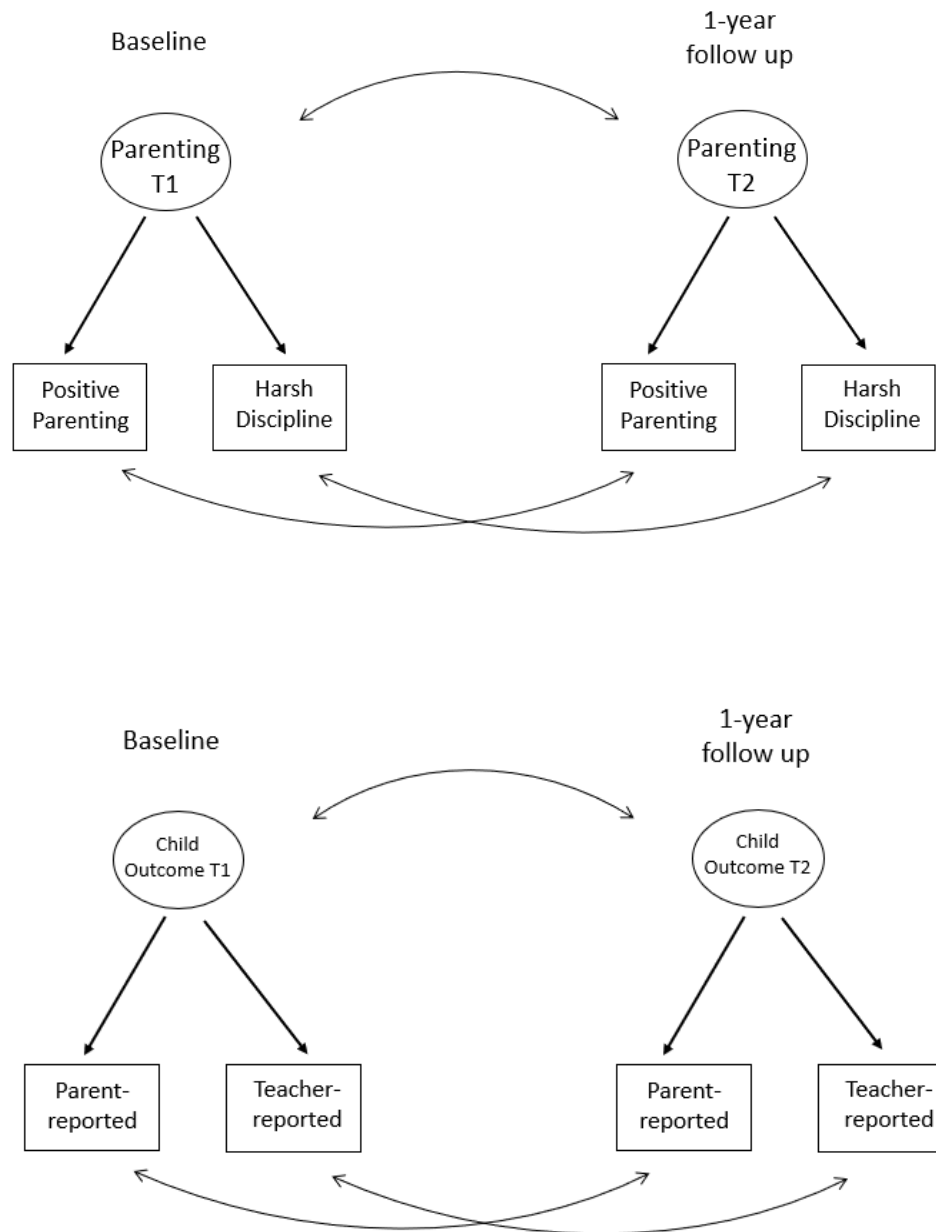
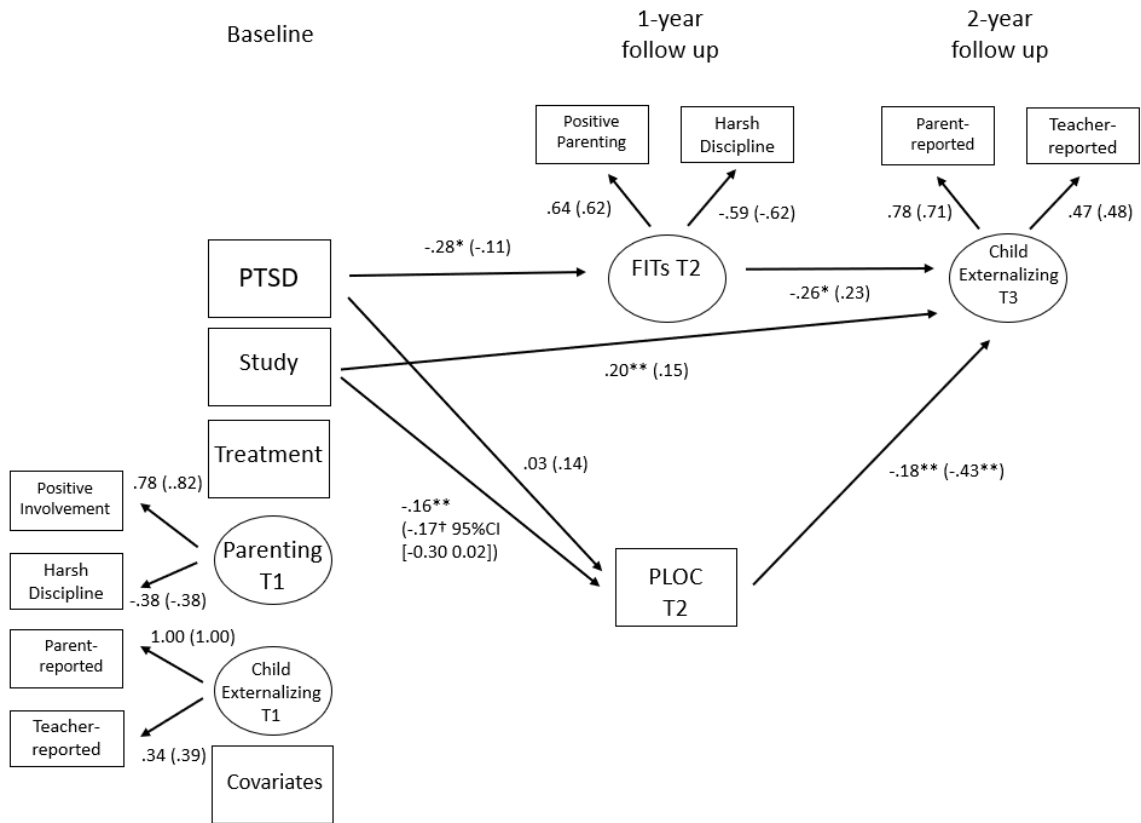
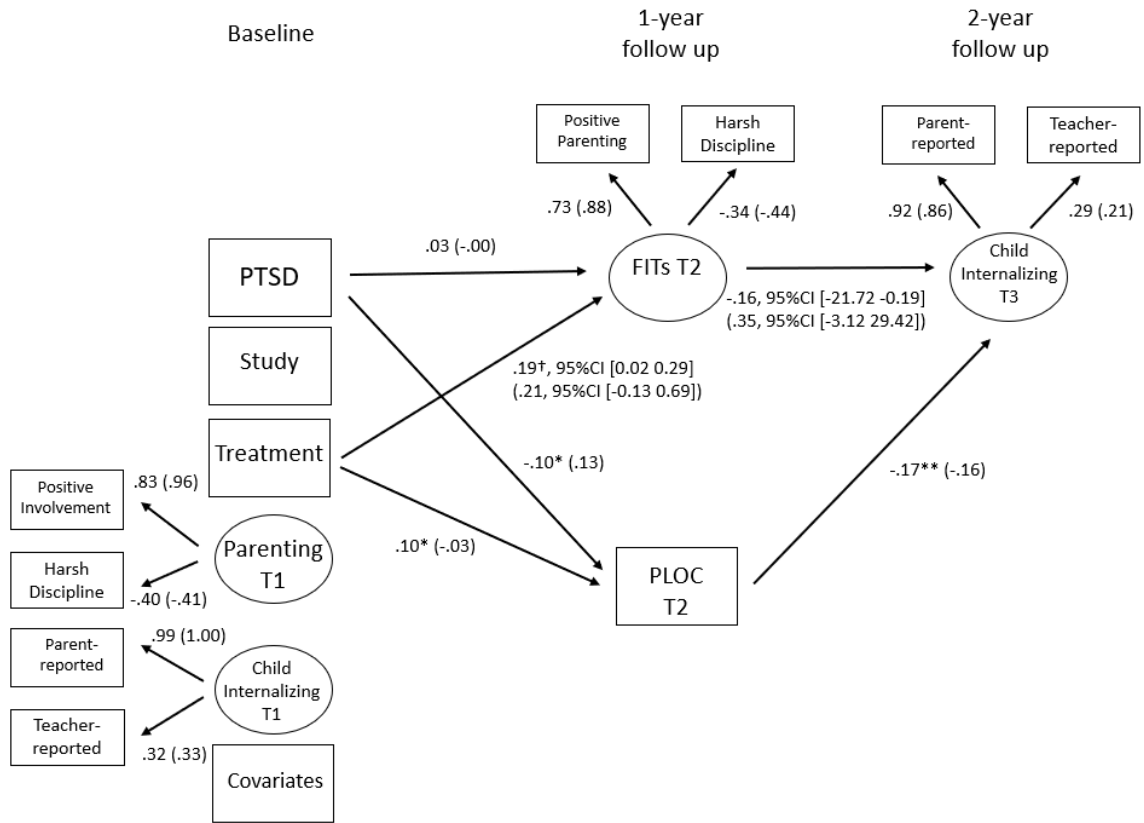


Figure 3. Final SEM Model between Deployed Fathers' and Deployed Mothers' Model.



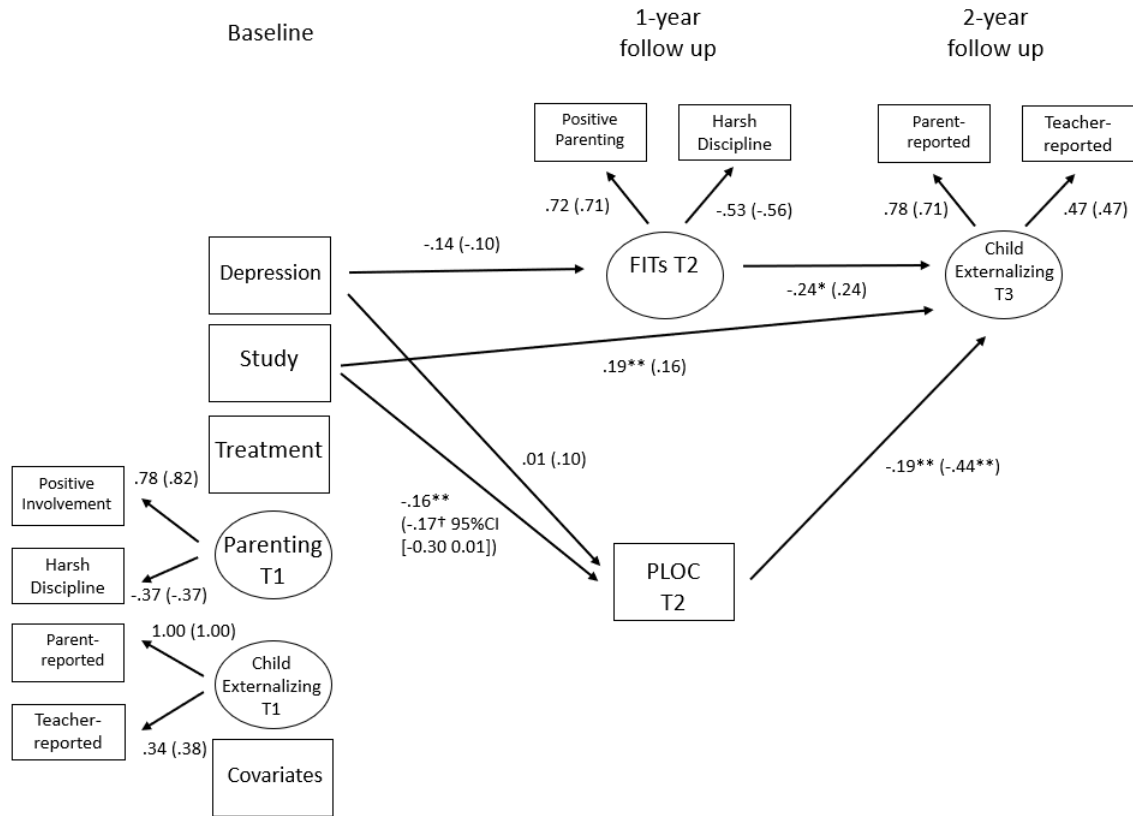
Note: Paths are standardized estimates, by having the first value referred to the deployed fathers' process model and the value in brackets referred to the deployed mothers' process model. Vary of standardized, instead of unstandardized, factor loading between the two groups was caused by using different group variances in calculation in *Mplus*. Pathways among key variables and significant pathways among key covariates were shown. $***p < .001$; $**p < .01$; $*p < .05$; $\dagger p < .10$. Model fit $\chi^2(104) = 171.79$, $p < .001$, $\chi^2/df = 1.65$, CFI = .94, RMSEA = .05, SRMR = .05. PTSD = Post-traumatic Stress Disorder; PLOC = Parental Efficacy; FITs = Observed Parenting Practices.

Figure 4. Final SEM Model between Deployed Mothers' and Non-deployed Mothers' Model.



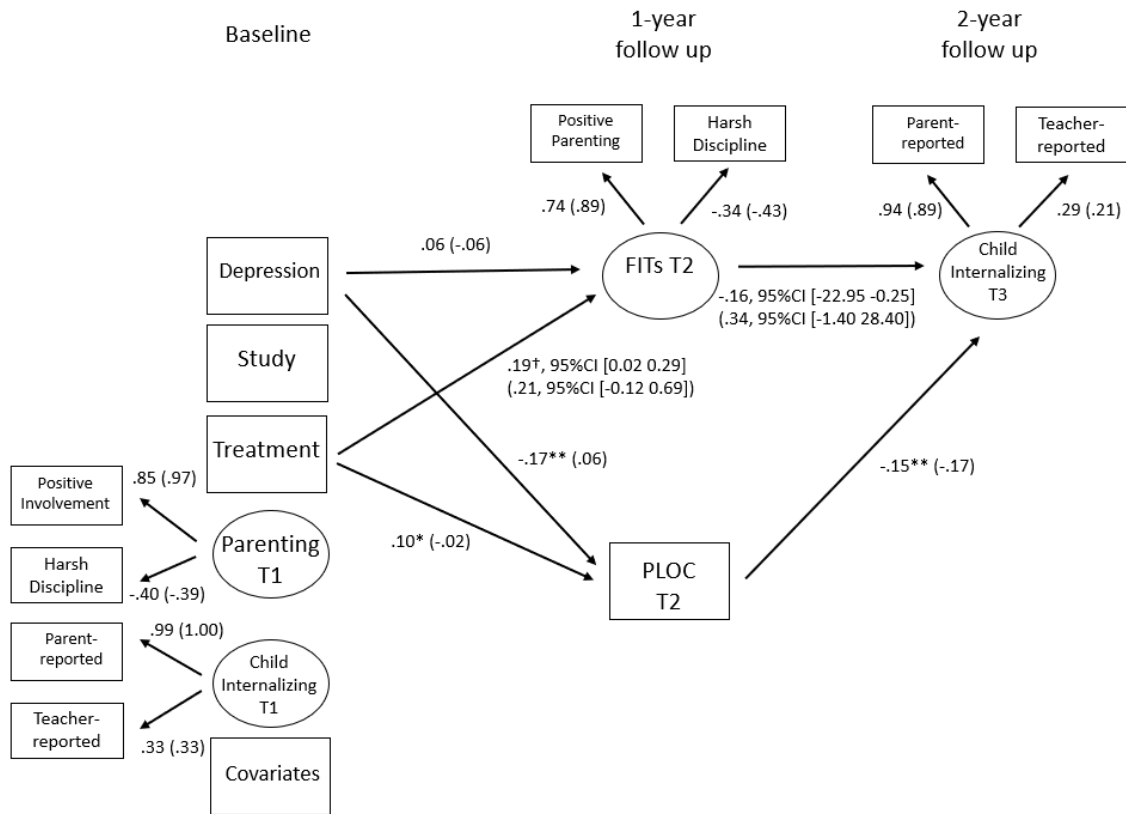
Note: Paths are standardized estimates, by having the first value referred to the non-deployed mothers' process model and the value in brackets referred to the deployed mothers' process model. Vary of standardized, instead of unstandardized, factor loading between the two groups was caused by using different group variances in calculation in *Mplus*. Pathways among key variables and significant pathways among key covariates were shown. *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. Model fit $\chi^2(102) = 178.64$, $p < .001$, $\chi^2/df = 1.75$, CFI = .91, RMSEA = .05, SRMR = .05. PTSD = Post-traumatic Stress Disorder; PLOC = Parental Efficacy. FITs = Observed Parenting Practices.

Figure 5. Post-hoc SEM Model by replacing PTSD with depression between Deployed Fathers' and Deployed Mothers' Model.



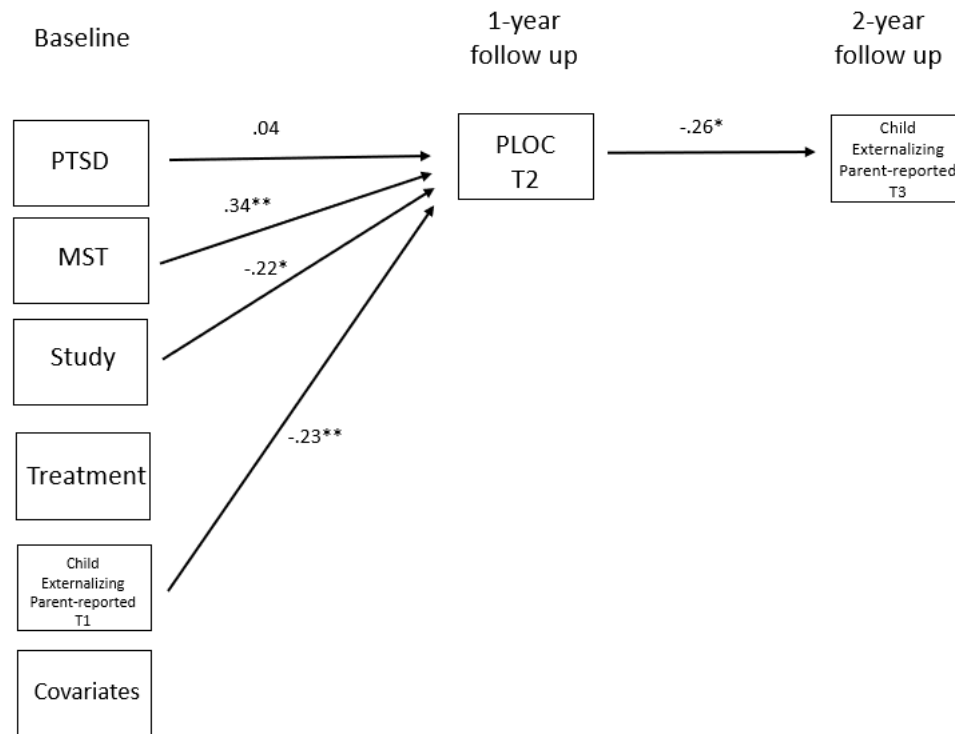
Note: Paths are standardized estimates, by having the first value referred to the non-deployed mothers' process model and the value in brackets referred to the deployed mothers' process model. Vary of standardized, instead of unstandardized, factor loading between the two groups was caused by using different group variances in calculation in *Mplus*. Pathways among key variables and significant pathways among key covariates were shown. *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. Model fit $\chi^2(104) = 170.07$, $p < .001$, $\chi^2/df = 1.64$, CFI = .94, RMSEA = .05, SRMR = .05. PTSD = Post-traumatic Stress Disorder; PLOC = Parental Efficacy. Parenting = Observed Parenting Practices.

Figure 6. Post-hoc SEM Model by replacing PTSD with depression between Deployed Mothers' and Non-deployed Mothers' Model.



Note: Paths are standardized estimates, by having the first value referred to the non-deployed mothers' process model and the value in brackets referred to the deployed mothers' process model. Vary of standardized, instead of unstandardized, factor loading between the two groups was caused by using different group variances in calculation in Mplus. Pathways among key variables and significant pathways among key covariates were shown. *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. Model fit $\chi^2(102) = 168.01, p < .001, \chi^2/df = 1.65, CFI = .92, RMSEA = .05, SRMR = .05$. PTSD = Post-traumatic Stress Disorder; PLOC = Parental Efficacy. FITs = Observed Parenting Practices.

Figure 7. Post-hoc SEM Model Examining Risk Pathway among Deployed Mothers.



Note: Paths are standardized estimates. Pathways among key variables and significant pathways among key covariates were shown. *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. Model fit $\chi^2(1) = 0.42, p > .05$, CFI = 1.00, RMSEA = .00, SRMR = .00. MST = Military Sexual Trauma; PTSD = Post-traumatic Stress Disorder; PLOC = Parental Efficacy. Parenting = Observed Parenting Practices.