Emotional Distress, Deployment Length, and Change in Parental efficacy after a Military Parenting Program: A Dyadic Longitudinal Model

A Thesis

SUBMITTED TO THE FACULTY OF THE

UNIVERSITY OF MINNESOTA

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MASTER OF ARTS

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May 2020

Abstract

Deployment and emotional distress are related to compromised parenting, which brings challenges to child adjustment. Parental efficacy, defined as one's beliefs in his/her capabilities related to the parenting role, is an important aspect of parenting and a key outcome in parenting interventions. However, less is known about differences among parental efficacy between mothers and fathers, how parental efficacy changes over time, and its relationship with other key parental dimensions (emotional distress, and deployment length). In the current study, data from 271 heterosexual couples were used to explore the non-independence structure of parental efficacy between couples. The results revealed interesting gender differences. In general, couples' parental efficacy at baseline but not the rate of change was correlated with each other. Mothers but not fathers benefited from the parenting intervention and maintained positive change over two years, while deployment length had a negative impact on fathers' change over time. Besides, while mothers' baseline parental efficacy was associated with their own emotional distress and children's age, fathers' baseline parental efficacy was related to their own as well as their partners' emotional distress, and in addition, to their partner's deployment length. The results suggest that mothers are the primary caregivers in military families and have a bigger influence on co-parenting. Limitations and implications are discussed.

Keywords: parental efficacy; emotional distress; deployment length; military family; actor-partner interdependence model;

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Introduction

In the United States, more than 2.7 million service members have been deployed to the war zones of Iraq and Afghanistan since 2001, over half of whom served more than one deployment (Wenger, O'Connell, & Cottrell, 2018). About 10% of those deployed were women, and about 6.5% of Active-Duty Members and 2.6% of Selected Reserve and National Guard Members were in dual-military marriages (Institute of Medicine, 2013). About 57% of military service members were married and 45% had children at the time of deployment. Those deployments posed challenges for the mental, emotional, and social well-being of military family members, including more than two million children.

Understanding how deployment can impact family functioning is important. Numerous studies have shown the negative impact of combat exposure on service members' mental health, including higher PTSD prevalence (Fulton et al., 2015), more suicidal ideation and behaviors (Stanley & Larsen, 2019), alcohol abuse (Eisen et al., 2012), etc. Palmer (2008) argued that combat exposure has an indirect effect on child outcomes via parenting, which is compromised by war-related parental distress and psychopathology. Because of the difficulty of adjusting to combat-related physical and/or psychological injuries and reestablishing normal roles and routines, parenting might be harmed at the post-deployment reunion (Walsh et al., 2014). A review of 20 studies (Creech & Misca, 2017) illustrated how three processes (cognitive process including parenting perception and parental efficacy, behavioral avoidance, and emotional disturbance) lead to maintained war-related PTSD symptoms and negative parenting practices after reunifications. In general, military parents are faced with specific stressors,

which could harm their parenting and then have a negative impact on children's adjustment.

For the last several decades, findings also showed parenting plays a crucial role in child adjustment, especially for children growing up under adversities. Masten (2001) illustrated how good parenting could buffer the negative impact of risk factors, for example, poverty. Gewirtz and Zamir (2014) illustrated how parental deployment could impact child socioemotional development and academic adjustment from early childhood to adolescence and stressed the mediating role of parenting practices. Evidence from randomized controlled trials revealed that parenting is malleable and parenting intervention could reduce child behavioral problems via the change of parenting (e.g., Gardner, Montgomery, & Knerr, 2015; Yap et al., 2016). Thus, parenting interventions specific to military families are crucial to improve military family functioning.

Parental Efficacy as a Core Component of Parenting

Parental efficacy refers to parents' beliefs about their own competence in their parenting role (Tedi & Gelfand, 1991). This concept mostly draws from Bandura's (1997) social cognitive theory, where self-efficacy is defined as one's belief in his/her ability to successfully organize and execute certain actions required in a specific situation. In a concept analysis, de Montigny and Lacharite (2005) compared terms used to describe parental efficacy in 60 articles from the field of psychology and nursing and differentiated between parental efficacy and parental confidence: parental efficacy includes both affirmations of capability and strength of that belief, while parental confidence only assesses the degree of certainty about success and might not be domain-specific. Thus, in this study, parental efficacy is defined as parents' beliefs/judgment of

their capabilities to organize and execute a set of specific tasks specifically related to their parent role. Since self-efficacy is highly situation- and domain-specific, which could be different from the general self-efficacy, multiple measures about parental self-efficacy were developed, including Maternal Efficacy Questionnaire (MEQ; Tedi & Gelfand, 1991), Parenting Sense of Competence Scale (PSOC; Johnston & Mash, 1989), and Early Intervention Parenting Self-Efficacy Scale (Guimond, Wilcox, & Lamorey, 2008), etc.

Empirical evidence revealed that parental efficacy is closely related to parenting practices and child outcomes. In a review, Coleman and Karraker (1998) suggested higher task-specific parental efficacy was related to multiple maternal behavioral competencies, including responsiveness, parental acceptance, and active maternal coping orientations; also, low maternal efficacy was related to maternal defensive and controlling parenting behaviors, as well as children's emotional and behavior problems. One study also found observed parenting could mediate the relationship between parental efficacy and child adjustment in families residing in supportive housing and suggested parental efficacy might be an important element in parenting interventions (Gewritz et al., 2009).

Some debates are going on and researchers are trying to figure out the direction between parental efficacy and parenting. According to Bandura (1997), self-efficacy is the core mechanism that mediates the relationship between knowledge and behavior; successful adaptions can, in turn, confirm and enhance self-efficacy. Ardelt and Eccles (2001) built a reciprocal model based on Bandura's idea to illustrate the bidirectional relationships among parental efficacy, parenting strategies, and child adjustment. Efficacious parents are more likely to engage in promotive parenting strategies, which

could benefit children's socioemotional development; parental efficacy may also have a direct effect on children's development via social learning. Meanwhile, the relationship also could be reversed, where effective parenting and successful child development could enhance the feelings of being a successful parent. They also stressed a systematic perspective, saying the whole process is impacted by bigger family and environmental context. Although some evidence supported the reciprocal model, a longitudinal study (Dumka, Gonzales, &Wheelers, 2010) using cross-lagged panel design evaluated the potential causal directions among parental efficacy, parental positive control practices, and adolescents' conduct problems over time. The results showed that parental efficacy predicted future positive parenting practices and then adolescents' conduct problems but not vice versa. Parental efficacy also directly impacted adolescents' later conduct problems. Similarly, three potential processes, including parenting-efficacy-driven, parenting-behavior-driven, and child-driven process, were tested in 305 families across two years, and the results did indicate that higher maternal efficacy was related to promotive parenting and less externalizing problems in early adolescence, thus supporting the parenting-efficacy-driven process (Glatz & Buchanan, 2015b). Although more evidence is needed to build causal relationships across developmental stages, it is widely acknowledged that parental efficacy plays an important role in parenting practices and child positive adjustment.

Emotional Distress and Parental Efficacy

In the past several decades, studies have established robust negative relationships between parental psychopathology (especially maternal depression and anxiety) and parental efficacy across different development stages, including infants (e.g., Kohlhoff &

Barnett, 2012), preschoolers (e.g., Jackson & Huang, 2000), school-aged children with intellectual disability (e.g., Lloyd & Hastings, 2009), pre- and post-adolescence (e.g., Freed & Tompson, 2011). The directions are complex. On one hand, depressed parents tend to hold more negative cognitions about themselves as parents and about their children's behaviors and/or temperament; higher stress is related to doubt, hesitation, and impulsive parental response. On the other hand, low parental efficacy makes parents perceive parenting as more stressful and challenging. Regardless of the complex causal directions, one thing is clear: the relationship between parental psychopathology and parental efficacy could be transactional; and once the negative link has been established, they could reciprocally influence and strengthen each other (Crnic & Ross, 2017). A longitudinal study (Gross, Conrad, Fogg, & Wothke, 1994) showed the processes: higher depressed mothers were more likely to perceive their children's temperament to be difficult, which led to lower parental efficacy six months later. Besides, lower parental efficacy was related to more depression symptoms 12 months after baseline assessment.

More importantly, many studies showed that parental efficacy could buffer the toxic effect of parental psychopathology on parenting behaviors. Teti and colleagues (1996) argued that the impact of maternal depression on parental sensitivity was mediated by parental efficacy. Mothers with severe mental health problems were more likely to experience lower levels of parental efficacy, which in turn negatively impacted adolescents' academic outcomes (Oyserman, Bybee, Morbray, & Hart-Johnson, 2005). Evidence indicated that parental efficacy mediated the relationship between parenting behaviors and child externalizing behaviors for both mothers and fathers (Meunier, Roskam, & Browne, 2011), as well as the relationship between parenting stress and child

behavioral problems in children with autism spectrum disorders (Rezendes & Scarpa, 2011). These results provided a rationale for strengthening parental efficacy: it can help improve parenting practices and reduce child behavioral and emotional problems.

Parenting Intervention and Parental Efficacy

Based on the theoretical implication and empirical evidence, parental efficacy is viewed as a key outcome in many parenting intervention programs (e.g., Wittkowski, Dowling, & Smith, 2016). Typically, parental efficacy can increase after parenting interventions since parents could experience mastery in practices and accomplish their goals. Parental efficacy has been proven to be sensitive to intervention. Lindsay, Strand, and Davis (2011) found that all three parenting interventions funded by the UK government improved parental efficacy over two years with moderate to large effect sizes and implied the possibility to successfully implement those programs on a large-scale community setting. A meta-analysis on the effectiveness of self-directed parenting programs (Tarver, Daley, & Lockwood, 2014) also revealed medium to large intervention effects on parental efficacy for parents of children both with and without clinical levels of externalizing problems. Besides, a parenting intervention with preschoolers displaying disruptive behaviors established a two-mediator model whereby intervention reduced children's externalizing behaviors via improvements to parental efficacy and then to parenting practices (Seabra-Santos et al., 2016). A military parenting intervention program was effective to improve parental efficacy at post-intervention (Gewirtz, DeGarmo, & Zamir, 2016). However, most analyses have examined only short-term intervention effects (i.e. immediately posttest to 2-years follow-up, mostly within 1-year) by comparing pre- and post-intervention assessments. Therefore, researchers and

practitioners should treat parental efficacy as an important outcome in parenting interventions and examine the longitudinal change.

The Current Study

Despite there are many studies related to parental efficacy, there are two main limitations. First, most studies only included mothers as primary participants; paternal parental efficacy is understudied. Even among the few studies exploring parental efficacy that include both parents, few analyses have examined gender differences in parental efficacy of mothers vs. fathers. Reece and Harkless (1998) argued that mothers had higher levels of parental efficacy and parental satisfaction than fathers in general. In a study including 62 cohabiting dyads with their firstborn toddlers, fathers' parental efficacy was associated with parenting stress and relationship functioning while mothers' parental efficacy was associated with general self-efficacy and relationship functioning, which may indicate different sources of parental efficacy between mothers and fathers (Sevigny & Loutzenhiser, 2009). Interestingly, from a dyadic perspective, Biehle and Mickelson (2011) found both actor and partner effects on parental efficacy during the transition to parenthood: one's performance influenced their partners' parental efficacy, and fathers' depression could influence mothers' parental efficacy but not vice versa. Under a systematic perspective, mothers' and fathers' parental efficacy do not exist independently and should have an impact on each other. More evidence is needed to examine associations between couples' parental efficacy.

Second, parental efficacy emerges from a parent's direct experience with their children, thus it is reasonable to assume parental efficacy changes according to the child's developmental stage. A cross-sectional study (Ballenski & Cook, 1982) compared

parental efficacy among parents of infants, toddlers, preschoolers, school-age children, and adolescents. They found that mothers of preschools had the highest parental efficacy; while parents of adolescents reported the lowest level of efficacy. However, due to the small sample sizes for each group (range from 15 to 46), statistical tests were not conducted. Consistent with the results, Salonen et al. (2011) found that maternal and paternal efficacy increased significantly during the postpartum period regardless of the intervention. Weaver et al (2008) also found that parental efficacy improved between age 2 to 4. Latent growth analyses were used to show that parental efficacy decreased from early (11-12 years old) to middle (14-15 years old) adolescence (Glatz & Buchanan, 2015a) despite generally high levels of parental efficacy. However, we still know little about change in parental efficacy over time in parents of elementary-aged children.

In the current study, we want to understand the longitudinal change of parental efficacy in both mothers and fathers after a military parenting intervention program. We are interested in the following questions:

1. Do couples' parental efficacy at baseline correlate with each other?
2. How do mothers' and fathers' parental efficacy change over time? Do couples rate of change correlate with each other?
3. Can the ADAPT program improve mothers' and fathers' parental efficacy?
4. Are baseline emotional distress and deployment length associated with one's own (actor effect) and partner's (partner effect) baseline parental efficacy and the rate of change?

Method

Participants

Data were drawn from a full data set of 336 military families who participated in the After Deployment, Adaptive Parenting Tool (ADAPT) randomized clinical trial/RCT. Detailed information can be found in Gewirtz, DeGarmo, & Zamir (2018a). All data from two-parent families (N = 271) were included in the analysis, regardless of their marital status. Families had at least one parent who was previously deployed to Iraq and/or Afghanistan since 2001 and at least one child aged between 4 and 12 years old.

In these families, 95.6% fathers and 12.5% mothers were deployed overseas at least once since 9/11/2001, and in 8.5% families both parents had been deployed. 89.6% fathers and 10% mothers were deployed for at least 6 months. Among the 271 families, 250 fathers and 254 mothers reported being married at baseline; others were never married (2 fathers and 5 mothers), divorced (9 fathers and 8 mothers), separated (3 fathers) or did not indicate marital status (7 fathers and 4 mothers). Among the married couples, the mean length of the marriage was 9.66 (SD = 5.32, range = 1 to 28) years. 85.6% fathers and 91.9% mothers were Caucasian/White, and a small proportion were African American (4.8% fathers and 1.8% mothers), multi-racial (2.6% fathers and 1.1% mothers), Asian (2.2% fathers and 1.1% mothers) and Pacific Islander (0.4% fathers and mothers). On average, fathers were 37.44 (SD = 6.43, range = 23.74 to 58.33) years old and mothers were 35.76 (SD = 5.87, range = 23.08 to 51.15) years old at baseline. Parents were generally well-educated, with 46.5% fathers and 52.4% mothers having a bachelor's degree or higher. Most families were middle- to upper-middle-class: 41.6% families reported annual household income between $40,000 to $79,999 and 30.5% families

reported between $80,000 to $119,999. Children (*N* = 271) at baseline assessment were mostly in middle childhood (*M* = 8.44, *SD* = 2.52, range = 4.06 to 13.86) and 44.3% were boys. On average, there were 2.36 children in each household (*SD* = 0.89, range = 1 to 5).

Procedure

A CONSORT diagram is shown in Figure 1. All procedures were approved by the Institutional Review Board at the University of Minnesota (IRB number: 1005S82692). Participants were recruited via multiple methods: presentations at pre-deployment and reintegration events for NG/R families, mailings from the local Veteran's Administration Medical Center to OIF/OEF/OND veterans, media, and word of mouth. Interested participants were referred to online screeners to see whether they met all the criteria. Eligible parents completed consents and then were asked to complete a baseline online survey which was followed by an in-home interview. After the baseline assessment, 60% of the families (*N* = 162 in this sub-dataset) were randomly assigned to the intervention group and 40% (*N* = 109 in this sub-dataset) were randomly assigned to the services-as-usual group. Follow-up data were collected 6-months post-baseline (T2, post-intervention), 1-year post-baseline (T3), and 2-years post-baseline (T4). Each parent received a $25 gift card when they completed an online assessment and a $50 gift card when they completed an in-home assessment.

Intervention

After Deployment, Adaptive Parenting Tool (ADAPT) is a modification of the GenerationPMTO program (previously known as Parent Management Training Oregon Model, or PMTO; see Forgatch & Gewirtz, 2017) based on the Social Interaction Learning theory (Patterson, 1982). GenerationPMTO aims to reduce coercion parenting

and then promote child socioemotional development via the change of parenting. Five core components are covered, including positive involvement, skill encouragement, problem-solving, monitoring, and appropriate discipline. The ADAPT program modified PMTO to add one more core component: parental emotion socialization, which included low dose mindfulness practices, and emotion coaching skills, as well as discussions about specific stressors relevant to the military family context. Participants were randomly assigned to the intervention group or the services-as-usual group based on a computer program. Families in the intervention group participated in a group-based preventive parenting program, for 2-hour sessions, held weekly for 14 weeks. In each session, a closed group of 6 to 15 parents learned and practiced parenting skills with the help of 2 or 3 trained facilitators. Families in the control group received a list of print and online parenting resources after they completed the baseline assessment.

Measures

Parental efficacy. The Parenting Locus of Control Scale– Short Form Revised (PLOC-SFR; modified by Hassall, Rose, & McDonald, 2005) was used to measure maternal and paternal parental efficacy from T1 to T4. Four subscales were used to access locus of control in the parenting-child interaction: parental efficacy (e.g., "No matter how hard a parent tries, some children will never learn to mind."), parental responsibility (e.g., There is no such thing as good or bad children – just good or bad parents."), child control of parents' life (e.g., "My life is chiefly controlled by child."), and parental control of child's behavior (e.g., "I always feel in control when it comes to my child"). Parents rated 24 statements about the parental locus of control on a 5-point Likert scale (1 = *strongly agree*, 5 = *strongly disagree*). Parents with more external locus

of control tend to believe they have little impact on their child's behaviors and feel less efficacious as parents. Items were reverse coded when necessary. A total mean score was calculated and higher scores representing higher levels of parental efficacy. Reliability was 0.76 for the mothers and 0.74 for fathers at baseline.

Emotional Distress. Hopkins Symptom Checklist (HSCL-25; Parloff, Kelman, & Frank, 1954) is a widely used self-reported symptom inventory to detect the presence and intensity of anxiety and depression symptoms over the previous week. It consists of 25 items, including 10 measuring anxiety (e.g., "Suddenly scared for no reason.") and 15 for depression (e.g., "Feeling low in energy, slowed down."). Participants rated how much each of the symptoms caused distress in the past week from 1 ("*Not at all*") to 4 ("*Extremely*"). The total score was averaged to represent emotional distress. Baseline emotional distress was used in the study, with high reliability (0.949 for mothers and 0.921 for fathers). A score above 1.75 is viewed as symptomatic in Western countries (Winokur, et al., 1984). In our study, 23.1% fathers and 21.5% mothers met the clinical criteria at baseline, and in 7.5% families both parents had clinical-level emotional problems, indicating our sample was at higher risk of mental health problems.

Deployment Length. Total deployment months were coded in 6-month increment, ranging from 1 to 7 (1 = *6 months or less*, 2 = *7 to 12 months*…7 = *37 months or more*).

Group assignment. Intervention status was dummy coded (1 = *intervention*, 0 = *control*). An intent-to-treat (ITT) approach was used to evaluate the intervention effects, where data from all participants were analyzed regardless of the actual responsiveness to the ADAPT program.

Covariates. Children's age (in years), education level (coded from 1 = *Some high school or less*, to 8 = *Doctoral or professional degree*), household income (coded in US$10,000 increments ranging from 1 to 16, 1 = *less than US$10,000 per year*, 2 = *US$10,000 to 19,999…* 16 = *US$150,000 or more; average score between fathers and mothers were used*), and race (coded as 0 = *Non-White*, 1 = *Caucasian/White*) were used as covariates.

Missing Data

Missing data analysis was conducted in SPSS 25. The percentage of missing data for PLOC-SFR was 3.3% for fathers and 1.8% for mothers at baseline, 33.9% for fathers and 25.5% for mothers and at six-month follow-up, 23.2% for fathers and 19.6% for mothers at 1-year follow-up, and 26.9% for fathers and 22.1% for mothers at 2-year follow-up. The percentage of missing data for HSCL-25 was 4.1% for fathers and 2.2% for mothers at baseline. The results of Little's missing completely at random (MCAR) test including all variables revealed that the data were not missing completely at random, $\chi^2(29) = 61.80$, $p < .001$. T-tests showed that fathers with lower education were less likely to be retained in the study at T2 (t (262) = -2.417, p = .017), T3 (t (262) = -2.906, p = .004), and T4 (t (262) = -3.594, $p < .001$); fathers with lower household income were also less likely to report data at T2 (t (260) = -1.969, p = .051); Caucasian fathers were more likely to report data at T2 (t (269) = 2.516, p = .012), while Caucasian mothers were more likely to report data at T4 (t (269) = 2.416, p = .033). Missing data were not related to parental age, marital status at baseline, deployment status, and child age. Thus, education level, household income, and race were included in the final model as

covariates. Full information maximum likelihood (FIML) was used to analyze missing data, which has been shown efficient with moderate levels of missing values.

Analytic Plan

Descriptive statistics (mean and standard deviation) and bivariate correlations were provided first to examine the relationship among variables listed in the model. Intent-to-treat analyses were used in the model to examine the intervention effect.

Dyadic interdependence was modeled in several ways: 1). The similarity on parental efficacy at baseline; 2) the similarity of the trajectory (i.e., the rate of change) of parental efficacy; 3). Unique actor and partner predictors on parental efficacy at baseline and the rate of change. The actor-partner interdependence model (Kenny, 1996) was used. To address the research question, dyadic latent growth models (LGM) were conducted under the structural equation modeling (SEM) framework using Mplus 8.2 (Muthen & Muthen, 1998-2017). The SEM framework was chosen over the multilevel modeling (MLM) framework based on the suggestions from Ledermann & Kenny (2017) that: 1). SEM with FIML can better handle missing data if not missing completely at random; 2). The path coefficients directly to intercept and slope could be easily estimated; 3). Different models could be compared based on multiple model fit indices.

A stepwise approach was established to model the dyadic growth curve model under the actor partner interdependence perspective. First, two base LGM models without any covariates were run separately for mothers' and fathers' parental efficacy across two years to check the model fit. Then, intervention status was included in the two separate LGMs to see whether the ADAPT program could have a significant impact on change in parental efficacy. Third, mothers' and fathers' parental efficacy growth trajectories were

put into one model, with intercepts and slopes correlated with each other. Fourth, intervention status was added as a covariate in the parallel process model. Finally, emotional distress, deployment length, child age, education level, household income, and race were included in the model. In all LGM models, time-zero was defined as the baseline assessment. Thus, the latent intercepts represent the initial status and the latent slopes represent the rate of change over time.

Multiple model fit indices of each estimated model to the data were evaluated. Good model fit indices include a nonsignificant χ^2 value, a CFI value bigger than 0.95, an RMSEA value smaller than 0.05, and SRMR value smaller than 0.06 (Hu & Bentler, 1999). Acceptable model fit indices include a CFI value greater than 0.90, RMSEA, and SRMR smaller than 0.08.

Results

Preliminary Exploratory Analyses

First, T-tests were conducted in SPSS 25 to check whether parents in the intervention group and the control group differed from each other at baseline. The results indicated successful randomization: no significant differences were found for the demographic variables, including parental age, education level, household income, race, marital status at baseline, deployment status, and child age, *ps* > .05. The intervention group and the control group also showed no differences in reports of parental baseline emotional distress and parental efficacy, *ps* > .05. Paired t-tests indicated no differences between mothers' and fathers' baseline emotional distress and parental efficacy, *ps* > .05. Figure 2 showed the change of parental efficacy over two years, for intervention and control group separately.

Descriptive statistics and bivariate correlations among all variables included in the study are shown in Table 1. Results from the Pearson correlations suggested non-independence between mothers and fathers on baseline emotional distress (r = .202, p = .001) and parental efficacy (r = .248, p < .001), as couples' emotional distress and parental efficacy were positively correlated with each other at baseline.

All main variables were checked for normality. Shapiro-Wilk tests showed that baseline mothers' parental efficacy was not normally distributed with negative skewness; baseline mothers' and fathers' emotional distress were not normally distributed with positive skewness. Thus, as suggested by Asparouhov and Muthen (2014), MLR estimator was used instead of ML in Mplus 8.2. Then, maximum-likelihood parameters

were estimated with standard errors and a chi-square test, which is robust to non-normality continuous outcomes.

Primary Analyses

Single LGM models.

First, measured parental efficacy across four time points were included in the latent growth model to examine the model fit for mothers and fathers separately. Fathers' parental efficacy (Model 1a) showed strong model fit, $\chi^2(5) = 4.626$, $p = .463$; RMSEA = 0, CFI = 1.000, SRMR = .059. The latent intercept and slope were not significantly correlated with each other, which indicated that initial levels of parental efficacy were not related to the change of parental efficacy over time. Generally, there was an overall increasing linear trend across time ($\mu_\beta = .023$, $p < .001$), but not much variance in the slope ($\varepsilon_{i\beta} = .002$, $p = .356$) was found. However, heterogeneity was found in the initial status of parental efficacy ($\varepsilon_{i\alpha} = .118$, $p < .001$).

The mothers' model (Model 1b) also showed strong model fit $\chi^2(5) = 7.990$, $p = .157$; RMSEA = .047, CFI = .990, SRMR = .044. Similarly, no significant correlation between latent intercept and slope was found. In general, maternal parental efficacy increased over time, $\mu_\beta = .018$, $p = .003$; and there was not much heterogeneity, $\varepsilon_{i\beta} = .002$, $p = .219$. Again, heterogeneity was found in the initial status of parental efficacy ($\varepsilon_{i\alpha} = .116$, $p < .001$);

Single LGM models with intervention effect

Then, intervention status was included as a time-invariant covariate in both models. Fathers' model (Model 2a) showed good model fit: $\chi^2(8) = 7.749$, $p = .458$; RMSEA = 0, CFI = 1.000, SRMR = .057. The intercept was significantly different from

0, μ_α = .018, p = .043; however, no intervention effect was found for the change of parental efficacy over time, which means that the increasing trend of paternal efficacy was not because of the intervention. The latent slope was not related to the latent intercept, which indicated the change of parental efficacy was not related to the baseline parental efficacy.

The mothers' model (Model 2b) showed adequate fit, χ^2 (8) = 22.103, p = .005; RMSEA = .081, CFI = .960, SRMR = .087; a significant intervention effect was found for the latent slope: b = 0.022, p = 0.054; and the variances of slope didn't differ from 0. The results showed that mothers who participated in the ADAPT program had a stronger positive rate of change in parental efficacy over two years compared to the control group, i.e., the intervention significantly improved their parental efficacy. No relationship between latent intercept and the latent slope was found, indicating the improvement was not related to initial status too.

Parallel LGM model

Next, a parallel process LGM (Cheong et al., 2003) was conducted to see whether the initial levels and changes in parents' parental efficacy were correlated with each other (Model 3). The model showed strong model fit, χ^2 (22) = 30.730, p = .102; RMSEA = .038, CFI = .988, SRMR = .059. The latent intercepts between mothers and fathers were significantly correlated with each other, r = .045, p < .001, which was consistent with our non-independence assumption; however, the rate of change of couples' parental efficacy overtime was only marginally correlated, r = .001, p = .074. Also, the rates of change of mothers' and fathers' parental efficacy were not influenced by their own and their partners' initial status parental efficacy. The results showed that although couples'

parental efficacy was correlated at baseline, the rate of change over two years was independent to some degree.

Parallel LGM model with intervention effect

Then, intervention status was included in the parallel process LGM to examine the intervention effect (Model 4). The model showed good model fit, χ^2 (28) = 46.002, p = .017; RMSEA = .049, CFI = .976, SRMR = .072. Consistent with previous results, couples' initial parental efficacy scores were correlated with each other, r = .045, p < .001, and the rates of change between maternal and paternal efficacy were only marginally correlated with each other, r = .001, p = .080. The intervention effect was only found for mothers (b = .021, p = .059), but not fathers (b = .008, p = .496), indicating mothers in the intervention group had a stronger improvement in parental efficacy, while no differences were found in fathers' change of parental efficacy between intervention group and control group. Interestingly, a trend was found such that the rate of change of fathers' parental efficacy was marginally related to mothers' initial status, b = - .043, p = .097. No other significant relationships were found.

Full Model

Finally, we added emotional distress, deployment length, child age, education level, household income, and parental race in the model as covariates. The model (Model 5) showed strong model fit, χ^2(76) = 99.814, p = .035; RMSEA = .035, CFI = .972, SRMR = .054. The initial statuses of maternal and paternal efficacy were still correlated with each other, r = .030, p = .001, but the rates of change between couples were no longer correlated with each other. Rates of change of maternal and paternal efficacy were not associated with either actor or partner baseline parental efficacy.

Consistent with prior models, a significant intervention effect was found for the rate of change in maternal efficacy regardless of self and partner emotional distress, deployment length, child age, education level, and household income, b = .027, *p* = .017. No intervention effect was found for change in father's parental efficacy, b = .013, *p* = .297. Mothers' race and fathers' deployment influenced their own change in parental efficacy over time. Caucasian mothers (b = .065, *p* = .014) were more likely to report greater improvement in parental efficacy over time. Deployment length had a negative impact on fathers' change in parental efficacy, b = -.007, *p* = .044; the longer fathers were deployed, the slower the change of parental efficacy. No other predictors were found for the latent slopes.

Interestingly, we found mothers' initial level of parental efficacy was negatively correlated with their baseline emotional distress (b = -.174, *p* = .011) but not related to fathers' baseline emotional distress. However, fathers' initial level of parental efficacy was not only negatively correlated with their own baseline emotional distress, b = -.152, *p* =. 002; but also associated with their partners' baseline emotional distress, b = -.167, *p* = .005. Child age was significantly related to baseline maternal efficacy, b = .025, *p* = .012, indicating mothers who had older children were more confident with their parenting roles at baseline. Fathers' initial parental efficacy was positively correlated with mothers' deployment length, b = .055, *p* = .045, but not their own deployment length, b = .017, *p* = .163. Fathers with higher education were more likely to have higher parental efficacy, b = .038, *p* = .050; Caucasian fathers were likely to have lower levels of parental efficacy, b = -.213, *p* = .002.

Discussion

Baseline Parental Efficacy in Couples

In Model 3, 4, and 5, the latent intercepts between mothers' and fathers' parental efficacy were consistently correlated with each other, indicating that before they participated in the ADAPT program, couples tended to have similar levels of parental efficacy. It might because couples shared the same environment, had similar parenting experiences, and did lots of activities together. To our knowledge, few studies have examined the non-independence structure between mothers' and fathers' parental efficacy. In the few studies including both parents, many established separate models for mothers and fathers (e.g., Murdock, 2013). Like Buehler (2020) argued, co-parenting can provide unique associations above and beyond parenting itself, and more studies are needed to understand the complex co-parenting processes.

Longitudinal Change of Parental Efficacy in Couples

In general, we found significant positive linear trends of parental efficacy over two years for both mothers and fathers. However, the rates of change between couples' parental efficacy were not correlated with each other. The results revealed that mothers' and fathers' parental efficacy changed independently overtime and the sources of change were different. In addition, the rate of change in parental efficacy was not associated with baseline parental efficacy in almost all the models, indicating that regardless of baseline parental efficacy, mothers' and fathers' parental efficacy improved over two years in general.

It is possible that in our sample, most fathers had deployment experiences and they had fewer opportunities to practice parenting compared to their civilian partners in

daily lives. They may be deployed again after baseline and thus feel less efficacious as parents. However, we cannot distinguish the impact of gender and deployment since most families had deployed fathers and civilian mothers. Data including deployed mothers and civilian fathers are needed to conduct future comparisons.

Considering the important role of marital quality in the context of co-parenting (Buehler, 2020), it is necessary to examine whether marital quality could impact the dependency between mothers' and fathers' change of parental efficacy over time. It is possible that significant correlations could only be found in those in high-quality relationships. Couples who have greater marital quality are more likely to have better communication and support each other to improve parenting. Some studies found that marital satisfaction is positively correlated with mothers'(Kersh, Hedvat, Hauser-Cram, & Warfield, 2006) and fathers' (Kwok, Ling, Leung, & Li, 2013) parental efficacy, but less is known whether there are gender differences nor whether marital satisfaction could impact the relationship between fathers' and mothers' change of parental efficacy.

Intervention Effect on Longitudinal Change of Parental Efficacy

In a prior paper investigating 6-month outcomes of the ADAPT program, both fathers and mothers benefited from improvements to parental efficacy as a result of the program (Gewirtz, DeGarmo, & Zamir, 2016). In this study, however, the intervention only had direct effects on mothers' parental efficacy over 2 years; father effects were not sustained. It is possible that although fathers felt more efficacious at post-intervention, they were less likely to practice the skills because of the separation from families and they were not primary caregivers. Nevertheless, their civilian partners took more responsibilities in parenting and they were more likely to translate what they learned

from ADAPT to daily lives; they may also feel more supported by participating in the intervention. Thus, mothers were able to maintain the change while fathers cannot. However, we need to be cautious since the confounding effects of gender and deployment.

Although no intervention effect was found for fathers' change of parental efficacy, deployment length at baseline was negatively related to the change of parental efficacy, suggesting that length of time away may have long-lasting negative effects on how fathers' views of their parental efficacy change over time. The separation with their children makes them feel less efficacious as parents. The results also support that civilian parents benefit more from the intervention compared to their military counterparts. More studies related to deployed mothers are needed to better examine how deployment has an impact on parenting and whether there are some gender differences. Studies also indicated web-based communication can help military members keep connected with their family during deployment (Gewirtz, Erbes, Polusny, Forgatch, & DeGarmo, 2011), and the effect of web-based communication on parental efficacy should also be examined in the future.

Besides, no moderation effect was examined in this model. It is also possible that not all parents benefit equally from the intervention. Prior research found that ADAPT could improve observed parenting at 1-year follow-up only for fathers without PTSD diagnosis (Chesmore, Piehler, & Gewirtz, 2017). For fathers with several mental health, their parenting is less likely to change after the intervention and they might need intervention with higher intensity. It is also possible that parental mental health could moderate the intervention effect on parental efficacy.

Although we found a significant influence of race on mothers' latent slope; however, our sample is homogenous, and the majority of mothers were Caucasian. Although Caucasians tended to have a higher household income at baseline, which could have a negative impact on parental efficacy, no racial differences in mothers' parental efficacy from T1 to T4 and emotional distress at baseline were found. More data are needed to understand the relationship between race and parenting, especially the change over time.

Actor and Partner Effects: Emotional Distress, Deployment, and Parental Efficacy

Probably the most interesting finding in this model is how mothers' and fathers' baseline parental efficacy scores were associated with their own and their partners' emotional distress. Mothers' initial parental efficacy was only associated with their own emotional distress (mother actor effect), which is consistent with numerous studies that maternal psychopathology is negatively related to parental efficacy (e.g., Gondoli & Silverberg, 1997). However, fathers' parental efficacy was not only associated with their own emotional distress (father actor effect) but also associated with their partners' emotional distress (mother partner effect). Interestingly, the father actor effect and mother partner effect even had similar magnitude. The results might indicate that mothers play a more important role in parenting and co-parenting, and when mothers are more distressed, both couples feel less competent in their parenting roles. Our results differ from those of Biehle and Mickelson (2011), who reported that fathers' depression impacted mothers' parental efficacy, but mothers' depression had no effect on fathers' parental efficacy. However, the contexts of the two studies also differ, with the latter study examining parents during pregnancy and the following birth and reporting separate

regression models for mothers and fathers rather than dyadic APIM. In this study, most fathers were deployed when their children were young and were less available parents, thus it is reasonable that mothers were the primary caregivers and had bigger influence. Future studies are needed to examine the longitudinal change between actor and partner effects between parental psychopathology and parental efficacy.

After controlling for emotional distress, neither mothers' nor fathers' parental efficacy were related to their own deployment length (i.e. no actor effects). The results support assertions that parents' war-related mental health problems are more powerful predictors of parenting variables and child adjustment than features of the deployment (i.e. number and length of time away) (Gewirtz, DeGarmo, & Zamir, 2018b). However, a partner effect related to maternal deployment was found: the longer mothers were deployed, the more efficacious fathers perceived themselves. It might because when mothers were deployed overseas, fathers were more likely to be the primary caregiver and more involved in parenting practices. One important source of parental efficacy is direct experiences with children in daily life and with more practices, fathers feel more competent. The results might support Bandura's idea (1997) that successful practices could enhance self-efficacy. However, considering that only 10% mothers have been deployed, more data are needed to support this finding.

Mothers' baseline parental efficacy was also correlated with child age, thus provided some evidence that parental efficacy might increase over time in middle childhood. Mothers, but not fathers with older children felt more efficacious in general. The gender differences might also reflect their different roles in parenting.

Limitations and Future Research

The study had several limitations. First, only baseline emotional distress and deployment length were examined as correlates of parental efficacy at baseline and its rate of change. Thus, we are not able to model the dynamic processes nor the directions among emotional distress, deployment, and parental efficacy. The finding that baseline emotional distress did not predict the rate of change for fathers or mothers may reflect the complexity of the associations. As argued by Crnic and Ross (2017), once the detrimental link between parenting psychopathology and parental efficacy is built, they may reinforce each other. We were also unable to explore change in emotional distress over time in the current model. Future studies could treat emotional distress as a time-varying variable.

Second, all measures were self-reported with questionnaires by parents, likely raising the possibility of shared method variance. The results might also reflect some social desirability. Also, we examined parental efficacy but not parenting practices. Although research has indicated parental efficacy is linked to parenting practices and child adjustment, we didn't test the model directly. Future studies should extend the model by including distal outcomes like parenting practices and child adjustment.

Third, since 92% of fathers were deployed while only 10% mothers were deployed, it is impossible to differentiate the effects of deployment and gender in understanding parental efficacy. In 8.5% families both parents were deployed overseas at least once. Prior data found that females in the military are more likely to be single and have higher divorce rates compared to their male counterparts (Institute of Medicine, 2013), showing that deployment might have a different impact on males and females. However, few studies examined differences related to parenting. Future studies should collect data in different families to delineate the effects of deployment and gender on

family functions, including deployed fathers and civilian mothers, deployed mothers and civilian fathers, and dually deployed parents.

Conclusion

To our knowledge, our study is the first to examine the longitudinal change of parental efficacy in military families after a parenting intervention program using the actor-partner interdependence perspective. The impact of emotional distress and combat exposure were explored. Mothers' initial parental efficacy was associated with their emotional distress and children's development stages. However, fathers' initial parental efficacy was associated with mothers' combat experience and emotional distress, which might reflect that mothers took the primary role in caregiving in those military families even after reunification. Intervention effects were found for mothers but not fathers, which might also because that mothers are the primary caregivers in the families and they have more opportunities to practice the skills learned, while fathers might need more time to intake the benefits. Besides, deployment length had a negative impact on fathers' change of parental efficacy over time, reflecting the long-standing negative impact of war-related experience on parenting. The study suggested that researchers should take a more systematic and developmental perspective to understand parenting and co-parenting in families.

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Appendix

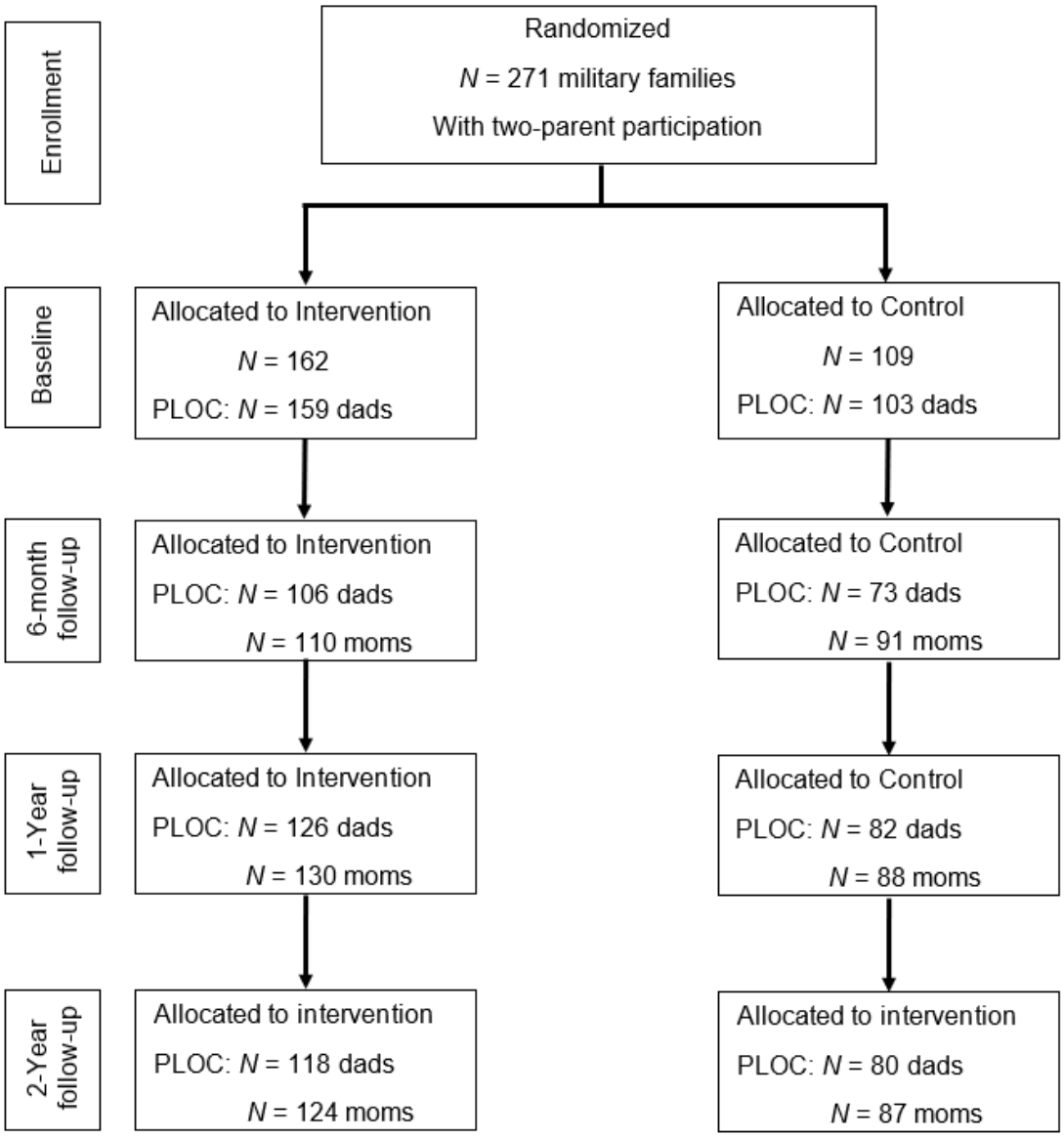

Figure 1. A CONSORT diagram of the current study.

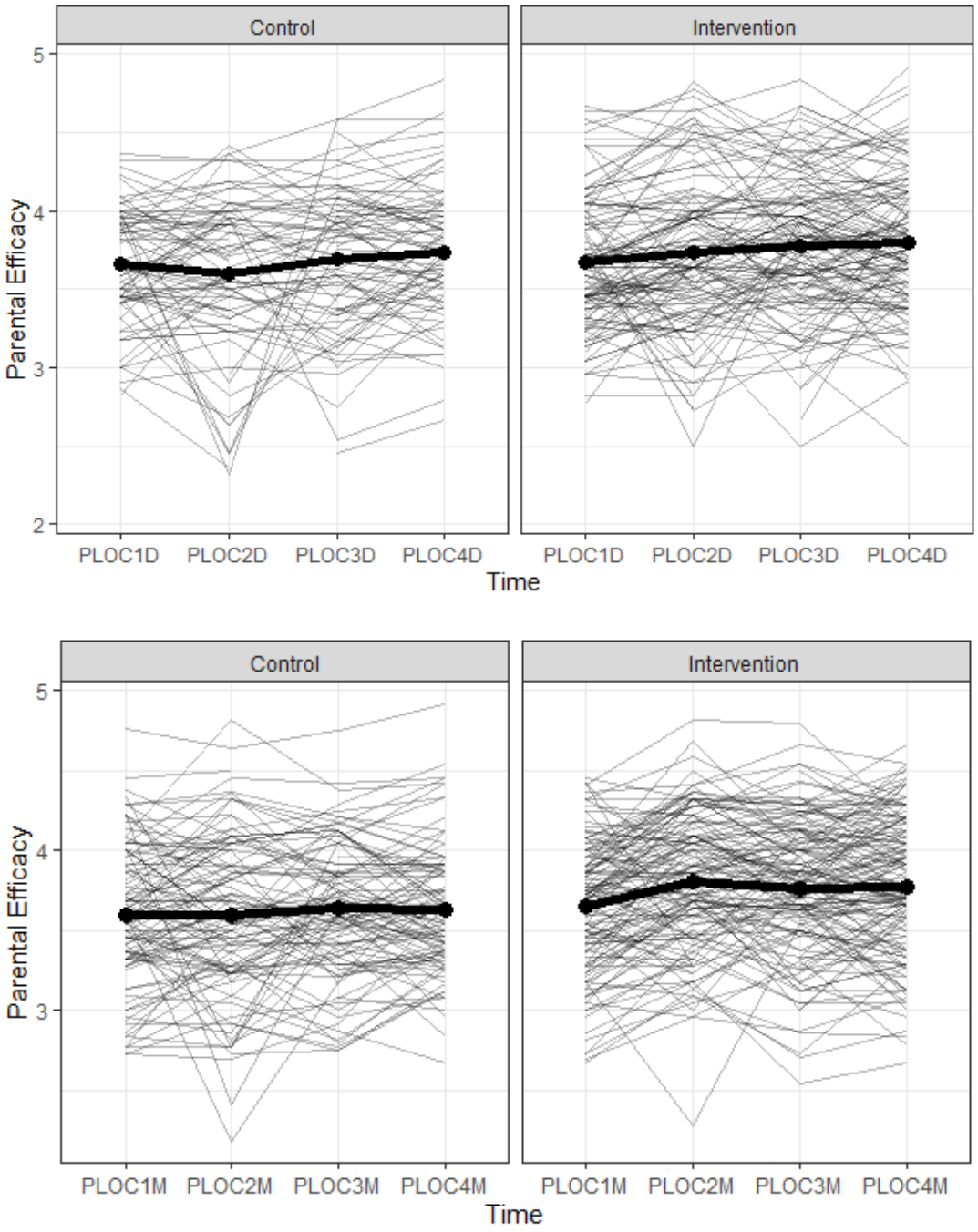

Figure 2. Plot showing the change of parental efficacy over time for fathers (upper plot) and mothers (lower plot). In each plot, the left side includes participants in the control group and the right side includes participants in the intervention group. The average growth profiles are also displayed.

Table 1. Descriptive statistics and bivariate correlations among variables. All significant correlations were bolded. $* p < .05$, $** p < .01$, $*** p < .001$.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.Group	1																			
2.Child age (in years)	-.074	1																		
3.Child gender	-.004	-.001	1																	
4.Household Income	.040	**.145***	-.049	1																
5.Educaton_Dad	.067	.060	.003	**.402****	1															
6.Education_Mom	-.025	-.044	.015	**.390****	**.371****	1														
7.Race_Dad	-.093	-.077	**-.151***	-.037	.071	.003	1													
8.Race_Mom	-.007	.001	.059	**-.210****	-.058	-.088	**.375****	1												
9.Deployed months (Dad)	.064	.068	-.022	-.018	-.029	-.091	-.040	.023	1											
10.Deployed months (Mom)	-.080	.001	.055	.058	-.081	-.081	.057	.026	**-.294****	1										
11.SCLT1(Dad)	.013	.035	.089	-.101	**-.182****	-.038	-.027	-.026	-.001	-.060	1									
12.SCLT1(Mom)	-.033	-.109	-.012	-.122	-.051	**-.166****	.089	.011	-.031	.109	**.202****	1								
13.PLOCT1(Dad)	.002	.096	.032	.045	.094	.018	.103	.058	.056	.075	**-.297****	**-.140***	1							
14.PLOCT2 (Dad)	.097	.020	.024	.058	.112	-.081	**.158***	.025	.082	**.159***	-.128	**-.184***	**.575****	1						
15.PLOCT3(Dad)	.087	.059	.037	.107	.097	.003	.058	-.071	-.049	.128	**-.234****	-.124	**.687****	**.571****	1					
16.PLOCT4(Dad)	.068	.076	.095	.055	.126	.021	.041	-.008	-.026	.137	**-.242****	-.093	**.692****	**.626****	**.700****	1				
17.PLOCT1(Mom)	.111	**.152***	.012	.108	-.057	.097	-.043	-.092	-.025	.042	-.097	**-.155***	**.248****	**.171***	**.235****	**.153***	1			
18.PLOCT2(Mom)	**.270****	**.176***	.012	.114	-.022	.026	-.098	.027	.000	.062	.006	**-.188****	**.205****	**.385****	**.251****	**.195***	**.614****	1		
19.PLOCT3(Mom)	**.170***	**.172***	-.032	.112	-.085	.014	-.042	**-.149***	-.026	.053	-.052	**-.202****	**.224****	**.274****	**.226****	**.135**	**.659****	**.673****	1	
20.PLOCT4(Mom)	**.225****	**.148***	.031	.111	-.042	.037	-.091	**-.184****	.028	.083	-.086	**-.195****	**.238****	**.256****	**.238****	**.241****	**.622****	**.657****	**.741****	1
M	.598	8.440	2.557	8.416	5.136	5.273	1.657	1.417	3.633	.327	1.493	1.484	3.657	3.670	3.741	3.753	3.640	3.739	3.716	3.726
SD	.491	2.516	.498	3.449	1.286	1.255	1.986	1.642	1.936	.983	.473	.406	.402	.483	.450	.424	.421	.457	.423	.421
N	271	271	271	257	264	267	271	271	270	269	260	265	262	179	208	198	266	201	218	211