

# Effect of Parents' Wartime Deployment on the Behavior of Young Children in Military Families

Molinda M. Chartrand, MD; Deborah A. Frank, MD; Laura F. White, PhD; Timothy R. Shope, MD, MPH

**Objective:** To describe the effect of wartime military deployments on the behavior of young children in military families.

**Design:** Cross-sectional study.

**Setting:** Childcare centers on a large Marine base.

**Participants:** Parents and childcare providers of children aged 1½ to 5 years enrolled in on-base childcare centers.

**Main Exposure:** Parental deployment.

**Outcome Measures:** Mean externalizing, internalizing, and total symptom scores on the Child Behavior Checklist (CBCL) (1½-5 years) and the CBCL-Teacher Report Form (TRF) (1½-5 years).

**Results:** One hundred sixty-nine of 233 consenting families (73%) participated. Nonresponders did not differ from responders in their child's age or TRF scores. Fifty-five children (33%) had a deployed parent. Parents with chil-

dren aged 3 years or older and a deployed spouse had significantly higher depression scores than those without a deployed spouse. There were no differences in the demographic characteristics between groups. After controlling for respondent's age, stress and depressive symptoms, deployed service member's rank, and total number of children in the home, we found an age by deployment interaction: children aged 3 years or older with a deployed parent had significantly higher CBCL externalizing and total scores (externalizing, 48.50 vs 43.31,  $P < .05$ ; total, 47.71 vs 42.68,  $P < .05$ ) and externalizing and total TRF scores (externalizing, 50.21 vs 45.62,  $P < .05$ ; total, 48.54 vs 43.73,  $P < .05$ ) compared with same-aged peers without a deployed parent.

**Conclusions:** This study is the first to show that children aged 3 years or older with a deployed parent exhibit increased behavioral symptoms compared with peers without a deployed parent after controlling for caregiver's stress and depressive symptoms.

*Arch Pediatr Adolesc Med.* 2008;162(11):1009-1014

**R**ECENT REPORTS HAVE FOCUSED on the mental health outcomes of soldiers returning from duty in Iraq and Afghanistan.<sup>1-3</sup> Little research has focused on the effect of soldiers' wartime deployments on their children. More than 2 million US children have been affected directly by a parent's military wartime deployment to Iraq and Afghanistan; 40% of these children are

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younger than 5 years.<sup>4</sup> Recent policy statements from the American Psychological Association<sup>5</sup> and the Department of Defense Task Force on Mental Health<sup>6</sup> have called for research on the effect of wartime deployments on children in military families.

Although children in military families are routinely exposed to stresses such as frequent moves and parental separations (even during peacetime), they do not have higher baseline levels of psychopathology compared with children in civilian families.<sup>7</sup> Children's ability to adapt to such stresses is mediated by variables like their caregiver's depression and stress.<sup>8</sup>

Research on the effect of routine (non-wartime) military separations from fathers on the mental health and behavior of children in military families has shown that children's depressive and anxiety symptoms were not statistically significantly elevated after controlling for mothers' stress and depressive symptoms. Studies of the effect of military deployments on children younger than 5 years, a potentially higher-risk group, are limited. Noncombat deployment of enlisted Navy mothers of young children (mean age, 3.1

**Author Affiliations:** Department of Pediatrics, Boston University School of Medicine, Boston Medical Center (Drs Chartrand and Frank), and Department of Biostatistics, Boston University School of Public Health (Dr White), Boston, Massachusetts; and Department of Pediatrics, Naval Medical Center Portsmouth, Portsmouth, Virginia (Dr Shope).

years) caused elevations in mothers' and childcare providers' reports of internalizing and externalizing behavior compared with nondeployed and civilian control groups.<sup>9</sup> However, this study did not control for maternal mental health symptoms.

School-aged children with a parent deployed during Operation Desert Storm (August 1990-February 1991) demonstrated (by parental report) moderate, but not clinically significant, increases in internalizing and externalizing symptoms,<sup>10</sup> increased tearfulness/sadness in girls, discipline problems in boys,<sup>11</sup> and increased levels of child self-reported depression<sup>12</sup> compared with children whose parent had not been deployed. These symptoms were completely mediated by the nondeployed parent's mental health symptoms. Younger children (age, 4-5 years) and boys were at higher risk for symptoms (children younger than 4 years were not included in the analysis in that study).<sup>12</sup>

Among adolescents, those with parents deployed during Operation Iraqi Freedom (March-May 2003) had higher measured heart rates and perceived stress levels compared with civilian controls and adolescents without a deployed parent.<sup>13</sup> A qualitative study conducted during the current conflicts in Iraq and Afghanistan found that adolescents with a deployed parent report feelings of uncertainty and loss, which may disrupt successful adolescent development.<sup>14</sup> Recent evidence also suggests that military families who experience repeated or prolonged deployments were at risk for child maltreatment. Young married couples with young children were at greatest risk for reports of child neglect.<sup>15,16</sup>

To our knowledge, there are no published studies that examined the behavioral effect of current wartime deployments on children aged 5 years and younger. Current deployments last 12 to 15 months (longer than those in Operation Desert Storm), representing a significant portion of a young child's life. Our study describes the effect of military deployment on the behavior of children aged 1½ to 5 years as reported by their primary caregiver and their childcare provider.

## METHODS

### DESIGN AND SAMPLE

We conducted a cross-sectional survey of parents and childcare providers of children aged 1½ to 5 years who were enrolled in on-base military childcare centers from May to December 2007 at a large Marine base with a high rate of deployment. All parents (N=310) with children aged 1½ to 5 years enrolled in on-base military childcare centers were given written information regarding the study protocol entitled *The Health and Behavior of Young Children in Active Duty Military Families*. Parents interested in participating then contacted the research assistant, who obtained informed consent from the parents and childcare providers. Parents were excluded if they reported that their child had a known behavioral disorder or developmental disability (eg, Down syndrome, autism spectrum disorder, global developmental delay, and attention-deficit/hyperactivity disorder) or if the parents were members of the Reserve or National Guard. If parents had more than 1 child enrolled in childcare, they were asked to consider their oldest child when completing the questionnaires. This study was approved by the Naval Medical Center

Portsmouth investigational review board and by the Marine base commander.

### OUTCOME MEASURES

For the index child, parents completed the Child Behavior Checklist (CBCL), a widely used parental-report behavior problem assessment with established psychometric properties.<sup>17</sup> In addition to a total behavior problem score, the CBCL provides 2 broad-band subscales: internalizing and externalizing. Problem behaviors encompassed in the internalizing subscale include emotional reactivity, anxiousness/depression, somatic complaints, and withdrawal. The externalizing subscale measures attention difficulties and aggression. A *t* score greater than 60 is considered clinically elevated for all scales. Parents also completed the Parenting Stress Index-Short Form (PSI-SF) and the Center for Epidemiologic Studies-Depression screener (CES-D),<sup>18</sup> a 20-item self-report measure, to assess their own level of depressive symptoms. Scores of 16 or higher on the CES-D (range, 0-60) suggest the need for a clinical referral for evaluation of depression. The PSI-SF is a shortened, validated version of the Parenting Stress Index, which is used to assess the level of stress in the parenting system.<sup>19</sup> The assessment yields a total parenting stress score composed of the following subscale scores: parental distress, parent-child dysfunctional interaction, and difficult child. As recommended by the developers of the PSI-SF, scores that were in the 85th percentile or higher in the standardization sample were considered clinically meaningful. Caregivers provided information on the service member's current deployment status and history, military rank (officer or enlisted), family composition, parents' age, education, and ethnicity. Military rank was included as a proxy for socioeconomic status.

Once caregiver consent was received, the center childcare provider who knew the child best was asked to complete the CBCL-Teacher Report Form (TRF). The TRF has psychometric properties similar to the CBCL and also has a clinical cutoff score of greater than 60. Mothers with elevated symptoms of depression and stress have been shown to report higher symptom scores for their children on the CBCL,<sup>20-22</sup> though there are data to suggest that their reporting is still accurate compared with nondepressed mothers.<sup>23</sup> For this reason, childcare providers' reports of child behavior were included as a potentially more objective measure of the children's behavior. Parents and childcare providers were unaware of each others' responses.

### STATISTICAL ANALYSIS

Children were divided into 2 groups: those with a deployed active duty parent (deployed group) and those without a deployed active duty parent (nondeployed group) during the time of data collection. In most cases (91%), mothers completed the parental report measures. Because some children had mothers who were deployed, all parental measures were combined into a single caregiver parent group.

*t* Tests and multiple linear regression analysis were used to compare the internalizing, externalizing, and total scores on the CBCL and TRF of children with and without a deployed parent. Potential covariates were chosen based on previous association with CBCL and TRF scores (respondent depressive/stress symptoms and education),<sup>17</sup> a priori (respondent ethnicity, respondent age, number of children in home, and whether the family lived on base), and based on a potential relationship with adverse behaviors during deployment (rank, deployment length and history, child sex, child age, parental age, PSI-SF total score, and CES-D total score). Younger children may be affected by deployment differently than older children<sup>12</sup>; therefore, we stratified our sample by age (<3 years and ≥3 years)

based on our sample's mean age (36.7 months; standard deviation [SD], 11.3 months). The potential covariates were tested in bivariate models for an association between CBCL score, TRF score, deployment status, and age category. The covariates in the final multivariate model were retained because of their relationship with the outcome variables (PSI-SF total score), child's age category (rank, age of respondent, and number of children in home), or deployment by age category (CES-D). A sub-analysis was performed using the Fischer exact test to determine the rates of clinically concerning CBCL and TRF scores ( $t > 60$ ) in each category. Two-tailed  $P < .05$  was considered significant. All analyses were conducted using SAS, version 9.1 (SAS Institute, Cary, North Carolina).

## RESULTS

### SAMPLE CHARACTERISTICS

Two hundred thirty-eight parents provided consent for participation. Five parents withdrew consent after receiving the questionnaire packet. Of the remaining 233 families, 169 returned complete information and were included in the analysis (73%). The 64 children on whom we do not have complete survey information did not differ from those with complete information in age or TRF scores. Descriptive statistics for the study sample are presented in **Table 1**. Most of our respondent parents are white mothers who have some college education and are married to enlisted service members. Ninety-two percent of deployed parents were fathers. No cases occurred in which both parents were deployed simultaneously. The mean length of deployment was 3.9 months (SD, 2.4 months). No characteristics differed significantly between deployment groups, though there was a trend for higher CES-D scores in the respondent parents with a deployed spouse (12.1 vs 9.4,  $P = .06$ ). When the sample was stratified by the child's age category, the only difference found was that caregiver respondents with a deployed spouse and a child aged 3 years or older had significantly higher mean CES-D scores (12.7 [SD, 9.1] vs 9.0 [SD, 7.5],  $P = .04$ ) compared with those from the nondeployed group.

### BIVARIATE ANALYSIS

On bivariate analysis for the full sample, we found no significant association between deployment and the internalizing, externalizing, or total scores on either the CBCL or TRF. To assess whether effects of deployment may vary by age, the analysis was repeated with the sample stratified by age (**Table 2**). There were, by parental report, significantly higher CBCL internalizing (48.74 vs 44.45,  $P = .05$ ), externalizing (48.36 vs 43.74,  $P = .03$ ), and total (47.71 vs 43.34,  $P = .04$ ) scores for older children with a deployed parent compared with same-aged children in the nondeployed group. Childcare providers reported significantly higher externalizing scores ( $P = .05$ ) on the TRF and a trend toward higher scores for internalizing ( $P = .06$ ) and total ( $P = .06$ ) symptom scores for older children with a deployed parent compared with same-aged children without a deployed parent. For younger children with a deployed parent, there was a trend toward lower parent-reported externalizing scores on the CBCL (43.92 vs 48.14,

**Table 1. Characteristics of Caregiver Respondent, Service Member, and Child by Parental Deployment Status**

Characteristic	No. (%)		P Value
	With Deployed Parent (n=55)	Without Deployed Parent (n=114)	
<b>Caregiver Respondent</b>			
Relationship to child			
Mother	51 (92.7)	103 (90.4)	.65
Father	3 (5.5)	10 (8.8)	
Race/ethnicity			
White	36 (70.4)	75 (65.8)	.67
Hispanic	6 (11.1)	17 (14.9)	
Asian	0	3 (2.6)	
Black	10 (18.5)	17 (14.9)	
Other	0	2 (1.8)	
Missing	1 (0.02)	0	
Education			
High school or less	7 (12.7)	15 (13.3)	.69
Some college	27 (49.1)	49 (43.4)	
College degree or higher	21 (38.2)	49 (43.4)	
Missing	0	1 (0.1)	
Age, mean (SD), y	28.2 (5.9)	29.6 (5.3)	.35
PSI-SF total score, mean (SD)	65.0 (18.5)	64.8 (21.2)	.95
CES-D total score, mean (SD)	12.1 (9.3)	9.4 (8.5)	.06
<b>Deployed Service Member</b>			
Length of deployment, mean (SD), mo	3.9 (2.4)		
Enlisted rank	44 (80.0)	91 (79.8)	.98
<b>Child</b>			
Age, mean (SD), mo	36.6 (11.4)	36.8 (11.3)	.92
Age, y			
<3	24 (43.6)	49 (43.0)	.94
≥3	31 (56.4)	65 (57.0)	
Male sex	27 (49.1)	60 (52.6)	.67
Living on base	19 (34.6)	36 (31.6)	.70
Parents			
married/cohabitating	51 (92.7)	101 (88.6)	.40
No. of children in home, mean (SD)	1.59 (0.63)	1.64 (0.78)	.69

Abbreviations: CES-D, Center for Epidemiologic Studies–Depression screener; PSI-SF, Parenting Stress Index–Short Form.

$P = .08$ ) compared with same-aged children in the nondeployed group. There was no association between deployment and TRF scores for this younger age group.

### MULTIVARIATE ANALYSIS

The results of the multivariate regression analysis are presented in **Table 3**. After controlling for respondent's age, total PSI-SF score, total CES-D score, number of children in the home, and the deployed service member's rank, we found that children aged younger than 3 years with a deployed parent had significantly lower parent-reported externalizing (42.02 vs 47.01,  $P = .02$ ) and total (42.25 vs 46.46,  $P = .05$ ) symptom scores on the CBCL than children without a deployed parent. In contrast, children aged 3 years or older with a deployed parent had significantly higher scores on the internalizing (49.28 vs

**Table 2. Unadjusted Analysis of Child Outcomes by Age and Parent's Deployment Status**

Outcome	Full Sample (N=169)			Children Aged <3 y (n=73)			Children Aged ≥3 y (n=96)		
	Mean (SD)		P Value	Mean (SD)		P Value	Mean (SD)		P Value
	Deployed (n=55)	Nondeployed (n=114)		Deployed (n=24)	Nondeployed (n=49)		Deployed (n=31)	Nondeployed (n=65)	
Parental CBCL score									
Internalizing	47.38 (9.88)	44.77 (9.60)	.10	45.63 (8.28)	45.20 (9.90)	.86	48.74 (10.90)	44.45 (9.43)	.05
Externalizing	46.42 (9.45)	45.63 (10.07)	.63	43.92 (8.33)	48.14 (10.06)	.08	48.36 (9.93)	43.74 (9.74)	.03
Total	46.13 (9.50)	44.96 (10.03)	.47	44.08 (8.91)	47.12 (10.22)	.22	47.71 (9.77)	43.34 (9.64)	.04
TRF score									
Internalizing	48.07 (11.34)	45.83 (11.19)	.23	47.67 (10.73)	48.27 (12.10)	.83	48.39 (11.96)	44.00 (10.16)	.06
Externalizing	50.15 (12.42)	49.03 (10.56)	.54	49.20 (11.01)	53.06 (9.88)	.14	50.87 (13.54)	45.99 (10.10)	.05
Total	48.75 (13.36)	47.45 (12.26)	.53	48.21 (12.34)	52.10 (11.20)	.18	49.16 (14.28)	43.94 (11.93)	.06

Abbreviations: CBCL, Child Behavior Checklist; TRF, CBCL-Teacher Report Form.

**Table 3. Adjusted Analysis of Child Outcomes Stratified by Age With Age by Parental Deployment Interaction<sup>a</sup>**

Outcome	Children Aged <3 y (n=73)			Children Aged ≥3 (n=96)			Age by Deployment P Value
	Mean (SE)		P Value	Mean (SE)		P Value	
	Deployed	Nondeployed		Deployed	Nondeployed		
Parental CBCL score							
Internalizing	45.05 (2.22)	45.55 (1.67)	.83	49.28 (1.71)	44.75 (1.32)	.03	.07
Externalizing	42.02 (2.05)	47.01 (1.55)	.02	48.50 (1.57)	43.31 (1.21)	.007	<.001
Total	42.25 (2.07)	46.46 (1.56)	.05	47.71 (1.51)	42.68 (1.16)	.006	<.001
TRF score							
Internalizing	45.99 (3.02)	47.18 (2.28)	.70	47.97 (2.13)	43.79 (1.64)	.10	.14
Externalizing	47.81 (2.64)	51.73 (1.99)	.14	50.21 (2.23)	45.62 (1.72)	.08	.02
Total	46.42 (2.95)	50.79 (2.22)	.15	48.54 (2.52)	43.73 (1.94)	.11	.03

Abbreviations: CBCL, Child Behavior Checklist; TRF, CBCL-Teacher Report Form.

<sup>a</sup>Adjusted for respondent Center for Epidemiologic Studies-Depression screener score, Parental Stress Index-Short Form total score, respondent age, deployed service member's rank, and total number of children in the home.

44.75,  $P = .03$ ), externalizing (48.50 vs 43.31,  $P = .007$ ), and total (47.71 vs 42.68,  $P = .006$ ) symptom scores on the CBCL than those without a deployed parent. A trend toward higher childcare provider-reported scores on all 3 symptom scales of the TRF was found for the older age group of children with a deployed parent (internalizing,  $P = .10$ ; externalizing,  $P = .08$ ; total,  $P = .11$ ).

#### AGE BY DEPLOYMENT INTERACTION

The differential response to deployment of children in different age categories was explored further through the introduction of an interaction term of age category by deployment status. After controlling for respondent's age, stress and depressive symptoms, deployed service member's rank, and total number of children in the home, we found an age by deployment interaction: children aged 3 years or older with a deployed parent had significantly higher externalizing and total scores on the CBCL (externalizing,  $P < .001$ ; total,  $P < .001$ ) and TRF (externalizing,  $P = .02$ ; total,  $P = .03$ ) compared with same-aged children without a deployed parent and children aged younger than 3 years regardless of deployment status.

#### CLINICALLY ELEVATED CBCL AND TRF SCORES

To determine if parental deployment was associated with clinically elevated scores on the CBCL and TRF, we analyzed these outcome variables as a 2-level categorical variable.  $t$  Scores greater than 60 on the internalizing, externalizing, and total symptom scales are considered clinically elevated (**Table 4**).<sup>17</sup> On unadjusted analysis, for children in the younger age group, deployment status was not associated with clinically elevated scores on either the CBCL or TRF. For children in the older age group, however, deployment was significantly associated with a greater likelihood of having a clinically elevated internalizing score as reported both by parents and childcare providers. There was also a trend for children aged 3 years or older with a deployed parent to have a higher likelihood of a clinically elevated externalizing score as reported by parents and childcare providers and clinically elevated total scores as reported by parents. While this finding is consistent with our analysis of the CBCL and TRF as continuous variables, a clinically elevated score on any of the subscales was a relatively rare event and a further controlled multivariate analysis could not be done.

To our knowledge, this is the first study to (1) demonstrate an effect of parental wartime deployment in children younger than 5 years that is independent of the non-deployed parent's stress and depressive symptoms and (2) to use parents and childcare providers as informants in this context. Our data indicate that children aged 3 to 5 years with a deployed parent experience greater behavioral symptoms than children without a deployed parent. Our data also indicate that children aged between 1½ and 3 years react differently to having a parent deployed than those aged 3 to 5 years.

Parents of children in the older age group (3-5 years) who have a deployed spouse reported significantly higher internalizing, externalizing, and total symptom scores on the CBCL. These findings are similar to those of children older than 5 years in other research.<sup>8,11,12,24</sup> Such reported differences might be dismissed as distorted perceptions of the child by the distressed nondeployed parent; however, the association remained after controlling for parental stress and depressive symptoms. There was also a trend for childcare providers to report similarly elevated scores on the TRF.

A new and interesting finding of our research is the suggestion by the data that children aged between 1½ and 3 years appear to react differently to parental deployments than children aged 3 to 5 years (by parental report). The children with the highest reported behavioral symptoms were those aged 3 to 5 years who had a deployed parent. However, children aged between 1½ and 3 years with a deployed parent had significantly lower externalizing symptoms scores as reported by their caregiver parents. In our small sample, it was not possible to tease out the factors that may explain this apparently paradoxical observation. The effect may be independent of deployment and due to factors not captured by our study. Children have a better response to stress when they have a caring and supportive adult present.<sup>25</sup> For most of the children in our sample, the deployed parent was their father. The time between 18 and 35 months is critical for the development of attachment relationships. For most children, their main attachment figure is their mother. As a result of a father's deployment, these young children in our sample may, by default, have more time with their preferred attachment figure, thereby providing a continuous secure base for them during the parental separation. This hypothetical effect may be attenuated for older children, who are more aware of the absence of their other parent and are more involved in relationships outside of the family.

We must be cautious about generalizing from these findings. All respondents lived within a military community, which offers resources to support military families during times of deployment. Lengths of deployment on average at the time of measurement were relatively brief, with a mean of 3.9 months. For security reasons, we cannot ascertain the explanation for the relatively homogeneous and short length of deployments found in this sample. In general, operational units from a single military base are often deployed together. Children in this

**Table 4. Unadjusted Rates of Clinically Significant Scores on CBCL and TRF for Children Aged 3 Years or Older**

Outcome	Children, No. (%)		P Value <sup>a</sup>
	With Deployed Parent (n=31)	Without Deployed Parent (n=65)	
Parent CBCL score			
Internalizing	6 (19.4)	1 (1.5)	.004
Externalizing	6 (19.4)	4 (6.2)	.07
Total	5 (16.1)	3 (4.6)	.10
TRF score			
Internalizing	5 (16.1)	2 (3.1)	.03
Externalizing	7 (22.6)	6 (9.2)	.10
Total	6 (19.4)	6 (9.2)	.20

Abbreviations: CBCL, Child Behavior Checklist; TRF, CBCL-Teacher Report Form.

<sup>a</sup>Fisher exact test.

study attended high-quality childcare on a routine basis, which may have provided a level of stability and consistency for these children that could mitigate their response to parental deployment. Yet, despite these favorable demographic and contextual conditions, there were significant differences in the behaviors of children aged 3 years and older with a deployed parent compared with peers whose parent was not deployed.

Questions may be raised about the clinical importance of our findings. *t* Scores higher than 60 on the CBCL and TRF are suggestive of symptoms that required further evaluation or treatment. In our sample, older children with a deployed parent were significantly more likely, on bivariate analysis, to have clinically elevated internalizing scores. A trend in the same direction was also noted on the TRF.

Our study is limited by its cross-sectional nature and relatively small sample size. This constrained our ability to examine clinical cut-off scores in a multivariate analysis and the effect of maternal vs paternal deployment on young children. Because the sample only included children whose parents were in active duty (military families enrolled in on-base childcare centers), the applicability of these findings to children enrolled in family-based childcare, off-base childcare, or no childcare or those living in Reserve National Guard families is limited. We report the experience of children on 1 Marine base and generalization to other Marine or non-Marine facilities should be undertaken with care.

The childcare providers were not blinded to the deployment status of children in their care. As such, their reports may reflect their own biases regarding the effect of parental deployment on child behavior. Additionally, there may be residual confounders not accounted for by our analysis. The mean length of deployment for our sample was relatively short. Therefore, we did not attempt to describe the effect of various phases of deployment (predeployment, deployment, and reunification) on the behavior of these children, though there are multiple popular media reports of difficult and sometimes tragic sequelae of a service member's return from Iraq or Afghanistan on spouses and children.

## CONCLUSIONS

Our findings indicate that young children, especially those aged 3 to 5 years, have behavioral responses to parental wartime deployments, independent of the nondeployed parent's symptoms of stress and depression. Additionally, there is a suggestion that children in the older age group are more likely to have clinically elevated internalizing symptom scores as reported by parents and child-care providers. Larger, longitudinal studies are needed to ascertain whether there are changes in children's behavior from the time before parental deployment, during parental deployment, and at the time of reunification. This information is necessary to provide clinicians serving military families with evidence-based anticipatory guidance and clinical interventions. Finally, the needs of the children of deployed parents in the National Guard and Reserves also warrant urgent further elucidation.<sup>26</sup>

**Accepted for Publication:** August 1, 2008.

**Correspondence:** LTC Molinda M. Chartrand, MD, PSC 9 Box 2263, APO, AE 09123 (molinda.chartrand@spangdahlem.af.mil).

**Author Contributions:** *Study concept and design:* Chartrand, Frank, and Shope. *Acquisition of data:* Chartrand. *Analysis and interpretation of data:* Chartrand, Frank, White, and Shope. *Drafting of the manuscript:* Chartrand. *Critical revision of the manuscript for important intellectual content:* Chartrand, Frank, White, and Shope. *Statistical analysis:* Chartrand and White. *Obtained funding:* Chartrand. *Administrative, technical, and material support:* Chartrand. *Study supervision:* Frank and Shope.

**Financial Disclosure:** None reported.

**Funding/Support:** This study was supported by the Joel and Barbara Alpert Foundation and the Society for Developmental and Behavioral Pediatrics. Support in the form of books was provided by Reach Out and Read.

**Disclaimer:** The views expressed in this article are those of the authors and do not reflect the official policy or position of the US Air Force, Department of Defense, or US government.

**Previous Presentation:** Results from this study were presented at the Pediatric Academic Societies Meeting; May 3, 2008; Honolulu, Hawaii.

**Additional Information:** Research data derived from The Effect of Parental Deployment on the Behavior and Healthcare Utilization of Young Dependent Children in Active Duty Military Families, an approved Naval Medical Center (Portsmouth, Virginia, institutional review board/Institutional Animal Care and Use Committee) protocol (Clinical Investigation Protocol No. P07-008).

**Additional Contributions:** Marilyn Augustyn, MD, Steven Parker, MD, and Howard Bauchner, MD, reviewed and critiqued earlier versions of this manuscript. Timothy Heeren, PhD, provided statistical advice. Joan Cordero, MPA, collected data for this study.

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