Effects of War-Induced Maternal Separation on Children's Adjustment During the Gulf War and Two Years Later[1]

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Military personnel deployed to the Middle East included an unprecedented number of women, many of whom were mothers. Using a structural equation modeling approach, we examined the predictors of children's adjustment problems in data collected from a representative sample of 263 Air Force mothers 2 years after the Gulf War. Using a retrospective survey, we found that the main predictors of children's adjustment problems at the time of the war were mothers' difficulties in providing for the care of the children, mothers' deployment in the theater of the war (vs. deployment elsewhere), and degree of change in children's lives. Most important, war-related adjustment problems were not related to children's adjustment 2 years later, suggesting that the effects of maternal separation during the war were transient.

The large mobilization and deployment of military personnel following the invasion of Kuwait in August 1990 and during the Gulf War included a large number of women, many of whom were mothers with dependent children. The media soon captured the demographics of the deployment, calling the operation the "Mommy War" (Holm, 1992). By war's end, a total of 40,793 women had served in the Persian Gulf. The Air Force alone deployed 4,246 women and nearly a third (32%) of these women had at least one dependent child. These children, who were left behind, were cared for by fathers and other relatives (U.S. Presidential Commission, 1993).

Questions began to surface concerning the potential impact of the mass deployment on the well-being of children as the scope of mobilization increased

during the period between Operation Desert Shield and Operation Desert Storm. However, we did not know what problems might occur or what could be done to prevent them (Costello, Phelps, & Wilczenski, 1994; Monaco & Gaier, 1992). Little is known about the impact of wartime separation of women from their families on the well-being of family members, particularly children.

It must be recognized that the deployment of a military parent is stressful for a child. For the children whose mothers were serving in the Gulf War, life stressors may have been major and may have affected multiple domains of their lives. For example, many children went to live with new caregivers, often in a new geographic location and social environment. They were exposed to media reports that highlighted the dangers in the war zone (Hoffner & Haefner, 1994; Safran, 1993). If a child had adjustment problems, we did not know if they resulted from separation stress, fear of loss of the mother, life changes such as relocation, or a combination of factors. We did not know to what extent adjustment problems could be attributed to the mother's demographic characteristics, social resources, or circumstances of deployment, or to the nature of the family life disruption. We also did not know whether a child's adjustment problems were temporary or whether the child's gender and age affected the onset, expression, and duration of the adjustment problems.

Research findings concerning the differential effects of life stressors on boys versus girls suggest that girls are more likely to exhibit depressive symptoms (Ge, Conger, Lorenz, & Simons, 1994), and boys are more likely to manifest conduct problems (Gjerde, Block, & Block, 1988). The consensus is that boys act out and girls internalize their feelings concerning family stressors (Flanagan & Eccles, 1993). Although girls have been found to be more emotionally reactive than boys (Ge et al., 1994) and generally judge events to be more upsetting than boys (Brown & Cowen, 1988; Lewis, Siegel, & Lewis, 1984), it is also believed that it is more acceptable for girls to be more expressive than boys (Hamilton, VanMouwerik, Oetting, Beauvais, & Keilin, 1988; Slee & Cross, 1989). In military families, it has been shown that boys may have greater difficulty with separation than do girls (Dickerson & Arthur, 1965). However, until recently, the separation was due to the father's absence, which leaves open the question whether boys and girls react differently to the separation from their military mother.

In contrast to more general life stressors, there is evidence that boys and girls react differently to war-related stress (Chimienti & Abu Nasr, 1992). Boys are more troubled with nervous, regressive, aggressive, or depressive symptoms or social misbehavior, or a combination of these. In contrast, girls tend to experience more war-related anxieties and to express more separation anxiety than do boys under these specific circumstances (Engel, 1984; Hesse, 1986; Moracco & Camilleri, 1983).

As for the effects of age, a preponderance of evidence suggests that younger children (6 months to 4 years) are more vulnerable to psychological problems during stressful situations (Lystad, 1984; Rosenthal & Levy-Shiff, 1993; Rutter, 1993). They are more distressed when separated from a parent (Vormbrock, 1993) and more likely to experience fears of abandonment (Costello et al., 1994). These effects were confirmed by experts who testified before Congress following the Gulf War that young children separated from their mothers are more vulnerable to emotional and psychological problems, such as anxiety, depression, and insecurity (U.S. Presidential Commission, 1993). Further, child development experts predicted that younger children would be most profoundly affected by the separation. Citing research based on attachment theory (e.g., Bowlby, 1960; Vormbrock, 1993), experts agreed that children from birth to 3 years of age would be most vulnerable, responding with anxiety and depression (U.S. Presidential Commission, 1993).

Older children, in contrast, have more cognitive sophistication and can comprehend stressful events going on around them (Hobfoll et al., 1991; Myers-Walls & Fry-Miller, 1984; Rigamer, 1986). They are more prone to worry than are younger children (Thearle & Weinrich-Haste, 1986), and may experience greater psychological turmoil (Buban, McConnell, & Duncan, 1988). Older children are concerned about the disruption of their family life (Kelly & Rieber, 1992). Moving into the role of the absent parent, they may experience loneliness, abandonment, guilt, and even anger (Amen, Jellen, Merves, & Lee, 1988; Hobfoll et al., 1991; Palmer, 1986). Adolescents may express hostility toward the remaining parent (Honig, 1986) or hold resentment over increased responsibility and household duties (Kelly & Rieber, 1992), and discipline problems may develop. In summary, it appears that while the expression of adjustment problems may vary according to the age or gender of the child, children of all age and gender groups are almost equally likely to experience the adverse effects of stressful life events.

The invasion of Kuwait and the Gulf War provided a unique opportunity for the study of adjustment problems of children of military mothers. In this paper, we identify and examine retrospectively the factors that are most predictive of children's adjustment problems during the mother's service in the war and assess factors that are predictive of children's adjustment problems 2 years post-war. We provide some answers to the following specific questions: (a) What are the immediate and long-term effects of mothers' wartime deployment on their children's adjustment? (b) What are the effects of maternal separation and associated changes in the children's lives on the adjustment problems of children? and (c) Are there differential effects on children's adjustment as a function of gender or age? Answers to these questions are guided by a series of hypotheses based on the existing literature regarding

adverse effects of stressful life events on children's well-being (Compas, 1987a, 1987b; Dubow & Tisak, 1989; Quamma & Greenberg, 1994; Sterling, Cowen, Weissberg, Lotyczewski, & Boike, 1985; Swearingen & Cohen, 1985a, 1985b), and the influence of multiple factors (e.g., mother's mental health) on the well-being of children.

Consistent with the literature on the effects of stressful life events on children's well-being (Compas, 1987a, 1987b; Johnson, 1986; Sarason, Johnson, & Siegel, 1978; Swearingen & Cohen, 1985a, 1985b), we first hypothesized that the scope of changes in children's lives is a significant predictor of their adjustment problems. Second, we hypothesized that in the period prior to and during the war, effects on children of difficulties of the mother in providing for the care of children are particularly pronounced. Third, we hypothesized that the significant predictors of children's adjustment problems 2 years after Desert Storm are the children's adjustment problems during the war, poor mental health of the mother, and difficulties of the mothers in providing for their care. Fourth, we hypothesized that the significant predictors of the mothers' poor mental health are financial, job, and parental strain (Barnett & Marshall, 1991; Berkowitz, 1989; Conger et al., 1991, 1992; Kandel, Davies, & Raveis, 1985). Fifth, we hypothesized that financial strain and difficulties in providing for the care of the children are predictors of job and parental strain (Lempers, Clark-Lempers, & Simons, 1989; Patterson, Reid, & Dishion, 1992; Vormbrock, 1993). Sixth, we hypothesized that difficulty in providing care 2 years after Desert Storm is predicted by financial strain 2 years after the war and by difficulties in providing care at the time of the war.

Method

Model

We present a conceptual model based on the existing literature regarding (a) the adverse effects of stressful life events on children's well-being (Compas, 1987a, 1987b; Dubow & Tisak, 1989; Quamma & Greenberg, 1994; Sterling et al., 1985; Swearingen & Cohen, 1985a, 1985b), and (b) the influence of related factors such as financial strain or difficulties in providing for care on the well-being of children. We used structural equation modeling to provide both an analytic and a statistical tool to represent and test the joint influence of multiple factors on the outcomes of interest. We also used the structural modeling approach to test the viability of the model (i.e., the degree to which the data fit the model) and to estimate the degree of influence of the various factors on our mediating and outcome measures. The model and the results of its test are presented in Figure 1.
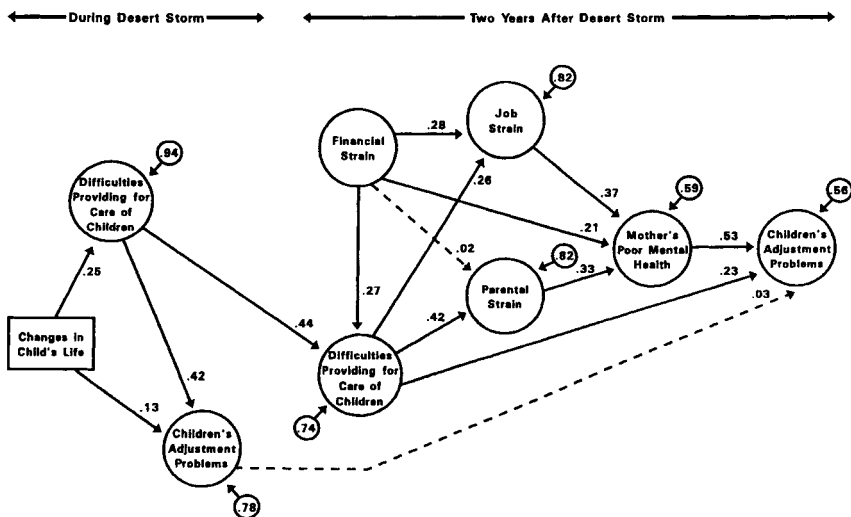
Figure 1. Structural equation model of the predictors of children's adjustment problems during the Desert Shield/Storm war and 2 years later, $\chi^2(119, N = 244) = 185, p < .001$, NFI = .91, NNFI = .95, CFI = .97, RMR = .046. Solid lines represent statistically significant paths at $p < .05$. Dotted, broken lines represent paths which are not statistically significant. Numbers in small circles represent residual variance.

The model is presented as longitudinal because it separates stressors occurring during the war period from those occurring 2 years after Desert Storm. The effects of military background variables (e.g., rank) and socioeconomic and demographic variables are not represented in this model that encompasses both periods. Instead, the effects of these variables are tested separately in supplementary models, one for the retrospective reports regarding the period of Desert Shield and Desert Storm (Figure 2), and another for the data-collection period 2 years later (Figure 3).

Sampling Procedure

We analyzed data collected from a representative sample of Air Force mothers who served in the military during Operations Desert Shield and Desert Storm. These data are retrospective about their own experiences and those of their children during the period of the war, and current about their experiences 2 years later at the time of the survey.

A computerized data tape was provided by the Department of Defense Manpower Data Center (DMDC) with background demographic and military
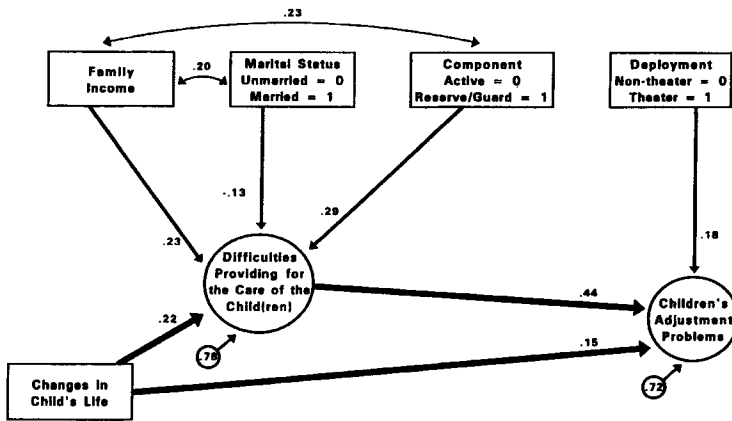
Figure 2. Children's adjustment problems during the time of mother's deployment in Operations Desert Shield/Storm, $\chi^2(23, N = 244) = 24, p < .44$, NFI = .95, NNFI = .99, CFI = .99, RMR = .04. All paths are statistically significant at $p < .05$. Numbers in small circles represent residual variance. Paths representing effects of background variables are drawn in thinner lines.

Figure 3. Children's adjustment problems as a function of Air Force mothers' strains, difficulties providing care and background variables, $\chi^2(23, N = 244) = 2, p < .44$, NFI = .95, NNFI = .99, CFI = .99, RMR = .04. All paths are statistically significant at $p < .05$. Numbers in small circles represent residual variance. Paths representing effects of background variables are drawn in thinner lines.
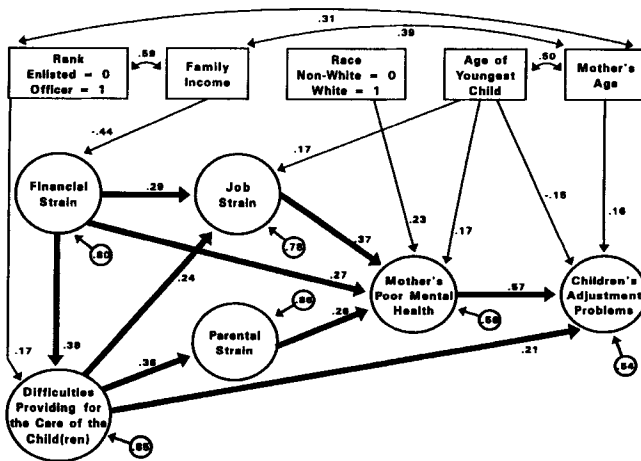
information on all of the 88,415 women who were in military service (active duty and activated reserve and guard members) in the Air Force during Operations Desert Shield and Desert Storm; that is, from August 1, 1990 to May 31, 1991.[3] (Henceforth we refer to this time as the war period). A stratified sample of 638 women was drawn from the database for the purpose of our study.

To achieve representativeness, as well as to obtain large enough subgroups for statistical analyses of particular interest, we applied a random-sampling procedure with oversampling from certain strata. Thus, the sampling frame was stratified on component of the Air Force (active duty, 89%; reserve, 9%; guard, 2%), deployment (in theater of operations, 7.5%; elsewhere, 92.5%), and parental status (nonparents, 68%; parents, 32%). Our obtained stratified sample of Air Force women consisted of 50% active duty, 25% reserve, and 25% guard; 55% nonparents and 45% parents; and 33% who were deployed to the theater of operations versus 66% who served elsewhere.

Of the 638 women who were sampled, 525 (82%) were located and provided data in one telephone interview and two successive self-administered questionnaires, which were mailed to the respondents within a period of 6 weeks. Only those respondents who had a dependent child during the war period were included in the analyses reported in this paper.

Data-Collection Procedures

Respondents were contacted via a letter describing the general purpose of the study and were then interviewed for approximately 25 min by telephone. Immediately following the telephone interview, the respondents were mailed the first questionnaire (T1) with a letter that explained the purpose of the study, that participation was completely voluntary, and that individual responses would remain confidential. Respondents were also promised payment for their effort in providing information.

Within 1 week of receiving the first completed questionnaire from each respondent, the second self-administered questionnaire (T2) was mailed with a $24 check ($12 for the telephone interview and $12 for returning the first questionnaire). When the second self-administered questionnaire was received, an additional $12 check was mailed.

The telephone interview was conducted by trained interviewers using computer-assisted telephone interviewing (CATI). Questions were designed to capture demographic and biographical data on participation in the armed forces and in Operations Desert Shield and Desert Storm, as well as demographic detail

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[3]Although the cease-fire was declared on February 28, 1991, we extended the period to May 31, 1991, since many troops remained in the theater to redeploy equipment and supplies.

about dependent children. Each child's name was recorded and used later to personalize the self-administered questionnaires.

The T1 questionnaire included questions that focused on the respondent's primary work. *Primary work* was defined as the Air Force assignment for active duty women or a civilian job for reserve and guard members. Sections were included on the respondent's relationship with her significant other, parenting, personal health and well-being, and demographics.

The T2 questionnaire contained a section on employment oriented to the military work of reserve and guard members. Sections were included on childrens' life events and experiences during the war, childrens' distress symptoms during the war period and 2 years following Desert Storm, the respondents' attitudes and intentions regarding reenlistment, and additional questions about respondent health and well-being.

Measures

Background Information

Demographic information. Subjects were asked standard survey questions for reporting age, education, marital status, family income, occupation, race or ethnic identification, and dependent children. Details were collected on each child's gender and birth date.

Military status. Questions asked about the respondents' Air Force rank and military component (active duty, reserve, or guard) during the war period. Demographic information as well as relevant biographical data, such as military status and rank, were also supplied on tape by the DMDC. The data from the tape were used to complete the data set when information from the respondent was missing.

Strains in Major Life Domains

Job strain. There were eight items on job strain, of which six were developed by Kandel et al. (1985) and also used by Frone, Russell, and Cooper (1992a, 1992b). Two additional items ("feeling harassed," "intimidated") were added to represent aspects of distress in military work environments (Johnson & Lewis, 1991; Schneider & Schneider, 1992). The items assessed various daily emotional experiences on the job (e.g., "relaxed," "frustrated," "upset"). The 4-point response scale for these items ranged from 1 (*not at all*) to 4 (*very*). Cronbach's alpha coefficient was .83 (Nunnally, 1978).

Financial strain. A three-item index (Kessler, Turner, & House, 1988; Vinokur & Caplan, 1987) measured financial strain, based on answers to three

questions with 5-point rating scales: "How difficult is it for you to live on your total household income right now?"; "In the next 2 months, how much do you anticipate that you or your family will experience actual hardships, such as inadequate housing, food, or medical attention?"; and "In the next 2 months, how much do you anticipate having to reduce your standard of living to the bare necessities of life?" The alpha coefficient for the index was .83. The three items were used as the indicators of the financial strain latent construct.

Parenting strain. This is a measure based on work by Frone et al. (1992a, 1992b) and others (Kandel et al., 1985). The six-item scale was developed by Kandel et al. (1985) to assess the strength of emotional reactions (e.g., upset, frustrated) in day-to-day experiences with children. The parenting strain scale had a Cronbach's alpha coefficient of .77. The parenting strain latent construct in our structural latent analyses comprised two subindexes, each formed from a random half of the items of the entire index.[4]

Difficulty in providing care for children. Respondents rated the extent to which it was difficult for them to provide care for their children during the war period, and 2 years after Desert Storm. The areas assessed included providing for daily care; providing financially; meeting children's physical, emotional, social, and educational needs; and the extent to which responsibilities to their work and their children conflicted. Extent of difficulty in each area was rated on a 5-point scale ranging from 1 (*none or no extent*) to 5 (*a very great extent*). The Cronbach's alphas of these indexes for the war period and 2 years after Desert Storm were .87 and .85, respectively. For each time period, the underlying latent construct comprised two subindexes, each formed from a random half of the items of the entire index.

Mental Health and Well-Being of Mothers

Depression symptoms. Depression was measured by an 11-item depression symptoms index based on the Hopkins Symptom Checklist (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). The 11-item scale required respondents to indicate how much, from 1 (*not at all*) to 5 (*extremely*), they had been bothered or distressed in the last 2 weeks by various depression symptoms such as "feeling blue," "having thoughts of ending one's life," and "crying easily." The Cronbach's alpha coefficient of the index was .86.

Anxiety symptoms. These symptoms were measured by a 10-item anxiety symptoms index based on the Hopkins Symptom Checklist (Derogatis et al.,

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[4]The use of randomly chosen items to form subindexes as indicators of constructs for structural equation analyses is a frequently used procedure (e.g., Stacy, Bentler, & Flay, 1994; Vinokur & van Ryn, 1993).

1974). The index required respondents to indicate how much, from 1 (*not at all*) to 5 (*extremely*), they had been bothered or distressed in the last 2 weeks by symptoms of anxiety such as "nervousness," "feeling scared for no reason," and "worrying about things." The Cronbach's alpha coefficient of the index was .85.

The *mother's poor mental health* latent construct comprised the depression symptoms and anxiety symptoms indexes.

Wartime Life Changes and Adjustment Problems of Children

Time away from children during Desert Storm. This was assessed by respondent reports of the number of nights, weeks, or months they were away from their children between August 1, 1990 and May 31, 1991, due to their military responsibilities.

Number of life changes experienced by child. This was assessed by respondent reports about whether the child experienced a change in place of residence, a change of school, changes in primary caregiver, a change in daily schedule, or separations from friends, siblings, pets, and possessions.

Children's adjustment problems. These problems were assessed by a modified version of the Achenbach and Edelbrock (1983) behavioral checklist (Achenbach & McConaughy, 1987). This instrument is widely used to assess emotional and behavioral problems of children of practically all age and gender groups because it includes questions that indicate adjustment problems and distress symptoms in several emotional and behavioral domains. *Adjustment problems at the present time* were based on an index of 18 items assessing various negative and positive manifestations of behavioral problems or emotional states (e.g., anxiety, depression, aggressiveness, impulsiveness, relaxed, happy, cooperative). The items required the mother to indicate on 5-point scales how much of the time during the last 2 weeks the child had been experiencing or showing the various behaviors or symptoms. The scales range from 1 (*none of the time*) to 5 (*all of the time*). The Cronbach's alpha for this index was .91. The assessment of *children's adjustment problems during the war* included the same 18 items. However, the response scale for each item required the respondents to rate the child in terms of "How much more or less (or same) was each symptom (e.g., anxiety, impulsiveness) displayed by the child during Desert Shield and Desert Storm *compared to the time before that period?*" The alpha coefficient for this measure was .89.

Each latent construct representing the child(ren)'s adjustment problems (i.e., during the war, and at the present time) comprised two subindexes, each formed from a random half of the items of the entire index.

Description of All Respondents

Military status. Of the 525 respondents who were interviewed, 370 (70.5%) were enlisted and 155 (29.5%) were officers. By May 1991, the respondents had served an average of 8.72 (*SD* = 5.38) years in the military. By the summer of 1993, there were 187 (36%) were on active duty, 228 (44%) in the reserve or National Guard, and 109 (21%) had left the Air Force (about half classified as inactive reserve). (One respondent did not indicate this variable.)

Demographics. The respondents' ages ranged from 19 to 60 years, with a mean of 33.9 (*SD* = 7.0). The mean number of years of education was 14.6 (*SD* = 1.9). In terms of marital status, 110 (21%) were never married, 287 (55%) were married, 28 (5%) were separated, 97 (19%) were divorced, and 3 (0.6%) were widowed. Of the 525 women, 298 (57%) were also primary care providers, with a mean of 1.7 (*SD* = 0.8) children. The median family income was $36,080 per year. The racial or ethnic composition of the sample included 81% Whites, 13% African Americans/Blacks, 3% Hispanics, and 3% other minorities. Of the 337 women who were out of the active duty Air Force or in the reserve or guard, 222 (66%) were employed in a civilian job.

Description of the Sample of Mothers Used for the Analysis

Analysis of the predictors of child adjustment during the war period and 2 years after Desert Storm was limited to respondents who reported parenting a child born prior to May 31, 1991, the end of the deployment period following the war.

Military status. Of the 263 Air Force mothers who were interviewed, 187 (71%) were enlisted and 76 (29%) were officers. By spring and summer of 1993, the respondents in the subsample of mothers had served an average of 11.47 (*SD* = 4.83) years. During the war period, 102 (39%) were on active duty and 161 (61%) were on reserve/guard duty. Thirty-five (13%) have since left the Air Force (with half classified as inactive reserve).

Demographics. The respondents' ages ranged from 19 to 51 years, with a mean of 33.7 (*SD* = 5.76). The median number of years of mothers' education was 14.00 (*M* = 14.5, *SD* = 1.8); only 1 (0.4%) had completed part of high school, 49 (20.3%) were high-school graduates, 103 (42.7%) had completed 1 to 3 years of college, 40 (16.6%) had completed 4 years of college, and 48 (19.9%) had additional years of education. Of 247 reporting marital status, 177 (71.7%) were married or living with a partner in a committed relationship, and 70 (28.3%) were single (includes never married, divorced, separated, and widowed). The number of dependent children living with the respondent during the war period ranged from one to four, with a mean of 1.6 (*SD* = 0.7). The mean age of the children was 7.3 years (*SD* = 4.6). The median family income at the

time of the survey was $41,550 per year. The racial or ethnic composition of the sample included 210 (80%) non-Hispanic Whites and 53 (20%) minorities including Hispanics, of which 35 (13.3%) were African Americans/Blacks.

Response Rate and Analysis of Attrition Bias

The 638 respondents who were sampled were scattered among Air Force bases and locations all over the world. Further, many have moved and/or changed names (through marriage or divorce), or left the Air Force, or a combination of these during the 2 years following the war period. Nevertheless, we were able to collect data from 525 (82%) respondents. Since the data base provided by the DMDC included demographic and military status data on all of the women, we examined whether the characteristics of the nonrespondents (the 113 women who did not provide data) differed systematically from the respondents (i.e., the 525 women who provided data for the study). Response rate was not related to marital status, parental status, years in the Air Force, or rank in the Air Force. However, the respondents, compared to the nonrespondents, were somewhat older (32 years vs. 29 years), predominantly White (87% vs. 67%), and more respondents were deployed to the theater than nonrespondents (89% vs. 79%).

Results

Analytic Strategy

The principal analyses consisted of confirmatory latent variable structural modeling using the EQS program (Bentler, 1989) to test three models. The structural modeling technique provides simultaneous estimation of the hypothesized regressions using the estimated covariance matrix generated, based on the observed covariance matrix of the measured variables. The estimated matrix is also used for evaluating the goodness of fit between the data and the model. In reporting the results of the structural equation modeling, we followed the guidelines suggested by Raykov, Tomer, and Nesselroade (1991). Frequently, structural equation models are statistically rejected by the chi-square test. For this reason, other goodness-of-fit measures, such as Bentler and Bonett's (1980) normed fit index, were used instead to indicate the degree to which the model fits the data. Four goodness-of-fit measures are reported: normed fit index (NFI), nonnormed fit index (NNFI), comparative fit index (CFI), and root mean squared residual (RMR) measure. NFI, NNFI, and CFI that exceed .90 and RMR that is below .05 are indicative of an acceptable model fit. In all instances, other goodness-of-fit measures that were examined in our analyses, such as LISREL's goodness-of-fit index (GFI) and adjusted goodness-of-fit index (AGFI) and

Bollen's (1990) incremental fit index (IFI) indexes, provided compatible results (for a detailed discussion of fit indexes, see Bagozzi & Yi, 1988; Bentler, 1990; Bollen, 1990). All of the analyses were performed separately on listwise and pairwise covariance matrices. The results were virtually the same. We therefore present the results from the pairwise matrices, which generated slightly better GFIs and are based on a larger portion of the original sample.

Over the 2-year period following the Gulf War, there were considerable changes in the respondents' demographic and military background characteristics, such as rank, military component (active, reserve, or guard), marital status, and number of children. Consequently, it was not possible to include all of the associated background variables in an overall test for the model as presented in Figure 1. Thus, in addition, two other period-specific analyses were conducted. Each of these period-specific analyses included all of the relevant variables for the respective time frame. These two additional analyses provided tests for models that focus, respectively, on the war period (Figure 2), and 2 years after Desert Storm (Figure 3).

All of the structural analyses were based on mean scores for all the children of each mother. Additional series of analyses were conducted to examine whether the results were different when they were based on the score of only *one* child for each mother. Thus, we repeated the analyses for each mother once using the score of the firstborn (or only) child, and the second time using the score of the lastborn (youngest or only) child. To investigate developmental and gender issues, we conducted comparative analyses of the younger (aged 3 to 7 years) and older (aged 8 to 17 years) children and of male children versus female children.

The Comprehensive Model for Children's Adjustment Problems

The results of testing a comprehensive model that incorporates the two time periods are displayed in Figure 1. The results of the measurement model demonstrates an acceptable fit, $\chi^2(100, N = 244) = 157, p < .001$, NFI = .92, NNFI = .95, CFI = .97, RMR = .03. The test for the model itself also produced an acceptable fit with $\chi^2(119, N = 244) = 185$ ($p < .001$) and with NFI = .91, NNFI = .95, CFI = .97, RMR = .046. Furthermore, of the 15 hypothesized paths, 13 were statistically significant at the .05 level.

For the war period and 2 years after Desert Storm, mothers' difficulties in providing for the care of children were significant predictors of their children's adjustment problems (βs = 0.44 and 0.23, respectively). As expected, because of the greater difficulties of providing care to children during the war period while significant number of mothers were away, this variable was a stronger predictor of children's adjustment problems during the time of the war period than 2 years post-war.

A predictor of the children's adjustment problems during the war was the number of changes in children's lives ($\beta = 0.13$). A predictor of children's adjustment problems 2 years post war was mothers' poor mental health ($\beta = 0.53$). The remaining significant paths in the model include the predicted effects of financial, job, and parental strain on mothers' poor mental health (βs = 0.21, 0.37, and 0.33, respectively), the predicted effects of financial strain on job strain ($\beta = 0.28$), and the effects of difficulties providing for the care of children on parental strain ($\beta = 0.42$). Interestingly, and most important, children's adjustment problems during the war did not predict their adjustment problems at the present time ($\beta = 0.03$, *ns*), suggesting that the adverse effects of mothers' service during the war were temporary.

Predictors of Children's Adjustment Problems During the War

The results of the structural analysis for describing the predictors of children's adjustment during the war period are displayed in Figure 2. These results provide an excellent fit to the model, $\chi^2(23, N = 244) = 25, p < .34$, NFI = .95, NNFI = .99, CFI = .99, RMR = .04. The results show that the significant predictors of the adjustment problems were, indeed, as predicted, the difficulties in providing for care, changes in the child's life, and deployment of the mother in the theater of war (βs = 0.44, 0.15, and 0.18, respectively). In addition, difficulties in providing care were predicted by several background variables, including family income, marital status, Air Force component, and changes in the child's life during that time (βs = 0.23, -0.13, 0.29, and 0.22, respectively). Lacking help and support from a husband, unmarried women had more difficulties in providing care, as did those in the reserve or guard, whose life circumstances changed more dramatically with the deployment during that period. Interestingly, women who reported higher family incomes were also more likely to report having difficulties in providing care.

Predictors of Children's Adjustment Problems 2 Years After the War

The results that focus on the predictors of children's adjustment problems 2 years after Desert Storm are displayed in Figure 3. Again, the data provide a good fit to the model, $\chi^2(121, N = 244) = 195, p < .001$, NFI = .90, NNFI = .95, CFI = .96, RMR = .03. As hypothesized, mothers' poor mental health was a main predictor of children's adjustment problems; in fact, it was the strongest predictor variable ($\beta = 0.57$). In addition, and as noted for the war period, difficulties in providing care appear as an independent predictor of children's adjustment problems ($\beta = 0.21$). Of the demographic background variables, two appear as additional independent predictors of children's adjustment problems.

The children of older mothers and the children who were younger or who had a very young sibling experienced greater adjustment problems than did children of younger mothers and children who were older (β = 0.16 and -0.15, for mother's age and age of youngest child, respectively).

The results of this analysis also demonstrate the adverse effects of financial strain, job strain, and parental strain on mothers' mental health (βs = 0.27, 0.37, and 0.26, respectively). In addition, mothers who identify themselves as White (vs. Black or other minorities) and mothers with a younger child (vs. an older child) also were found to have higher levels of poor mental health (β = 0.23 and 0.17, respectively). Other predicted paths included effects of difficulties in providing care on parental and job strains (βs = 0.36 and 0.24, respectively) and effects of financial strain and rank on difficulties in providing care (βs = 0.38 and 0.17, respectively). It appears that officers who also report higher family incomes have greater difficulties in providing care.

Comparative analyses of the models based on the data regarding firstborn (or only) children with lastborn (or only) children were conducted to examine whether the results were systematically different when data were not aggregated, but limited to one child per mother. In each analysis, we tested whether an unconstrained model that included the two groups provided significantly better fit to a model that constrained the factor loadings and paths of the two groups to equality. The results for the two-group comparison of the constrained comprehensive model were as follows: $\chi^2(261, N = 488) = 427, p < .001$, NFI = .91, NNFI = .95, CFI = .96; for the model for the time of the war, $\chi^2(57, N = 488) = 57, p < .48$, NFI = .95, NNFI = 1.00, CFI = 1.00; and for the present time, $\chi^2(267, N = 488) = 454, p < .001$, NFI = .89, NNFI = .94, CFI = .95. For all three models, the results of the constrained models were not statistically significantly different from the results using the unconstrained model. Finally, a detailed comparison of the path coefficients yielded by the constrained models with those obtained based on a mean score of all the children, as presented in Figures 1, 2, and 3, did not show any meaningful difference.

Age-Group Comparisons

To explore whether predictors for adjustment problems differ between younger children (aged 3 to 7 years) and older children (aged 8 to 17 years) we repeated the analyses using these two age groups. To construct the two groups, the mothers were separated into those having younger children and those having older children. If the mother had children whose ages were in both the younger and the older groups, she was randomized into one of the groups and only the children belonging to the respective group were used in the analysis. The scores of all children who belonged to the same mother and the same age group

were averaged. Thus, one group included mothers of children between the ages of 3 and 7 years (M = 5.33, SD = 1.41, N = 96). In this subgroup, the mothers had a mean age of 33 and a mean of 1.88 (SD = 0.83) dependent children. The second group included the mothers of children between the ages of 8 and 17 years (M = 11.92, SD = 2.49, N = 104). The mothers in this group had a mean age of 36 and a mean of 1.87 (SD = 0.99) dependent children.

Using the data of these two subsamples of younger and older children, we compared the results of the unconstrained model having the two groups with those of the constrained model. In relation to the number of indicators in the models, each subgroup included only a small number of cases (96 and 104 for the younger and older children's groups, respectively), it was necessary to limit the number of indicators for each latent factor in the model to one, and each index was taken as the sole indicator for its respective latent factor. Because only one indicator per factor was used, the correction for random error (i.e., unreliability of the index) was handled by setting the random error variance associated with each index to its variance multiplied by the quantity 1 minus its estimated reliability (Bollen, 1989); that is, [variance * (1 - alpha)]. The technique involved in using one composite measure per latent factor has been suggested by Bollen (1990) and Liang, Lawrence, Bennett, and Whitelaw (1990), who demonstrated that the results obtained with this method are virtually the same as when multiple indicators are used. Because this method provides an appropriate way to analyze smaller data sets, it has been applied successfully in an increasing number of recent studies (e.g., Frone et al., 1992a, 1992b; Netemeyer, Johnston, & Burton, 1990; Schaubroeck, Cotton, & Jennings, 1989).

The results for the two-group comparison of the constrained comprehensive model were $\chi^2(54, N = 200) = 60, p < .26$, NFI = .83, NNFI = .97, CFI = .97. For the model at the time of the war, the results were $\chi^2(33, N = 200) = 43, p < .12$, NFI = .70, NNFI = .88, CFI = .90; and for the present-time model these results were $\chi^2(89, N = 200) = 107, p < .09$, NFI = .79, NNFI = .94, CFI = .95.

The results of the two constrained models were not significantly different statistically from the results of the unconstrained model. However, one or two paths or correlations were significantly different between the types of model. None of these paths was related to the central questions of our study regarding direct effects on difficulties in providing care for the children or on adjustment problems of children. For example, we found that the path coefficient from job strain to mothers' poor mental health was different across the groups both in the comprehensive model (Figure 1) and in the model for 2 years after Desert Storm (Figure 3). In the younger group, the coefficients in the two models were .004 and .02, respectively. In contrast, these coefficients in the older children's group in the two models were .44 and .43, respectively. The other differences between the groups were related to correlations between demographic variables.

For example, in the model for the time of the war, the correlation between mothers' income and marital status (unmarried = 0, married = 1) was .02 for the younger group and .37 for the older group.

Gender-Group Comparisons

To explore whether different predictors account for the adjustment problems of boys versus girls, we repeated the analyses once again on each group separately and on the two groups together. To construct the two groups, the mothers of children ranging in age from 3 to 17 years were separated into either those having boys or those having girls. If the mother had both a boy (or boys) and a girl (or girls), she was randomized into one of the groups and only the children belonging to the respective group—boys or girls—were used in the analysis. The scores of children who belonged to the same mother and the same gender group were averaged. As in the age-group analyses, we used the data of the boys and girls to compare the results of the unconstrained model with the results of the constrained model of the two groups. And since we had only small groups (83 boys and 113 girls), it was necessary to limit the number of indicators for each latent factor in the model to one and to use each index as the sole indicator for its respective latent factor.

For all three models, as displayed in Figures 1, 2, and 3, in which we constrained the path coefficients and the covariances to equality for the boys and girls, the analyses produced excellent goodness of fit. In all cases the deviations of the data from the model were small, as indicated by a chi square that was not statistically significant. Furthermore, the three constrained models were not different in a statistically significant way from their counterpart unconstrained models.

Discussion

Overview of the Findings

The deployment of military mothers during Desert Shield and Desert Storm was shown in this study to put children of those mothers at risk for various adjustment problems. These risks increased significantly when the mother was deployed in the theater of war, when she experienced difficulties in providing care for the children she left behind, and when her deployment resulted in significant changes in her children's lives. The model is based on the belief that the deployment of military women creates multiple disruptions and resulting stressors within the family that have both direct and indirect influences on the well-being of individual members (Amen et al., 1988; Kelley, 1994; Kelley,

Herzog-Simmer, & Harris, 1994; Wolfe, Brown, & Kelley, 1993). Our model suggests that as mothers prepare for deployment with an uncertain future, particularly when the deployment is to the war zone, they are likely to experience separation anxiety even before they leave their children in the care of others (e.g., Hock, McBride, & Gnezda, 1989). (This effect of deployment to theater of war is shown more specifically in the model in Figure 2.) The exchange of anxiety between mother and child may account for the finding that mothers anticipating deployment reported that parenting was more stressful and their children were more difficult than mothers not anticipating deployment (Kelley et al., 1994).

Unless deployed in the theater of the war, mothers from the active-duty force who participated in the war effort continued to live with their children, usually on the military base, and to preserve the routine of their family life. In contrast, when mothers from the reserve and guard are deployed, they must leave their children behind with their spouses or other caregivers. Thus, in confirmation of findings from earlier studies (Figley, 1993; Kelly et al., 1994; Peebles-Kleiger & Kleiger, 1994), and as expected, we found that the mothers from the reserve and guard as well as unmarried mothers experienced greater difficulties in providing for the care of their children, which, in turn, increased the adjustment problems of their children. It appears that these difficulties in providing care are not just economic, but represent multiple concerns of mothers for the physical, emotional, psychological, and social well-being of their children.

The results of this study also show that the adjustment problems during the period of deployment were not associated with adjustment problems 2 years later. Therefore, findings suggest that the adjustment problems experienced by the children during the period of the mothers' deployment were transient. This encouraging outcome is in contrast with other research on life events on children's well-being. For example, it was suggested that, following divorce, children's mental health is altered for at least 2 years (Green, Grace, & Gleser, 1985; Murphy, 1986, 1987; Newman, 1976; Terr, 1985) and that recovery from divorce takes a few years if there are no further stresses (Hetherington, Cox, & Cox, 1982).

Consistent with the general literature on predictors of children's well-being, the results based on the period 2 years after Desert Storm, which are displayed in Figure 3, show that the poor mental health of the mother and her difficulties in providing for the care of her children predicted the children's adjustment problems. However, other effects of demographic variables on children's adjustment— such as mother's age and age of youngest child or effects of age of youngest child and race on mother's mental health—may be unique to this sample of Air Force mothers. For example, it may be the case that non-White mothers show

better mental health than Whites because of better career opportunities available for them in the armed forces, compared to the civilian job market.

Potential Weaknesses

While this study is based on structural modeling analyses of data from a sizable representative sample of Air Force women, its findings need to be evaluated with respect to the methodological weaknesses of the study's design and data collection methods. First, all of the data in this study were collected from the mother and thus may be influenced by common factors such as the mother's mood, mental health, and so forth. Second, in our first two models (Figures 1 and 2), three indexes are based on recall of events that happened 2 years previously: changes in a child's life, difficulties in providing for the care of the children, and children's adjustment problems. Third, one might question the validity of mothers' reports on children's adjustment problems during the war period, when most of the mothers were deployed away from home. Together, these weaknesses of the study may have resulted in inflated estimates of relations among the variables, or other biases. The weaknesses, however, did not contribute to major distortions of the findings. For example, there was an absence of a relationship among very similar strain measures, such as between parental strain and job strain and between parental strain and financial strain (Figures 1 and 3). This suggests that although the data were collected from one source, they were not seriously contaminated by the characteristics of the source that were unrelated to the measured concepts, such as mood, negative affectivity, and the like.

Close examination of the pattern of results pertaining to the retrospective assessment of the three variables relevant to the war period, including mothers' reports of their children's adjustment problems during the time that they were away from home, suggests that the results can be trusted to be free of major biases. First, the measure of changes in a child's life is based on salient factual events that would not be forgotten by the mother (e.g., change in residence, school). Second, and as expected, changes in a child's life affected the relevant variables (i.e., difficulties in providing care and children's adjustment) at the time of the war, but did not affect any of the respective variables at the later time period of data collection. Only difficulties in providing care at the time of the war were related to the same variable at the time of data collection. However, this relationship was expected, given the other relatively permanent structural determinants of this factor, which include family income, marital status, and Air Force component, as seen in Figure 2.

Finally, it seems that the separation from home and children did not impair the ability of the mothers who were away to be informed about the adjustment

problems of their children. The women who were away from home learned about their children's adjustment problems via phone conversations, mail, audiotape, or video, and even by personal visits back home for some. Although during the war many mothers were away from their children, all had intermittent opportunities to communicate with their families, and some of those serving in the theater of the war had either short assignments or temporary return duties at their home base that allowed them direct contact with the children and caregivers to enable them to monitor the well-being of their children. The average contact mothers had with their families was between one and three times per week. Mothers were separated from their children an average of 12½ weeks, however, those in the theater were separated for an average of nearly 19 weeks. Comparison of the data of the women who were away for shorter time periods (less than 2 months) with those who were away for longer periods (2 months or more) reveals, again, an expected pattern of results. Those who were away for longer periods reported that their children had significantly more life event changes than did those who were away for shorter periods (Ms = 2.88 and 1.49, SDs = 2.35 and 2.12, respectively, $p < .001$). Correspondingly, those who were away for longer periods reported that their children had significantly greater adjustment problems, and that the mothers had greater difficulties in caring for the children than did those mothers who were away for shorter periods (Ms = 3.46 and 3.17, SDs = 0.39, 0.35, respectively, for adjustment problems, $p < .001$; Ms = 2.41 and 2.04, SDs = 0.80 and 0.93, respectively, for difficulties in caring, $p < .003$). Equally important, and as expected, there were no significant differences between these two groups of women on the same three variables at time of data collection. Therefore, it is very unlikely that this coherent, expected, and complex pattern of results could have been determined solely because of biases of retrospective recall or from common factor methods of data collected from the same source.

Implications

Although father absence has long been viewed as a risk factor for family dysfunction in military settings (Jensen, Lewis, & Xenakis, 1986; Wexler & McGrath, 1991), there are few published studies to date that explore the effects of maternal separation during wartime (e.g., Kelley et al., 1994) because this is a relatively recent family problem. Our findings are specific to military mothers, but have implications to other women in nontraditional roles that temporarily separate them from their children under threatening or stressful circumstances. Our results suggest that any effort to reduce the disruptions in children's lives when mothers are called to duty are likely to reduce the negative impact of the separation on the well-being of their children.

Other efforts that can reduce the adverse effects on children's well-being when mothers serve in a war effort, particularly when the service requires separation from the children, should include both instrumental help (i.e., child care, financial help) and emotional support in providing for the care of the children. Mothers are concerned about safe, affordable, and quality care for their children, particularly under circumstances where their children may need additional comfort and support. Parental strain that accumulates from feelings of guilt and responsibility for inadequate arrangements for the care of children contributes to the poor mental health of the mother (Hock et al., 1989; Hoffman, 1974), which, in turn, as shown in our results, adversely affects the children's well-being.

Finally, it is reassuring to learn that there appear to be no long-lasting effects on the children of mothers who were deployed in the Gulf War effort. However, as more military women move into traditional male roles and career fields that require short-notice mobilizations away from home, there will be a growing need within the military community to address family support issues, such as the provision of adequate physical and emotional care for children.

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