

# Informing efforts to prevent family maltreatment among airmen: A focus on personal resilience

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## ABSTRACT

Family maltreatment is a serious public health concern within civilian and military populations. The U.S. Air Force Family Advocacy Program (FAP) delivers services to active-duty Air Force members and their families that aim to promote personal resilience and prevent maltreatment perpetration among those most at risk. Informed by family resilience and ecological perspectives, the purpose of this study is to empirically test a theory of change or conceptual model that could serve as an evidence-informed foundation for the selection of prevention interventions used by military and FAP service providers. A representative sample of 30,541 active-duty Air Force members from the 2011 Air Force Community Assessment Survey was analyzed, comprising participants who had at least one child and who were in a committed relationship. Structural equation modeling was employed to test the hypothesized model. Neighborhood safety was analyzed as a moderating influence. With a focus on personal resilience as an asset-based outcome, results indicated that personal resilience among airmen was positively associated with features of individual fitness, informal support, adaptive family processes, and unit leader support. Results also indicated that neighborhood safety significantly moderated associations in the empirical model.

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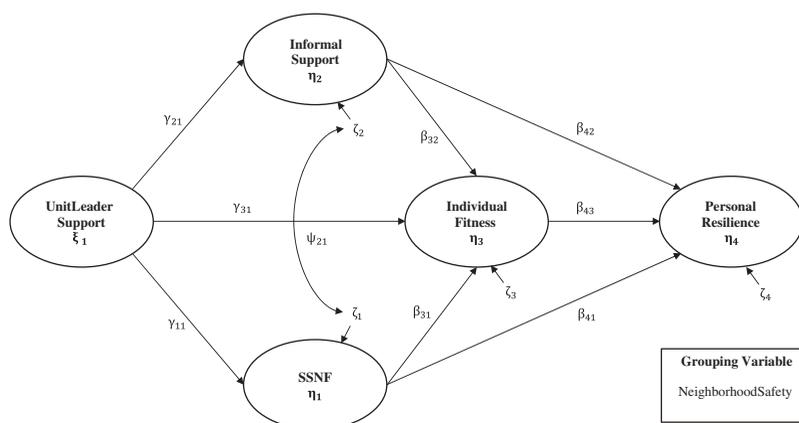
Child maltreatment;  
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Family maltreatment is a serious public health issue among members of civilian and military populations (Smith Slep, Foran, Heyman, & Snarr, 2011). General conceptualizations of family maltreatment include the perpetration of nonaccidental physical, sexual, or emotional trauma, abuse, or neglect toward an intimate partner or child. As compared with those without a maltreatment history, adult survivors of maltreatment are more likely to report poor mental health, substance use, and chronic diseases (Afifi et al., 2008; Coker et al., 2002; Golding, 1999). Among youth, victimization is associated with various adverse outcomes such as high rates of mental disorder diagnoses, suicide attempts, drug use, social and cognitive impairment, and poor academic functioning (Alink, Cicchetti, Kim, & Rogosch, 2012; Mills et al., 2011; Norman et al., 2012).

The substantial link between maltreatment victimization and poor health outcomes has led a number of government departments and centers to

advocate for effective treatment and prevention strategies (Zimmerman & Mercy, 2010). Turning to the U.S. Air Force (AF) specifically, the Family Advocacy Program (FAP) is charged with delivering prevention services to active-duty AF members (airmen; Note. The U.S. AF uses *airmen* as a gender inclusive term) and their families, with a particular focus on preventing family maltreatment among those most at risk or in early stages of exhibiting undesirable behavior (i.e., secondary prevention). However, an understanding of the specific factors or outcomes that should be the target of prevention services has been more implicit than explicit until recent efforts were undertaken to bolster the empirical base guiding the selection and implementation of FAP services (Bowen, Jensen, & Williams, 2015). Building on research in the civilian sector (O’Leary & Smith Slep, 2012), these efforts have included a systematic review that first identified the variables associated with family maltreatment among active-duty military members, and then synthesized that information to develop an explicit and inclusive theory-of-change model for maltreatment prevention (Bowen, Jensen, & Williams, 2017). This process gave particular attention to modifiable variables, or malleable mediators, to ensure that identified antecedents or correlates of family maltreatment could be effectively influenced by interventions (Fraser & Galinsky, 2010).

The purpose of the current study was to further validate this formulated theory-of-change model via secondary analysis of a large, representative sample of active-duty AF members. Support for this model could strengthen the knowledge base regarding the correlates and antecedents of family maltreatment, particularly in the AF context. Moreover, validation of model constructs and construct associations could provide FAP stakeholders (and perhaps other practitioners) clear targets for interventions designed to prevent family maltreatment. We begin with a review of relevant background



**Figure 1.** Hypothesized model. Measurement components are omitted to improve image clarity. Note. SSNF = Safe, stable, and nurturing family.

information to frame our hypothesized analytical model (see [Figure 1](#)) in which personal resilience is the dependent outcome. Variables hypothesized as associated with personal resilience are unit leader support; informal support; features of safe, stable, and nurturing families; and individual fitness.

## **Background**

### ***Secondary prevention***

The overarching goal of prevention science is “to assist societies in ensuring the social, psychological, and physical wellbeing of every member of society” (Biglan, 2016, p. 1). In the context of the family maltreatment literature, scholars now strongly recommend prevention strategies over postmaltreatment interventions (Dutton, 2012; Langhinrichsen-Rohling & Capaldi, 2012; O’Leary & Smith Slep, 2012). Arguably, prevention of family maltreatment is more cost-effective and efficacious than postmaltreatment interventions (O’Leary & Smith Slep, 2012).

Secondary prevention efforts target individuals within a population who are at risk or in the early stages of exhibiting undesirable outcomes or behaviors (Mrazek & Haggerty, 1994). The process of moving at-risk individuals away from an undesirable outcome can be optimized if these persons can be moved toward a countering positive outcome. This notion is consistent with the paradigm shift that is ongoing in public health and related disciplines, which is moving away from pathology or a problem-orientation approach toward an approach emphasizing health, wellness, and resilience (Bowen, Jensen, & Martin, 2016; Connor & Davidson, 2003; Tusaie & Dyer, 2004). As stated in a recent RAND Corporation report, “with the aim of preventing rather than simply responding to deleterious outcomes, the study of resilience is of paramount importance” (Meadows, Miller, & Robson, 2015, p.1).

A focus on resilience and positive outcomes with respect to prevention is also consistent with the Department of Defense’s Total Force Fitness initiative, which focuses on optimizing well-being and performance in the context of adversity and positive challenges (Meadows et al., 2015). Rather than merely assessing the presence/absence of family maltreatment perpetration, our hypothesized model reflects these emergent paradigms through a twofold emphasis on personal resilience as an asset-based outcome linked to reductions in family maltreatment, and an asset that individuals can be assisted in acquiring and strengthening. In a recent analysis, higher levels of personal resilience among airmen were associated with decreases in the odds of maltreatment perpetration against a partner or child (Bowen, Jensen, & Williams, 2016).

As a fortifying and clarifying example of this asset-based approach, consider practitioners who seek to strengthen couple relationships. These practitioners would likely use more than a measure of divorce/separation

occurrence to gauge the quality and dynamics of an intimate partnership. After all, divorce or separation does not always occur among couples with high levels of distress, dissatisfaction, or even harm (Amato & Hohmann-Marriott, 2007). A more desirable measure might be one that monitors factors affecting positive functioning within a couple's relationship to help couples move toward desirable outcomes (Amato, Booth, Johnson, & Rogers, 2007), which is more ambitious than merely avoiding separation or divorce. Similarly, a focus on the presence or absence of family maltreatment is likely too simplistic and shortsighted, particularly in the context of secondary prevention (O'Leary & Smith Slep, 2012).

### ***Personal resilience***

Starting from the right side of our hypothesized model shown in Figure 1, we conceptualize personal resilience, our focal endogenous construct, as an asset-based indicator for behaviors inconsistent with family maltreatment. The construct of resilience has a rich history with diverse conceptualizations (Meadows et al., 2015; Tusaie & Dyer, 2004). In this study, personal resilience reflects a general sense of self-efficacy and a perceived ability to handle unexpected events, solve problems, and regulate stress and emotions in the face of challenge or adversity (Connor & Davidson, 2003; Meadows et al., 2015). As noted earlier, we fully expect military members who report high levels of personal resilience to be less likely to perpetrate any form of family maltreatment—a notion supported by previous research (Bowen, Jensen, & Williams, 2016; Smith Slep, Foran, Heyman, & Snarr, 2010; Smith Slep et al., 2011).

Additional research has highlighted a link between a military member's ability to successfully manage stress related to work, life, and finances (i.e., high levels of personal resilience) and lower rates of perpetration of intimate partner maltreatment (Bell, Harford, Fuchs, McCarroll, & Schwartz, 2006; Fonseca et al., 2006; Foran, Heyman, & Smith Slep, 2014; Smith Slep, Foran, & Heyman, 2014). Low levels of personal resilience might be indicated when military members engage in excessive alcohol use, which is a behavior closely associated with the perpetration of intimate partner maltreatment (Foran et al., 2014; Smith Slep et al., 2014; Stander et al., 2011). In the context of the literature, we framed personal resilience as an asset-based outcome that is antithetical to maltreatment behavior and a desired outcome of FAP prevention efforts. Although this literature review uses the terms *personal resilience* and *family maltreatment* to convey related but opposing meanings, we view personal resilience as more than the opposing side of the family maltreatment dichotomy.

### ***Individual fitness***

Other correlates of family maltreatment or personal resilience include components of individual fitness, that is, indicators of individual health and wellness that range across the physical, behavioral, and psychological domains (Bowen, Jensen, & Martin, 2016). For example, higher levels of depressive symptoms among active-duty military members have been associated with elevated risk for perpetrating intimate partner maltreatment (Foran, Heyman, Smith Slep, & Snarr, 2012; Forgey & Badger, 2010; Smith Slep et al., 2011), whereas greater levels of physical health and individual functioning have been linked to lower risk for perpetrating intimate partner maltreatment (Foran et al., 2014; Smith Slep et al., 2014). Financial fitness, which is the avoidance of financial problems and stress, has been linked by senior military leaders to higher resiliency (Battaglia, 2012) and linked empirically to lower rates of intimate partner maltreatment perpetration (Foran et al., 2014; Foran et al., 2012; Smith Slep et al., 2014, 2010, 2011). These variables fit broadly within the comprehensive airman fitness framework (Bowen & Martin, 2011), which encompasses mental, physical, social, and spiritual domains of fitness—the totality of which is positively linked to individual performance-based resiliency (Bowen, Jensen, & Martin, 2016).

### ***Safe, stable, and nurturing family***

Perhaps the most well-studied correlates of family maltreatment among military members represent what the Centers for Disease Control and Prevention (CDC) conceptualize as safe, stable, and nurturing relationships and environments (Zimmerman & Mercy, 2010), or, in the case of this study, features of a safe, stable, and nurturing family (SSNF). SSNFs resemble the concept of family well-being (Armstrong, Birnie-Lefcovitch, & Ungar, 2005) marked by characteristics such as mutual respect and tolerance, successful management of personal conflicts and family challenges, clear and consistent family roles and boundaries, predictable patterns of family routines and traditions, and positive affirmation, affection, support, and encouragement in addressing the collective needs of individual family members and the family as a whole.

A host of studies have identified associations between the perpetration of family maltreatment and low levels of couple relationship satisfaction, poor career support from a partner, low levels of satisfaction with the parent–child relationship, and poor adjustment to married life (Fonseca et al., 2006; Foran et al., 2014; Foran et al., 2012; Forgey & Badger, 2010; Rosen, Kaminski, Parmley, Knudson, & Fancher, 2003; Rosen, Parmley, Knudson, & Fancher, 2002; Smith Slep et al., 2014, 2010, 2011). Child maltreatment also appears more likely to occur among families experiencing intimate partner

maltreatment (Rumm, Cummings, Krauss, Bell, & Rivara, 2000). Rooted in a family systems perspective (Cox & Paley, 1997), vast empirical and theoretical literatures have also linked positive family dynamics and interactions to individual functioning and well-being in civilian and military contexts (Cigrang et al., 2016; Patterson, 2002; Proulx, Helms, & Buehler, 2007; Snyder et al., 2016). Thus, SSNFs can promote individual fitness.

### ***Informal support***

Informal support is another important correlate of the family maltreatment–personal resilience spectrum, which is indicated when fellow servicemembers and their families perceive a sense of connection with one another, look out and show concern for one another, form trusting relationships, offer help to one another in times of need, and share information about programs and services of benefit to the family or individual members (Bowen et al., 2017). Previous research has shown military members who are less likely to perpetrate intimate partner maltreatment are those who report strong social support; high levels of community cohesion and unity; positive support from peers, neighbors, and community members; and good work relationships (Bell et al., 2006; Foran et al., 2014; Foran, Smith Slep, & Heyman, 2011; Mancini, Nelson, Bowen, & Martin, 2006; Rosen et al., 2003; Smith Slep et al., 2014, 2010, 2011; Stander et al., 2011).

Consistent with the resiliency model of role performance and the concept of community capacity (Bowen & Martin, 2011), informal support can also positively influence individual fitness and personal resilience (Bowen, Martin, Mancini, & Swick, 2015; Cigrang et al., 2014; Huebner, Mancini, Bowen, & Orthner, 2009; Kawachi & Berkman, 2001; Mancini et al., 2006). Informal support systems can encompass a wide variety of intimate and nonintimate associations. These associations can help individuals increase their social capital and form networks through which important information about services can be shared (Bowen & Martin, 2011). Informal support and SSNFs might also be positively correlated, such that high-quality family dynamics enable individual family members to offer greater support to members of the informal community, and high levels of perceived informal support among military members and their families foster positive family dynamics and greater family adaptation (Armstrong et al., 2005; Bowen, Mancini, Martin, Ware, & Nelson, 2003; Huebner et al., 2009; Mancini et al., 2006).

### ***Unit leader support***

Previous research has also found a direct, albeit limited, association between the quality or extent of unit leader support and family maltreatment among

active-duty military members (Foran et al., 2014; Rosen et al., 2003). Unit leader support represents the extent to which leaders (1) provide direct support and outreach to military members and their families in times of need and (2) sponsor informal social events and activities that promote cohesion and informal support between unit members and members' families. We hypothesized that the influence of unit leader support on family maltreatment or personal resilience operates in a distal, indirect manner. It is probable that unit leader support exerts greater proximal influence on levels of informal support and features of SSNFs (Bowen & Martin, 2011; Bowen, Jensen, & Williams, 2015) and, in turn, deters family maltreatment and bolsters personal resilience. For example, Bowen et al. (2003) found that unit leader support was positively associated with military members' informal support and sense of community. They also found a significant pathway between unit leader support and family adaptation. Both findings might be the result of unit leaders promoting connections between servicemembers and families as well as helping families access and secure support services (Bowen & Martin, 2011). Unit leader support can also have a direct association with individual fitness because unit leaders often help individuals secure behavioral and psychological services when needed (Bowen & Martin, 2011).

### ***Contextual and sociodemographic characteristics***

Scholars, practitioners, and theorists have long advocated for a contextual view of individuals and families (Boss, Bryant, & Mancini, 2017; Mancini & Bowen, 2013; Ungar, 2013). One key context of individual and family functioning is the neighborhood or community environment in which individuals and families reside (Noah, 2015). Among military families, perceived community safety is associated with a reduced likelihood of maltreatment occurring in the home (Foran et al., 2014; Foran et al., 2012; Smith Slep et al., 2010). In a recent review, Noah (2015) highlighted the various ways that the effects of the neighborhood on family functioning can be conceptualized and analyzed. Relevant to this study, neighborhood characteristics can be viewed as a moderator of the association between individual- or higher-level processes (e.g., unit, family, community) and individual outcomes and behaviors such as maltreatment or personal resilience.

Although not malleable, other sociodemographic and contextual characteristics might be linked to the perpetration of family maltreatment and other individual- and family-level issues. Notable among such characteristics are paygrade, gender, marital status, deployment history, and parental status, including the age of children, which reflects parenting demands (Bell et al., 2006; Foran et al., 2011; McCarroll et al., 2010, 2003; Merrill, Crouch, Thomsen, Guimond, & Milner, 2005; Rabenhorst et al., 2015, Rabenhorst

et al., 2013; Smith Slep et al., 2010; Snyder et al., 2016). Such variables could be included in analytical models as covariates.

## **Method**

### ***Data and sample***

Data for the current study came from the 2011 AF Community Assessment Survey (CAS). Between January and April 2011, the CAS was administered to active-duty members, reservists, Department of Defense civilians, and spouses of active-duty members and reservists. The 2011 CAS represents the 10th iteration of the survey and is generally used as a community-needs assessment to inform action planning at AF, major command (MAJCOM), and installation levels. The survey included more than 300 items pertaining to sociodemographic characteristics, deployments, mental health, secretive behaviors, resilience, help-seeking attitudes, family and couple relationships, informal networks, and other features of military life. Sources for many of the items and scales used for the current study are identified in Martin and Bowen's (2003) reference manual.

Because the focus of this study was on the behaviors, characteristics, and environments of active-duty AF members, we focused exclusively on data from such respondents (response rate of 40% among active-duty members). Sampling weights were used to generate model estimates representative of the full AF active-duty population. The full sample of active-duty members included 63,290 participants. Because we were interested in partner or child maltreatment behaviors among participants, we narrowed the analytical sample to include only those participants who had at least one child and were in a committed relationship (i.e., married, engaged, or involved in a serious relationship). These criteria reduced the final analytical sample to 30,541 participants.

Approximately 83% of the sample was male, 7% reported being currently deployed, and 30% reported residing in on-base government housing or dorms (as opposed to off-base housing). The majority—45%—of respondents were in the 26- to 35-year-old age group. Nine percent of participants were in the lower enlisted paygrade (i.e., E1–E4), 43% were in the mid enlisted paygrade (i.e., E5–E6), 21% were in the senior enlisted paygrade (i.e., E7–E9), 10% were company grade officers (i.e., O1–O3), and 17% were field grade officers (i.e., O4 or higher). In terms of relationship status and family structure, 2% ( $n = 632$ ) of participants were cohabiting with an unmarried partner, 2% ( $n = 655$ ) had an unmarried partner not residing in the home, and 96% ( $n = 29,254$ ) were married and residing with their partner. No information about racial/ethnic identity was available.

## **Measures**

### **Personal resilience**

Consistent with an asset-based perspective, personal resilience ( $\alpha = .92$ ) was the focal endogenous construct in our model and was measured with the following six items: “I am confident that I could deal effectively with unexpected events,” “Thanks to my resourcefulness, I know how to handle unforeseen situations,” “I can solve most problems if I invest the necessary effort,” “I can remain calm when facing difficulties because I can rely on my coping abilities,” “If I am in trouble, I can usually think of a solution,” and “I can usually handle whatever comes my way.” Response options ranged from 1 (*not at all true*) to 4 (*exactly true*).

### **Individual fitness**

The broader construct of individual fitness was captured using three sets of items representing financial fitness, physical fitness, and psychological fitness. Financial fitness ( $\alpha = .71$ ) was measured with three items that asked respondents to identify the number of months in the last year they had difficulty paying bills because of a lack of money (continuous response options from 0 – 12), the extent of difficulty respondents had living on their total current household income (range: 1 [*no difficulty at all*] to 5 [*a great deal of difficulty*]), and how much difficulty they had paying bills each month (range: 1 [*no difficulty at all*] to 5 [*a great deal of difficulty*]). The three items were reverse-coded so that higher values indicated greater financial fitness. Similarly, physical fitness ( $\alpha = .77$ ) was measured with three items that asked respondents to indicate their usual energy level (range: 1 [*none*] to 5 [*very much*]), how well they slept (range: 1 [*very restless*] to 5 [*very sound or restful*]), and their overall health during the past 4 weeks (range: 1 [*very poor*] to 6 [*excellent*]).

Psychological fitness ( $\alpha = .84$ ) was measured with a seven-item version of the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) that asked respondents to indicate how many days during the past week they felt that they just could not get going, felt sad, had trouble getting to sleep or staying asleep, felt that everything was an effort, felt lonely, felt they could not shake the blues, and had trouble keeping their mind on what they were doing. Response options ranged from 1 (*none*) to 4 (*5 to 7 days*); all items were reverse-coded such that higher values indicated greater psychological fitness.

### **Safe, stable, and nurturing family**

The broader SSNF construct was measured with four interrelated sets of items representing family coping, couple relationship quality, partner support, and parent–child relationship quality.

Four items were used to assess family coping ( $\alpha = .84$ ) and were informed by the work of Antonovsky and Sourani (1988): “When my family has to cooperate

to accomplish something, we work together as a team,” “When my family is going through a rough period, we keep a positive perspective,” “When my family faces a challenge or difficulty, we confront the problem directly,” and “How often are you successful at managing your family demands?” Response options ranged from 1 (*almost never*) to 6 (*almost always*).

Couple relationship quality ( $\alpha = .98$ ) was measured with four items that asked the respondents to indicate how rewarding they found their relationship (range: 1 [*not at all*] to 7 [*absolutely and completely*]), how satisfied they were with the relationship (range: 1 [*not at all*] to 7 [*absolutely and completely*]), how happy they were with their relationship (range: 1 [*extremely unhappy*] to 8 [*could not possibly be any happier*]), and the extent to which the relationship was warm and comfortable (range: 1 [*not at all true*] to 7 [*absolutely and completely true*]). These items were conceptually informed by Norton’s (1983) measure of marital quality.

Partner support ( $\alpha = .83$ ) was measured with three items that asked respondents to indicate the extent to which their partners understood the demands of their AF job (range: 1 [*almost never*] to 6 [*almost always*]), how supportive their partners were of their work in the AF (range: 1 [*extremely unsupportive*] to 6 [*extremely supportive*]), and how their partners felt about them making a career of the AF (range: 1 [*extremely unsupportive*] to 6 [*extremely supportive*]).

Parent–child relationship quality ( $\alpha = .75$ ) was measured with two items that asked respondents to indicate how much of their time as a parent was enjoyable (range: 1 [*almost never*] to 6 [*almost always*]) and how satisfied they were with parent–child relationships (range: 1 [*very dissatisfied*] to 6 [*very satisfied*]).

### ***Informal support***

The broader construct of informal support was measured with three sets of items representing sense of community, neighbor support, and personal network support.

Sense of community ( $\alpha = .93$ ) was measured with four items that asked respondents to indicate the extent to which the community felt a sense of common mission and purpose, showed teamwork and cooperation, felt a collective sense of community, and felt connected to other members and families. Response options ranged from 1 (*strongly disagree*) to 6 (*strongly agree*).

Neighbor support ( $\alpha = .95$ ) was measured with four items that asked respondents to indicate the extent to which people in the neighborhood knew the names of their neighbors, looked out for one another, offered help in times of need, and talked to or visited with neighbors. Response options ranged from 1 (*strongly disagree*) to 6 (*strongly agree*).

Personal network support ( $\alpha = .95$ ) was measured with four items that asked respondents to indicate the extent to which friends, neighbors,

coworkers, or relatives outside their home would lend household tools or equipment, provide transportation if needed, give information about available community agencies and resources, and take care of their children in an emergency. Response options ranged from 1 (*almost never*) to 6 (*almost always*).

### **Unit leader support**

Unit leader support ( $\alpha = .95$ ) was measured with four items that asked respondents to indicate the extent to which unit leaders sponsored events and informal activities for members and their families, helped new members and families get settled in the community and connected with other members and families, worked together as a team to support members and their families, and worked with AF support agencies to address the needs of members and families. Response options ranged from 1 (*strongly disagree*) to 6 (*strongly agree*).

### **Covariates**

Our analyses incorporated a number of covariates that could influence personal resilience (i.e., the focal endogenous construct). These variables included paygrade (E1–E4: Airman Basic to Senior Airman [1], any other higher enlisted or officer paygrade [0]), biological sex (female [1], male [0]), marital status (married [1], not married, cohabiting or not cohabiting [0]), deployment status (currently deployed [1], not currently deployed [0]), and the presence of young children in the home (youngest child is 5 years or younger [1], youngest child is older than 5 years [0]).

### **Grouping variable**

Neighborhood safety was used as a contextual indicator and measured with the following item, “How safe are you from crime and violence in your neighborhood?” Response options ranged from 1 (*very unsafe*) to 6 (*very safe*). Based on the face validity of response-option labels and the frequency of each response, we created a binary item such that responses indicating the neighborhood was safe or very safe were coded as 1, and responses of very unsafe, unsafe, slightly unsafe, or slightly safe were coded as 0. To ensure we were not conflating neighborhood safety with housing location, we examined the association between these two factors. Although a chi-squared test was significant ( $\chi^2[4] = 157.91, p < .001$ ), this was likely due to large sample sizes. From a practical standpoint, similar proportions of participants living in base housing described their neighborhoods as safe (74%) or unsafe (15%; 11% missing data) as those in off-base housing who described their neighborhoods as safe (80%) or unsafe (10%; 10% missing data).



## **Analysis**

We used structural equation modeling in Mplus 7.31 (Muthén & Muthén, 2012) to model latent constructs, handle measurement error, examine associations with numerous endogenous variables, estimate indirect effects, and examine measurement and structural invariance between residents of safe versus unsafe neighborhoods. Preliminary calculations showed the hypothesized model was overidentified and sufficiently powered (Kline, 2011; MacCallum, Browne, & Sugawara, 1996). To begin, we randomly partitioned the analytical sample into two subsamples; one was used for model construction ( $n = 15,100$ ) and the other for model validation ( $n = 15,084$ ). The subsamples did not differ on characteristics of paygrade, gender, marital status, deployment history, or age of children.

Using the construction subsample, we specified a measurement model in which all latent constructs were linked to the appropriate observed indicators and correlated. We used a jigsaw piece-wise technique to assess the measurement model, whereby latent constructs were specified one at a time, enabling us to identify any model fit issues (Bollen, 2000). Acceptable fit was assessed using the following model fit indices: Comparative Fit Index (CFI; Bentler, 1990); Tucker-Lewis Index (TLI) values  $> .95$  (Hu & Bentler, 1999); and a root mean square error of approximation (RMSEA) value (and upper 90% confidence level [CI])  $< .06$  (Browne & Cudeck, 1993).

After establishing the measurement model, three second-order factors were specified such that (1) first-order factors representing financial fitness, physical fitness, and mental fitness loaded onto a higher-order factor representing individual fitness; (2) first-order factors representing family coping, couple relationship quality, partner support, and parent-child relationship quality loaded onto a higher-order factor representing SSNF; and (3) first-order factors representing sense of community, neighbor support, and personal network support loaded onto a higher-order factor representing informal support. Structural parameters were then specified between latent constructs consistent with our hypothesized model. After finding that the construction subsample yielded a final model with acceptable fit, the same model specification was imposed on the validation subsample. The validation subsample also yielded acceptable model fit. We then combined both subsamples and analyzed the model with the full sample before proceeding to multiple-group comparison analyses.

Multiple-group comparison analyses began with an assessment of configural, metric, and scalar measurement invariance between residents of safe neighborhoods and residents of unsafe neighborhoods across all latent factors (Dimitrov, 2010). Structural invariance was then assessed between groups. Changes in CFI ( $\Delta\text{CFI} > .01$ ; Cheung & Rensvold, 2002) and the DIFFTEST function in Mplus were used to assess whether constraining measurement and structural parameters to equality between groups significantly worsened model fit. In terms of

estimation, we used a polychoric correlation input matrix and a means- and variance-adjusted weighted least squares (WLSMV) estimator to handle ordinal level and non-normally distributed observed indicators (Flora & Curran, 2004). Full-information maximum likelihood estimation was used to handle missing data (Enders, 2010). Model estimates were corrected for clustering by base and the available sampling weight was applied to generate model parameters representative of the active-duty AF population.

## Results

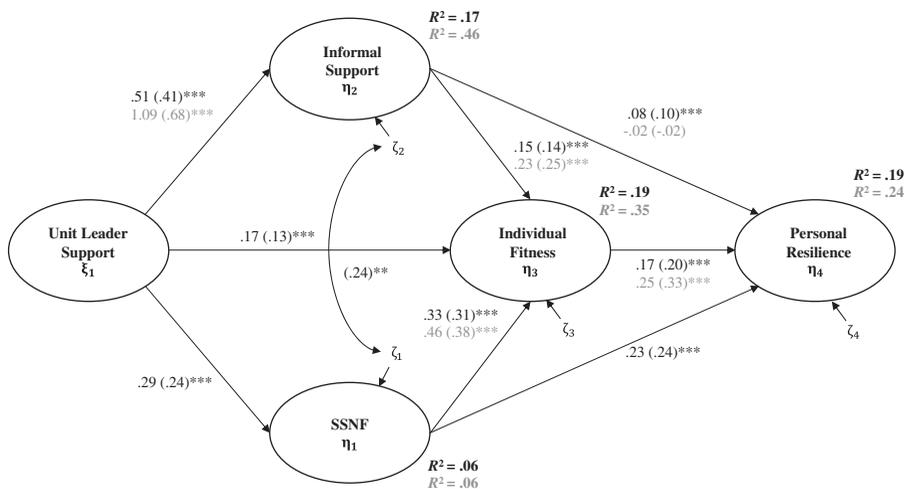
### *Model building and invariance tests*

The measurement model and full-hypothesized model yielded acceptable fit in the context of the construction subsample ( $n = 15,100$ ;  $\chi^2[1296] = 5853.01$ ,  $p < .001$ ; CFI = .99, TLI = .99; RMSEA = .015, 90% CI [.015, .016]) and validation subsample ( $n = 15,084$ ;  $\chi^2[1245] = 5888.05$ ,  $p < .001$ ; CFI = .99, TLI = .98, RMSEA = .016; 90% CI [.015, .016]). The hypothesized model with the full sample yielded the following model fit indices:  $\chi^2(1296) = 9298.36$ ,  $p < .001$ ; CFI = .99, TLI = .99, RMSEA = .014; 90% CI [.014, .014]. Using the full sample, measurement invariance tests indicated configural (factor structure;  $\Delta\text{CFI} < .01$ ), metric (factor loadings;  $\Delta\text{CFI} < .01$ ), and scalar (item thresholds;  $\Delta\text{CFI} < .01$ ) invariance between participants residing in safe neighborhoods and participants residing in unsafe neighborhoods. Thus, we had confidence that the measurement items used in the analysis functioned similarly between groups—a prerequisite condition for meaningful tests of structural invariance (Dimitrov, 2010).

### *Final model*

The final multiple-group comparison analysis yielded the following model fit indices:  $\chi^2(2794) = 19938.55$ ,  $p < .001$ ; CFI = .97, TLI = .97, RMSEA = .021, 90% CI [.021, .022]). First-order factor loadings ranged from .66 to .98. Second-order factor loadings ranged from .41 to .92. Detailed information about measurement parameters is available upon request.

To reiterate, the purpose of the current study was to build on previous research by empirically testing a model for maltreatment prevention among active-duty AF members. Working from the left side to the right side of the [Figure 2](#), unit leader support was positively associated with SSNF ( $b = .29$ ,  $p < .001$ ,  $\beta = .24$ ), individual fitness ( $b = .17$ ,  $p < .001$ ,  $\beta = .13$ ), and informal support. The link between unit leader support and informal support was particularly strong among those in unsafe neighborhoods ( $b = 1.09$ ,  $p < .001$ ,  $\beta = .68$ ), compared with those in safe neighborhoods ( $b = .51$ ,  $p < .001$ ,  $\beta = .41$ ). Informal support and SSNF were positively correlated ( $r = .24$ ,  $p < .001$ ). SSNF and



**Figure 2.** Multiple-group comparison of participants in safe and unsafe neighborhoods ( $N = 27,154$ ).

Note. SSNF = safe, stable, and nurturing family.

Standardized coefficients are displayed in parentheses. Estimates on top (black font) represent participants in safe neighborhoods ( $n = 23,176$ ) and those on bottom (gray font) represent participants in unsafe neighborhoods ( $n = 3,978$ ). Paths with one parameter indicate invariance between groups. Model fit indices were as follows:  $\chi^2(2794) = 19938.545$ ,  $p < .001$ ; root mean square error of approximation = .021, 90% confidence interval [.021, .022]; Comparative Fit Index = .974; Tucker-Lewis Index = .974. A means- and variance-adjusted weighted least squares estimator was used. Estimates were corrected for clustering by base and weighted for representativeness across all active-duty Air Force members. Measurement invariance between groups was indicated at configural, metric, and scalar levels. The analytical sample was reduced due to missing values on exogenous variables ( $n = 357$ ) or the grouping variable ( $n = 3,030$ ). Covariates: paygrade, biological sex, marital status, deployment status, and youngest child being 5 years old or younger.

\*\*\* $p < .001$ .

informal support were positively associated with individual fitness for residents of safe neighborhoods ( $b = .33$ ,  $p < .001$ ,  $\beta = .31$ , and  $b = .15$ ,  $p < .001$ ,  $\beta = .14$ , respectively) and unsafe neighborhoods ( $b = .46$ ,  $p < .001$ ,  $\beta = .38$ , and  $b = .23$ ,  $p < .001$ ,  $\beta = .25$ , respectively). SSNF was positively associated with personal resilience ( $b = .23$ ,  $p < .001$ ,  $\beta = .24$ ). Individual fitness was also positively associated with personal resilience, particularly among residents of unsafe neighborhoods ( $b = .17$ ,  $p < .001$ ,  $\beta = .20$  vs.  $b = .25$ ,  $p < .001$ ,  $\beta = .33$ ). Informal support was associated with personal resilience only among residents of safe neighborhoods ( $b = .08$ ,  $p < .001$ ,  $\beta = .10$ ).

In terms of covariates, females reported lower levels of personal resilience than males ( $b = -.20$ ,  $p < .001$ ), those currently deployed reported slightly higher levels of personal resilience than those not deployed ( $b = .10$ ,  $p < .01$ ), and participants whose youngest child was 5 years or younger reported slightly lower levels of personal resilience than participants whose youngest child was older than 5 years ( $b = -.06$ ,  $p < .01$ ).

Paygrade was significantly associated with personal resilience only among residents of safe neighborhoods, such that participants ranked E1 to E4 reported lower levels of personal resilience than those in higher paygrades ( $b = -.16, p < .01$ ).

For participants residing in safe neighborhoods, the hypothesized model explained 17% of the variance in informal support, 6% of the variance in SSNF, 19% of the variance in individual fitness, and 19% of the variance in personal resilience. For residents of unsafe neighborhoods, the hypothesized model explained 46% of the variance in informal support, 6% of the variance in SSNF, 35% of the variance in individual fitness, and 24% of the variance in personal resilience.

### Indirect effects

The estimation of indirect effects between model constructs was conducted without bootstrap methods because our overall sample and both neighborhood subsamples were extremely large (Preacher & Hayes, 2008; Shrout & Bolger, 2002). Table 1 presents a decomposition of unstandardized total indirect and specific indirect effects (Note. We use *effect* to match the methodological nomenclature only, not to suggest causal associations). Results indicated that all possible indirect pathways were significant for

**Table 1.** Decomposition of unstandardized total indirect and specific indirect effects

	Neighborhood Context					
	Safe ( $n = 23,176$ )			Unsafe ( $n = 3,978$ )		
	<i>b</i>	<i>SE</i>		<i>b</i>	<i>SE</i>	
Effects from ULS to PR						
Total indirect	0.163	0.006	***	0.185	0.016	***
Specific indirect						
ULS > IS > IF > PR	0.012	0.001	***	0.063	0.009	***
ULS > IS > PR	0.042	0.004	***	-0.018	0.018	
ULS > IF > PR	0.028	0.002	***	0.042	0.006	***
ULS > SSNF > IF > PR	0.016	0.001	***	0.033	0.004	***
ULS > SSNF > PR	0.065	0.003	***	0.065	0.003	***
Effects from IS to PR						
Specific indirect						
IS > IF > PR	0.025	0.002	***	0.058	0.008	***
Effects from SSNF to PR						
Specific indirect						
SSNF > IF > PR	0.056	0.002	***	0.117	0.013	***
Effects from ULS to IF						
Total indirect	0.168	0.006	***	0.379	0.033	***
Specific indirect						
ULS > IS > IF	0.074	0.005	***	0.247	0.033	***
ULS > SSNF > IF	0.094	0.004	***	0.131	0.009	***

Note. ULS = Unit leader support; IS = Informal support; IF = Individual fitness; PR = Personal resilience; SSNF = Safe, stable, and nurturing family.

\*\*\* $p < .001$

residents of safe neighborhoods, and all but one pathway were significant for residents of unsafe neighborhoods.

Although the total indirect effects between unit leader support and personal resilience were of similar magnitude between the neighborhood groups, indirect pathways involving individual fitness were about 2 times as large for residents of unsafe neighborhoods compared with those in safe neighborhoods. The indirect pathway between unit leader support and personal resilience via informal support and individual fitness was stronger among residents of unsafe neighborhoods ( $b = .06$ ) compared with those in safe neighborhoods ( $b = .01$ ). For both neighborhood groups, the strongest indirect pathway between unit leader support and personal resilience was via SSNF ( $b = .07$ ). The pathway from unit leader support to personal resilience via informal support was significant for those in safe neighborhoods ( $b = .04$ ) but not for those in unsafe neighborhoods.

Two pathways operating via individual fitness—the pathway between informal support and personal resilience and the pathway between SSNF and personal resilience—were about two times as strong for residents of unsafe neighborhoods ( $b = .06$  and  $.12$ , respectively) compared with residents of safe neighborhoods ( $b = .03$  and  $.06$ , respectively). The largest specific indirect pathway for those in unsafe neighborhoods was between unit leader support and individual fitness via informal support ( $b = .25$ ), followed by the pathway between unit leader support and individual fitness via SSNF ( $b = .13$ ). For residents of safe neighborhoods, these pathways were notably weaker ( $b = .07$  and  $.09$ , respectively). Overall, pathways involving unit leader support and individual fitness were particularly influential among those in unsafe neighborhoods.

## Discussion

The purpose of this study was to assess the tenability of a theory-of-change model in which specific antecedents and correlates of personal resilience were hypothesized (refer to [Figure 1](#)). Using a large, representative sample of active-duty AF members, the hypothesized model was supported as indicated by significant positive associations between all model constructs and good model fit (refer to [Figure 2](#)). We draw a number of important conclusions from our findings. First, personal resilience among active-duty AF members is influenced by a dynamic set of interrelated individual and socioecological characteristics, ranging from the intrapersonal fitness of the individual, to the nature of family relationships and interactions, to the quality of support received from the informal community and unit leaders. Therefore, FAP prevention efforts targeted to active-duty AF members should be linked to one or more of these components to optimize the likelihood that personal resilience will be enhanced and family maltreatment behaviors will be prevented or diminished. Because the components in our analytical model are highly interrelated, prevention efforts that target multiple

model components might yield cumulative benefits and influence a range of positive outcomes within individuals and across the social contexts in which individuals are embedded.

A second important conclusion is that neighborhood context matters regarding the ways a person's social ecology exerts influence on individual-level functioning. Indeed, the magnitude of some associations between constructs in our analytical model varied as a function of perceived neighborhood safety. Certain paths in the model were particularly pronounced among those in neighborhoods that the residents perceived as unsafe. Thus, prevention efforts might need to be tailored to meet the unique needs of active-duty AF members who reside in unsafe communities. Although beneficial across high and low levels of perceived neighborhood safety, efforts to promote unit leader support and informal support might be particularly impactful in neighborhoods perceived as unsafe, reinforcing the importance of community-capacity building efforts in family maltreatment prevention efforts (Mancini et al., 2006; Sabol, Coulton, & Korbin, 2004). Moreover, efforts to promote neighborhood safety could be helpful in making members less reliant on other socioecological supports to build individual-level capacity and resilience. Notably, some paths were indistinguishable between neighborhood groups, such as the paths between unit leader support and individual fitness or SSNF, and between SSNF and personal resilience. This finding suggests that improvements in certain socioecological conditions can yield similar benefits in family- and individual-level outcomes across high and low levels of perceived neighborhood safety.

### ***Research limitations***

We note some study limitations that temper our conclusions. For one, the study data were cross-sectional. Assessing data at a single time point can obscure the temporal order of constructs and render causal inferences untenable; however, our reliance on past research and theory bolstered our confidence in specifying directional paths in the analytical model. Additionally, the dataset contained no information on participants' racial/ethnic identity, making it impossible for us to account for differences between racial/ethnic groups (or account for its potential influence).

In terms of study strengths, our sample was large and representative of the active-duty AF population. Although some of our findings might generalize to civilian populations, we intended to focus on the specific population of active-duty AF members; therefore, our results are best interpreted in that context. The data for our analyses also possessed a rich set of items that enabled us to effectively compose the constructs in our analytical model. Our use of structural equation modeling was also a strength because this method allowed us to handle measurement error, model latent variables, conduct tests of measurement and structural invariance between neighborhood

groups, estimate indirect effects, and impose an appropriate parameter estimation method (i.e., WLSMV).

### ***Research implications***

Our findings also inform directions for future research. First, future studies should incorporate longitudinal data that will allow the researchers to specify the temporal order of constructs. A longitudinal view could bolster the confidence in the interpretation of construct associations. Additionally, longitudinal data would enable researchers to examine bidirectional or transactional processes between the constructs in our analytical model. For example, a dynamic and transactional pattern between SSNF and individual fitness might emerge, such that features of SSNF at one time point could influence individual fitness at subsequent time points, and individual fitness at one time point could influence features of SSNF at subsequent time points.

Consistent with the social and behavioral sciences' emerging emphasis on the importance of replication studies (Amato, 2015), future research should examine our analytical model in different contexts. Specifically, future waves of AF Community Assessment data could be used to reexamine our hypothesized model and determine the extent to which model estimates cohere with our findings. To the extent that data are available, our analytical model could also be examined among other branches of the military. Another logical direction for future research is to examine associations between levels of personal resilience and occurrence of specific subtypes of family maltreatment. Although we noted established links between levels of personal resilience and the likelihood of partner and/or child maltreatment, additional research could further demonstrate the predictive validity of personal resilience regarding the likelihood of specific forms of maltreatment (e.g., physical, emotional, or sexual abuse; neglect) toward a partner or child perpetrated by active-duty military personnel.

### ***Practice and policy implications***

In terms of clinical and policy implications, here we reiterate the value of our focus on personal resilience and the importance of moving individuals and families away from undesirable outcomes by moving them toward desirable outcomes (Meadows et al., 2015). This process might be especially important in secondary prevention efforts, whereas a singular and exclusive assessment to determine if undesirable outcomes are already occurring in the population of interest is more suited to identifying individuals or families for delivery of tertiary prevention or formal remedial treatment.

Ultimately, the study results further validate a proposed theory-of-change model that can serve as an evidence-informed foundation for FAP practice. Specifically, FAP programs and services should target aspects of informal

support, SSNFs, and individual fitness in an effort to promote personal resilience and, in the context of earlier research, lower the likelihood of family maltreatment perpetration among active-duty AF members (Bowen, Jensen, & Williams, 2016). Efforts to increase unit leader support are also warranted as a distal yet helpful antecedent to personal resilience. Indeed, greater unit leader support can promote greater levels of informal support, SSNF, and individual fitness.

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