Psychological aspects of the integration of women into combat roles

Ricardo Tarrasch a,⇑, Orit Lurie b, Ran Yanovich c, Dan Moran c

a Psychology Department, Tel Aviv University, Israel
b Surgeon General H.Q, Israeli Air Force, Israel
c Heller Institute of Medical Research, Sheba Medical Center, Tel Hashomer, The Sackler Faculty of Medicine, Tel Aviv University, Israel

1. Introduction

A significant change is taking place in recent years in the IDF's willingness to integrate women into what it previously considered to be primarily male army roles. According to a report by the Committee for the Status of Women in Israel published in 1976, only 30% of all military roles were open to women, yet by 1997 this number has risen to 78% (Israel, 1997). Women now are eligible for and serve in such elite combat roles as fighter pilots and naval officers, as well as in combat units such as anti-aircraft units, border police, nuclear, biological and chemical warfare defense units, artillery, and field information security units (Dandeker & Segal, 1996; Draude, 1995). A woman choosing to serve in a fighting role might have to cope with several stressors in addition to those that are common for her male counterparts.

Psychological factors have frequently been correlated with negative outcomes as a result of life changes causing stress, as these changes require adaptation. Induction into the army environment can readily be considered as a stressor arising from a lifestyle, due to the army's absolute control of the soldier's life, totalitarian chain of authority, and required obedience at all times. Soldiers assigned to combat units face even greater stress as their roles revolve around preparation for and actual engagement in battle.

Thus, induction into the army by itself may lead to chronic stress accompanied by episodic stress events (Louis, 1980; Moos, 1992).

Of the stressors affecting women in combat roles, some are physical in nature, having their origin in various physiological differences between males and females. Soldiers serving in field units, combat units in particular, are expected to hold a very high level of military capacity, which comprises a set of skills that require physical fitness and agility in difficult field conditions. Women thus face an inherent disadvantage in this regard, being generally shorter, weighing on average 20% less, their body mass containing 30% more fat, and their bones smaller, when compared with their male counterparts (Abernathy & Black, 1996). The United States Army has found differences in muscle strength between male and female soldiers that stem from muscle mass, as measured by isometric strength, with the strength of women averaging 30% less than that of men (Martin & Nelson, 1985; Sharp et al., 2002). In the British army, the abolishment of constraints related to gender recruitment led to a considerable rise in musculoskeletal injuries in female soldiers (Gemmell, 2002). Even among professional athletes, female aerobic capacity is 15–30% lower than that of males (Clarkson & Going, 1996; Miller, McDougall, Tarnopolosky, & Sale, 1993). As a rule, then, the average physical fitness of females is lower than that of males, resulting in a considerably greater challenge for female soldiers during their combat service.

Beyond their physical demands, armies are historically masculine cultures. Accordingly, military positions assignments were primarily associated with, and influenced by, historic gender roles. Several elements affecting the division of staffing according to...
gender include informal social networks, a widespread perception of females as unskilled assistants, exclusive consideration of male gender, and selective socialization. This can lead to anger, prejudice, and discrimination within their units. For example, male soldiers claimed that women complicate the normal order of operations, thereby providing an additional source of social stress facing female soldiers.

Stressful life events have been conceptualized as stimulus-based or environmental events that are threatening, harmful, or taxing. Chronic stress is the response of the brain to unpleasant events for a prolonged period over which an individual perceives he or she has no control. Both are hypothesized as having an impact on health or health outcomes, and much like physical pathogens, have the potential to cause illness (DeLongis, Folkman, and Lazarus, 1988). The relationship between stress and illness stems from stress-stimulating physical changes that disturb the affected individual’s homeostasis, followed by a struggle to regain their original condition, something that requires an adaptation period. This period is accompanied by a chain of behavioral, physical, autonomic, metabolic and immunogenic reactions, all of which can have negative effects on several aspects of life (Ader & Cohen, 1993; Ellis, 1999).

While the relationship between stress and its negative outcomes is well-established, it is not one of simple, direct stimulus–response, as other variables may moderate it. Salient among these moderators are the individual's personality traits, and set of preferences, values and beliefs as eventually expressed in their behavior. This interpersonal variability in these factors may lead one individual's vulnerability to increase when facing stress, and another's to decrease under the very same circumstances (Antonovsky, 1990; Bolger & Schilling, 1991; Kreitler & Kreitler, 1991).

As the actual outcomes of stressful situations depend on several individual factors, in addition to the objective characteristics of the stressor (e.g., stress magnitude and duration), the optimal model for describing stressors and the psychological and physical responses to them has to consider those personality variables that may serve as significant mediators or moderators. Among the most important of these may be the individual’s coping strategies, preparation, strength of self, and the intensity of the internal conflicts that the situation instigates. Possessing these qualities may significantly modify the degree to which the individual internalizes the stress situation and, subsequently, the scope of physical health problems and psychological distress affecting the individual as a result of it (Lazarus & Folkman, 1984; Motzer & Steward, 1996).

It is therefore crucial to identify which moderating factors may in fact strengthen or weaken the relationship between stress and stress response and thus render individuals as resistant or vulnerable (Kobasa, 1982; Pengilly & Dowd, 2000).

A comprehensive study into the integration of women into combat roles has yet to be conducted. Specifically, no studies have assessed female soldiers' psychological reactions to military life in general, or the stress it involves in particular, or their professional survivability. While this lack of research is possibly due to the integration of women into such roles substantially taking place only recently, its importance is nonetheless increasing: In 2009 the IDF Women’s Affairs Advisor published that women represent a significant portion of manpower in the combat units in which they serve: females comprise 25% of soldiers in Search and Rescue units; 20% of soldiers in the Anti-Aircraft Division and in the Artillery Corps; and 10% in the Border Police. As of 2007, women already comprise 15% of the US Army (Putko & Johnson, 2008) and 9.1% of the British Armed Forces, as reported by the British Ministry of Defence in 2006.

This study intends to improve our understanding of the possible mediators and moderators that may reduce stress reactions among women in combat roles. As such, it has considerable potential theoretical and practical uses, in terms of better understanding the process of women integration into combat roles as well as improving the methods used in their training. Based on the literature cited above, it is hypothesized that the stress levels of women in combat roles will be higher as compared to that of men in combat roles and women in non-combat roles, and that this stress level will be mediated by psychological characteristics of the soldiers. Additionally, stress levels will be negatively correlated more strongly with physical health among female as compared to male soldiers.

2. Method

2.1. Participants and questionnaires

This study's sample consisted of 450 soldiers, including 235 fighting women (FW) and 80 fighting men (FM) from the Caracal combat battalion. Established in 2000, this infantry battalion is composed of female and male soldiers undergoing the same high level of military training and serving in the same positions. Additionally, 135 control women (CW) were sampled from a medical-assistance, non-combat course. All participants were undergoing basic training (BT; 4 months) in their respective units. The three groups were of similar age (18.5 ± 0.5, 18.8 ± 0.4 and 18.5 ± 0.5 years; mean and standard deviations, respectively).

Participants responded to questionnaires measuring trait characteristics once (2 months after the beginning of the BT), and to questionnaires measuring state characteristics three times, these being before (within 3 days of arrival to the recruit training base), during (after 2 months) and upon completion of the 4-month (same length for the three groups) BT period. The participants underwent medical examinations at the same time they completed the questionnaires.

2.2. State characteristics questionnaires

This study used a self-report stress-reactions question that was written especially for this purpose in order to assess perceived stress. The item asked, “Estimate the stress level involved in the army role that you have chosen” in a five-point Likert scale.

This study used the Shirom-Melamed Burnout Measure (Melamed, Kushnir, & Shirom, 1992). This questionnaire consists of 22 items that assess its respondents' burnout level utilizing a seven-point Likert scale. The internal reliability of the questionnaire ranged from alpha = 0.91 to 0.92.

A self-efficacy measure was constructed on the basis of Bandura’s (1986) self-efficacy concept. It measured the participants’
expectations and beliefs with regard to their ability to cope with trouble successfully. Self-efficacy involves cognitive, social, and behavioral capacities, which people must organize in an integrated manner in order to achieve their goals. The belief in a person's own capacities influences the actions the person takes, the amount of effort that person expends, and accordingly those actions' results. The questionnaire included nine items utilizing a five-point Likert scale. The internal reliability of this questionnaire for the three times it was administered in this study ranged from alpha = 0.91 to 0.93.

This study also used IDF medical reports to record the number of visits the participants made to a doctor during the study period.

2.3. Trait characteristics questionnaires

This study used a 49-item questionnaire developed by Kobasa (1982) to measure hardiness. Hardiness is defined as a specific personality characteristic that facilitates handling stress by avoiding undesired reactions to stressful situations. The term addresses the participants' mental health, characterizing them according to the level in which they are active, involved, and behaving according to actual life circumstances. The questionnaire contains the three sub-scales measuring commitment, control and challenge. The internal reliability, as measured by Cronbach's alpha coefficient, was 0.68 for commitment, 0.62 for control, and 0.65 for challenge.

This study used the Lazarus and Folkman (1984) Ways of Coping Questionnaire to assess the participants' coping styles. This questionnaire consists of 68 items that evaluate its respondents' cognitive and behavioral efforts when confronting stress. It calculates scores for distance, problem solving, acceptance, and growth. The Cronbach's alpha coefficients of these scales for this study were 0.82 for distance, 0.83 for problem solving, 0.79 for acceptance, and 0.66 for growth.

This study also used the Bem Sex Role Inventory (BSRI) (1981) to calculate the participants' socially-defined degrees of masculinity and femininity. Each participant's scores was dichotomized for both masculinity and femininity by their medians, which further allocated them into the four categories of (a) under the median in both scores (non-sex type), (b) over the median in both scores (androgynous type), (c) below the masculine and over the feminine score (feminine type), and over the masculine and under the feminine score (masculine type). The Cronbach's alpha internal reliability coefficients of the masculinity and femininity scores were 0.67 and 0.76, respectively.

3. Results

3.1. State characteristics

The participants' state characteristics were compared using 3 x (3) repeated-measurements ANOVAs for the three participant groups and the three times they completed the questionnaires. Significant effects were further analyzed using Tukey's honestly significant difference (HSD) post hoc comparisons.

3.2. Stress

The responses to the stress question were analyzed for 141 FW, 40 FM, and 88 CW, and yielded a significant effect for group (F(2,266) = 10.61, p < .001, partial eta squared = .074) and a significant interaction between time of measurement and group (F(4,532) = 3.24, p < .05, partial eta squared = .024). Fig. 1 illustrates how women in general experienced higher stress than men, but the two groups of women did not differ significantly (Tukey's HSDs for

FW vs. FM p < .001, FW vs. CW p = .39, and FM vs. CW p < .001). In order to assess the source of the interaction, the three groups were compared at the time of each measurement. CW were found to be significantly more stressed than FM only at the time of the second measurement, with a Tukey's HSD of p < .005.

3.3. Burnout

This study analyzed the responses to the burnout questionnaire of 144 FW, 40 FM, and 90 CW, and found only a significant interaction between time of measurement and group (F(4,542) = 12.59, p < .001, partial eta squared = .085). Fig. 2 illustrates how the three groups did not differ significantly at any time this questionnaire was administered (no significant Tukey's HSDs). Although overall burnout did not change significantly over time, the CW group's burnout level rose significantly between the first and second measurements (Tukey's HSD of p < .001).

3.4. Self-efficacy

The responses to the self-efficacy questionnaire of 145 FW, 41 FM, and 90 CW were analyzed, and a significant interaction between time of measurement and group was obtained (F(4,546) = 7.97, p < .001, partial eta squared = .055). Fig. 3 illustrates how this interaction results from the FW group recording a significant drop in self-efficacy between their first and third measurements (Tukey's HSD of p < .01), while the CW group recorded a rise in self-efficacy between these measurements (Tukey's HSD of p < .05).
The FM group's decline in self-efficacy was not statistically significant.

3.5. Medical reports

Among participants, 43 FW, 8 FM and 10 CW visited a doctor during their basic training period. A chi square for the independence test comparing participants who made no visits to a doctor with those making at least one visit was found to be significant ($\chi^2 = 9.73, p < .01$). Of the FW group, 18.3% visited a doctor during the training period, compared to only 10% of the FM and 7.4% of the CW.

3.6. Trait characteristics

The trait characteristics of the three groups were compared using one-way ANOVAs. Significant effects were further analyzed using Tukey’s HSD post hoc comparisons.

3.7. Hardiness

The analysis of the hardiness questionnaire included 174 FW, 47 FM, and 93 CW, and found significant differences for the commitment subscale ($F(2,313) = 5.5, p < .005$, partial eta squared = .034) and for the challenge subscale ($F(2,313) = 4.1, p < .05$, partial eta squared = .026). Tukey’s HSD post hoc comparisons found that the CW group displayed less commitment than the FW group ($p < .05$) and the FM group ($p < .01$), and less challenge than the FM group ($p < .05$). Fig. 4 illustrates this graphically.

3.8. Coping strategies

No significant differences were found among the three groups in either of the coping-strategy sub-scales.

3.9. Sex-role type

The responses to the BSRI questionnaire of 232 FW, 77 FM, and 119 CW were analyzed. We assessed the distribution of the participants into the non-sex type, androgynous type, feminine type, and masculine type using a chi-square test for independence, which yielded a significant difference between the groups ($\chi^2 = 35.8, p < .001$). The source of this effect was assessed using standardized residuals analyses, which found that the FM group tended to be less female-typed ($p < .001$) and more male-typed by proportion ($p < .05$) than the other groups, while the CW group tended to be more female-typed ($p < .001$) and less-male typed ($p < .01$). Table 1 details the distribution of the types within the three groups.

4. Discussion

The integration of women into army combat roles is not trivial. While they are expected to cope with the intense military demands and lifestyle of their unit exactly as their male counterparts do, female soldiers must also face additional strains due to their gender. These may accumulate and increase the levels of stress experienced by the female soldiers during service, subsequently interfering with their successful integration as well as potentially resulting in health problems.

We found that female soldiers experienced more stress during their BT period than male soldiers did, regardless of their type of training. However, while female combat soldiers experienced almost the same intensity of stress during their BT as their male counterparts, female soldiers in the non-combat control group tended to show increased stress during the middle part of theirs.

Similarly, women serving in more traditionally female (medical) roles were more affected by burnout symptoms during the middle term than others. However, they also tended to have higher levels of self-efficacy by the end of their BT.

It was also found that women serving in combat units were more likely than soldiers in the other two groups to seek medical help.

Women in the control group experienced increased stress during their BT. While this finding may seem counterintuitive, for non-combat soldiers, BT is expected to be the most stressful period of the military service, and thus its conclusion may bring about a feeling of relief and a sense of success, reflected in lower stress levels. Having overcome all the challenges encountered during BT, they may tend to believe in their ability to cope with any stress that they would face during the rest of their service. Combat soldiers, however, are only at the beginning of a particularly challenging career when they leave BT, during which they establish a more precise evaluation of the challenges they are likely to encounter during the rest of their service. Being able to assess thesechal-

![Fig. 3. Reported self-efficacy of the three experimental groups at the three times measured.](image)

![Fig. 4. Hardiness sub-scales of the three experimental groups.](image)

| Table 1 Distribution of participants according to their sex type. |
|------------------------|----------------|----------------|----------------|
|                       | Female (%)     | Masculine (%)  | Non-sex typed (%) | Androgynous (%) |
| Fighting women        | 22.4           | 22.4           | 26.7            | 28.4          |
| Fighting men          | 3.9            | 31.2           | 31.2            | 33.8          |
| Control women         | 37.8           | 10.1           | 23.5            | 28.6          |
lenges in relation to their own resources, it is not surprising that they tend to feel only moderate levels of self-efficacy at the end of their BT.

Soldiers in combat roles tended to feel more committed and challenged while facing stress than the control group, likely due to the higher discipline and combat demands associated with combat BT. Female soldiers in combat BT tended to feel more committed, while male soldiers tended to see stressful demands as challenges. This may be explained by the fact that gender typed men and cross-gendered women have been suggested to exhibit more type A behavior and the accompanying high motivation rates (Byrne, 1996).

The groups also differed in how they behaved in regard to their sex roles. The members of each group set themselves different expectations in regard to their expected gender behavior. For years, society has expected men to be more task-oriented than women, and women to be more expressive than men. Such expectations greatly influence the way members of each gender behave during both routine life demands and in stressful situations. There are two possible explanations for this study’s findings in this regard.

One is that women in a combat role, especially pioneers, have to adapt to the training process and subsequent combat demands, while male soldiers tended to see stressful demands as challenges. This may be explained by the fact that gender typed men and cross-gendered women have been suggested to exhibit more type A behavior and the accompanying high motivation rates (Byrne, 1996).

The other is that the differences existed before enrolling into the army, such that women choosing a combat role possess an a priori tendency towards a more masculine sex role. In favor of the first explanation, it has been previously reported that women soldiers are expected to adapt to the governing masculine culture. Such adaptation demands an enhanced physical and emotional power, which sometimes interferes with their gender identity (Chandler, Bryant, & Bunyard, 1995).

This study found that female soldiers react in a more extreme manner than male soldiers while integrating into combat units. They experience high stress levels for long periods of time, stress for which BT represents only the beginning of their military careers. The abandoning of their gender roles can lead their coping process while they integrate into a masculine culture, thereby manifesting their commitment. This may explain their relatively more frequent visits to the unit medical service. A possible explanation for the outcomes is that although women soldiers who identify with masculine norms and demands tend to adopt those norms, being unaccustomed to them makes them less effective, consume more energy, and aggravates outcomes.

Further research is needed in order to confirm and expand on this study’s findings. It is important to clarify whether they result from differences that already existed before recruitment to the military service, which could explain why these particular women chose these specific combat roles. It is also essential to understand how female soldiers adapt to their new demands. While the first clarification would shed light on the classification process, the latter is related primarily to the training process and subsequent deployment. Tailor-made training can help these women to cope more efficiently by using their available resources in a more skilled manner.

References


Fenner, L. (1998). Either you need these women or you don’t: Informing the debate on military service and citizenship. Gender Issues, 16(3), 5–32.


