DEVELOPMENT OF A QUESTIONNAIRE TO MEASURE PSYCHOLOGICAL STRESS AND RELATED CONCEPTS IN THE CONTEXT OF THE MARINE CORPS BASIC TRAINING SETTING

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DEVELOPMENT OF A QUESTIONNAIRE TO MEASURE PSYCHOLOGICAL STRESS AND RELATED CONCEPTS IN THE CONTEXT OF THE MARINE CORPS BASIC TRAINING SETTING*

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INTRODUCTION

Basic military training is a time when young men and women have to make adjustments to a situation unlike any that most have faced before. The stress associated with this process has been attested to by a number of observers (e.g., Maskin & Altman, 1943; Brotz & Wilson, 1946; Janis, 1945; Bourne, 1967; Faris, 1973). Patterns of affect indicating variations in the level of stress associated with this adjustment process have been consistently demonstrated in prior studies (e.g., Datel, Engle & Barba, 1966; Biersner, La Rocco & Ryman, 1976) and major positive changes in attitude take place during the period of highest stress as indicated by the studies of affect (Booth & Hoiberg, 1973). While this change suggests that stress may have a positive effect on recruits, training stress may also contribute to attrition (e.g., Mobley, Hand, Baker & Meglino, 1979). To date, there has been little study of the actual processes of change in basic training and the effects of specific stresses in those processes. This report describes the initial phases of a program of research to detail the positive and negative effects of psychological stress in Marine Corps basic training.

Background

Four initial assumptions were made to direct the project toward a realistic description of the development process for both positive and negative effects of stress in basic training. These assumptions were:

1) Basic training is a socialization process.
2) Physical and psychological demands made on recruits requiring learning and personal growth are the primary bases for stress in basic training.
3) The effects of these growth and adjustment demands depend on contextual factors including leadership style.
4) The net effect of the stress can only be determined by considering a range of outcomes, including changes in attitudes, acquisition of basic skills and abilities, and health effects.

These assumptions embody the view that basic training requires individual adjustment (e.g., Maskin & Altman, 1943) including acquisition of a new role (Zurcher, 1967). Stress is associated with this adjustment, but the effects of stress emerge as the product of a process which can only be understood when viewed longitudinally. Evaluating the impact of stress will therefore require research designs which incorporate repeated assessment of stress and the outcomes which it may affect. The objective of the study presented in this paper was to identify important elements of the overall training process and develop scales to assess them.

Identification of Critical Concepts

A new questionnaire to measure stress in basic training was developed because of the presumed uniqueness of the situation. While all the processes involved in basic training undoubtedly occur in other life settings, the specific combination may be found only in basic training. As a result, it seemed unlikely that questionnaires developed to portray other settings (e.g., industrial organizations) would be sensitive to all of the important elements of stress in basic training. While such inadequacy was only a possibility, the decision was that it was important to employ a questionnaire that was maximally sensitive to the specific situation of basic training. Ensuring that this objective was achieved required the construction of a questionnaire for this specific purpose.

The identification of variables for inclusion in the questionnaire combined descriptions of recruits' experiences in basic training with theoretical considerations. Recruits' perceptions were given the highest priority to ensure that the questionnaire reflected the training experience expressed in terms that were meaningful to the recruits. Theoretical considerations translated the concrete, specific instances mentioned by recruits into general concepts for assessment. In addition, theoretical frameworks developed in connection with socialization, stress, and organizational research were examined to insure inclusion of key predictors for attitudinal changes, performance, and health outcomes. The recruits' perceptions and theoretical considerations from the different areas of research converged on a small number of apparently highly important variables which were included in the questionnaire. The process for identifying these variables is described briefly below.

Recruit Perceptions. Interviews with 40 graduating recruits were carried out as an initial step in this research program. The results of these interviews have been summarized previously (Vickers, Hervig & Ward, Note 1). The interviews indicated that the most important factors in basic training were (1) overload and pressure, (2) ambiguity concerning what to do, why to do it, etc., (3) loss of control over one's life and/or adjusting to discipline (4) inequitable treatment, and (5) absence of accurate feedback concerning performance. The behavior of drill instructors (DIs) was an important contributing factor in each of these areas. The recruits frequently mentioned that constant yelling and close surveillance were important pressures during training.

An additional 26 interviews were conducted with recruits who failed to complete training. These interviews produced similar responses to those obtained from the graduating recruits. In this sample, loss of personal autonomy and DI behavior stood out as exceptionally important. Receiving too little respect as a person and never being rewarded for effort or good performance were noted as important factors contributing to attrition. These last two factors were not frequently mentioned by the graduating recruits.

Work by other researchers has produced similar trends when identifying the reasons for leaving basic training. Mobley, Hand, Baker and Meglino (1978) identified (1) lack of personal freedom, (2) too much pressure, (3) rigid rules and regulations, (4) unfair treatment from superiors, and (5) too much emphasis on rules and regulations as among the ten most frequent self-reported reasons for failing training.

Other common reasons for leaving included health, missing family and friends, and wanting to get married. These reasons for leaving have been shown to be important in several samples of recruits (Youngblood, Meglino, Mobley, & Moore, 1980).

Socialization Research. Socialization, stress, and organizational psychology research supplemented the interviews as means of selecting variables. Each area of theory both reflected aspects of the recruit comments and focused on understanding a distinct element of stress effects in training. Socialization theory was crucial because training is a socialization process. This theory therefore provides a framework for predicting the development of relatively lasting, internalized attitudes which may be an important product of basic training. Socialization is a central aspect of basic training because "Strictly speaking, socialization occurs whenever an individual must adapt to the standards of a new group." (Jones & Gerard, 1967, p. 76). The need for adaptation in basic training has been noted repeatedly (Maskin & Altman, 1943; Brotz & Wilson, 1946; Janis, 1945; Bourne, 1967; Zurcher, 1967) and may be the primary source for psychological stress.

A key assumption in reviewing the socialization literature was that basic socialization processes are constant throughout the life span. If so, childhood socialization research can supplement the set of loosely-related hypotheses that characterize adult and organizational socialization research (cf., Sherlock & Morris, 1967; Moore, 1969; Graen, 1976; Van Maanen, 1976). Findings from childhood socialization research may be particularly appropriate to basic training where the situation may reinstate the conditions of childhood (Bourne, 1967). The important childhood socialization variables for predicting development of personality and internalization of attitudes are (1) the clarity of behavioral expectations communicated to the child, (2) the degree of conflict in expectations between parents or between parents and peers, (3) the use of reasoning as part of the reward-punishment process, (4) the warmth of the parent-child relationship, (5) the use of warnings and timing of punishment, (6) strictness of discipline, and (7) relative emphasis on punishment and reward (Maccoby, 1959); Whiting, 1960; Becker, 1964; Parke, 1972).

Adult socialization research explicitly mentions some of the variables noted above (cf., Van Maanen, 1976; Graen, 1976). For example, Johnson and Graen (1973) emphasize role ambiguity (i.e., clarity of behavioral expectations) and role conflict (i.e., degree of conflict in expectations). Parental warmth and use of reasoning parallel the variables of leadersupport or consideration and leader structuring. These parallels support the assumption that the processes involved in socialization continue throughout the life cycle, but, as noted above, the adult socialization literature is not as systematically developed as the childhood socialization literature at present.

Although it has some limitations relative to childhood socialization research, organizational socialization studies have extended the general area of socialization research to include variables that are not emphasized in the literature on early childhood socialization. These include "resocialization" variables and group membership variables which are not likely to be factors in early socialization. Because adult socialization builds on prior socialization, a period of isolation from prior social influences accompanied by random patterning of activity may facilitate new learning by reducing the effectiveness of old behavior patterns (McHugh, 1966; Moore,

1969). Isolation is inherent in basic training and was therefore not a topic for furthe concern, even though it may affect outcomes (Wamsley, 1972; Christie, 1954; Zurcher, 1967). Subjectively, events in the early phases of training may appear to be randomly structured (cf., Bourne, 1967; Vickers, Hervig & Ward, Note 1), a trend which may be intentionally reinforced by some DIs (Faris, 1973). This subjective randomness should facilitate "desocialization" and may ultimately have positive effects despite its initial negative impact. Therefore, stresses such as role ambiguity occurring early in training may contribute to positive outcomes by the end of training. In the later phases of training, however, normal social learning processes which require structured events should be necessary for positive changes (McHugh, 1966).

In adult socialization, group membership reduces individuality. Obviously this observation applies to basic training (Faris, 1973) and may contribute to desocialization as part of the "stripping" process that removes external social status as a factor in this setting (Zurcher, 1967). This stripping process can be a positive factor by giving people a new start (Janowitz, 1969). The group identity and affective ties which may result between recruits can facilitate or hinder the socialization process depending on the attitudes of the group (Moore, 1969; Van Maanen, 1976).

Stress Research. The second area of theory reviewed was stress research. This area was reviewed to identify factors which influence health outcomes from training or determine whether stress produces positive or negative effects. Social conditions which influence the response to stress were also identified. With regard to the first of these objectives, any event which disturbs physiological homeostasis may contribute to illness regardless of its positive or negative implications (Holmes & Rahe, 1967). This perspective makes it possible to identify more stresses in basic training than it would be possible to study in a single project, so it was necessary to single out a small number which were likely to be major contributors to health outcomes. Models of stress developed by Weiss (1972) and Seligman (1975) point to unpredictability and uncontrollability of negative outcomes as important factors in such effects. These concepts can also describe conditions which produce low motivation, poor learning, and poor performance coupled with negative affective states (Seligman, 1975). Recent studies suggest connections between these concepts and physiological responses to jobs (Frankenhaeuser & Gardell, 1976) which may link stress to chronic disease (cf., Karaseck, 1978; Henry & Stephens, 1977). Recent research has also contributed to an understanding of the physiological mechanisms which translate these stresses into behavioral responses (e.g., Weiss, Glazer, & Pohorecky, 1976). Detailed exploration of such mechanisms is a critical need for stress research today (Wolf & Goodell, 1979). Predictability and controllability are therefore stresses which should contribute significantly to our understanding of the effects of stress in basic training and also to our general understanding of stress.

The review of stress research also considered factors which might differentiate positive and negative outcomes from stress. This consideration led to adopting a "problem solving" conceptualization of stress. Situations which can produce negative outcomes are commonly thought stressful, but may not always be so. In some instances, stressful situations may even produce positive effects. Identifying conditions which produce positive effects was important for this study given the objective of examining

both positive and negative effects of stress. Although no complete theoretical framework for such effects exists, available discussions suggest that positive effects occur when a person meets and masters exceptional situational demands (Haan, 1977; Lazarus, 1978). Mastery is also implicit in Moore's (1969) hypothesis that succeeding when failure is actually possible is crucial to effective adult socialization. A mastery approach to positive stress effects is therefore useful in general and specifically applies to the socialization setting of basic training.

Mastering a demanding situation implies the use and/or development of skills and abilities that provide some control of situational outcomes. This obviously ties mastery to the issue of control which was noted above as an important determinant of health outcomes. Stress and mastery are further linked by adopting the view that stress occurs when a person has a problem to be solved (Ruff & Korchin, 1967; G. Vickers, 1968). This perspective is clearly applicable to basic training where the "problem" is meeting and adjusting to the psychological and physical demands. These demands cover need deprivation (e.g., loss of freedom) and ability overload. These two broad categories of stress can be used to conceptualize most or all psychological stress concepts (cf., French, Rodgers & Cobb, 1974). The "problem" approach to stress is therefore sufficiently broad to cover all types of psychological stress.

The problem solving approach to stress points to aspects of training which should contribute to positive outcomes. These outcomes depend on mastery which may be influenced by many factors. A key factor should be the behavior of the DIs. Interviews make it clear that the DIs are a critical part of the training process (Vickers, Hervig & Ward, Note 1). DIs can help define the goals of training and the means of achieving them (House, 1971) and thereby provide important "problem definition" for the recruits. Such definition is critical to achieving a solution (G. Vickers, 1968). DIs are also important sources of feedback which is necessary for the recruits to adjust their behavior to arrive at an effective "solution to the problem" (cf., Miller, Galanter & Pribram, 1960). The DIs also serve as role models for the recruits and as such embody the "solution" to the problem.

The DIs make the contributions listed above through social influence processes involving power bases common to all areas of social life. These include legitimate authority, expertise, being a role model or point of reference, use of punishment, and use of reward (French & Raven, 1959). Each type of social power can be important to the outcomes from training because they have implications for how the recruits are likely to define their "problem." For example, are they supposed to gain skill to gain the rewards offered by the DIs, or are they simply trying to avoid punishment? The answer to this question may have very important implications for what the person learns and how enduring the changes made during training will be (Ring & Kelley, 1963; Kelman, 1958). According to current conceptualizations, expert and referent power should be the most effective means of leading given today's social context (Janowitz, 1959) and it seems likely that these are the types of power that are most useful in helping define path-goal relationships and thus enhancing problem solving.

The problem solving approach to stress has other advantages as well. One is that it clearly points to the importance of viewing stress as a process over time.

The initial reaction to encountering a problem may be negative, but if the person learns to deal with the demands inherent in the problem, mastery occurs. In this case, there should be an accompanying shift to a positive reaction to the experience and a possible overall net gain. The results of interviews with recruits indicate that this is a reasonable, if crude, description of the experiences of recruits who succeed in basic training. In the early stages of training, recruits are confused about what is expected of them and why, and they have difficulty dealing with problems such as loss of freedom. During the course of training, they learn to deal with the demands of the situation and to master specific tasks. The interviews also indicated that increased self-control was an important product of this learning experience. The net result is that the recruits feel a sense of mastery of difficult demands at the end of training with resulting feelings of improvement in themselves (Vickers, Hervig & Ward, Note 1). In general, the effects of stressful life situations, including basic training, will be understood only when they are studied longitudinally. This underscores the ultimate need for longitudinal studies of the basic training experience.

The final contribution of the stress literature review was identification of elements of the social context that can reduce stress responses without necessarily contributing directly to problem solving, i.e., without actually changing the stress. Cobb (1976) refers to this as "buffering" stress effects and attributes this characteristic to social support. Social support may consist of help[1] such as information that clarifies a problem or assistance in carrying out a solution. Social support might also consist of indications of respect and friendship that help a person maintain self-esteem when loss of esteem might hinder future performance and produce a vicious circle. Social support can also consist of confirmation of a person's world view. This confirmation may enhance motivation and performance in good groups, but decrease it in poor groups (cf., Van Maanen, 1976). Social support should be closely linked to "esprit de corps" in basic training and is also embodied in the concept of a "band of brothers" which describes an important part of Marine Corps life (Cooper, Note 3). In fact, the ability to rapidly develop a social support network may be one product of basic training (Faris, 1973). Therefore, social supports are important in understanding the effects of stress in basic training.

In summary, three important considerations emerged from the review of stress research. First, controllability and predictability have been identified as stress factors that are particularly likely to affect health. Second, factors that increase or decrease the likelihood of problem solving should determine whether situational demands produce positive or negative outcomes. Third, social supports are important means of avoiding negative consequences of stress and may even contribute to positive outcomes.

Organizational Psychology. Socialization theory provided bases for predicting attitude changes, and stress theory supplied hypotheses concerning health and conditions for positive effects of stress. Organizational psychology was briefly reviewed to insure inclusion of concepts related to theoretical formulations concerning

[1]The three types of support described are based on definitions of aid, affect, and affirmation support, respectively, which were provided by French (Note 2).

motivation and performance. Several general theories of motivation dominate investigations in this area of organizational psychology (Mitchell, 1979). One, expectancy theory, is being applied in Marine basic training by researchers at the University of South Carolina (Mobley, Baker, Hand & Meglino, 1979). Their findings provide a basis for applying this model to basic training in future studies, so expectancy theory was not pursued in this study. A second possibility was equity theory, but the pivotal concept in this theory has already been expressed in the recruits' concern for fair treatment from the DIs. Overall, there appeared to be little need to add variables for the specific purpose of measuring motivation.

A related area of organizational research is the study of organizational climate. Inquiries in this area have included consideration of conditions which enhance motivation by altering expectancies or contributing to perceptions of equity. Basically, the variables important in this respect are organizational equivalents of those identified as important for socialization and stress (cf., for example, James, Hartmann, Stebbins & Jones, 1977).

Factors Critical to Training Outcomes

Table 1 lists the variables selected for this initial questionnaire expressed in terms of organizational psychology concepts. The use of these concepts is appropriate considering the organizational setting of the research. The evident convergence of different theoretical areas makes it possible to predict attitudes, performance, and health with a limited set of variables, so all three classes of outcomes can be integrated to describe the net effects of stress.

TABLE 1

BASES FOR SELECTING VARIABLES TO BE MEASURED

Equivalent Organizational Psychology Variable	*Basis for Selection*			
	Recruit Interviews	Childhood Socialization Theory	Organizational Socialization Theory	Stress Theory
Role Demands				
Overload/Job Pressure	X			X
Role Ambiguity	X	X	X	X
Role Conflict		X	X	X
Role Challenge/Self-Utilization Opportunity	X		X	X
Interpersonal Processes				
Leader Structuring	?	X	?	X
Leader Support	?	X		X
Group Cohesion/Support	X	X	X	X
Feedback	X			X
Warning		X		X
Discipline and Power				
Discipline	X	X		
Rules Orientation	X	X	?	?
Surveillance/Closeness of Supervision	X	?	?	
Equity	X	?		X
Punitiveness/Punishment-Reward Balance	?	X	X	X
Evaluations/Standards	X		X	
Power Base	?	X		X

X = Equivalent concept explicitly mentioned. ? = Equivalent concept implied.

Convergence also increases the likelihood that the limited set of variables will provide powerful prediction in all three outcome categories even though no single theoretical area has been exhaustively sampled. If different lines of research, proceeding independently, develop similar concepts to explain behavior, these concepts appear to be basic to human behavior in general. The overall predictive power achieved by these variables may be moderate when individual attributes and nonorganizational environmental factors (e.g., stress tolerance, climatic factors, pathogens in the air) are not taken into account, but the predictive potential of psychological factors should be well-approximated with the limited set of variables.

Comparison to Factor Analytic Studies

The variables in Table 1 were compared to the results of factor analyses from studies of organizational climate and stress to ensure that major psychological aspects of the situation were not being overlooked. Studies by Jones and James (1979) and Johannesson (1973) were chosen as reference studies for organizational climate and research by Caplan, et al. (1975) and R. Vickers (1979) provided the comparisons for organizational stress (see Appendix A for details). The initial intent was to include two or three variables representing each factor in these studies, but the variables in Table 1 did not always satisfy this intent (see Table 2). The unrepresented factors did not figure in recruits' descriptions of basic training and the coverage of most factors seemed adequate, so no variables were added on the basis of this comparison.

TABLE 2

VARIABLES WHICH MAY REPRESENT FACTORS FOUND IN REFERENCE STUDIES

Reference Study	*Possible Representative Variables*
Jones & James (1979)	
Factor 1	None[b]
Factor 2	Discipline (includes autonomy), Feedback, Challenge, Goal Setting
Factor 3	Leader Support, Leader Structure, Goal Emphasis
Factor 4	Group Teamwork, Group Support
Factor 5	Role Conflict, Job Pressure
Factor 6	Job Pressure, Goal Setting
Johannesson (1973)[a]	
Factor 1	Expert Power, Group Support, Challenge, Role Clarity, DI and System Equity
Factor 2	None[c]
Factor 3	Job Pressure
Vickers (1979)[a]	
Factor 1	Role Clarity, Challenge, Leader Support
Factor 2	Work Load
Caplan, et al. (1975)[a]	
Factor 1	Challenge
Factor 2	Work Load, Role Conflict
Factor 3	Role Clarity, Group Support

[a]The reference given represents the source of data for factor analyses performed as part of this study. The results of the factor analyses are presented in Appendix A.

[b]The factor represents higher-level aspects of the organization.

[c]The factor deals only with pay.

METHOD

Selection of Items

A large pool of items was developed by searching a range of sources (see Appendix B). From these, an attempt was made to take previously used items which had maximum applicability to the basic training situation. The work of Mobley, et al. (1978) was given the highest priority to ensure sensitivity to recruit perceptions and therefore situation-appropriateness. Second priority was given to items from the studies selected for factor structure comparison (i.e., Jones & James, 1979; Johannesson, 1973; Caplan, et al., 1975; Vickers, 1979) to facilitate those comparisons. Additional sources of items were chosen as needed. When necessary, new items were written specifically for this study on the basis of the recruit interviews. Ultimately the items selected were those that seemed most pertinent to basic training situations based on the recruit interviews (see Appendix B for items).

Final Operational Scale Definitions

Selecting items required decisions which clarified the definitions of the variables for this study. The resulting operational definitions are given below.

Overload/Job Pressure. Overload was the extent to which there was more work to be done than could be accomplished in the time available. Feelings of "pressure" associated with being a recruit were measured with the emphasis on hurrying and being aware of pressure.

Role Ambiguity. Role ambiguity means not knowing clearly what behaviors are expected on the job (Kahn, et al., 1964; House, Lirtzman & Rizzo, 1968). The items employed to represent this concept dealt with the what and why for training tasks as these were the key aspects of ambiguity for the recruits.

Role Conflict. As originally defined (Kahn, et al., 1964), role conflict occurs when a person receives different, mutually exclusive, expectations about tasks, goals, or procedures from different role senders. This is distinct from the conflict of having to choose which of several tasks to do when overloaded and this distinction was maintained in the selection of items for this study.

Role Challenge. Challenge is commonly discriminated from threat in discussions of positive and negative stress. The key element is opportunity for personal growth. Role challenge therefore emphasized opportunity to display or learn skills and ability. An attempt was made to eliminate "motivation" or "effort" as factors in this scale, because these concepts overlap with others in the study.

Leader Structuring. "Leader structuring" was defined as means-ends specification by DIs. Items reflected the DI's behavior in specifying what to do, how to do it, who should do it, and why the work should be done.

Leader Support. Leader support emphasized provision of aid or assistance to the recruits and affective factors (French, Note 2). Aid is evidenced in the drill instructor's approachability during times of difficulty and his concern for the general well-being of his recruits. Affect is essentially a communication from the drill instructor that he sees the recruits as worthwhile human beings and potentially good Marines. This aspect of "support" is reflected in the DI's pride in the platoon and concern for its performance.

Group Cohesion. Group cohesion was defined in terms of group teamwork. Items emphasized willing cooperation to get work done and free sharing of information.

Group Support. This group variable reflects the character of interpersonal interactions in the platoon. Items reflected positive affective relationships and actual assistance provided in time of need. These two aspects of support correspond to the affect and aid concepts mentioned in connection with the DIs.

Feedback. Feedback is important to motivation (Hackman & Lawler, 1971; Hackman & Oldman, 1974) and stress (Weiss, 1972; Seligman, 1975). Items to measure feedback reflected the extent to which DIs provided recruits' information concerning their progress. This index is conceptually related to the providing structure, but the specific structure provided may be of special importance.

Warning. Warning signals for impending problems are important to the person's ability to cope with problems and can be critical to positive personal growth in training. Warning measure items indicated the extent to which recruits knew when they were in danger before actually being punished by the DIs.

Discipline. Discipline is a general concept that was broken into rules emphasis, surveillance, standardization, equity, and loss of autonomy.

> Rules Emphasis: The working definition for rules emphasis revolved around the priority given to rules and regulations in the platoon. Items dealt with whether rules were more important then getting work done efficiently and the magnitude of infraction required to elicit punishment. This could be regarded as a "strictness" variable.
>
> Surveillance: Graduating recruits often said that the best times in training were those when they were "free" of their DIs. A time when the DI was not constantly watching them gave an opportunity to relax. The surveillance scale was comprised of items dealing with the general frequency of such periods.
>
> Standardization: Standardization emphasized having tasks spelled out in detail. A standardized procedure is similar to a lack of autonomy (see below), but autonomy more generally refers to control over the entire of one's life, not just task-related aspects.
>
> Equity: Being punished for others' mistakes or being singled out for special attention when making a mistake is a common recruit complaint and may contribute to attrition (Mobley, et al., 1978). DI equity and system equity were considered to assess fairness of treatment. Items focused on the relation between effort or performance and outcomes, particularly receiving negative outcomes due to someone else's error and being punished even when trying as hard as possible.
>
> Autonomy: Loss of personal freedom is acutely felt by the recruits. Conceptually, loss of autonomy was treated as an extension of discipline into areas that the recruits feel are not appropriate. The items for this scale were taken from Mobley, et al. (1978).

Power Bases. When social influence and power were discussed in connection with stress research (see p. 5 above), attention was directed to French and Raven's (1959) list of coercive, reward, referent, expert, and legitimate power bases. Scales were constructed for each, drawing heavily from an item set developed by Weinstein and Holzbach (1973). The items for coercion and reward reflected concepts which should be self explanatory. Referent power items indicated the degree to which the DI is seen as a role model to be emulated. Expert power items indicated the degree to which the DIs are seen as skilled, knowledgeable, etc. Legitimate power items reflected the recruits' perceptions that their DIs had formally invested power to direct recruits' actions. A scale reflecting utilization of punitive controls was also constructed because punishment/reward ratio may be an important factor in training and coercion did not seem sufficiently sensitive to actual punishment behavior.

Sample

Four hundred and sixty-four graduating recruits were sampled from 32 platoons. Sixteen recruits were sampled from each of 28 platoons; for another four platoons only four recruits per platoon appeared for testing. Four hundred and thirty-eight of these recruits volunteered to participate and 413 (94.3%) of these volunteers completed usable questionnaires.

A stratified sampling procedure based on formal organizational structure was used. A series consists of four platoons, each of which is divided into four squads. During the study, each platoon had about 64 men, so squads were comprised of approximately 16 men. Squads are divided into four fire teams, each with four men.

Squads are numbered "1" through "4" and the fire teams within squads are similarly numbered. One fire team was chosen from each squad with a first, second, third and fourth fire team selected for each platoon. Within a series, each squad-fire team combination (e.g., first squad, third fire team) occurred only once.

Administration of the Questionnaire

Data were gathered the day prior to graduation in a group setting with only the participants and the investigators present. After obtaining informed consent, a short biographical questionnaire was completed. The stress questionnaire was then administered verbally to speed completion of the test and avoid possible effects of reading difficulties. Recruits marked their responses on an optical scanning form with alternatives ranging from "Disagree Strongly" (1) to "Agree Strongly" (7). Responses were to be based on the overall basic training experience. Explanations of individual questions were given when requested, and questions which had been missed were repeated upon request at the end of the session.

Analysis Procedures

The sample was divided randomly in half within each platoon to form two samples. All analyses were performed separately for each subsample using the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, et al., (1975). Specific analysis procedures are described in the presentation of the results.

RESULTS

Scale Reliabilities

Item composite reliabilities were computed using the SPSS subprogram "RELIABILITY" (see Table 3). Initially, a Cronbach's $\alpha \geq .70$ was set as a desirable consistency level. If this criterion was met in both halves of the sample, the initial composite was accepted as a scale. If one or both subsamples had an $\alpha < .70$, the inter-item correlations were examined to determine whether α could be increased to at least .65 by deleting one or more items (see Table 3).

TABLE 3

RELIABILITY ESTIMATES FOR INITIAL AND REVISED ITEM COMPOSITES

	Reliability for: Initial Item Set		Final Item Set		
Sample:	*1*	*2*	*1*	*2*	Final Set of Items in Scale
Role Demands					
Role Clarity	.69	.73	.72	.76	25, 55, 100, 103, 126
Role Conflict	.58	.60	.63	.61	61, 72, 114, 125
Challenge	.42	.51	.42	.51	20, 30, 43, 46, 49, 53, 74
Overload	.57	.69	.57	.69	16, 68, 73, 84, 102, 120
Interpersonal Processes					
Leader Support	.73	.77	.73	.77	22, 40, 64, 89, 108, 113
Leader Structure	.71	.75	.71	.75	47, 94, 105, 111, 118, 121
Group Support	.72	.71	.72	.71	11, 21, 35, 63, 87, 88
Group Teamwork	.72	.73	.74	.76	8, 12, 19, 54
Feedback	.75	.75	.75	.75	10, 38, 48, 52, 106, 109
Warning	.42	.43	.42	.43	1, 70, 78, 101
Discipline and Power					
Lack of Autonomy	.39	.55	.39	.55	66, 96, 119, 123
Rules Emphasis	.29	.40	.47	.52	26, 69, 79, 93, 107
Surveillance	.70	.70	.70	.70	7, 50, 67, 75, 83, 116
System Equity	.50	.52	.59	.53	15, 41, 110
DI Equity	.72	.69	.72	.69	29, 32, 34, 65, 71, 124
Punishment Behavior	.62	.63	.62	.63	37, 57, 58, 60, 112
Coercive Power	.46	.57	.46	.57	5, 31, 33, 42, 98
Reward Power	.74	.68	.77	.71	24, 39, 44
Legitimate Power	.55	.46	.55	.46	3, 28, 59, 62, 90
Expert Power	.87	.83	.87	.83	85, 92, 99, 104, 122
Standardization	.20	.32	.33	.32	6, 17, 80, 115
Performance Goals	.45	.47	.45	.47	2, 45, 51, 76, 77, 95
Referent Power	.77	.75	.77	.75	4, 9, 81, 82, 117, 127

NOTE: The items in each scale are identified in Appendix B. Item composites with the same internal consistency estimates for the initial and final item sets had no items deleted. Item composites with differing initial and final internal consistency estimates had one or more items deleted.

Scales with satisfactory reliability could not be constructed for many of the discipline and power variables. To determine whether sets of highly intercorrelated items were contained in this item pool, a principal components factor analysis was performed with the items from: (a) composites in these areas with $\alpha < .65$; and (b) the conceptually related "Warning" scale. Only two of the resulting factors had more than two items which loaded significantly and neither produced a scale with $\alpha > .65$ for each subsample. Therefore, no new scales were added.

A final consideration was the possibility that skewed item score distributions might be limiting the consistency of some scales. With such distributions, dichotomous scoring might increase reliability, so item scores for the unreliable scales were split near the median and the resulting dichotomous scores submitted to the reliability analysis. Reliability increased for punishment behavior (α_1/α_2 = .68/.67), legitimate power (α_1/α_2 = .59/.53), overload (α_1/α_2 = .62/.65)[1] and performance goals (α_1/α_2 = .57/.53). For these scales, scores based on the dichotomized items were used in subsequent analyses.

Table 4 describes the scales retained for the analyses reported below. These include the 11 scales with internal consistency estimates greater than .65 for both samples plus overload, role conflict, legitimate power, punishment behavior, and performance goals. These latter scales had internal consistency estimates ranging from .53 to .68. These scales were included because the concepts were especially important in the recruit interviews and the scales met recommended internal consistency standards for preliminary research (Nunnally, 1967).

TABLE 4

DESCRIPTIVE STATISTICS FOR SELECTED STRESSES AND STRESS-RELATED VARIABLES

	Mean		*S. D.*		*Skewness*		*Kurtosis*	
Sample:	1	2	1	2	1	2	1	2
Role Demands								
Overload*	0.55	0.62	0.34	0.34	–0.18	–0.45	–1.18	–1.02
Role Clarity	4.56	4.53	1.05	1.08	–0.86	–1.17	0.62	1.71
Role Conflict	3.75	3.98	1.23	1.17	–0.53	–0.57	0.18	0.68
Interpersonal Processes								
Leader Structure	4.44	4.45	0.99	1.08	–0.89	–0.88	1.11	1.37
Leader Support	4.47	4.45	1.01	1.04	–0.71	–1.05	0.07	1.81
Group Teamwork	3.98	3.79	1.29	1.34	–0.76	–0.52	0.28	–0.34
Group Support	3.16	3.09	1.13	1.14	–0.24	–0.22	–0.22	–0.28
Feedback	4.19	4.12	1.13	1.15	–0.64	–0.87	0.18	1.11
Discipline and Power Bases								
Legitimate Power*	0.63	0.65	0.29	0.27	–0.44	–0.46	–0.56	–0.50
Expert Power	5.53	5.57	0.77	0.70	–2.52	–3.11	7.31	15.33
Referent Power	4.14	4.14	1.20	1.19	–0.96	–0.64	0.69	0.03
Reward Power	4.12	4.15	1.40	1.36	–0.91	–0.80	0.49	0.14
DI Equity	3.11	3.06	1.21	1.21	–0.08	–0.10	–0.49	–0.32
Surveillance	3.92	4.14	1.08	1.08	–0.38	–0.47	–0.09	–0.02
Punishment Behavior*	0.48	0.52	0.33	0.33	–0.02	–0.01	–1.21	–1.13
Performance Goals*	0.58	0.61	0.27	0.25	–0.31	–0.34	–0.77	–0.52

*Scale is composed of dichotomized items.

NOTE: The sample size for these statistics ranges from 204 to 206 in Sample 1 and from 205 to 207 in Sample 2.

[1]These reliabilities are based on the inclusion of only four items, i.e., 16,73,84, and 120. These scales were used in subsequent analyses because they satisfied the criterion of $\alpha > .65$.

Distributions for the scale scores generally approximated normality. Skewness and kurtosis were pronounced only for expert power. Because deviations from normality appear to have little influence on correlations (Havlicek & Peterson, 1977), the score distributions should have little impact on the results presented in this paper with the possible exception of those concerning expert power.

Factor Analysis

Correlations for the 16 scales listed in Table 4 are presented in Appendix C. These correlations were generally stable across the two subsamples and were factor analyzed to provide a relatively simple summary of the pattern of intercorrelations and to obtain an indication of the number of dimensions of stress that would have to be considered in longitudinal studies. A principal factors method was used with squared multiple correlations as the initial communality estimates (SPSS program Factor with option PA2). Varimax and oblique rotations of the factor matrix were performed. The oblique rotation was performed to examine the possibility that higher order factors were present (cf., Gorsuch, 1974).

An initial concern was the number of factors required to describe the dimensionality of the variables. In sample 1, four factors had eigenvalues greater than 1.00. Application of Cattell's scree test (cf., Gorsuch, 1974) suggested that a fifth factor with an eigenvalue of 0.98 might be included. In the second sample, three factors had eigenvalues greater than 1.00, while the scree test suggested inclusion of a fourth factor with an eigenvalue of 0.98. Comparison of the three-, four-, and five-factor solutions using coefficients of congruence (Gorsuch, 1974) established the four-factor solution as most consistent across the two samples (see Table 5). The second and fourth factors were the same in each sample, but the first and third reversed between samples. These latter factors appeared to represent a general leadership factor which split differently in the two samples. The oblique factor solution showed these two factors to be correlated, r = .62 in Sample 1 and r = .49 in Sample 2.

TABLE 5

COEFFICIENTS OF CONGRUENCE BETWEEN SAMPLES FOR THREE-, FOUR-, AND FIVE-FACTOR VARIMAX SOLUTIONS

	Sample 1 Factor	*Sample 2 Factor* 1	2	3	4	5
Three-	1	.88	−.26	.93		
Factor	2	−.20	.98	−.11		
Solution	3	.71	−.19	.38		
Four-	1	.78	−.29	.97	.47	
Factor	2	−.19	.98	−.09	−.17	
Solution	3	.96	−.20	.68	.51	
	4	.55	−.20	.43	.95	
Five-	1	−.29	.92	.66	.50	.83
Factor	2	−.21	.63	.96	.55	.86
Solution	3	.93	−.47	−.38	−.31	−.44
	4	.63	.48	.29	.11	.05
	5	−.20	.44	.50	.95	.47

NOTE: Only coefficients greater than .90 have been underlined.

The components of the several factors can be described as follows, using the results from the varimax orthogonal rotation (see Table 6).

TABLE 6

VARIMAX FACTOR LOADINGS FOR FOUR-FACTOR SOLUTIONS IN TWO SAMPLES OF MARINE RECRUITS

Variable	*SAMPLE:*	Factor A 1	Factor A 2	Factor B 1	Factor B 2	Factor C 1	Factor C 2	Factor D 1	Factor D 2	h^2 1	h^2 2	Cronbach's α 1	Cronbach's α 2
Overload		−.02	−.07	.67**	.69**	−.03	−.09	−.11	−.07	.46	.49	.62	.65
Role Clarity		.28	.14	.13	.02	.71**	.78**	.22	.23	.64	.67	.72	.76
Role Conflict		−.14	−.22	.39*	.44*	−.19	−.16	−.07	.01	.21	.27	.63	.61
Legitimate Power		.25	.41	.51*	.45*	.29	.09	−.02	.06	.40	.38	.59	.53
Leader Structure		.32	.21	−.08	−.04	.82**	.81**	.11	.19	.79	.75	.71	.75
Leader Support		.73**	.62**	−.13	−.20	.32*	.45*	.15	.07	.68	.62	.73	.77
Group Teamwork		.17	.10	.03	.03	.18	.37	.72**	.81**	.58	.81	.74	.76
Group Support		.15	.19	−.14	−.19	.10	.22	.79**	.61**	.67	.50	.72	.71
Feedback		.49	.29	−.09	−.14	.55*	.73*	.13	.17	.56	.66	.75	.75
Performance Goals		.23	.27	.61*	.54*	.18	.07	.10	−.02	.47	.37	.57	.53
Expert Power		.69**	.64**	.18	.05	.16	.20	.14	.15	.55	.48	.87	.83
Surveillance		−.27	−.22	.56*	.74*	−.08	−.11	−.04	−.01	.39	.61	.70	.70
Referent Power		.71**	.64**	−.03	−.16	.16	.22	.10	.11	.54	.49	.77	.75
DI Equity		.52*	.54*	−.25	−.40	.43*	.45*	.16	.18	.54	.68	.72	.69
Reward Power		.58*	.32*	−.19	−.22	.34*	.61*	.14	.20	.51	.56	.77	.71
Punishment Behavior		−.14	−.10	.75**	.73**	−.13	−.12	.01	−.17	.59	.58	.68	.67
Eigenvalue		5.21	1.36	2.76	2.63	1.33	5.64	1.07	0.98				
% Variance		32.5	8.5	17.3	16.5	8.3	35.2	6.7	6.1				

*Indicates variables with loadings greater than .30 in both samples, but less than .60 in one or both.
**Indicates variables with loadings greater than .60 in both samples.

NOTE: A lower limit of .30 was chosen by applying the rule that the loading should be approximately twice as large as the required correlation coefficient to be significant for a given sample size (cf., Gorsuch, 1974). Sample sizes are $N > 203$ for Sample 1 and $N > 204$ for Sample 2. Factor A corresponds to the first factor in Sample 1 and the third factor in Sample 2. Factor B corresponds to the second factor in each sample. Factor C corresponds to the third factor in Sample 1 and the first factor in Sample 2. Factor D corresponds to the fourth factor in each sample.

Factor A: The primary loadings ($\geq$ .60 in both samples) were for Leader Support (.73/.62), Expert Power (.69/.64) and Referent Power (.71/.64). Secondary loadings ($\geq$ .30 in both samples) were observed for DI Equity (.52/.54) and Reward Power (.58/.32).

Factor B: Primary weightings were for Overload (.67/.69) and Punishment Behavior (.75/.73). Secondary loadings were found for Role Conflict (.39/.44), Legitimate Power (.51/.45), Performance Goals (.61/.54), and Surveillance (.56/.74).

Factor C: Primary loadings occur for Role Clarity (.71/.78), and Leader Structure (.82/.81). Secondary weightings occurred for Leader Support (.32/.45), Feedback (.55/.73), DI Equity (.43/.45), and Reward Power (.34/.61)

Factor D: Primary loadings occurred for Group Teamwork (.72/.81) and Group Support (.79/.61). There were no secondary loadings.

The oblique factor analysis showed the same pattern of primary and secondary loadings (see Appendix D). This analysis provides additional information concerning the independence of the factors. As noted above, the two leadership factors were highly correlated. There was also a correlation between Factor A and Factor D indicating that leader support and group support are related ($r = .34$ and $r = .25$ in Samples 1 and 2, respectively).

DISCUSSION

The present study developed preliminary situation-specific scales to measure stress and related facets of basic training. Interviews with graduating and attriting recruits identified factors contributing to positive and negative perceptions of training. Socialization, motivation, and stress research indicated variables which should be important predictors of attitudes, performance, and health, respectively. Analyses presented in this paper described the resulting scales and their intercorrelations.

Psychometrically, the study produced mixed results. While most scales showed reasonable score distributions, the average internal consistency estimate was lower than had been hoped. This result was probably due to a combination of two factors. First, a retrospective summary of basic training experiences may be difficult to make because the different phases of training have distinct attributes (cf., Vickers, Hervig & Ward, Note 1). This may be particularly true for the scales concerning discipline and performance demands. Second, mean scores on some scales were quite high suggesting a possible ceiling effect which could reduce inter-item correlations (Carroll, 1961). This latter problem is important for future studies, because the resulting restriction of range of scores could reduce the predictive power of the stress measures. The important point for the moment, however, is that the present internal consistency estimates probably represent a lower bound for the internal consistency of the scales. Internal consistency may be increased by rewording the items to reduce possible ceiling effects and asking about each phase of training separately. Using these approaches, internal consistency should be satisfactory in longitudinal studies, but additional research is needed to verify this assumption prior to undertaking such studies.

When longitudinal studies are undertaken, multiple administrations of an hour-long questionnaire will not be practical. This is one reason why attention was given to determining the number of basic dimensions in recruit perceptions of stress and related factors. Abbreviated forms covering the major dimensions of stress will be the best practical approach. The analysis results showed four basic dimensions of stress which should be included in these abbreviated forms. These dimensions isolate distinct theoretical concepts reflecting demands on the recruit, the role model characteristics of the DIs, the clarity of role expectations, and group behaviors.

The demands of training are reflected in the factor with high loadings for Overload, Performance Goals, Surveillance, and Punishment Behavior. This combination clearly identifies demands on the recruits and threat of negative sanction for failure to meet the demands. Evidently, subjective role pressure is higher when associated with threats even though all recruits face the same objective demands. Use of

punishment would therefore be an important, potentially controllable, determinant of stress in basic training. However, the differences reflected in these correlations occur against a background of generally high stress for all recruits.

Conditions which surround the demands on recruits are reflected in the remaining three factors. One factor which had high loadings for Leader Support, Expert Power, Referent Power, and DI Equity indicates a good role model. This factor combines elements of the leader consideration concept studied in organizational psychology (cf., Stogdill & Coons, 1957 ; House, 1971; Schreischeim & Kerr, 1974) with elements of an idealized military leadership style (Janowitz, 1959). According to the socialization models reviewed in the introduction, such a role model should produce internalized norms, values, and attitudes. The performance-reward contingency implied in DI Equity should reduce negative affective and physiological responses to performance demands (see pp. 4-6).

The combination of Leader Structure, Role Clarity, and Feedback produces a factor which implies clear role expectations based on DIs' defining tasks and giving accurate feedback on progress. These behaviors may contribute to seeing the DIs as supportive and fair as indicated by secondary loadings for Leader Support and DI Equity. A low score on this factor would indicate high stress due to ambiguity (Kahn, et al., 1964; House, et al., 1968; Caplan, et al., 1975). A high score would imply low stress and a positive context for the demands made on the recruit. Potential negative effects of performance demands should be reduced because uncertainty has been reduced and feedback concerning progress toward goals provided (House, 1971; Weiss, 1972; Seligman, 1975). DIs' providing structure may increase internalization of values just as parental explanations do in children (Parke, 1972). This factor should also be related to high motivation and therefore to better performance (James, Hartman, Stebbins & Jones, 1977).

Group climate was the final factor. This factor was correlated with the one reflecting leader support, as would be predicted by some models of organizational influence (Franklin, 1975). A high score on the group variables indicates availability of tangible assistance and emotional support from the group during stress. This social support should increase the likelihood of mastering the demands of training and thus contribute to positive outcomes. This factor may also represent an important training outcome because learning to make friends and develop a positive group climate under stress is sometimes viewed as an outcome of training (Faris, 1973).

The four factors described above may not be sufficient to describe the basic training experience. One reason is that critical discipline variables are not adequately measured by the current scales. These may form an additional factor or factors. A second reason is that at least one reliably measured variable, Role Conflict, does not load heavily on any of the four factors and should therefore be considered an independent stress factor. Because this scale includes conflicts between behavioral expectations communicated by other recruits and DIs, it may index negative group factors that can hinder organizational socialization (Van Maanen, 1976). Additional research will be needed to establish these points clearly by improving the measures of some variables and relating the several factors to outcomes to determine their predictive power.

In summary, the present study described the construction of situation-specific measures of critical stress-related variables in Marine basic training. Variables were identified from recruit comments and theoretical review. Initial item composites constructed to measure these variables produced acceptable scales except for some with marginal internal consistencies. The estimated internal consistency is probably a lower limit for the consistency of the scales in longitudinal studies, because the retrospective design of this study required recruits to combine perceptions from qualitatively different phases of training. If so, the scales would be adequate for studies of change processes in training. Factor analysis indicated that those process studies should include variables representing at least four basic dimensions of recruit perceptions. Additional dimensions may exist because the current study does not adequately measure disciplinary variables and because role conflict is not strongly related to any of the four dimensions. One important conclusion from this study is that the major dimensions of stress and related facets of basic training are limited in number. Longitudinal studies of training processes which include measures from each dimension in a brief questionnaire are therefore feasible, once the issue of the additional dimensions is resolved.

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APPENDIX A

SELECTION OF FACTOR-ANALYTIC STUDIES

Prior factor analyses of organizational climate and organizational stress were reviewed as part of the process of variable identification for this study. One object was to ensure breadth of coverage by ensuring that important factors were not overlooked in variable selection. A derivative objective was to determine whether the variables identified on the basis of recruit comments and review of pertinent theory was adequate to make comparisons to other factor structures.

Nine prior factor analytic studies of organizational climate were reviewed to identify appropriate reference studies. The studies that were reviewed are listed in the references at the end of this appendix. Jones and James (1979) and Johannesson (1973) were chosen as reference studies because they provided the best comparison bases. Each study covered a wide range of variables, including attributes of group and interpersonal processes, leadership, and the nature of the work itself. Both studies were designed to minimize the methodological problems common to many other studies of organizational climate. In addition, the items for the scales in each study were available, thereby making it possible to use them in our scales if they could be adapted to the basic training setting.

Jones and James (1979) included variables from four broad areas, including role variables, leadership variables, work group variables, and subsystem and organization variables. When they factor analyzed the resulting scales, they found six factors. Four of these factors had significant (>.40) loadings for two or more variables included in the initial list developed from recruit comments and review of theory. A fifth factor had very few significant loadings, but among them was a loading for role conflict which was included in the initial list. The only factor that was not reflected in the initial list of variables was one pertaining entirely to subsystem and organization variables. A decision was made not to extend the initial list to include these variables because lengthening the questionnaire would have posed a major problem. In view of the fact that the recruits did not comment on these factors with any great frequency during the interviews, this did not seem likely to represent a major shortcoming in meeting our initial objectives.

Johannesson (1973) did not perform a direct factor analysis of the instruments employed in his study. Instead, he cluster-analyzed items to form scales within each of two questionnaires and reported the intercorrelations between the resulting clusters of items. This stopping point was unsatisfactory for the present purposes, so the reported correlations were used to perform a principal factors analysis with oblique rotation (see Table A-1). This analysis produced 3 factors, two of which were well represented in the initial list. The second factor, concern with pay, did

not appear important to recruits in basic training, perhaps because basic training is seen as a brief entry period during which pay is not important.

Consideration of stress-related factor analyses was brief. Only one article dealing with this topic was located (Cummings & DeCotiis, 1973) and the actual content of the scales dealt more with organizational climate than stress. As a result, factor analyses were performed on data from two studies carried out at the Institute for Social Research at the University of Michigan. These studies each developed from an explicit, well-developed theory of organizational stress (cf., French & Kahn, 1962; Kahn, Wolfe, Quinn, Snoek & Rosenthal, 1964). As a result, the data taken from Caplan, Cobb, French, Harrison and Pinneau (1975) and Vickers (1979) provided broad coverage of the major areas currently studied under the heading of "organizational stress." The same factor analysis procedures described above were applied to these data with the results presented in Tables A-2 and A-3, respectively.

The stress-related factor analyses produced factors that were moderately well-represented by the initial variable list. The findings for Caplan, et al. (1975) were not as well-represented as those from Vickers (1979). However, the current list still provided two variables representing each of the three factors identified by Caplan, et al. (1975) and it was felt that this was sufficient.

The results of comparing factor analyses to the prior list of variables generated from recruit comments and reviews of theory indicated that the initial list of variables was generally adequate to represent the important areas of stress and climate. Thus, in addition to knowing that several areas of theory converge, the present study began with the knowledge that the overlapping variables also covered most general topic areas identified in stress and organizational climate research. Naturally, this does not ensure that the coverage was complete, but it does increase the likelihood that general trends in associations between training outcomes and stress will be identified. Subsequent studies may require additional attention to specific variables that have been overlooked.

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TABLE A-1

RESULTS OF THE FACTOR ANALYSIS OF CLUSTERS OF ITEMS FROM JOHANNESSON'S STUDY OF ORGANIZATIONAL CLIMATE

	Factor Loadings		
	1	*2*	*3*
SRA Employee Inventory Clusters			
Management Interest	.328	.199	.346
Working Conditions	.097	.012	.540
Employee Benefits	−.045	.342	.172
Supervision-Technical Competence	.797	−.063	−.111
People	.735	−.247	.026
Work Itself	.503	.048	−.032
Pay	−.202	.948	−.051
Supervision-Interest	.807	−.040	−.091
Organizational Climate Clusters			
Degree of Organization	.550	.085	.198
Pressure	−.129	−.083	.668
Rewards-Promotions	.603	.353	−.295
Friendly Team Spirit	.754	−.095	.138
Rewards-Criticism	.122	.102	.273
Pay	−.022	.851	−.093

NOTE: The sample size for the analysis is 499 employees of a manufacturing organization. The solution given above is the result of an oblique rotation. A three-factor solution was selected on the basis of Catell's "Scree" test (see Gorsuch, 1974). The correlations between factors are r_{12} = .719, r_{13} = .631, and r_{23} = .645. The factors account for 38.7%, 9.3%, and 7.9% of the total variance, respectively.

TABLE A-2

RESULTS OF THE FACTOR ANALYSIS OF STRESS SCALES FROM VICKERS (1979)

	Factor Loadings	
	1	*2*
November		
Role Ambiguity	−.873	.190
Future Ambiguity	−.607	−.062
Work Load	−.178	1.063
Underload	−.014	−.611
Participation	.755	.145
Self-utilization	.575	.225
Superior Consideration	.758	−.019
Responsibility for People	.260	.411
Responsibility for Things	.213	.467
March		
Role Ambiguity	−.826	.056
Future Ambiguity	−.577	−.014
Work Load	−.135	1.059
Underload	−.065	−.601
Participation	.795	.038
Self-utilization	.596	.140
Superior Consideration	.820	−.121
Responsibility for People	.358	.249
Responsibility for Things	.255	.385

NOTE: N = 161 for November and N = 141 for March. The factor loadings are for an oblique rotation. The correlation between factors is r = .43 in November and r = .50 in March. The first and second dimensions account for 45.2% and 17.0% of the total variance in November and 45.5% and 14.8% in March.

TABLE A-3

RESULTS OF THE FACTOR ANALYSIS OF STRESS SCALES FROM THE JOB DEMANDS AND WORKER HEALTH STUDY
(Caplan, Cobb, French, Harrison, and Pinneau, 1975)

	Factor Loadings		
	1	2	3
Quantitative Work Load	.194	.495	.124
Variance in Work Load	.355	.272	.036
Responsibility for People	.150	.329	.539
Complexity	.780	.181	−.128
Role Conflict	−.110	.574	−.035
Role Ambiguity	.139	.122	−.489
Future Ambiguity	−.538	.152	−.096
Underutilization	−.829	.126	.128
Participation	.431	.038	.249
Supervisory Support	.252	−.422	.286
Support from Others	.245	−.094	.456
Support at Home	−.029	.053	.364

NOTE: N = 318. This represents approximately 14 men selected at random from a larger sample in each of 24 occupational groups. More detail on the sampling is provided in Caplan, et al., (1975). The correlations between the dimensions are $r_{12} = .20$, $r_{13} = .51$, and $r_{23} = -.17$. The dimensions account for 28.2%, 15.0%, and 9.1% of the total variance, respectively.

APPENDIX B

ITEM CONTENT OF SCALES

This appendix provides the item content for the scales. For each scale, all items are given along with an indication of their source and their order of presentation in the questionnaire. The source is indicated by including the numbers of the appropriate references at the end of the appendix after each question. Order of presentation is reflected in the questionnaire item number.

In addition to the stress/climate questions, the questionnaire includes a number of scales to assess attitudes at the end of training. These are given at the end of the appendix with references to their sources.

Questionnaire Item Number	Overload/Job Pressure
16	Recruits are always working on rush jobs and having to work very fast. (3,4)
84	Training is always a tight schedule with pressure to get things done on time. (3,4)
73	There are so many assignments that there is always more to do no matter how much gets done. (3,4)
120	There is so much work, recruits have difficulty keeping up with it. (3)
102	Recruits have to work after hours to get all their assignments done. (3)
68	There is too much pressure during boot for some recruits. (17)

	Role Ambiguity
103	Recruits know what they are supposed to accomplish in recruit training. (14, 3, 6)
100	Recruits know exactly what is expected of them. (14, 6)
13	Recruits can tell when they have made the best use of their time. (4, 6)
55	Recruits' responsibilities are clearly defined. (14, 4, 6)
25	Orders and explanations are clear about what has to be done. (6)
126	Rules and decisions are clearly explained. (3)
23	It is clear how recruit training fits into the Marine Corps. (4)

Questionnaire Item Number	
	Role Conflict
61	Recruits have to do things that should be done differently. (4, 6)
72	Recruits receive conflicting orders about what to do from different DIs. (6, 14)
114	Recruits have to do things in a way that is acceptable to one DI but not another. (4, 6)
36	Other recruits want you to go against the rules or the DIs' orders. (Same spirit as 6, #19)
125	Recruits work under conflicting policies and regulations. (6)
	Challenge/Utilization of Skills and Abilities
20	Recruit training gives little chance for recruits to show their best abilities. (14, 3)
74	Recruit training requires skill and effort to do well. (14, 4)
46	Recruit training is boring. (3, 4)
53	Recruit training is difficult and challenging. (4)
30	Recruit training requires attention to detail. (4)
43	Recruit training teaches worthwhile new skills. (3)
49	Recruit training is physically demanding. (17)
	Leader Structure
94	The DIs let the recruits know exactly what is expected of them in terms of goals. (3)
47	DIs tell us exactly how to do things. (13)
111	DIs coordinate recruits' efforts. (13)
121	DIs explain in detail what to do. (2)
118	DIs tell recruits why things had to be done.
105	DIs keep the platoon well informed.

Questionnaire Item Number	
	Leader Support
22	DIs are easy to talk to about problems. (4, 13, 14)
108	DIs listen to recruits' problems when a difficulty arises. (4,13,14)
40	DIs are interested in the welfare of recruits. (3)
89	DIs stand up for their recruits.
113	DIs are proud of the platoon.
64	DIs care about the platoon and the recruits in it.
	Group Teamwork
54	Recruits cooperate to get work done. (4)
12	Recruits stress teamwork and team goals. (4, 13)
86	Recruits share information about how to do things. (13)
8	Groups work together well to get things done. (4, an approximate reversal of "friction" question)
19	Recruits willingly do their jobs when there is a group task to be done.
	Group Support
35	Recruits in the platoon get along well. (3, 4, 14)
11	Recruits in the platoon trust one another. (4, 11, 3)
21	Recruits in the platoon help each other out during tough times.
87	Recruits in this platoon lend each other a hand when things get rough.
88	As far as I can see, there isn't much loyalty to this platoon. (3)
63	In this platoon, people pretty much look out for their own interests. (3)
	Feedback
109	Recruits are told how well they're doing during training. (6)
52	DIs let recruits know how they were doing. (7)
48	The DIs report progress to the group. (7)
10	DIs let recruits know what they needed to improve.
106	DIs are specific about what types of mistakes recruits made.
38	DIs spell it out when you do something right as well as when you do something wrong.

Questionnaire Item Number	
	Warning
70	The DIs let recruits know in advance exactly what is expected of them. (3)
1	Recruits know when to expect punishments. (6)
101	There are signs when trouble is brewing.
78	You know when the DI is getting ready to explode.
	Rules Emphasis
69	Formal rules and regulations have a very important place around here. (8)
26	Recruits who break minor rules are punished for it. (11)
93	Obeying rules in this platoon seems to be more important than getting the work done. (11)
107	There's a strict emphasis in this platoon on following rules and regulations. (11)
79	Rules and regulations are well-enforced. (11)
14	There are too many Mickey Mouse rules and regulations. (17)
	Surveillance
116	Recruits are constantly being checked on for rule violations. (9)
83	Recruits are constantly being watched to see that they obey all the rules. (9)
75	DIs check everything; recruits are not trusted. (4)
7	DIs act as though all recruits must be watched or the recruits will slack off. (4)
50	DIs are always breathing down your neck.
67	DIs are always just waiting for someone to make a mistake.
	Autonomy
119	There is a lack of personal freedom as a recruit. (17)
123	Recruits are treated like children. (17)
66	Recruits are given little responsibility. (17)
96	Recruits have little control of their own activities. (17)

Questionnaire Item Number	
	DI Equity
124	Our DIs deal fairly with all the recruits in the platoon. (8,17)
65	Our DIs consistently keep their word. (8)
34	The DIs sometimes punish recruits for others' mistakes.
29	Punishments that the DIs give out are fair for the mistakes that are made.
71	DIs always have a good reason for the punishments they give.
32	DIs blame the same recruits when anything goes wrong.
	System Equity
41	Recruits are rewarded for their own personal performance. (3)
110	Recruits are rewarded based on how much they contribute to the platoon's success. (3)
91	Tests are fair if you study hard. (16)
15	If you try hard in the Marine Corps, you are rewarded for it. (16)
27	The Marine Corps fulfills its promises to you. (17)
	Punishment Behavior
60	DIs criticize poor work. (7, 3)
112	DIs criticize recruits in front of others. (7)
37	DIs ride a recruit who makes a mistake. (7)
57	DIs are quick to criticize poor performance. (3)
58	DIs often use threats and fear of punishment to motivate recruits. (3)
	Standardization
17	Recruits always follow standard operating procedures. (13)
115	Everything is done "by the numbers.
80	There is only one way to do a thing around here.
6	Procedures are spelled out in detail and followed closely.
56	The rules and regulations during boot camp are too rigid. (17)

Questionnaire Item Number	
	Performance Goals
95	DIs stress the importance of achieving goals. (3)
77	DIs maintain high standards of performance (3, 14)
76	The DIs stress keeping ahead of other platoons. (13)
45	It is not good enough just to pass a test.
51	The DIs always expect us to be perfect.
2	Recruits are always expected to be trying to get better and better at what they are doing.
	Referent Power
81	I admire my DIs.
127	I respect my DIs as people.
4	I identify with my DIs.
82	I would like to be like my DIs.
117	My DIs are good examples for the recruits.
	Reward Power
39	My DIs give credit where it is due.
24	My DIs recognize achievement.
97	My DIs are willing to promote recruits.
44	My DIs reward good work.
18	My DIs would offer rewards for good performance.
	Coercive Power
42	My DIs rule by might.
31	My DIs get even when things went wrong.
5	My DIs are overly critical
98	My DIs are strict disciplinarians.
33	My DIs are strict about the rules.
	Expert Power
99	My DIs are very skilled Marines.
122	My DIs really know their stuff.
104	My DIs are very experienced Marines.
92	My DIs are very good at what they do.
85	My DIs are well-qualified for their jobs.
	Legitimate Power
28	Recruits are obligated to accept all their DIs' orders.
59	Recruits are duty-bound to obey their DIs.
62	DIs have the authority to tell recruits what to do.
90	DIs have a right to tell recruits what to do.
3	DIs are authorized to make recruits perform their jobs.

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APPENDIX C

CORRELATIONS BETWEEN THE SCALES INCLUDED IN THE FACTOR ANALYSIS

TABLE C-1

CORRELATIONS BETWEEN ROLE DEMAND SCALES

	Overload		*Clarity*		*Conflict*	
Sample:	1	2	1	2	1	2
Overload	–	–				
Role Clarity	.02	–.07	–	–		
Role Conflict	.34	.41	–.15	–.19	–	–

NOTE: N > 200 for all correlations. $p < .05$ if $r \geq .14$, $p < .01$ if $r \geq .18$, and $p < .001$ if $r \geq .25$.

TABLE C-2

CORRELATIONS BETWEEN INTERPERSONAL PROCESS SCALES

	Feedback		*Leader Structure*		*Leader Support*		*Group Teamwork*		*Group Support*	
Sample:	1	2	1	2	1	2	1	2	1	2
Feedback	–	–								
Leader Structure	.65	.67	–	–						
Leader Support	.58	.54	.51	.54	–	–				
Group Teamwork	.30	.41	.28	.50	.26	.28	–	–		
Group Support	.21	.36	.21	.32	.30	.29	.60	.59	–	–

NOTE: N > 200 for all correlations. $p < .05$ if $r \geq .14$, $p < .01$ if $r \geq .18$, and $p < .001$ if $r \geq .25$. The underlined correlations differ significantly in the two samples.

TABLE C-3

CORRELATIONS BETWEEN DISCIPLINE AND POWER SCALES

	Legitimate Power		*Expert Power*		*Referent Power*		*Reward Power*		*DI Equity*		*Surveillance*		*Punishment Behavior*		*Performance Goals*	
Sample:	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Legitimate Power	–	–														
Expert Power	.30	.29	–	–												
Referent Power	.15	.21	.59	.49	–	–										
Reward Power	.08	.09	.42	.32	.47	.38	–	–								
DI Equity	.20	.12	.35	.40	.48	.53	.49	.61	–	–						
Surveillance	.14	.19	–.15	–.13	–.15	–.22	–.24	–.26	–.35	–.48	–	–				
Punishment Behavior	.30	.23	–.03	–.06	–.15	–.26	–.18	–.29	–.35	–.45	.49	.61	–	–		
Performance Goals	.49	.43	.35	.17	.17	.09	.01	.00	.14	–.04	.21	.34	.47	.36	–	–

NOTE: $N > 200$ for all correlations. $p < .05$ if $r \geq .14$, $p < .01$ if $r \geq .18$, and $p < .001$ if $r \geq .25$.

TABLE C-4

CORRELATIONS BETWEEN INTERPERSONAL PROCESSES AND ROLE DEMAND STRESS

Interpersonal Processes	*Role Demands*					
	Overload		*Role Clarity*		*Role Conflict*	
Sample:	1	2	1	2	1	2
Feedback	−.11	−.22	.51	.61	−.14	−.17
Leader Structure	−.07	−.13	.71	.76	−.22	−.22
Leader Support	−.11	−.26	.44	.42	−.21	−.24
Group Teamwork	−.04	−.08	.33	.49	−.06	−.06
Group Support	−.18	−.21	.27	.33	−.17	−.14

NOTE: $N > 200$ for all correlations. $p < .05$ if $r \geq .14$, $p < .01$ if $r \geq .18$, and $p < .001$ if $r \geq .25$.

TABLE C-5

CORRELATIONS BETWEEN DISCIPLINE-POWER AND ROLE DEMAND SCALES IN TWO SAMPLES OF MARINE RECRUITS

Discipline-Power Scales	*Role Demands*					
	Overload		*Role Clarity*		*Role Conflict*	
Sample:	1	2	1	2	1	2
Legitimate Power	.35	.27	.37	.18	.06	.11
Expert Power	.10	−.04	.41	.26	−.06	−.15
Referent Power	−.04	−.18	.33	.31	−.14	−.28
Reward Power	−.19	−.22	.36	.53	−.13	−.25
DI Equity	−.19	−.32	.43	.43	−.39	−.40
Surveillance	.43	.53	−.07	−.11	.34	.40
Punishment Behavior	.45	.52	−.06	−.14	.35	.33
Performance Goals	.35	.34	.28	.10	.05	.11

NOTE: $N > 200$ for all correlations. $p < .05$ if $r \geq .14$, $p < .01$ if $r \geq .18$, and $p < .001$ if $r \geq .25$.
The underlined correlations differ significantly in the two samples.

TABLE C-6

CORRELATIONS BETWEEN DISCIPLINE-POWER AND INTERPERSONAL PROCESS SCALES

Discipline-Power Scales	*Interpersonal Process Scales*									
	Feedback		*Leader Structure*		*Leader Support*		*Group Teamwork*		*Group Support*	
Sample:	1	2	1	2	1	2	1	2	1	2
Legitimate Power	.18	.15	.22	.14	.24	.18	.06	.14	.00	.05
Expert Power	.36	.32	.36	.38	.52	.56	.29	.31	.17	.21
Referent Power	.44	.41	.40	.31	.57	.50	.21	.19	.20	.30
Reward Power	.72	.70	.49	.54	.62	.55	.26	.39	.25	.39
DI Equity	.51	.58	.53	.51	.55	.61	.28	.35	.27	.39
Surveillance	−.13	−.20	−.20	−.20	−.35	−.38	−.05	−.04	−.17	−.22
Punishment Behavior	−.16	−.26	−.22	−.17	−.22	−.21	−.04	−.17	−.11	−.28
Performance Goals	.11	.04	.18	.09	.16	.05	.15	.04	.05	−.03

NOTE: $N > 200$ for all correlations. $p < .05$ if $r \geq .14$, $p < .01$ if $r \geq .18$, and $p < .001$ if $r \geq .25$.

APPENDIX D

RESULTS OF THE OBLIQUE FOUR-FACTOR SOLUTION

TABLE D-1

FACTOR PATTERN FOR OBLIQUE FOUR-FACTOR SOLUTION[a] OF STRESS SCALES AND OBLIQUE FACTOR CORRELATIONS FOR TWO SAMPLES OF MARINE RECRUITS

	Factor A		*Factor B*		*Factor C*		*Factor D*	
Overload	.04	−.01	.66**	.69**	−.01	−.01	−.10	−.05
Role Clarity	−.03	−.12	.14	.11	.76**	.85**	.14	.07
Role Conflict	−.05	−.17	.39*	.45*	−.17	−.12	−.04	.06
Legitimate Power	.18	.44	.51*	.44*	.29	.02	−.06	.05
Leader Structure	−.03	−.05	−.08	.05	.90**	.88**	.00	.02
Leader Support	.69*	.51*	−.12	−.19	.13	.36	.05	−.03
Group Teamwork	.01	−.06	.08	.12	.05	.13	.74**	.85**
Group Support	.00	.09	−.08	−.14	−.05	−.02	.82**	.65**
Feedback	.30	.06	−.08	−.06	.50*	.76*	.04	.02
Performance Goals	.21	.30	.62*	.54*	.14	.07	.08	−.03
Expert Power	.73**	.63**	.19	.05	−.04	.04	.07	.13
Surveillance	−.25	−.17	.56*	.75*	.01	−.01	.00	.02
Referent Power	.76**	.61**	−.02	−.17	−.05	.05	.02	.07
Of Equity	.38*	.41*	−.24	−.38	.34*	.32*	.07	.09
Reward Power	.50	.13	−.18	−.16	.21	.58	.05	.08
Punishment Behavior	−.07	−.03	.75**	.72**	−.10	.00	.05	−.16

[a] Delta = 0

*Indicates variables with loadings greater than .30 in both samples, but less than .60 in one or both.

**Indicates variables with loadings greater than .60 in both samples.

TABLE D-2

CORRELATIONS BETWEEN THE OBLIQUE FACTORS

		Sample 1		
Factor:				
A	--			
B	-.07	--		
C	.62	-.05	--	
D	.34	-.10	.35	--
		Sample 2		
Factor:				
A	--			
B	-.06	--		
C	.49	-.20	--	
D	.25	-.16	.54	--

NOTE: These intercorrelations are obtained using the SPSS program Factor Analysis with the value of delta equal to zero.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Military basic training is an adult socialization process involving stresses which can have both positive and negative effects. An understanding of the processes which produce changes in basic training should make it possible to increase the likelihood of positive outcomes and minimize the negative outcomes. As a first step toward longitudinal studies of these processes, a questionnaire was developed to measure key elements of stress, interpersonal relations, and social influence processes. Interviews with

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20. Abstract (continued)

graduating and attriting recruits and reviews of pertinent literature on socialization, stress and organizational psychology identified 22 variables for measurement. Overall, the initial item composites designed to measure these variables had satisfactory internal consistency and score distributions although some scales require further development. Factor analysis identified factors characterized by (a) supportive leadership combined with expertise and provision of a good role model, (b) low role ambiguity associated with leader provision of structure and feedback, (c) supportive group climate coupled with teamwork, and (d) stress, including overload, pressure, role conflict in combination with constant surveillance and threat of punishment. These factors make brief instruments representing major elements of the training process feasible for longitudinal studies.