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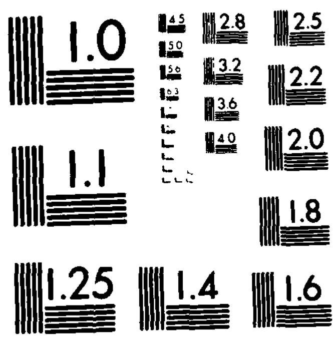

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EFFECTS OF RESPONSE STYLE ON THE

POLARITY AND VALIDITY OF TWO-DIMENSIONAL MOOD MODELS†

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SUMMARY

Despite advances in the diagnosis and treatment of infectious diseases, these diseases continue to be a significant source of lost manpower in training and operational settings. Emotional reactions to job and life stresses may influence susceptibility to infection by inducing physiological states that suppress the immune system. Any test of this hypothesis requires appropriate measures of emotional state. Therefore, this study compared two alternative models for describing emotional states as the first step in a projected series of studies to examine the relationship between emotion and susceptibility to infection.

The comparison was undertaken because the typical approach of measuring 6 to 12 specific moods may be unnecessarily cumbersome. Recent findings suggest that two dimensions adequately represent mood differences, but there is disagreement on what the dimensions should be. One proposed model represents emotional states in terms of positive and negative mood dimensions. An alternative model represents emotional state in terms of psychological arousal (ranging from low to high arousal) and hedonic tone (ranging from negative to positive). When applied to mood self-reports, the second model includes a response style adjustment on the assumption that responses to mood questions are influenced by individual differences in responses to the rating format rather than the item content. One objective was to evaluate the effect of this adjustment on the validity of the resulting mood measures.

Self-reports of mood states obtained from Marine Corps recruits on 7 days during basic training were factor analyzed with and without the response style adjustment. Without adjustment, the analyses produced dimensions of positive and negative mood. With adjustment, the analyses produced psychological arousal and hedonic tone. Direct comparison of the factors produced by the two analyses showed that both models described the same factor space using slightly different frames of reference.

Further analyses compared the validity of the two-dimensional model in terms of their ability to describe mood differences between members of different basic training platoons and between successful and unsuccessful recruits. Platoon membership and training outcome were determined from records kept by the training command. The two models produced equivalent descriptions of these differences. Also, both models described the group differences as well as a model involving six specific moods.

The alternative two-dimensional models provide comparable descriptions of emotional state, but express the information in terms of slightly different frames of

reference. Because both models effectively extracted the valid variance from the mood reports, these models are equally good candidates to replace more complex mood assessments. Therefore, employing the two dimensional models may produce a simple model to describe relationships between emotional state and infectious disease.

INTRODUCTION

Recent research suggests that two mood dimensions are adequate to replace more complex mood models, but competing two-dimensional models have been proposed. One model consists of bipolar dimensions which can be labelled hedonic tone (positive versus negative affect) and psychological arousal (lethargy versus arousal) (Mackay, Cox, Burrows & Lazzerini, 1978; McCormick, Walkey & Taylor, 1985; Plutchik, 1980; Russell, 1979, 1980; Thayer, 1978a, 1978b; Whissell, 1981). A second model consists of unipolar dimensions labelled positive mood and negative mood (Diener & Emmons, 1984; Tellegen, 1980; Zevon & Tellegen, 1982). Because no direct empirical comparison of the unipolar and bipolar two-dimensional mood models has been made to provide a basis for choosing between the models, this study compared Russell's (1980) version of the bipolar model with the unipolar model emphasizing response style adjustment as a potentially important determinant of mood polarity and validity.

Response style is important in this comparison because it is a component of Russell's (1980) bipolar model that is missing from unipolar models. Russell (1980) assumed that responses to mood questionnaires are influenced by ". . . individual differences in response to the rating format rather than in response to the content of the items" (p. 1172). To correct for this, Russell's (1980) bipolar model incorporates a response style construct as well as the dimensions of hedonic tone and psychological arousal. This response style construct is not subject to the criticisms leveled at many suggested response style variables (Hamilton, 1968), but the mood model that results from incorporating the adjustment is more complex than the competing unipolar model. It remains to be determined whether the increased complexity is justified by gains in the understanding of mood.

One study objective was to test the hypothesis that the same data which produce a unipolar two-dimensional mood structure when raw data are analyzed will produce a bipolar structure when Russell's (1980) response style adjustment is employed. This hypothesis is reasonable because adjusting for extreme response tendencies consistently increases the bipolarity of mood dimensions relative to results obtained with raw data (Lorr, McNair & Fisher, 1982; Lorr & Shea, 1979; Russell, 1979). However, no study of two-dimensional mood models has directly compared the results derived from a single data set analyzing both raw and adjusted scores to compare the resulting factor structures. This concern was addressed by analyzing raw data and data ipsatized using Russell's (1980) procedure and comparing the resulting mood models.

A second study objective was to evaluate the effect of response style adjustment on the validity of the resulting mood models. If response style is a reaction to questionnaire format with no other behavioral implications, the response style adjustment will eliminate a purely methodological source of variance in mood scores which should increase the validity of the resulting mood measures. However, extreme response style may indicate personality differences (Hamilton, 1968) or the presence of mixed emotions (Plutchik, 1980). In these cases, the response style adjustment could remove variance which has implications for non-questionnaire behaviors, thereby reducing the validity of the mood measures. These opposed predictions were tested by relating mood measures derived with and without Russell's (1980) response style adjustment to platoon membership and attrition from military basic training. These potential correlates of mood could be ascertained from non-self-report data, so any association to mood would not arise because both the mood measure and the external correlate were influenced by response style.

METHOD

Sample

Participants (N = 341) were volunteers representing 94.2% of the men in 4 Marine Corps basic training platoons. The average participant was 19.6 (S.D. = 1.58) years old, had 11.9 (S.D. = 0.69) years of education, and scored 102.1 (S.D. = 15.12) on the General Classification Test. The sample was 82% White, 12% Black, 4% Hispanic-American, and 2% other races.

Mood Questionnaire

Thirty-two items were selected from Ryman, Biersner and LaRocco's (1974) mood questionnaire to evaluate the two-dimensional mood models (see Table 1 for items). Twenty-nine items were chosen because they had been used by Diener and Emmons (1984), Mackay, et al. (1978), McCormick, et al. (1985), Russell (1980), Tellegen (1980), and/or Zevon and Tellegen (1982); three items were added to this list because they were judged to represent specific combinations of hedonic tone and arousal which improved the balance of the overall item set. Items used in previous studies were emphasized to ensure comparability to the results of those studies.

Platoon Membership

The relationship between mood state and platoon membership was one validity test for the two-dimensional mood models because basic training platoons differ with respect to psychological stress and leadership style, both of which should influence mood (Vickers, Wallick & Hervig, 1982). Platoon membership was the criterion rather than measures of stress and leadership perceptions because membership could be determined from the recruits' training records and would not be influenced by response style.

Attrition from Training

Attrition from military basic training was a second validity criterion because attrition is a reliable correlate of mood (Biersner, LaRocco & Ryman, 1976; Robinson, Novaco & Sarason, 1981; Spielberger & Barker, 1979) which does not involve self-reports. Attrition data were obtained from Marine Corps records. "Graduates" (n = 297) were recruits who successfully completed basic training. "Attrites" (n = 34) were recruits who were dropped from the training roster during training and discharged from the service within 180 days of entering the Marine Corps. Attrites were divided further into "Medical" (n = 19) and "Behavioral" (n = 15) categories based on their discharge classification. Attrition status could not be determined for 10 recruits.

Analysis Procedures

All analyses were performed using the Statistical Package for the Social Sciences (SPSS, 1983). Principle components analyses were performed on mood data collected on 7 days spread over the entire basic training period. Data from different days were analyzed to determine the stability of the factor solutions across different training experiences ranging from initial exposure to training to learning fundamental military skills and on to successful completion of training. Two-factor orthogonal and oblique solutions were determined for both raw data and ipsatized data for each day. Ipsatized data were derived by standardizing each participant's responses relative to his mean and standard deviation for the 32-item set. This procedure paralleled Russell's (1980) analysis and is referred to as "ipsatized data" to emphasize the within person aspect of the standardization. The correlations between the factors obtained with the oblique rotation averaged r = - .39 for the raw data and r = .25 for the ipsatized data. These correlations did not alter the general factor structure obtained with the orthogonal rotation, so the results from the orthogonal analysis have been used in the remainder of this paper.

The validity comparisons used factor scores computed with the average factor regression coefficients derived from the 7 factor analyses[1]. This weighted sum was

[1] The factor score coefficients had average interday correlations of r = .79 for positive mood, .91 for negative mood, .59 for hedonic tone, and .62 for psychological arousal. The estimated reliabilities for the averaged coefficients

preferred to simple item sums because simple sums have produced highly correlated factors in prior research even when there was reason to believe the mood factors should be independent (Burrows, Cox & Simpson, 1977).

Multivariate analyses of variance (MANOVAs) related the mood measures to platoon membership and attrition status. These analyses were limited to the data collected on the first study day because attrition prior to the second data collection substantially reduced the size of the attrition groups. As a result, data from later days of the study would not have provided stable estimates of the mean values for the attrition groups.

MANOVAs and discriminant analyses tested the adequacy of the two-dimensional model relative to the six standard scales from the mood questionnaire (Ryman, Biersner & LaRocco, 1974). MANOVAs determined whether scores on the mood scales differed significantly across the attrition groups and platoons. Discriminant analyses then were performed in which the measures from one of the two dimensional models were entered into the discriminant equation and individual mood scales added to the equation if they were significant predictors. This procedure was equivalent to a stepwise regression with group membership as the criterion and provided an estimate of the additional discriminating power of the specific mood measures after controlling for the general dimensions. A lenient criterion ($p < .10$ by Wilk's lambda) was used to permit the specific moods to enter the discriminant equation to favor the more complex model if there was even slight improvement in prediction. Separate discriminant analyses were performed with the factors from the bipolar and unipolar two-dimensional models as the initial variables in the discriminant function.

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ranged from alpha = .90 to alpha = .99. Comparing these factor score coefficients to the average coefficients determined from two additional samples of marines in cold weather training produced an average convergent correlation of $r = .73$ compared with an average discriminant correlation of $r = -.20$. These values would probably have been higher if the additional estimates had been based on more than two samples of marines. The factor score coefficients are available from the authors.

RESULTS

Factor Identification

The two-dimensional solutions for the raw and ipsatized data had substantial cross-time consistency. The average of the 21 pairwise correlations for the factor loadings across the 7 days was $r = .970$ for the first raw score factor, $r = .978$ for the second raw score factor, $r = .861$ for the first ipsatized score factor, and $r = .904$ for the second ipsatized score factor. The average loadings from the 7 analyses are presented in Table 1 as the best estimate of the true factor loadings.

The factors derived from the present data were similar to those reported by other researchers. As expected, the raw data produced essentially unipolar factors (30 of 33 loadings greater than .40 [absolute] were positive) while ipsatized data produced bipolar factors (14 of 30 loadings greater than .40 [absolute] positive). The raw data factors could be interpreted as positive and negative mood and the ipsatized factors as hedonic tone and psychological arousal. Coefficients of congruence (Gorsuch, 1974) based on the loadings for items common to this study and prior studies confirmed these designations, showing clear correspondence between both the unipolar and bipolar factors from this study and the comparable factors previously reported (Table 2). There was a trend toward higher coefficients of congruence when the polarity of the factors from this study matched that of the factors from the comparison study, but this trend did not include the comparison to Tellegen's (1980) factors.

Comparison of the Unipolar and Bipolar Factors

Simple, but highly accurate, equations for expressing the bipolar factor loadings in terms of the raw unipolar factor loadings were obtained by regressing the ipsatized data loadings (labelled y_1 and y_2) onto the corresponding raw data loadings (labelled x_1 and x_2):

$$y_1 = 1.002 * x_1 - .274 \qquad (r = .974)$$

$$y_2 = -0.948 * x_2 + .118 \qquad (r = -.987)$$

The 95% confidence interval included 1.00 for both regression weights, but both intercepts differed significantly from 0.00 ($t = -12.97$ for equation 1 and $t = 9.01$ for equation 2; $p < .0001$ for both).

TABLE 1

ORTHOGONAL FACTOR LOADINGS FROM TWO FACTOR SOLUTION FOR RAW SCORE AND IPSATIZED SCORE ANAYSES

ITEM	RAW SCORES FACTOR 1	RAW SCORES FACTOR 2	IPSATIZED SCORES FACTOR 1	IPSATIZED SCORES FACTOR 2
2. Lively	−.182	.783**	−.413**	−.636**
3. Irritated	.640**	−.218	.357	.293
4. Contented	−.102	.497**	−.394	−.316
5. Active	−.110	.747**	−.332	−.623**
6. Restful	−.085	.490**	−.231	−.407**
9. Weary	.492**	−.417**	.103	.606**
11. Calm	−.277	.350	−.445**	−.204
12. Blue	.678**	−.274	.476**	.336
15. Afraid	.560**	−.069	.303	.092
16. Happy	−.269	.708**	−.554**	−.491**
17. Miserable	.712**	−.324	.513**	.406**
18. Alarmed	.511**	.108	.229	−.067
20. Drowsy	.413**	−.361	−.121	.641**
21. Downcast	.678**	−.339	.512**	.372
22. Pleased	−.244	.708**	−.563**	−.479**
23. Satisfied	−.270	.664**	−.573**	−.433**
24. Depressed	.720**	−.303	.553**	.375
25. Energetic	−.099	.807**	−.333	−.675**
26. Cheerful	−.232	.738**	−.541**	−.512**
27. Uneasy	.719**	−.209	.441**	.310
28. Grouchy	.617**	−.183	.323	.263
29. Sluggish	.509**	−.402**	.077	.630**
30. Vigorous	−.010	.679**	−.305	−.538**
31. Alert	−.100	.652**	−.312	−.521**
32. Annoyed	.663**	−.232	.375	.336
33. Sad	.737**	−.238	.569**	.305
34. Hopeless	.685**	−.173	.501**	.163
35. Insecure	.709**	−.128	.485**	.180
36. Jittery	.613**	.015	.313	.062
37. Bored	.449**	−.237	.088	.375
38. Tired	.379	−.454**	−.098	.680**
40. Angry	.656**	−.177	.412**	.207

NOTE: Table entries are average factor loadings from analysis of seven days' data (see **Analysis Procedures**). Loadings greater than .40 (absolute) indicated by "**".

The generality of this surprisingly simple relationship between the raw and ipsatized factors was tested in data from two additional samples of marines (n = 161 and n = 153) who completed the mood questionnaire during a cold weather training course. The factor analysis results for the two samples were averaged to approximate

TABLE 2

COMPARISON TO FACTOR STRUCTURES FROM OTHER STUDIES

FACTOR LABEL	RAW SCORE FACTOR 1	RAW SCORE FACTOR 2	IPSATIZED SCORE FACTOR 1	IPSATIZED SCORE FACTOR 2
Arousal[1]	−.782	.974	−.727	−.996
Stress[1]	.828	−.819	.969	.878
Positive Mood[2]	−.494	.836	−.529	−.886
Negative Mood[2]	.859	−.535	.904	.520
Positive Mood[3]	−.607	.973	−.763	−.923
Negative Mood[3]	.958	−.575	.870	.628
Positive Mood[4]	−.442	.970	−.807	−.880
Negative Mood[4]	.983	−.575	.860	.767

[1]Based on average of the loadings for the bipolar factors from Mackay, et al. (1978) and McCormick, et al. (1985) factors analyses of Thayer's (1978a, b) activation checklist. Although the present analyses included 14 items from this research, the coefficents were based on n = 6 for Stress and n = 8 for Arousal because these studies reported just the loading for the more salient factor for each item.

[2]Based on the loadings for 13 items from Tellegen's (1980) unipolar factors as reported by Zevon and Tellegen (1982).

[3]Based on loadings for 11 items from Zevon and Tellegen's (1982) unipolar factors.

[4]Based on loadings for 14 items from Diener and Emmons' (1984) unipolar factors.

the averaging over time in the recruit analyses. Coefficients of congruence based on the resulting factor weights ranged from .918 to .976 (absolute value), so there were clear matches to the recruit factors.

The replicability of the initial regression findings was demonstrated by repeating the regression analyses with the following results:

$$y_1 = .991*x_1 - .518 \qquad (r = .947)$$
$$y_2 = -.938*x_2 + .128 \qquad (r = -.980)$$

The 95% confidence interval for the regression weights included 1.00, but the intercepts differed significantly from 0.00 ($t = -9.27$, $p < .0001$ for y_1 and $t = 4.18$, $p < .0003$, for y_2). Direct cross-validation of the initial regression equations would produce correlation coefficients identical to those obtained in the regression analyses (Hays, 1963), so it is noteworthy that the cross-validation coefficients would be extremely close to the initial correlation values.

Predictive Validity Comparison

Attrition Outcome. Attrition from training was related to the raw data factors (Hotelling's $T^2 = 5.32$, $p < .001$; canonical $r = .248$) and the ipsatized data factors (Hotelling's $T^2 = 5.95$, $p < .001$; canonical $r = .261$). Given the direction of scoring for the factors, the differences were consistent with previous findings that recruits who subsequently attrite from basic training initially have more negative moods (Table 3). The canonical correlation coefficients for the group differences were of comparable magnitude, indicating that the two models were about equally effective in discriminating between the groups.

TABLE 3

COMPARISON OF GRADUATES AND ATTRITES ON MOOD DIMENSIONS

	GRADUATE	MEDICAL ATTRITE	BEHAVIORAL ATTRITE	F	Sig.
RAW SCORE FACTORS					
Factor 1	−0.07	0.45	0.78	8.73	.001
Factor 2	0.03	−0.28	−0.49	3.24	.041
IPSATIZED FACTORS					
Factor 1	−0.07	0.52	0.80	11.65	.001
Factor 2	−0.04	0.28	0.41	3.11	.046

NOTE: Sample sizes were Graduate = 296, Medical Attrite = 19, and Behavioral Attrite = 15. **N** was 330 because attrition status was indeterminate for 10 participants and 1 participant did not complete the mood questionnaire.

Platoon Membership. The four platoons differed significantly for raw scores (Hotelling's $T^2 = 4.40$, $p < .001$, canonical $r = .269$) and ipsatized scores (Hotelling's $T^2 = 4.03$, $p < .001$; canonical $r = .257$). Again, the magnitudes of the canonical correlations and the group differences obtained with the alternative models were comparable (Table 4).

TABLE 4

COMPARISON OF PLATOONS ON MOOD DIMENSIONS

PLATOON:	I	II	III	IV	F	Sig.
RAW SCORE FACTORS						
Factor 1	−.16	−.05	−.06	.28	3.58	.014
Factor 2	.24	.09	.00	−.35	6.23	.001
IPSATIZED FACTORS						
Factor 1	−.16	−.08	−.05	.31	5.28	.001
Factor 2	−.21	−.06	.00	.29	5.52	.001

NOTE: Sample size was I = 86, II = 85, III = 87, IV = 82.

Comparison to Specific Mood Measures. Additional analyses compared the two-dimensional mood models to a six-dimensional alternative including scales for happiness, activity, depression, fear (or anxiety), anger, and fatigue (Ryman, et al., 1974). Initial MANOVAs showed significant differences for these six scales between attrition groups (Hotelling's $T^2 = 2.38$, $p < .005$; canonical $r = .280$) and between platoons (Hotelling's $T^2 = 2.36$, $p < .001$; canonical $r = .304$). Each individual mood scale differed significantly across the attrition groups ($p < .042$ to $p < .001$) and the platoons ($p < .008$ to $p < .001$).

Stepwise discriminant analyses then were performed with the mood measures from one of the two-dimensional models entered as predictors in the first step. The individual mood scales from Ryman, et al. (1974) then were entered stepwise using a $p < .10$ criterion. None of the specific mood scales even approached significance for the attrition group comparison ($p > .256$ for the raw scores; $p > .200$ for the ipsatized scores). Depression entered the predictive equation for the platoon comparison ($p < .032$ for the raw data; $p < .055$ for the ipsatized data).

DISCUSSION

Response style adjustment changed the polarity of the mood dimensions, but not their validity as determined by the relationships to attrition status and platoon membership. These facts are closely linked to the finding that the unipolar and bipolar models identified the same factor space, but used different reference axes to describe locations in that space. Mathematically, the fact that the bipolar factor loadings can be expressed as a linear transformation of the unipolar axes (i.e., $y = ax + b$) ensures that the two models describe the same factor space (Schutz, 1968). The choice of reference vectors to describe locations in factor space influences the polarity of the resulting dimensions by shifting the origin of the reference axes. However, this shift does not alter the distances between items in the factor space (Schutz, 1968). The invariance of the distances is important because statistical procedures such as correlation, analysis of variance, and their multivariate extensions are based on distance measures. In the absence of measurement error, the results of such analyses are not affected by changing the origin of reference axes or, in general, by any linear transformation of the reference axes within a factor space (Hays, 1963). The finding that the mood measures derived from the unipolar and bipolar models had comparable relationships to external criteria supported this expectation within the limits imposed by the imperfect measurement of the mood states.

The relationship between the unipolar and bipolar models extended previous observations that the relative locations of items in mood space are invariant across methodological factors (Plutchik, 1980; Russell, 1979). Because unipolar and bipolar models have not been directly compared in previous work, their apparent conceptual differences masked the fact that this invariance included the choice of unipolar or bipolar reference axes to describe the locations in factor space. The comparisons to the results of other studies suggest that this will be an empirically robust finding. Thus, the findings supported models which emphasize relationships between mood items as a fundamental aspect of mood (e.g., Plutchik, 1980; Russell, 1980).

A second important finding was that two dimensions described mood differences between basic training platoons and between successful and unsuccessful recruits as well as a six-dimensional representation of mood. Although platoon differences in depressed mood were marginally significant ($.03 < p < .06$) controlling for either the unipolar or bipolar mood dimensions, the additional predictive value of depressed mood did not extend to the comparisons of successful and unsuccessful recruits. Given that 12 statistical tests were involved, one significant finding could easily occur by chance.

This second major finding is important because this study apparently is the first to compare the two-dimensional model to a more complex model using non-mood criteria. Previous research has evaluated the adequacy of mood models by determining whether factor loadings conformed to theoretical expectations (e.g., Plutchik, 1980; Russell, 1980) or by relating one type of mood measure to another (Russell & Steiger, 1982). The finding that two dimensions are adequate to summarize relationships to non-mood criteria extends the basis for inferring that relatively simple mood models are empirically useful. Previous demonstrations have been limited to evaluations of mood reports. Specifically, the relationship between theoretically predicted patterns of correlation and observed patterns has been investigated by some researchers (Plutchik, 1980; Russell, 1980; Whissell, 1981) while others have compared the multiple correlations obtained by regressing specific moods on the two dimensions (plus acquiescence) to the estimated reliability of specific mood measures (Russell & Steiger, 1982). Each of these comparisons involves what Messick (1980) has labelled the internal structural validity of the mood measures. By relating the mood measures to platoon membership and attrition, this study demonstrated that the two-dimensional representation is comparable to a more complex mood model for describing associations to possible mood antecedents and consequences. These associations provide a broader empirical basis for asserting that the two-dimensional model is adequate to represent mood.

Although the results of this study have significant implications for mood models, this study did not provide an empirical basis for choosing between the unipolar and bipolar mood models. If the two models always represent the same factor space, a choice based purely on empirical findings will be impossible, but additional research is needed to confirm this tentative conclusion. To begin with, the relationship between the raw data factors and the ipsatized data factors is not a mathematical necessity arising from the ipsatization process (Broverman, 1961; Horst, 1965). Even though the relationship between the unipolar and bipolar factors probably will be empirically robust, the generality of the relationship reported here should be tested. In addition, the comparisons initiated here should be extended to additional validity criteria and further comparisons to more complex mood models. The comparisons reported here involved a very limited subset of possible validity criteria (cf., Messick, 1980) and other criteria may produce different results. Research to test this possibility should give special consideration to personality correlates of mood because a simple, reliable pattern of correlation between personality and mood has been reported in prior research with the unipolar mood model (Costa & McCrae, 1980; Diener & Emmons, 1984). Although the present findings imply that this pattern will extend to a bipolar model, this point must be confirmed because response style may have affected the previous findings by influencing both reported mood and self-descriptions of personality. Finally, further comparisons to more complex mood models are justified because two dimensions may adequately represent mood differences only when global criterion variables are studied. For example, a variety of maladaptive behavior patterns can cause attrition and platoons may differ in many ways that influence mood. Measures of specific moods may help understand the affective correlates of specific behavior patterns or mood-inducing conditions. If additional research along the proposed lines demonstrates that the unipolar and bipolar models are empirically equivalent, previous findings obtained using the different models can be integrated into an overall empirical basis for mood theories.

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Unipolar and bipolar two-dimensional models have been proposed to represent mood. This study showed that both models can be derived from the same data depending on whether a response style adjustment is employed. The unipolar and bipolar models defined the same factor space in the sense that mood items occupied the same relative positions in factor space under either model. Both models were equally sensitive to group differences in mood in comparisons between military basic training platoons and between successful and un-

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successful military recruits. Also, each model was as effective as a six-dimensional model for describing these group differences. The findings extend previous evidence that the relative locations of mood items in mood space is an empirical consistency which provides a suitable starting point for mood theories. The choice of a unipolar or bipolar frame of reference to express this consistency may be unimportant, but additional research is needed to confirm this conclusion.

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