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Preliminary Evidence for the Reliability and Validity of an Abbreviated Profile of Mood States

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Schacham (1983) developed a short version of the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) for use with hospital patients. The present study examined the psychometric properties of a slightly modified form of Schacham's scale when administered in a sport setting. Two items were eliminated from the original scale, and five new items were added to assess emotions associated with self-esteem. The revised scale consisted of 40 adjectives that measured tension, depression, fatigue, vigor, confusion, anger, and esteem-related affect. This scale was administered to 45 netball players immediately after competition, with the athletes instructed to respond according to how they were feeling at that point in time. Reliability coefficients (Cronbach's alphas) for the subscales ranged from .664 to .954 with a mean of .798. Validity was examined by comparing the mood states of winners and losers. All subscales, except fatigue, produced significant differences between these groups. It was concluded that this modified form of the POMS has acceptable psychometric properties for use in sport settings, and that it may be particularly useful to researchers when economy of assessment is important.

KEY WORDS: Competition, Emotion, Esteem-related affect, Mood.

Psychologists disagree about the specific nature of emotional experience, but there is general agreement that instruments designed to assess mood must account for one or more dimensions of positive affect and one or more dimensions of negative affect (Diener, Larson, Levine, & Emmons, 1985; Russell & Ridgeway, 1983; Watson & Tellegen, 1985). If these instruments are to be used for understanding the emotional experience of

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sport participants, then it is also important that they are validated within the social milieu of competitive sport (cf. Vallerand, 1983, 1984).

The Profile of Mood States (POMS) is a 65-item adjective checklist designed to measure the transient emotional states of tension-anxiety, depression-dejection, fatigue-inertia, vigor-activity, confusion-bewilderment, and anger-hostility (McNair, Lorr, & Droppleman, 1971). The psychometric properties of the instrument appear to be reasonably good, and it has been used to assess mood in sport as well as a variety of other settings (Boyle, 1987; Weckowicz, 1978).

Morgan (1979) was one of the first sport researchers to employ the POMS as a diagnostic tool. His early work indicated that POMS profiles could be used to distinguish between highly successful athletes and the normative population. In addition, a specific POMS profile was found to be correlated with success in Olympic qualifying competitions. This «iceberg profile» was characterized by low levels of tension, depression, fatigue, confusion, and anger as well as high levels of vigor. More recent work by Morgan and his colleagues has shown that scores on the POMS fluctuate in relation to the intensity of training, and that the instrument may be useful for monitoring of overtraining and staleness (Morgan, Brown, Raglin, O'Connor, & Ellickson, 1987).

Other investigators have used the POMS to compare athletes with nonathletes, to compare highly successful athletes with their less successful counterparts, and to examine mood changes as a function of participation in sport and exercise activities. In general, athletes appear to exhibit more positive POMS profiles that nonathletes unless their participation is overly zealous (Fuchs & Zaichkowsky, 1983; Gondola & Tuckman, 1982, 1983; LeUnes & Nation, 1982; Myers, Sterling, & LeUnes, 1988; Porter, 1985). A few studies also suggest that successful athletes may differ from less successful ones on certain POMS subscales (LeUnes, Daiss, & Nation 1986; Silva, Schultz, Haslam, Martin, & Murray, 1985).

The acute effects of exercise and sport participation on mood have also been examined using the POMS. Positive shifts in POMS subscales have been noted for a variety of aerobic and anaerobic activities, with the strongest effects typically occurring for untrained and/or highly stressed individuals (Berger & Owen, 1983, 1988; Dyer & Crouch, 1987; Lichtman & Poser, 1983; Wilfley & Kunce, 1986).

Previous research using the POMS in exercise and sport has relied almost exclusively on the original 65-item questionnaire. Although the full-length POMS can be completed in 5-7 minutes, there may be situations where greater economy of assessment is desirable. Schacham (1983) noted, for example, that individuals experiencing stress or pain sometimes took 15-20 minutes to complete the POMS. Similar administration periods have been reported when using the POMS with blind athletes (Mastro, French, Henschen, & Horvat, 1986) and with elderly exercise participants (B.G. Berger, personal communication, August, 1989). To overcome these time constraints, Schacham modified the original instrument so that it contained only 37 items rather than 65. This shortened version of the scale was shown to have good internal consistency, and it was concluded that the short form could be used as an alternative to the original instrument when limitations were imposed by the situation or by the subjects themselves. A recent study by Riem and colleagues (Riem, Judice, Meyers, Bourgeois, & LeUnes, 1990) suported Schacham's conclusions.

Since exercise and sport researchers must often deal with situational restrictions on data collection, they might find a short form of the POMS useful in certain circumstances. For example, coaches and athletes may be more willing to provide mood state information immediately before competition if their time commitments are minimized. Economy of measurement may also help researchers to obtain data on mood states during relatively short breaks in competition (e.g., between sets in tennis or between quarters in basketball) and to avoid needless repetition when multiple assessments are undertaken (see King, Taylor, Haskell, & Debusk, 1989). An abbreviated version of the POMS could also be useful for data collection immediately after exercise when rapid physiological and psychological recovery is expected to occur. In this situation, the use of an efficient but, at the same time, informative instrument may permit the researcher to obtain data which would otherwise go uncollected or which would be contaminated by the recovery process.

This study examined the reliability and validity of an abbreviated version of the POMS for a sample of competitive athletes. Schacham's (1983) modification of the POMS was used as a starting point, with minor changes made in the interest of both brevity and comprehensiveness. More specifically, the items used by Schacham to assess tension, fatigue, vigor, confusion, and anger were retained, but two items were eliminated from Schacham's depression subscale. At the same time, several esteem-related items were added in an effort to tap a positive dimension of emotion not usually assessed by the POMS.

The reliability of this modified scale was then evaluated by examining internal consistency coefficients (Cronbach's alphas) and item-total correlations. Validity was assessed by comparing winners and losers on total mood disturbance as well as the individual subscales. Competitive outcomes have

been shown to influence emotions (Biddle & Hill, 1988; McAuley, Russell, & Gross, 1983; Robinson & Howe, 1987), and a valid mood state instrument should be sensitive to differences across outcome groups. It was, therefore, predicted that athletes would report higher levels of tension, depression, anger, fatigue, and confusion after a loss than after a win. Levels of vigor and esteem-related affect were predicted to be lower after a loss than after a win.

Method

Subjects

Participants in the study were 45 female netball players from the upper divisions of a 30-team competition in a major metropolitan area. All players were members of teams that were placed among the top four sides in their division and, therefore, had distinct possibilities of gaining playoff berths. The mean age of the athletes was 26.61 years (SD = 9.53), and they had been playing netball for an average of 16 years (SD = 7.91). At the time of the study, these women were playing netball for 8.81 months out of the year (SD = 1.91) and were training or competing an average of 4.95 hours per week (SD = 6.09). Approximately 20% of the participants reported being selected to state or national netball teams at some point in their career. [1].

Instrument

The questionnaire used in the study was a modified form of Schacham's (1983) short version of the POMS. The specific modifications made to Schacham's scale for this study consisted of the deletion of two items used to assess depression and the addition of five items designed to assess esteem-related affect. With regard to the depression subscale, the adjective *blue* was deleted because pilot testing indicated that it presented interpretation problems for some subjects [2]. The adjective *unhappy* was also deleted because factor loadings reported by McNair et al. (1971) suggested that it may not cohere with other items in this subscale.

The five adjectives referring to esteem-related affect were added in an attempt in tap an additional positive dimension of emotion not assessed by the POMS. These items (*proud, ashamed, embarrassed, competent, satisfied*) were selected on the basis of statements made about the nature of self-esteem (Rosenberg & Kaplan, 1982) and the emotions associated with positive self-regard (Weiner, 1985; Weiner, Russell, & Lerman, 1978). Prominent among these emotions are feelings of pride, competence, and satisfaction.

The final instrument contained 40 adjectives which referred to seven different mood states: fatigue, anger, vigor, tension, esteem-related affect, confusion, and depression. Instructions printed on the questionnaire told subjects to respond according to how they were feeling «right now.» As is customary for the POMS, responses were made on a 0-4 scale with 0 labeled «not at all,» 1 labeled «a little,» 2 labeled «moderately,» 3 labeled «quite a bit,» and 4 labeled «extremely.»

Procedure

Coaches and netball players were contacted by telephone to explain the project and to request their cooperation. Athletes agreeing to participate were then asked to complete the modified POMS immediately following two of their matches. Trained research assistants handed the questionnaires to the players as they walked off the court and collected the forms as soon as the players had completed them. Testing was carried out over a four-week period which included the last round of regular-season play and three rounds of playoff competition. A few teams won both of their games, so only postwin data was available for 17 players. Most teams experienced both a win and a loss, however, so postwin and postloss data was available for the remaining 28 players.

Results

Subscale Relationships and Item-Total Correlations

Initially, correlations were computed between individual items and the total score on each of the seven subscales. Because subjects completed the mood state questionnaire following a win *and* following a loss, two sets of correlations were calculated (i.e., for winning outcomes and for losing outcomes). These two sets of correlations were then averaged to obtain a general measure of item/subscale relationships which was not dependent on a particular competitive outcome. Table I contains these averaged correlations and provides information about relationships among the subscales as well as relationships among specific items and the various subscales.

Examination of the subscale intercorrelations revealed three general clusters of subscales. The first cluster was comprised of four subscales related to negative emotion (confusion, depression, anger, and tension) which correlated moderately with each other. The range of r values within this cluster was from .53 to .67 with a mean of .58, suggesting similarity but not redundancy among these subscales.

The positive subscales of vigor and esteem-related affect also correlated moderately with each other (.52) but, at the same time, did not exhibit relationships with the first cluster noted above. Correlations between these

[1] Netball is similar to basketball, but there are 7 players per team rather than 5. Each player is restricted to a certain area of the court, and the ball must be advanced solely by passing. Shots can be taken only by designated shooters while they are in a specified shooting area. The goal consists of a ring on a 10-foot standard (there is no backboard). Each basket counts one point.

[2] We suspect that cultural differences may have created some interpretation problems here. The term *blue* is used less frequently in Australia than North America.

TABLE I

Correlations among items and subscales in the modified POMS.

Subscale and item	Subscale						
	FAT	ANG	VIG	TEN	EST	CON	DEP
Fatigue (FAT)	1.00	.28	−.05	.23	.19	.17	.11
Worn out	.90	.31	−.30	.22	.16	.17	.10
Weary	.90	.19	−.33	.17	.13	.11	.06
Bushed	.92	.24	−.16	.27	.26	.14	.11
Fatigued	.93	.32	−.29	.16	.08	.09	.15
Exhausted	.93	.22	−.21	.24	.25	.15	.11
Anger (ANG)	.28	1.00	−.16	.58	−.26	.53	.67
Peeved	.33	.76	−.26	.49	−.28	.40	.51
Bitter	.03	.61	−.13	.22	−.36	.26	.55
Resentful	.09	.69	−.10	.42	−.26	.46	.51
Grouchy	.31	.81	−.10	.53	−.05	.51	.53
Angry	.25	.87	−.05	.47	−.17	.35	.48
Furious	.10	.86	−.12	.48	−.31	.46	.57
Annoyed	.25	.87	−.11	.51	−.28	.45	.62
Vigor (VIG)	−.28	−.14	1.00	.17	.52	.11	.09
Cheerful	.01	−.29	.53	.07	.58	−.09	−.29
Vigorous	−.05	.07	.77	.32	.37	.38	.15
Full of Pep	−.16	.02	.82	.19	.32	.16	.01
Active	−.42	−.23	.86	.08	.34	−.04	−.13
Energetic	−.36	−.11	.86	.17	.31	.15	−.05
Lively	−.34	−.21	.89	.15	.05	.04	−.08
Tension (TEN)	.23	.58	.17	1.00	.05	.56	.53
Restless	.10	.27	.12	.66	.18	.46	.31
Nervous	.21	.22	.20	.59	.02	.43	.43
On-edge	.22	.52	.12	.73	.09	.35	.38
Tense	.09	.47	.13	.74	.02	.27	.32
Uneasy	.20	.58	−.04	.72	−.12	.53	.57
Anxious	.24	.39	.18	.85	.05	.54	.48
Esteem (EST)	.21	−.10	.52	.14	1.00	.09	−.08
Embarrassed	−.08	.16	.02	.07	.51	.25	.59
Ashamed	−.09	.35	−.20	.03	.68	.20	.56
Proud	.30	−.02	.39	.15	.81	.06	−.06
Competent	.09	−.29	−.06	.03	.77	−.04	−.34
Satisfied	.10	−.24	.45	.03	.77	−.08	−.31
Confusion (CON)	.17	.53	.12	.56	−.11	1.00	.60
Bewildered	.11	.26	.38	.40	.17	.51	.34
Forgetful	.09	.14	.16	.32	−.02	.61	.43
Confused	.05	.40	−.01	.55	−.14	.76	.44
Concentration [a]	.14	.42	−.07	.28	−.17	.69	.41
Uncertain [b]	.19	.58	.01	.46	−.22	.79	.51
Depression (DEP)	.11	.67	−.09	.53	−.35	.60	1.00
Hopeless	.02	.28	−.14	.25	−.38	.35	.55
Helpless	.11	.20	.15	.42	−.05	.40	.48
Sad	.03	.51	−.02	.39	−.22	.26	.63
Worthless	.05	.46	−.10	.17	−.46	.38	.66
Miserable	.28	.61	−.22	.41	−.12	.54	.57
Discouraged	.02	.57	−.06	.45	−.31	.42	.81

Note: Correlations were calculated separately for the win and lose conditions. These values were then averaged to obtain the data presented here. Correlations among subscale totals are shown opposite the name of each subscale, while correlations between items and their respective subscales are shown in bold print.

[a] The actual item is «unable to concentrate».

[b] The actual item is «uncertain about things».

two positive emotion subscales and the four negative emotion subscales ranged from −.28 to .21 with a mean of −.04. The fatigue subscale was unrelated to any of the other subscales and thus represented the third cluser. Correlations between this subscale and the other subscales ranged from −.05 to .28 with a mean of .16.

Examination of the item-total correlations in Table I suggests that most of the items exhibited appropriate interrelationships. That is, most items had higher correlations with their own subscale than with other subscales. There were three exceptions, however. The item *cheerful* correlated slightly higher with the esteem subscale than with the vigor subscale to which it was supposed to contribute (*r*s = .58 and .53, respectively). Similarly the item *miserable* had a stronger association with the anger subscale than the depression subscale (*r*s = .61 and .57, respectively). This same item also exhibited a correlation of .54 with the total confusion score. Finally, the item *embarrassed* correlated more highly with the depression subscale

than with the preassigned esteem-related affect subscale (rs = .59 and .51, respectively).

Subscale Reliability and Validity

Internal consistency was determined for each of the questionnaire's subscales by calculating alpha coefficients (Cronbach, 1951). Separate calculations were made for the responses provided after winning and losing outcomes, and these values were averaged to obtain mean alphas for the seven subscales. These coefficients are shown in the second column of Table II. They ranged from .954 for fatigue to .664 for depression with a mean of .798.

Validity. The validity of the various subscales in the modified POMS was evaluated by comparing scores for winners and losers. MANOVA procedures were used to make these comparisons, with outcome treated as a within-subjects' factor and the seven subscales analyzed as multiple dependent variables. This analysis revealed a significant multivariate effect for outcome, $T^2 = 80.17$, $F(7,21) = 8.91$, $p < .001$. Examination of univariate Fs indicated significant differences between winners and losers on tension, $F(1,27) = 19.89$, $p < .001$, depression, $F(1,27) = 22.85$, $p < .001$, vigor, $F(1,27) = 15.80$, $p < .001$, confusion, $F(1,27) = 6.52$, $p < .02$, anger, $F(1,27) = 27.87$, $p < .001$, and esteem-related affect, $F(1,27) = 26.35$, $p < .001$. There was no difference between winners and losers on fatigue. The direction of the significant outcome effects is shown in Figure 1. It can be seen that scores on the subscales measuring negative affect (tension, depression, confusion, anger) were higher after a loss than after a win. At the same time, scores on the subscales measuring positive affect (vigor, esteem) were higher after a win than after a loss.

Total Mood Disturbance and Item Analysis

Total mood disturbance. Total mood disturbance (TMD) is a global estimate of affective state which has been examined in a number of sport studies using the POMS (e.g., Morgan et al., 1987; Meyers et al., 1988; Robinson & Howe, 1987). TMD is typically calculated by summing the scores on the negative subscales (tension, depression, fatigue, confusion, anger) and then subtracting the score on the positive subscale (vigor) from this total. Morgan et al. (1987) suggested that a constant could also be incorporated into the calculation of TMD to eliminate negative values. In the present study, TMD was calculated by first summing the scores for

Table II

Internal consistency and discriminant validity for subscales and items in the modified POMS.

Subscale	Mean alpha for subscale	Item	Mean alpha if item deleted	Discrimination F	Discrimination P
Fatigue	.954	Worn out	.946	0.86	(NS)
		Weary	.943	0.39	(NS)
		Bushed	.943	1.34	(NS)
		Fatigued	.939	1.15	(NS)
		Exhausted	.939	0.28	(NS)
Anger	.892	Peeved	.893	19.97	(.001)
		Bitter	.892	6.20	(.05)
		Resentful	.887	7.76	(.01)
		Grouchy	.866	20.37	(.001)
		Angry	.863	36.83	(.001)
		Furious	.862	13.50	(.001)
		Annoyed	.858	31.15	(.001)
Vigor	.872	Cheerful	.905	29.19	(.001)
		Vigorous	.855	0.71	(NS)
		Full of pep	.842	6.25	(.05)
		Active	.831	6.04	(.05)
		Energetic	.830	1.42	(NS)
		Lively	.823	10.83	(.01)
Tension	.766	Restless	.757	3.24	(.08)
		Nervous	.751	3.95	(.06)
		On-edge	.736	4.31	(.05)
		Tense	.735	20.74	(.001)
		Uneasy	.724	8.90	(.01)
		Anxious	.690	10.89	(.01)
Esteem	.736	Embarrassed	.749	3.98	(.06)
		Ashamed	.694	2.23	(NS)
		Proud	.686	19.77	(.001)
		Competent	.651	5.30	(.03)
		Satisfied	.627	25.62	(.001)
Confusion	.701	Bewildered	.730	9.64	(.01)
		Forgetful	.672	0.27	(NS)
		Confused	.619	1.85	(NS)
		Concentration [a]	.619	1.53	(NS)
		Uncertain [b]	.575	3.13	(.09)
Depression	.664	Hopeless	.692	2.17	(NS)
		Helpless	.662	7.51	(.01)
		Sad	.618	24.17	(.001)
		Worthless	.613	6.10	(.01)
		Miserable	.609	10.44	(.01)
		Discouraged	.515	14.86	(.001)

Note: Cronbach's alphas were calculated separately after a win (n = 45) and after a loss (n = 28). These values were then averaged to obtain the alphas presented here. Significance levels are based on df = 1,27.
[a] The actual item is «unable to concentrate».
[b] The actual item is «uncertain about things».

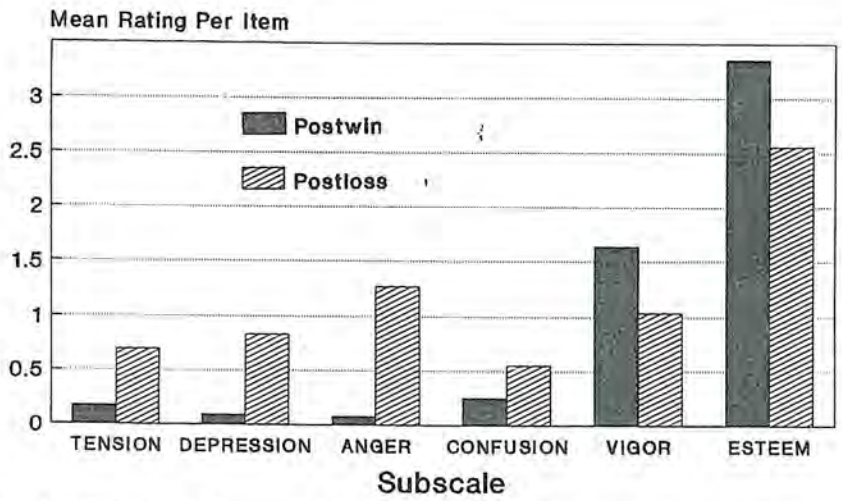

Fig. 1. - Subscales of the modified POMS that differed across winning and losing outcomes for netball players.

tension, depression, fatigue, confusion, and anger, then subtracting the sum of the scores for vigor and esteem-related affect, and finally adding a constant of 100. Thus, higher scores reflected a more negative emotional state (i.e., greater mood disturbance).

The TMD scores of winners and losers were then compared using a one-way ANOVA with outcome treated as a within-subjects' factor. This analysis revealed a significant outcome effect, $F(1,27) = 46.73$, $p < .001$. Examination of means revealed that TMD scores were higher after losing outcomes ($M = 109.71$) than after winning outcomes ($M = 84.04$).

Item Analysis. Reliability and validity analyses were also conducted on the individual items of the questionnaire. The extent to which each item was a coherent part of its respective subscale was assessed by calculating the subscale's alpha with that item omitted. The extent to which each item differed across winning and losing outcomes was determined using ANOVA procedures. Item-related alpha coefficients, *F*-ratios, and significance levels are shown in the last three columns of Table II.

Discussion

Our findings indicate that the modified POMS examined in this study has acceptable psychometric properties when administered to athletes immediately after competition. Table I shows that the subscales focusing on negative emotion (confusion, depression, anger, and tension) correlate with each other to an extent that indicates some overlap but not redundancy. The subscales addressing positive emotion show a similar degree of moderate intercorrelation with each other, and, at the same time, very little intercorrelation with the negative affect subscales. Table I also indicates that most of the items in the modified POMS contribute appropriately to their respective subscales.

In terms of internal consistency, Table II reveals alpha coefficients which were very high for the fatigue, anger, and vigor subscales (range = .954 to .872), moderately high for the tension, esteem, and confusion subscales (range = .766 to .701), and acceptable for the depression subscale (.664). There was also evidence of subscale validity with significant differences across winning and losing outcomes in the expected direction on all subscales except fatigue. Figure 1 illustrates that winning outcomes resulted in higher levels of vigor and esteem-related affect as well as lower levels of anger, tension, confusion, and depression than losing outcomes.

The findings with regard to esteem-related affect are particularly interesting, because the items used to assess this dimension of emotion were added to the POMS for this study. The models of achievement motivation and emotion proposed by Weiner (1985) and Vallerand (1987) view esteem-related affect as a consequence of cognitive appraisal of outcome information. Our data indicate that winning and losing outcomes in competitive sport produce variations in esteem-related affect and, therefore, imply that such appraisal processes may occur following competition. Feelings of pride and satisfaction were the specific emotions influenced most by competitive outcomes, with feelings of competence and embarrassment also affected but to a lesser degree (see Table II). Feelings of shame were not influenced by competitive outcomes in the present study, and it should be noted that the item *embarrassed* was more closely related to depression than esteem-related affect (see Table I). Subsequent research addressing esteem-related affect may benefit from the elimination of these last two items and/or the addition of other esteem-related adjectives such as *confident* or *secure*. Other investigators have shown that these affective states may be influenced by competitive performances (McAuley et al., 1983; Vallerand, 1987).

The data from this study permit some additional conclusions about the practical and statistical properties of the abbreviated POMS when used in sport research. We believe, for example, that the short fatigue and tension subscales are psychometrically sound and can be used with confidence

in future studies. Although fatigue failed to disciminate between winners and losers, this subscale exhibited extremely good internal consistency. Similar scores for winners and losers in this study may simply indicate that all competitors, regardless of outcome, were required to expend about the same amount of energy. These same items have been found to be sensitive to differences in a recently-completed study that compared swimmers at different points in their training schedule (Berger, Grove, & Prapavessis, 1991).

Similarly, the tension subscale cohered reasonably well, and all of the individual items appeared sensitive to between-group differences. The only change which might be indicated on the basis of our findings is the deletion of the items *restless* or *nervous* in the interest of further brevity. These items were the least coherent and least sensitive of the six tension items.

The anger subscale may also contain some items that could be deleted without adversely affecting its psychometric properties. Specifically, the items *bitter* and *resentful* may not be needed. Although these items produced significant differences between winners and losers, the size of the effect was less than that of the other items in this subscale (see Table II). Furthermore, deletion of these two items would leave a brief, five-item subscale with very good reliability and validity.

Recommendations with regard to the vigor subscale are not so straightforward. Despite the high level of internal consistency in this subscale, the item *cheerful* appears to be tapping a slightly different aspect of emotion than the rest of the subscale. On the other hand, it was a very good discriminator of winning and losing outcomes, and items that fit the subscale better (i.e., *vigorous, energetic*) failed to discriminate between these experiences. At the same time, our preliminary work with young athletes suggests that the item *vigorous* may pose interpretation problems for some respondents. Based on these findings, we tentatively suggest that the item *cheerful* be deleted from the questionnaire and that the adjective *powerful* be substituted for *vigorous*. Albrecht and Ewing (1988) suggest that such a substitution is justified.

The weakest subscales in the modified POMS from a psychometric standpoint were those assessing confusion and depression. For the confusion subscale, the adjective *bewildered* was the least coherent of the five items, but it also differed the most across winning and losing outcomes. The items *forgetful, confused,*, and *unable to concentrate*, on the other hand, were coherent but did not discriminate between outcome categories. These findings suggest that further refinement of the abbreviated confusion subscale is desirable. Since the original version of this subscale contains only

seven items, it may be advisable to use all of these items in subsequent studies in order to increase internal consistency and further explore the discriminant capabilities of each of the items.

Although the mean alpha of .664 for depression was acceptable, this subscale was the least coherent of the seven subscales examined in this study. This finding is in contrast to results obtained by Schacham (1983) and Riem et al. (1990) where the depression items were found to possess high internal consistency relative to other subscales. McNair et al. (1971) also report very high reliability estimates for this subscale in the long version of the POMS. In retrospect, we feel that the deletion of *unhappy* and *blue* from this subscale could have adversely affected its internal consistency in the present study. At the same time, our findings reveal that it may not have been wise to retain the item *miserable* because it correlated more strongly with other subscales than it did with depression. In terms of discrimination, however, all of the items except *hopeless* were sensitive to differences across winning and losing outcomes. Moreover, the outcome effect was quite strong for these items. Since *hopeless* was the least coherent of the depression items and did not discriminate between winning and losing, we suggest that it be omitted and/or replaced by *unhappy* in subsequent studies using the modified POMS. We also suggest that *miserable* be replaced by *blue*.

Finally, although the modified POMS demonstrated acceptable psychometric properties in the present study, cross-validation of these results is definitely needed. All of the participants in this study were adult females, and the sample size was relatively small. Larger-scale studies using both males and females, and possibly young athletes as well as older ones, would permit more sophisticated scale-development procedures such as factor analysis to be employed and would allow norms to be developed. It should also be pointed out that measurement scale validity can be highly situation-specific (American Psychological Association, 1985). Thus, while this study found that all subscales in the modified POMS except fatigue discriminated between female competitors who won or lost, different findings could emerge in studies examining male subjects, youth sport participants, and/or in other competitive settings. Subsequent research should investigate such possibilities in order to refine the present instrument and provide researchers with a brief, comprehensive, and psychometrically sound measure of positive and negative affect in sport. This refinement process should include an examination of behavioral and physiological correlates of mood state ratings.

RÉSUMÉ

Cette étude a vérifié les propriétés psychométriques de la version modifiée du «Profile of Mood States» (McNair, Lorr, & Droppleman, 1971). Le nombre de éleménts contribuant à chacune des six sous-échelles du test original fut réduit et cinq autre éléments furent ajoutés dans un effort d'evaluation des émotions associées à l'estime de soi. L'échelle modifiée contenait un total de 40 adjectives suppisé mesurer la tension, la dépression, la fatigue, la vigueur, la confusion, la colère, et les émotions associes à l'estime de soi. Cette échelle de 40 éléments fut administrée à 45 joueses de netball immediatement après la compétition. Il fut demondé aux athlètes de répondre aux questions du test d'aprés leur état emotionel à ce moment là. Les coefficients de fidelité (alpha de Cronbach) des sous-échelles considérées varièrent de .664 à .954 avec une moyenne de .798. La validité de la discrmination vainqueurs-perdants fut analysée en comparant les états d'humeur. Toutes les sous-échelles, sauf celle concernant la fatigue, ont montré des differences significatives entre les deux groupes. Il a été conclu que cette version modifiée du «POMS» présente des propriétés psychométriques acceptables dans les situations sportives et qu'elle peut être utile en cas de limitation de temps pour effectuer les évaluations de sujets.

RESUMEN

Schacham (1983) desarrollò una versiòn màs corta del Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) que puede ser utilizada con los enfermos hospitalizados. Este ensayo analiza las propriedades psicomètricas de una versiòn ligeramente modificada de propinar en situaciones deportivas. Se han sacado dos item de la escalera original y nuevos item se han agregado, para avaluar las emociones juntas a la autoestimaciòn. Esta escalera asì reformada està constituida por 40 adjetivos que median la tensiòn, la depresiòn, el cansancio, la fuerza, el cace,el furor y las emociones juntas e la autoestimaciòn. Se proporcionò a 45 jugadores de netball inmediatament despuès del acompeticiòn solicitando responder de acuerdo con sus emociones de aquel particular momiento. Los coeficientes de fiabilidad (alpha de Cronbach) mudan de .664 a .954 con una media de. 798. Se ha examinado la validez paragonando las condiciones perdadoras y de las vencedoras. Todas las ecaleras secondarias, fuera del consancio han puesto en evidencia diferenciaciones significativas entre los dos grupos. Los resultados indican que esta versiòn modificada del POMS pone en evidencia propriedades psicomètricas aceptables para el deporte y que puede ser ùtil en particular, para los investigadores cuando se encuentran tiempos limitados para la valoraciòn.

ZUSAMMENFASSUNG

Schacham (1983) entwickelte eine kurze Version von Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) für die stationären Patienten. Diese Forschung analysiert die psychometrischem Eigenschaften einer veränderten Version, die für den Sport benutzt wird. Zwei Items der originalen Klassifikation sind ausgeschlossen gewesen und fünf neue Items sind hinzugefügt gewesen ,um die Gemütsbewegungen verbunden mit der Selbstachtung zu bestimmen. Diese veränderte Klassifikation besteht aus 40 Eigenschaftswörtern, die die Spannung, die Depression, die Mühe, die Stärke, die Konfusion der Ärgerund die Gemütsbewegungen verbunden mit der Selbstachtun abschätzen. 45 Netballspielerinnen haben den Fragebogen sofort nach dem Wettkampf gemacht, sie wurden gefragt, die Fragen beatworten so vie sie sich in dieser Gelegenheit fühlten. Die VErläßlichkeitsfaktoren (Alpha von Cronbach) ändern sich von 664 bis 954 mit einem Mittelwert von 798. Die Wirksamkeit wurde uberprüft, indem man den Gemütszustand der Siegerinnen mit demjenigen der Verliererinnen vergleichen hat. Alle Unterklassifikationen, mit Ausnahme der Müke, haben bedeutende Unterschiede zwischen den zwei Gruppen hervorgehoben. Dei Ergebnisse beweisen, daß diese veränderte Version des POMS psychometrische Eigenschaften zeight, die nützlich fur Sport sind. Außerdem ist sie besonders nützlich für die Forscher, wenn die Zeiten für die Schätzung beschränkt sind.

RIASSUNTO

Scacham (1983) ha sviluppato una versione breve del Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) da utilizzare con pazienti ospedalizzati. Questo studio analizza le proprietà psicometriche di una versione leggermente modificata da somministrare in situazioni sportive. Due item della scala originale sono stati eliminati e cinque nuovi item sono stati aggiunti, per valutare le emozioni associate all'autostima. Questa scala modificata consiste di 40 aggettivi che misurano la tensione, la depressione, la fatica, il vigore, la confusione, la rabbia e le emozioni correlate all'autostima. È stata somministrata a 45 giocatrici di netball immediatamente dopo la gara, con l'istruzione di rispondere in accordo a come si sentivano i quel momento. I coefficienti di affidabilità (alpha di Cronbach) variano da .664 a .954 con una media di .798. La validità è stata esaminata comparando lo stato d'animo delle vincenti e delle perdenti. Tutte le sottoscale, eccetto la fatica, hanno evidenziato differenze significative fra i due gruppi. I risultati evidenziano che questa versione modificata del POMS mostra proprietà psicometriche accettabili per lo sport e che può essere particolarmente utile per i ricercatori quando siano limitati i tempi per la valutazione.

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