

## EFFECTS OF DANCE ON ANXIETY<sup>1</sup>

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*Summary.*—The study investigated the effects of modern dance on anxiety. State anxiety was assessed before and after a 3-mo. education programme, using the Spielberger State-Trait Anxiety Inventory. The target group followed a class in modern dance. Control groups were (1) a physical education group to control for the effects of exercise, (2) a music group to control for aesthetic sensitivity training, and (3) a mathematics group. Several concomitant variables were measured: age, sex, attitude towards dance, and previous experience in sport, dance, and relaxation. Dance training significantly reduced anxiety, but no control activities did so. Examination of the concomitant variables showed that the result could not be accounted for by any obvious artifacts.

Since the pioneering work of Marion Chance (1953), dance therapists have written enthusiastically about the curative potential of the art of movement. Bunny (1979) states her view that dance "furtheres the physical and emotional integration of the individual." Schmais (1976) defined the role of the dance therapist as concerned with changing the emotional state of the client. Hard evidence has been somewhat lacking from all the supporters of the dance therapy movement, however, their ideas do generate hypotheses which can be empirically tested.

Within a clinical setting a number of studies have looked at the effect of dance as an aid to recovery after illness (Costonis, 1979). Looking specifically at anxiety, Serlin (1976) has given an anecdotal account of one subject who became less anxious during dance therapy. Kline (1977) attempted a statistical investigation, although with a small sample, and noted that a significant reduction of self-reported anxiety occurred during dance. Several studies with children following classes in "movement studies," have also claimed to show reductions in anxiety (Hanson, 1970; Kearne, 1978). None of the above studies considered the possibility that effects may be due to specific components of dance, such as exercise or listening to music, rather than to dance *per se*. The present study assessed the effects of dance on anxiety while controlling for physical exercise and music.

### METHOD

#### *Subjects*

Subjects were 114 students at two colleges of further education in the

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London area. There were four groups corresponding to four areas of study; Dance (26 women and 3 men), Sport (physical education, 13 women and 8 men), Music (9 women and 3 men), and Mathematics (24 women and 31 men). Both the Dance and the Sport groups carried out their activities as an integral part of their study. The groups did not differ significantly in age; *M* age was 19.9 yr.

### *Design*

The design was essentially  $2 \times 2$ , the two factors being physical exercise and aesthetic appreciation. The dance group was the target group, insofar as we were postulating that training in dance should affect anxiety. Two of the remaining three groups were controls for other possible bases for anxiety; exercise which the dance group had in common with the sport group; and aesthetic appreciation which dance shared with music. Finally, a mathematics group was included as it had neither element.

Allowing a period of three weeks from the beginning of the first term for adjustment to the course, the first testing session (the pretest) involved a battery of tests and took place at the beginning of the fourth week of the first term. Questionnaires were administered to groups of subjects. Post-testing for state anxiety was carried out in the middle of the second term.

### *Measures*

Anxiety was measured by the state scale within the Spielberger State-Trait Anxiety Inventory (Spielberger, *et al.*, 1971). The scope of state-anxiety measurement of the inventory was adjusted from "right now" to "the last few days." Trait anxiety was also measured. The mean trait anxiety score was 41.29, with a standard deviation of 10.91. For state anxiety the mean score was 39.57 ( $SD = 10.43$ ) on the pretest. The correlation between state and trait anxiety was .64, while the correlation between state anxiety at the pre- and posttest was .43 which compared well with Spielberger's (1972) data.

Two other sets of questionnaires were included. First was a set of questions about previous experience of dance, sport, physical exercise and relaxation prior to the start of the courses, as these activities might have limited the ability of the courses to produce further change. Second, an attitude to dance questionnaire was constructed to assess whether changes in anxiety might be affected by attitude directly. Those with a positive attitude to dance might be more susceptible to the learning process or there may be an experimenter-type effect in which subjects modify their responses to the questionnaire in a socially desirable manner. The attitude toward dance questionnaire was constructed according to standard procedure for Likert-type scales. Item analysis was carried out by factor analysis. The first factor accounted for 27% of the variance of the 60-item questionnaire, and the second gave only 7% which indicated a

unidimensional scale. Nearly all the items loaded on the common factor. Items with loadings above .46 were selected giving a 24-item scale which retained the characteristics of the specification. Half the items of the 24-item scale were positive, and half negative, with respect to the common factor.

#### RESULTS

Only results from those subjects (84) who completed all the questionnaires were analysed. Analysis of variance was carried out on the pretest scores of both STAI state- and trait- anxiety measures to assess differences in initial levels of anxiety. No significant differences between groups were noted for state anxiety ( $F_{3,80} = 1.99, p = .12$ ) or for trait anxiety ( $F_{3,80} = 1.05, p = .37$ ). For each subject, change in anxiety during treatment was measured by the posttest-pretest difference. This is the statistically recognized approach for analysing repeated-measures data. It avoids breaking assumptions about the independence of observations on the same subject, reduces the error due to individual differences in initial scores, and avoids making the additional assumptions necessary with analysis of covariance. Analysis of variance between groups on this change variable was significant ( $F_{3,80} = 4.18, p < .01$ ).

It was useful to investigate and partition this significant effect further. The means for the pre- and poststate anxiety, as well as the change scores and their standard errors appear in Table 1. It looks from the means as if the

TABLE 1  
STAI STATE ANXIETY FOR FOUR GROUPS MEASURED PRE- AND POST-TREATMENT,  
TOGETHER WITH CHANGE SCORES, THEIR STANDARD DEVIATIONS,  
AND STANDARD ERRORS

Group	N	State Anxiety: Ms			SD	SE
		pre	post	change		
Dance	23	45.5	37.7	-7.8	8.4	1.75
Sport	16	42.3	40.7	-1.5	8.7	2.17
Music	7	39.8	42.8	3.0	20.7	7.81
Mathematics	38	37.7	38.6	0.9	8.8	1.42

large change for the dance group may be as much due to the high initial level as to the low posttest level, however, we have already shown that pretest scores did not differ significantly from each other. Partitioning of the 3 *df* between groups as well as the 1 *df* provided by the grand mean gave us 4 *df* with which to test the change scores for the individual groups. These are equivalent to the *t* tests (square root of *F*) provided by the mean over standard error ratio in Table 1. It is clear that none of the groups other than the dance group showed significant change on their own. For the dance group the *t* value for the change score was 4.47 (*df* = 22,  $p < .01$ ).

Looking now at age and sex, age did not differ significantly between the groups. However, sex showed a large difference between groups ( $\chi_{7,76}^2 = 19.14, p < .01$ ). This was almost entirely determined by the larger number of women in the dance group. Women are known to have higher trait-anxiety scores than men, but it is unlikely that this accounts for our significant main effects as there was no significant trait-anxiety difference between the groups.

Analysis of variance was also carried out to look at differences between groups on our other questionnaire measures. No significant effect was found for previous experience of relaxation ( $F_{3,80} = 1.30$ ), but previous participation in dance was significant ( $F_{3,80} = 45.13, p < .001$ ) as was previous sport participation ( $F_{3,80} = 74.3, p < .001$ ) and attitude to dance ( $F_{3,80} = 22.16, p < .001$ ). *Post hoc* Scheffé tests applied to the means after analysis of variance showed that the difference between means on attitude to dance and previous experience of dance was entirely due to the favourable attitude and former dance experience of the dance group. The other three groups did not differ significantly from each other. As far as previous sport participation was concerned, rather surprisingly, the mathematics group did not differ significantly from the sport group. Both groups differed significantly from the dance and music groups.

Pearson product-moment coefficients were calculated among all the variables to enable us to identify common modes of action. The pooled within-groups correlation matrix is given in Table 2 (The over-all matrix would be contaminated by group differences). It can be seen that none of the possible contaminants correlated significantly with anxiety change.

TABLE 2  
PEARSON PRODUCT-MOMENT CORRELATIONS (POOLED WITHIN GROUPS)  
BETWEEN VARIABLES

Variable	2	3	4	5	6	7	8	9	10
1. Sex	.27	.00	-.44	-.12	-.11	-.02	-.08	.04	.11
2. Age		.21	-.01	-.14	-.07	-.13	-.10	-.13	-.04
3. Previous dance			.13	.21	.15	-.08	.02	-.01	-.03
4. Previous sport				.14	.03	-.05	.09	-.09	-.18
5. Previous relaxation					-.01	.13	.18	.01	-.15
6. Dance attitude						.06	.06	-.06	-.12
7. Trait Anxiety							.61	.30	-.26
8. Pretest State Anxiety								.42	-.49
9. Posttest State Anxiety									.60
10. State Anxiety change									

Note.—Correlations above .22 are significantly different from zero at  $p = .05$  ( $r = .27, p < .01; r = .35, p < .001$ ).

## DISCUSSION

From our results it seems that, for this dance group at least, a course in modern dance was associated with a reduction in anxiety. However, before we can say anything about the nature of this association we need to investigate a little more fully the conceptual and statistical structure of our variables.

First, it is worth noting that in the results there was no significant correlation of previous experience of dance or sport, with either trait-anxiety or change in state-anxiety. If dance affected anxiety, might we not have expected that those with previous experience of it would have lower anxiety levels? This effect was not supported by our data although, of course, single measures of state- or trait- anxiety do not have the precision associated with our change scores. Furthermore, if physical exercise reduces anxiety, might it not be that those previously involved in sport had already had their anxiety reduced and were not susceptible to any further change in anxiety? This was contraindicated by the non-significant correlations, however, we have to recognize that a proper resolution of these possibilities would require a wider longitudinal study.

Second, it could be argued that some of the non-significant control effects, both in the analysis of variance and the correlations, may have been non-significant through unreliability or poor validity of the measures. The reliability of the Spielberger trait measure and state measure are given in the STAI handbook as .80 and .87, respectively, so that these are unlikely to present any problems. The measures of previous experience of sport, dance, and relaxation were specifically designed for the study. The questions asked were very direct to the matter at hand. As there was no reason why subjects should lie about the extent of their former participation in sport and dance, we can have reasonable confidence that the scores on these are reliable and valid. This received some support from the correlation between previous experience of dance and attitude to dance which was .54 (using the over-all correlation matrix which is appropriate here). This can perhaps be taken as setting a lower limit to the reliability of both measures.

For the attitude to dance, face and content validity were good in terms of the usual processes of attitude scale construction and item analysis. It would not be appropriate to give a figure for reliability as item analysis was carried out on data yielded during the experiment and is not independent (any such figure would be artificially high). However, there was no reason to suppose that the test was unreliable as even the very minimum possible value for internal consistency which we get from the unprocessed 60-item test would be .52, implying a post-selection reliability of at least .8. It seems we can have reasonable confidence in the strength of our findings in the present study.

No significant effect on anxiety was found for either the sport group or for the music group. However, we must be careful here about interpreting the

null hypothesis. The most we can conclude is that, for our groups, any effects of music and physical exercise alone are less than when they are combined in dance.

Finally, we need to be cautious about generalizing from our sample to all groups or manifestations of dance. Ideally, to look at the effect of dance classes we would need a random sample of classes, rather than a group of subjects in one class. The importance of common class variables has to be borne in mind, and it could, quite reasonably, be argued that in the present study there were only four "subjects" (the four groups) rather than the 84 claimed. However, the results do indicate that a serious effect may have been involved here. It is one which is certainly worthy of further investigation.

#### REFERENCES

- BUNNY, J. R. Dance therapy, and notes on the Task Panel on "The role of the arts in mental health." *Art Psychotherapy*, 1978, 5, 7-9.
- CHANCE, M. Dance as an adjunctive therapy with hospitalized mental patients. *Bulletin of the Meninger Clinic*, 1953, 17, 219-225.
- COSTONIS, M. N. *Therapy in motion*. Urbana, IL: Univer. of Illinois Press, 1978.
- HANSON, D. S. The effects of a concentrated program of movement on the affective behavior of four year old children at university elementary school. Unpublished doctoral dissertation, Univer. of California, Los Angeles, 1970.
- KEARNE, F. J. Instructional models and the development of the body concept and anxiety reduction in elementary school children. Educational Report, Ohio Univer., 1978.
- KLING, F. A. A report on the use of movement therapy for chronic severely disabled outpatients. *Art Psychotherapy*, 1977, 4, 181-182.
- SCHMAIS, C. Dance therapy in perspective. In K. C. Mason (Ed.), *Dance therapy*. Washington, DC: American Association of Health, Education & Recreation, 1974. Pp. 103-127.
- SERLIN, L. Portrait of Karen: a Gestalt phenomenological approach to movement therapy. *Journal of Contemporary Psychology*, 1976, 8, 145-152.
- SPIELBERGER, C. D. *Anxiety: current trends in theory and research*. New York: Academic Press, 1972.
- SPIELBERGER, C. D., GORSUCH, R. L., & LUSHENE, R. *The State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press, 1971.

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