British Journal of Psychiatry (1986), **149**, 486–490

Follow-up of Agoraphobic Patients Treated with Exposure In Vivo or Applied Relaxation

L. JANSSON, A JERREMALM and L. G. ÖST

The present study describes the results of a 7-month and a 15-month follow-up of 32 agoraphobic patients treated with exposure *in vivo* or applied relaxation. During the follow-up period, all patients were given self-exposure instructions. Assessments were made in three response systems—subjective-cognitive, behavioural, and physiological—at the follow-up points. The study showed overall maintenance of treatment results in all three response systems for exposure-treated patients. For applied relaxation/self-exposure, there was a relapse on Δheart-rate at 7 months for physiologically reactive patients, but the improvement was regained at the 15 month follow-up. Furthermore, a large proportion of the total improvement occurred during the follow-up period: 36% and 22% for exposure and applied relaxation/self-exposure respectively. The proportion of patients reaching a clinically significant improvement was 50% at the end of treatment and 66% at the 15 month follow-up.

Different behavioural treatments have been recorded as having a powerful immediate effect on agoraphobia, with a mean of 63% of the patients being much improved after treatment by the most widely used method, exposure *in vivo* (Jansson & Öst, 1982). However, the long-term effects of behaviour therapy on agoraphobia are more uncertain, since few studies report on the long-term results (see Table I).

Marks (1971) reported the follow-up results on 36 agoraphobic patients treated with systematic desensitisation and other forms of psychotherapy. Four years after treatment the results were maintained on phobia ratings made by the patients and their therapists. Emmelkamp & Kuipers (1979) assessed 70 agoraphobic out-patients with self-report forms at four years after treatment with variations of exposure therapy. They found that the improvements were maintained during the follow-up period.

Four studies have used independent assessor ratings of agoraphobic symptoms, giving more credence to the follow-up results. Hafner (1976) administered self-report assessment forms to 39 patients treated with *in vivo* exposure one year after treatment, and found that one third of them were unimproved or worse at follow-up. However, on independent ratings of agoraphobic symptoms the improvements were maintained at one year. Munby & Johnson (1980) assessed 66 patients at 5–9 years after treatment, and they also used both self-report and independent assessor ratings. Both these measures showed that the improvements were maintained, and no evidence of symptom substitution was found. Another investigation also used self-report and independent assessor ratings for 40 agoraphobic patients treated with imipramine or exposure (Cohen *et al*, 1984). Two years after treatment, two thirds of the patients remained improved or much improved in their phobias.

It seems that the effects of behaviour therapy for agoraphobia are maintained for several years after treatment, as evidenced by both subjective measures and independent ratings. However, little is known about the long-term stability of the behavioural changes in agoraphobic patients, since only two unpublished studies have included a behavioural test at follow-up. Burns *et al* (1983) reported the follow-up results at eight years of 18 out of 32 patients treated with different behavioural methods. At the follow-up point the patients were assessed by self-report, independent assessor ratings and a behavioural test. In general, the improvements were maintained on all three measures.

The primary purpose of the present investigation was to study the long-term effects of behavioural treatment on self-report, behavioural and physiological measures of agoraphobia. A secondary purpose was to compare the amount of change immediately after treatment with that after the follow-up period, and also to determine the clinical significance of the improvements at the different points of assessment.

TABLE I
Follow-up results of controlled studies on behavioural treatments of agoraphobia

Authors	*n* at follow-up	% of *n* at treatment	Measure[1]	Results				Total improvement[4] %	[3]Proportion of improvement during follow-up[5] %	% receiving further treatment
				Pre-treatment	Post-treatment	One year follow-up	Later follow-up[2]			
Marks (1971)	36	92	P+T	6.0	4.2	4.0	3.6 (4)	40	25	15
Hafner (1976)	39	95	I	5.8	1.97	1.77	—	69	5	?
Emmelkamp & Kuipers (1979)	70	86	P	6.05	3.45	—	3.1 (4)	49	12	19
Munby & Johnston (1980)	63	95	I	6.60	4.11	—	4.2 (7)	38	−4	49
Burns *et al* (1983)	18	56	B	51%	79%	83%	86% (8)	71	28	20
Cohen *et al* (1984)	40	89	I	6.65	2.55	2.9	3.2 (2)	62	−14	23

1. P = patient, T = therapist, I = independent assessor, B = behaviour test (distance walked).
2. Figure in brackets is time of later follow-up in years after treatment.
3. On a scale of 0–8, either as originally reported or converted from a scale of 0–5.
4. Difference between pre-treatment and lowest value as a percentage of pre-treatment value.
5. As a percentage of total improvement.

Method

Patients and design

Details of the original design and treatment have been described by Öst *et al* (1984). The subjects were out-patients at Ulleråker Mental Hospital, and fulfilled the following criteria.

(a) They were aged 20–60.
(b) The major presenting complaint was fear of, and avoidance of, being alone in public places from which escape might be difficult or help not available in case of sudden incapacitation.
(c) They have no other psychiatric problem in need of immediate treatment.
(d) If any medication was used the intake was to be held constant during the study.
(e) They indicated their willingness to participate in the study for a period of three months.
(f) They received no other kind of psychiatric or psychological treatment except for the ongoing medication during the treatment.

Of the 40 patients that were included in the study, 38 were women and 2 were men. The sample's mean age was 36.2 years (range 25–52) and the average duration of the phobia was 8.3 years (range 1–28). Twenty-nine of the patients (73%) experienced panic attacks outside their phobic situations. Only 7 were drug-free at the start of treatment, while 20 were taking benzodiazepines, 11 some combination of benzodiazepines and other psychoactive drugs, and 2 were taking neuroleptics.

Each patient was first classified as a behavioural or a physiological reactor depending upon their reactions on a behavioural test (Öst *et al*, 1984). The patients were then randomly assigned to receive 12 session of either exposure *in vivo* (E) or applied relaxation (AR). The applied relaxation included practical training in how to use relaxation as a coping technique in difficult situations. The treatment was carried out by two experienced therapists with relevant training and five years of clinical experience in behaviour therapy.

A maintenance programme was delivered at the final session consisting of the following strategies: a list of high-risk situations; an individualised strategy in case of a set-back; a monthly self-monitoring schedule for self-exposure; and monthly telephone contacts with the therapist (Jansson *et al*, 1984). All patients received this self-exposure component during the first five months of follow-up.

Assessment

All of the following assessments were made before and after treatment and (on average) 7 months and 15 months after the end of treatment.

Self-report. The patients completed a Swedish version of the Wolpe & Lang (1964) Fear Survey Schedule (FSS-III). To assess the specific agoraphobic reaction they filled out the Agoraphobia Scale (constructed by the authors) with twenty common agoraphobic situations, estimating both anxiety in entering the situation and degree of avoidance of the situation. Also, the patients filled out the Agoraphobia Questionnaire (Zitrin *et al*, 1980) and panic attacks were

assessed with the Acute Panic Inventory (Zitrin *et al*, 1980). The physiological reactions in anxiety-provoking situations were measured with the Autonomic Perception Questionnaire (Mandler *et al*, 1958). To tap negative thoughts during the behavioural test the patients rated on a scale from 0 to 4 the frequency of ten negative self-statements. To measure the patients' degree of depression and marital satisfaction the Beck Depression Inventory (Beck, 1967) and Maudsley Marital Questionnaire (Crowe, 1978) were administered. Lastly, the patients also rated an individual hierarchy of the 15 agoraphobic situations used in the behavioural test, on a scale from 0–100 in anticipated anxiety.

Behavioural measure. A behavioural test was conducted: each patient was asked to enter real agoraphobic situations unaccompanied. From an individual hierarchy of 15 situations, the patients entered frightening situations until they failed or refused to enter two consecutive situations. The request to enter these situations was presented with emphasis on doing their utmost to provide a realistic picture of their performance and their physiological reactions in the phobic situation. At the post-treatment test the patients were asked to enter both the most difficult situation they had performed at the pre-treatment test and then to try the most difficult situation that they would dare to try after treatment. The test continued in the same way as before: until the patient failed or refused to enter two consecutive situations, or performed the most difficult situation of the hierarchy. The dependent behavioural measure was the percentage of situations completed.

Self-rating of anxiety. During the behavioural test the patients carried a portable ECG-cassette recorder (Mediolog 4–2, Oxford Instruments) which also recorded their verbal ratings of anxiety every 2–5 minutes depending on the total estimated time in the phobic situation. The cue for the anxiety rating was a signal from a portable timer, set for the time intervals chosen for the situation. A microphone was attached to the patient's collar to record what was said in the situation as well as sounds from the surroundings.

Physiological measure. The patient's heart-rate was continuously recorded during the behavioural test through one of the four channels on the portable tape recorder. The patient's resting pulse was recorded while the patient was both seated and walking around for five minutes during the screening interview. In this way, the patient's Δheart-rate (difference between resting pulse and heart-rate in the most difficult phobic situation) could be calculated.

Clinically significant improvement

In order to assess if the degrees of improvement shown by the patient's were clinically significant (Hugdahl & Öst, 1981) the criteria developed by Jacobson *et al* (1984) were used. According to these, a patient's score on the outcome measure must fall outside the range of the agoraphobic population, where the range is defined as mean ±2 s.d. As there are no norms for agoraphobic patients on the measures used in this study the sample's pre-treatment values were used. The criteria which had to be fulfilled were as follows: on the behavioural measure the patient had to complete 73% of the situations; the Δheart-rate must not exceed +0.5 beats/min, and the self-rating of anxiety had to be 0. An overall criterion was also constructed, according to which a patient had to be improved on any two of the three criteria above.

Results

Four patients dropped out from the study and did not complete the original treatment. Another three patients were not available for the 7 month follow-up, leaving 33 patients; 32 of these were available for the 15 month follow-up. The division of subjects into behavioural and physiological reactors did not yield significant differences in treatment effects for exposure *in vivo* and applied relaxation/self-exposure (Öst *et al*, 1984); consequently the two response patterns were combined and data presented for the two treatment methods only.

Within-group changes

Student's *t*-tests for independent samples were computed to analyse the differences between pre-treatment and post-treatment testing, post-treatment and 7 month, and between 7 month and 15 month follow-ups.

Self-report measures. Both groups improved significantly after treatment on most of the measures: E on seven and AR on nine of the ten measures (see Öst *et al*, 1984). A table of the complete data can be obtained from the authors.

At the 7 month follow-up, all self-report measures showed that the improvements were maintained for the exposure group. There were no significant differences between post-treatment test and the 7 month follow-up on any of the self-report inventories for those patients receiving exposure *in vivo*. For the applied relaxation/self-exposure group, all but two of the self-report inventories showed maintained improvements. On the Fear Survey Schedule there was a further significant deterioration ($P<0.001$), and on the Acute Panic Inventory there was a significant deterioration ($P<0.05$).

At the 15 month follow-up there was a significant further improvement on several of the self-report measures for the E group: Agoraphobia Scale (Anxiety) ($P<0.05$), Individual Hierarchy ($P<0.05$), Acute Panic Inventory ($P<0.05$), APQ (Specific) ($P<0.05$), and the Negative Thought Index ($P<0.01$); on all other inventories the improvements were maintained but without further improvement. For the AR group there was a significant further improvement from 7 to 15 month follow-up on the Individual Hierarchy ($P<0.01$), APQ (Specific) ($P<0.01$) and on the Negative Thought Index ($P<0.05$), while the other scales showed a maintained improvement.

Behavioural measure. The results on the behavioural test at 7 month and 15 month follow-ups showed a maintained improvement for both groups: there were no significant differences for either group between the results at post-treatment testing compared with 7 month follow-up, or between situations performed at 7 month and 15 month follow-up.

Physiological measure. There was a steady and continuing improvement for the exposure-treated patients in heart-

rate, responding from pre-testing, across post-testing and 7 month follow-up to the 15 month follow-up. No significant differences, however, were found between post-treatment testing and 7 month follow-up, or between 7 month and 15 month follow-up. However, for the AR group there was a significant increase in Δheart-rate at the 7 month follow-up compared with post-testing ($P<0.001$). This increase in physiological reactivity occurred mainly among the physiologically reactive patients. There was a significant difference between physiological (mean = 27.5) and behavioural reactors (mean = 0.8) on Δheart-rate at 7 month follow-up ($P<0.01$). At 15 month follow-up, however, there was again a significant improvement in Δheart-rate compared with the results at 7 month follow-up ($P<0.01$).

Self-rating of anxiety. Both groups improved significantly after treatment regarding the degree of anxiety experienced during the behavioural test. The E group continued to improve somewhat at the 7 and 15 month follow-ups. The AR group, however, displayed a significant deterioration ($P<0.05$) at 7 month follow-up, parallelling that seen in the physiological measure. At the 15 month assessment the group's mean was again down at the post-treatment level.

Between-group comparisons. Analyses of variance (split-plot design) were computed to investigate between-group differences. These showed that the two treatment groups were equal on 10 of the 13 measures. Significant F values for the group factor were obtained on the Anxiety ($P<0.05$) and Avoidence ($P<0.05$) sections of the Agoraphobia Scale, and on the Agoraphobia Questionnaire ($P<0.05$). Subsequent Tukey tests on the Agoraphobia Scale (Anxiety) showed that the AR group was better than the E group at the 7 month follow-up. On the Avoidance part, the AR group was better than the E group at the 15 month follow-up. Finally, on the Agoraphobia Questionnaire, the difference between the groups was due to a significant pre-treatment difference, which disappeared when analysis of covariance was used.

Improvement during treatment and follow-up. There was a large variation between the different measures, expressed as percentage change from pre-treatment values, with 13% for the E group on the Maudsley Marital Questionnaire (items 1–20) and 98% for the AR group on Δheart-rate as the extremes. The means across all measures were 56% for the E group and 68% for the AR group.

If the improvement is divided into that occurring during treatment and that occurring during follow-up, the E group shows a continued improvement on all measures. The AR group, however, improved further on 11 of the 13 measures, the two exceptions being Δheart-rate and Acute Panic Inventory. The proportion of each group's total improvement that occurred during follow-up was 36% for the E group and 22% for the AR group.

Clinical significance of the improvements

The proportion of patients who had improved to such an extent that it could be considered clinically significant is higher on the behavioural measure than on the subjective and the physiological measures. For exposure-treated patients, 59%, 65% and 71% were clinically improved on this measure directly after, at 7 month and at 15 month follow-up respectively. For relaxation/self-exposure treated patients, the corresponding figures were 58%, 67% and 83%. For the three forms of measure taken overall there is a tendency for AR to yield a higher proportion of improved patients (AR: 58%, 50%, 72%; E: 41%, 47%, 59%). When the two groups are taken together, 50% are clinically improved at the end of treatment; this figure is increased to 66% at the 15 month follow-up. A comparison of the 15 month with the post-treatment outcome showed that only one patient had relapsed, while 17 had maintained their improvement and 6 had changed from not improved to clinically improved.

During the follow-up period eight patients (25%) received further treatment, five from the original exposure group and three from the applied relaxation/self-exposure group. All patients received exposure *in vivo* for 3–10 sessions (mean = 5). However, four of these patients showed no improvement at any assessment point and were clearly treatment 'failures' in spite of further treatment. Another changed from clinically improved to not improved at the 7 month follow-up, and requested further treatment, which led to his regaining the status of clinically improved at the 15 month assessment. The remaining three patients, who were not improved at post-treatment, changed to clinically improved at follow-up as a result of obtaining further treatment.

Discussion

This is, to our knowledge, the first published study which reports follow-up results for subjective, behavioural and physiological measures. The study showed that the improvements on subjective and behavioural measures were maintained up to 15 month follow-up for exposure-treated patients, and that there was a non-significant trend of continuing improvement in anxiety-ratings and Δheart-rate among physiologically reactive patients at 7 month follow-up. However, at 15 month follow-up the improvements in all the three response systems were maintained. One possible explanation for the deterioration at 7 months for the AR group could be that they had difficulties with continuing to practice and with applying relaxation techniques during the first follow-up period. However, because of the maintenance programme, which involved self-exposure practice, the behavioural gains were maintained and eventually resulted in a satisfying long-term result at 15 month follow-up. It could be that physiologically reactive patients treated with applied relaxation need an individually tailored maintenance programme containing prompts to continue to practice and to apply relaxation techniques. These specific elements could be incorporated into a standard maintenance programme which is more oriented towards self-exposure (Jansson *et al*, 1984). This investigation shows a change on the behavioural measure (E group 61%; AR group 72%) which is comparable with the

71% found by Burns *et al* (1983). Also, the changes in ratings of anxiety are in the expected range (E group 57%; AR group 66%).

However, when looking at all the outcome measures taken together, it was found that 36% and 22% of the improvements for exposure and applied relaxation/self-exposure treated patients respectively occurred during the follow-up period. These are more promising results than usually found in follow-up studies (see Table I, where the figures range from −14% to +25%). The findings of a continuing improvement at follow-up is encouraging; one possible explanation for it could be the maintenance programme employed in this study. Self-exposure alone has been found to be as effective as therapist-directed exposure (Gosh *et al*, 1984), and it therefore seems reasonable to assume that the self-exposure component of our maintenance programme was responsible for the continuing improvement found in this study. Therapy with agoraphobic patients should contain a maintenance programme of self-exposure for at least the first half-year after treatment to ascertain continuing improvement. However, further research is needed on how to administer an effective maintenance programme.

The proportion of patients having a clinically significant improvement was surprisingly high (66%) in the present study. These results give further credence to the clinical usefulness of the treatments used. It is suggested that future studies in the treatment of phobias should use the same way of determining clinical significance (Jacobson *et al*, 1984), so that a more universal way of comparing results will be possible.

Acknowledgement

This research was supported by Grant 05452 from the Swedish Medical Research Council.

References

BECK, A. T. (1967). *Depression: Causes and Treatment*. Philadelphia: University of Pennsylvania Press.

BURNS, L. E., THORPE, G. L. & CAVALLARO, A. (1983) Agoraphobia eight years after behavioural treatment: a follow-up study with interview, questionnaire, and behavioral data. Paper presented at the World Congress of Behavior Therapy, Washington DC.

COHEN, S. D., MONTEIRO, W. & MARKS, I. M. (1984) Two-year follow-up of agoraphobics after exposure and imipramine. *British Journal of Psychiatry*, **144**, 276–281.

CROWE, M. J. (1978) Conjoint marital therapy: a controlled outcome study. *Psychological Medicine*, **8**, 623–636.

EMMELKAMP, P. M. G. & KUIPERS, A. C. M. (1979) Agoraphobia: a follow-up study four years after treatment. *British Journal of Psychiatry*, **134**, 352–355.

GOSH, A., MARKS, I. M. & CARR, A. C. (1984) Controlled study of self-exposure treatment for phobics: preliminary communication. *Journal of the Royal Society of Medicine*, **77**, 483–487.

HAFNER, R. J. (1976) Fresh symptom emergence after intensive behaviour therapy. *British Journal of Psychiatry*, **129**, 378–383.

HUGDAHL, K. & ÖST, L.-G. (1981) On the difference between statistical and clinical significance. *Behavioral Assessment*, **3**, 289–295.

JACOBSON, N. S., FOLLETTE, W. C. & REVENSTORF, D. (1984) Psychotherapy outcome research: methods for reporting variability and evaluating clinical significance. *Behavior Therapy*, **15**, 336–352.

JANSSON, L., JERREMALM, A. & ÖST, L.-G. (1984) Maintenance procedures in the behavioral treatment of agoraphobia: a program and some data. *Behavioural Psychotherapy*, **12**, 109–116.

——, ÖST, L.-G. (1982) Behavioral treatments for agoraphobia: an evaluative review. *Clinical Psychology Review*, **2**, 311–336.

MANDLER, G., MANDLER, J. M. & UVILLER, E. T. (1958) Autonomic feedback: the perception of autonomic activity. *Journal of Abnormal and Social Psychology*, **56**, 367–373.

MARKS, I. M. (1971) Phobic disorders four years after treatment: a prospective follow-up. *British Journal of Psychiatry*, **118**, 683–688.

MUNBY, M. & JOHNSTON, D. W. (1980) Agoraphobia: the long-term follow-up of behavioural treatment. *British Journal of Psychiatry*, **137**, 418–427.

ÖST, L.-G., JERREMALM, A. & JANSSON, L. (1984) Individual response patterns and the effects of different behavioural methods in the treatment of agoraphobia. *Behaviour Research and Therapy*, **22**, 697–707.

WOLPE, J. & LANG, P. (1964) A fear scale for use in behaviour therapy. *Behaviour Research and Therapy*, **2**, 27–30.

ZITRIN, C. M., KLEIN, D. F. & WOERNER, M. G. (1980) Treatment of agoraphobia with group exposure *in vivo* and imipramine. *Archives of General Psychiatry*, **37**, 63–72.

*Lars Jansson, MA, *Research Psychologist*

Anita Jerremalm, MA, *Research Psychologist*

†Lars-Göran Öst, PhD, Dr Med Sc, *Associate Professor of Psychotherapy Research*

Psychiatric Research Centre, Ulleråker Hospital, S–750 17 Uppsala, Sweden

**We regret that Dr Jansson is now deceased*

†Correspondence

(*Accepted 18 September 1985*)