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Changes in Cognition with Pharmacotherapy and Cognitive Therapy

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Summary: A treatment trial comparing cognitive therapy and pharmacotherapy, alone and in combination, in depressed out-patients, indicated that outcome on cognitive variables was similar to outcome on mood and severity measures, pharmacotherapy being less effective than cognitive therapy or the combined treatment in a hospital and a general practice sample. While combined treatment was superior to cognitive therapy in the hospital out-patients, the two treatments were equivalent in the general practice. Significant effects were obtained on measures of views of self, the world and the future, whose validity was demonstrated. The pattern of change through treatment showed the same order of progress for responders, while non-responders to cognitive therapy tended to do worst. The specificity of treatment effect is discussed.

Most studies in the treatment of depression report on only one or two classes of dependent variables, namely mood and general severity, for example, HRS–D, HRS–A, BDI, Raskin scales, DACL, etc. This is particularly true of drug trials, and more recent studies of the efficacy of psychological treatments have followed suit (e.g. Rush *et al,* 1977; Shaw, 1977; Di Mascio *et al,* 1979; Beck *et al,* 1979; Fuchs and Rehm, 1977).

This leads to the assumption of the primary importance of mood in depressive illness, if not, indeed, the equation of depressive illness with mood disturbance.

In contrast, studies using behavioural therapy sometimes include measures of the frequency and the enjoyability of pleasant events pre and post treatment. This follows from the theoretical stand-point of behavioural explanations of depression which emphasize reinforcing events (e.g., Lewinsohn *et al,* 1980). Similarly, outcome studies of interpersonal psychotherapy have sometimes used social adjustment as a dependent variable (e.g., Rounsaville *et al,* 1981).

However, cognitive therapy treatment trials have rarely looked at the specific effect of cognitive interventions on cognitive variables. Taylor and Marshall (1977) in their comparison of cognitive therapy and behaviour therapy, both alone and in combination, measured two cognitive factors, self-esteem and self-acceptance, using Kelly's (1955) Repertory Grid. They obtained the same effect on all classes of variables: namely the combination of cognitive and behaviour therapy was superior to either treatment on its own. McLean and Hakstian (1979), in their comparison of psychodynamic short-term psychotherapy, drug therapy, cognitive behavioural therapy, and relaxation therapy, used a whole gamut of dependent variables which included cognitive, coping, activity, social, somatic, mood and personality measures. Cognitive changes at outcome followed the same pattern as changes in other variables. Rush *et al* (1981) reported that both cognitive therapy and drug treatment (imipramine) reduced hopelessness and improved self-concept and cognitive therapy effected improvement in hopelessness, view of self and mood before changes in vegetative and motivational symptoms, while no particular pattern was associated with pharmacotherapy.

Zeiss *et al* (1979) particularly addressed the question: 'Is target behaviour selectively influenced?' in their comparison of three modes of therapy aimed respectively at: (1) increasing the rate of mood related pleasant activities: (2) interpersonal skill training, and (3) changing cognitions. They included different classes of dependent variables aimed at tapping pleasant events, social skills and cognitive functioning. Like Taylor and Marshall (1977), McLean and Hakstian (1979) and Rush *et al* (1981), they found no specific effects for the three treatments.

Few outcome studies in the treatment of depression have looked a a wide range of outcome variables and even fewer have looked at the specific effects of different types of therapies on targeted behaviour.

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Cognitive variables have been particularly disregarded in the literature so far, probably because of three main reasons:

(1) The paucity of easily administered and well validated instruments.
(2) The implicit assumption among therapists that cognition has changed if mood has changed.
(3) The assumption that the important parameters to measure are mood and general severity of symptoms.

In the treatment trial conducted in Edinburgh comparing the efficacy of cognitive therapy and pharmacotherapy, each alone and in combination, the outcome on mood and general severity variables has already been reported in two papers (Blackburn and Bishop, 1981; Blackburn *et al*, 1981). This study looks at outcome on cognitive variables.

The questions addressed in this part of the study were:

1 What is the relationship between changes in mood and in cognitive variables?
2. Do the changes in cognitive variables mirror the changes in mood variables at the end of treatment?
3. What is the pattern of change in cognitive variables over course of treatment?

Summary of previous reports

Subjects

Patients were seen in two settings: in a hospital outpatient department (HOP) and in a general practice (GPP). All patients satisfied RDC criteria for primary major depressive disorder, were unipolar, non-psychotic (no delusions or hallucinations), had a BDI score ≥14, and were aged between 18–65 years. One hundred and forty patients were screened, of whom 52 (22 HOP + 30 GPP) were rejected. 24 patients (9 HOP + 15 GPP) dropped out of treatment, leaving 64 (40 HOP + 24 GPP). Patients were assessed at baseline and every 2–3 weeks, up to the end of treatment, on mood, severity, cognitive and behavioural variables.

Results

All groups of patients improved on most variables, except for the GP drug group and when the results were analysed in a 2-way analysis of covariance (covariates = total PSE score, social class, education level and duration of illness episode), the following results were obtained: for the hospital outpatients the combined treatment of cognitive therapy and pharmacotherapy was superior to either treatment on its own and cognitive therapy tended to be better than pharmacotherapy at a non-significant level. The variables which differentiated significantly were the Beck Depression Inventory, inward irritability, the combination of inward and outward irritability (Snaith *et al*, 1978) and the Hamilton Rating Scale for depression. For the general practice patients, the combined treatment did not differ from cognitive therapy alone and both were significantly superior to pharmacotherapy alone. Variables which discriminated significantly were inward irritability and the Hamilton Rating Scale for depression.

Method

Present study

Measures and procedures

Several cognitive measures were administered to all patients, following the same procedure as for the mood and general severity measures, this is at base line and every two to three weeks until the end of treatment which lasted 12–15 weeks on the average.

1. The *hopelessness scale* of Beck *et al* (1974) is a measure of pessimism about the future, consisting of 21 items scored as true or false. This scale has been widely used clinically and shown to correlate highly with level of depression and with measures of suicidal tendencies in clinical groups. Normative data exist for a normal population and pathological groups (Greene 1981; Beck *et al*, 1975; Nekanda-Trepka *et al*, 1983).
2. Semantic differential measures (Osgood *et al*, 1959) of *views of self, the world and the future.* Beck (1967) has described the negative view of self, the world and the future as the negative cognitive triad comprising the biased content of thought of depressed patients, in terms of which the other signs and symptoms of depression can be understood. Thus this aspect of thinking is central to the cognitive theory of depression.
   Three constructs relating to the self were used:
   (a) view of current self: "Myself as I am now";
   (b) view of premorbid self: "Myself as I was before this illness";
   (c) ideal view of self: "Myself as I would like to be".

A measure of *change in self image* due to illness was obtained by subtracting (a) from (b): view of premorbid self *minus* view of current self and a measure of *discrepancy from ideal self* was obtained by subtracting (a) from (c): ideal view of self *minus* current view of self.

One construct was used to measure view of the world: "My environment as I see it" and one for view of the future: "My future as I see it for me".

Seven-point bipolar scales were used for each construct. These were culled from the factor-analytic studies of meaning presented by Osgood *et al* (1957) and were chosen for their relevance in describing the

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chosen concepts. These bipolar adjectives cover the three factors which have emerged from previous factor-analytic studies, namely evaluation, potency and activity, evaluation being most widely represented as it has most consistently been shown to be the most important factor. The scales were labelled: successful-unsuccessful, bad-good, worthless-worthwhile, hopeful-hopeless, active-passive, interesting-dull, slow-fast, unpleasant-pleasant, negative-positive, in control-helpless, inadequate-adequate, happy-sad. The positive and negative ends of the scales were randomised to control for position bias in self-rating and scores were from 1 to 7, low scores indicating a negative rating. Thus scores could range from 12–84 from each construct.

Statistical analysis

Product-moment correlations of the cognitive measures with two severity scales at base line, correlations between change scores on cognitive and severity measures and differences between base line and end of treatment scores were calculated for the whole population (N = 64) to demonstrate the validity of the measures.

Differential response to treatment was analysed by a two-way analysis of co-variance of change scores (treatment × location), with duration of index episode, social class, education level and total PSE scores as co-variates, as in the previous report of response on mood variables (Blackburn *et al*, 1981).

The pattern of change through treatment was analysed by a repeated one-way analysis of variance for the hospital and general practice patients combined, using cumulative percentage change scores to take into consideration basal level. The analysis uses the usual end-point procedure, i.e. to keep the N constant at each point of testing the last score of an individual who completed treatment early is repeated (Friedman, 1975). Seven points of testing were analysed for responders and non-responders separately (HOP and GPP combined). Responders were defined as patients who, at the end of treatment, had scores of 8 or less on the BDI and/or 9 or less on the HRS–D. A cut-off score of 8 on the BDI was chosen instead of a score of 10 as recommended by Beck and Beamesderfer (1974), because of Metcalfe and Goldman's (1965) study showing relatively lower scores for a British population. They obtained a mean score of 5.4, S.D. 5.8., for their non-depressed group. A cut-off score of 9 on the HRS–D was based on a review (Schwab *et al*, 1967), a score of 9 being more than three standard deviations from reported mean scores in depressed out-patients, and on agreement with global ratings of absence of depression by experienced clinicians (Bech *et al*, 1975). There were 48 responders: 19 on combined treatment (COM), 17 on cognitive therapy (CT) and 12 on drugs (D), and 16 non-responders: 3 on COM, 5 on CT and 8 on D.

Results

Validation of cognitive measures

1. All cognitive measures, hopelessness, view of self, the world and the future, view of premorbid self, of ideal self, of change in self, and of discrepancy from ideal self, at base line, were intercorrelated with two severity measures of depression, the Hamilton Rating Scale (HRS–D) and the Beck Depression Inventory (BDI) for all treatment groups and the two sources of referral combined (N = 64). The BDI was highly correlated ($P < .001$) with all variables, except for view of premorbid self and of ideal self. The HRS–D did not correlate significantly with view of ideal self, of the world and of the future and with hopelessness; the significant correlations with the other cognitive variables were of a lower order than the corresponding correlations with the BDI ($P < .05$ with view of self, of change in self and of discrepancy from ideal self; $P < .01$ with view of premorbid self). Thus, though the BDI and HRS–D were correlated at the .001 level ($r = .51$), the cognitive bias of the BDI relative to the HRS–D, with its strong anxiety and physical symptoms component, was evident.

All cognitive measures were highly inter-correlated except for view of premorbid self and of ideal self, which were, however, intercorrelated at $P < .001$ ($r = .47$). The highest correlation was between hopelessness and view of the future, $r = 0.74$, $P < .0001$.

2. Table I shows the means and standard deviations for all cognitive variables and for all subjects (N = 64) at the beginning and end of treatment. All differences were significant beyond the .001 level, except for change in view of premorbid self and view of ideal self which changed less ($P <,05$) and changed in the

TABLE I

Mean scores: first and last occasion of testing

	baseline HOP + GPP (N = 64)	End-point HOP + GPP (N = 64)
Hopelessness	12.4 (5.2)	6.1 (5)***
Self	35.9 (12.5)	61.1 (17.6)***
Premorbid self	66.3 (12.7)	59.6 (17.6)*
Ideal self	79.2 (5.2)	77.6 (7.2)*
Ideal self/self	43 (13.5)	24.1 (43.2)***
Premorbid self/self	30.7 (15.4)	2.6 (24.7)***
World	40.3 (16.5)	63 (16.2)***
Future	43.3 (20.4)	65.2 (16.9)***

* $P < .05$

*** $P < .001$ (t for change scores, df = 63)

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opposite direction: that is, at the end of treatment, patients took a less highly positive view of their premorbid self and had lower standards about their ideal self.

3. When change scores on cognitive variables were correlated with change scores on severity variables for all 64 patients, all the correlations with the BDI and HRS–D were significant at the .001 level, except for view of premorbid self, and of ideal self and discrepancy between self and ideal self. In fact, changes in these three variables did not correlate highly or significantly with any other changes. Changes in view of self, the world and the future, in discrepancy between premorbid self and current self and in hopelessness were highly intercorrelated ($P < .001$).

Differential response to treatment

The means for each treatment sub-group adjusted for significant co-variates are shown in Table II. The significant level of co-variates is shown in column 1 for relevant variables. The variables which discriminated significantly among treatments, with no location or interaction effects, were views of self, of the environment and of the future ($P < .01$, $< .05$, $< .05$ respectively). For view of self in the *hospital out-patient group,* (HOP), the combined treatment group shows the largest change and the drug therapy group the smallest change, with cognitive therapy occupying an intermediate position (a-posteriori least significant difference tests, LSD, COM> D, $P < .05$). The same pattern is seen in view of the environment and view of the future where the significant differences were not located.

In the *General Practice Group,* (GPP) the changes in view of self were largest for the cognitive therapy group, followed by the combined treatment group and the drug group doing worse. LSD tests showed that both CT and COM were significantly superior to D at the .05 level. For view of the world, there was little difference between CT and COM and both were

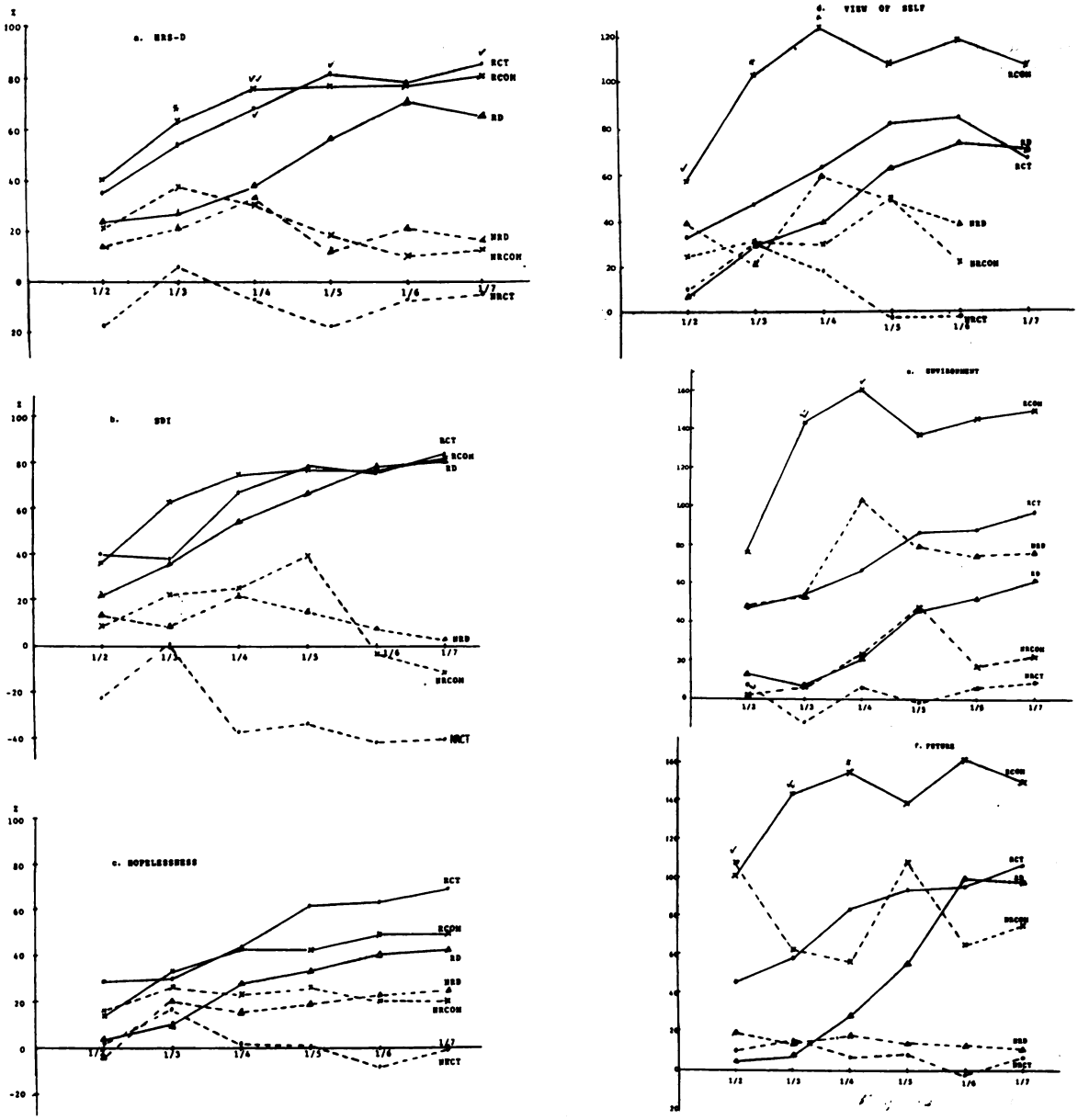
TABLE II

Change scores for cognitive variables (2-way analysis of co-variance)

		HOP	GPP	
N		(CT = 14, D = 13, COM = 13)	(CT = 8, D = 7, COM = 9)	F
Hopelessness	CT	7.3	7.4	
	D	5.8	3.9	NS
	COM	6.5	6.7	
View of self (duration of illness $P < .05$: PSE, $P < .002$)	CT	−23.9	−24.6	
	D	−19.4	− 8.8	TR = .01
	COM	−34.3	−22.7	
View of premorbid self	CT	6.3	2.1	
	D	5.2	7.6	NS
	COM	1.5	9.7	
Ideal self	CT	2.1	1.8	NS
	D	0.9	7.0	
	COM	2.0	− .1	
Ideal self-self	CT	− 2.4	29.8	NS
	D	19.2	20	
	COM	32	24.2	
Premorbid self-self (PSE, $P < .008$)	CT	34.1	18.3	NS
	D	25.7	25.1	
	COM	34.1	30.8	
View of environment (social class, $P < .005$)	CT	−13.5	−35.6	TR = .03
	D	−12.9	−22.9	
	COM	−23.1	−35	
View of future	CT	−21	−20.8	
	D	−18.4	− 8.4	TR = .05
	COM	−33.4	−26.8	

CT = cognitive therapy, D = drug treatment, COM = combined treatment (CT + D); HOP = Hospital out-patients, GPP = General Practice patients.
TR = treatment effect

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FIGS. 1a–f. Cumulative percentage change in severity and cognitive measures.†

×———× Recovered on combination treatment (RCOM, N = 19)
●———● Recovered on cognitive therapy (RCT, N = 17)
△———△ Recovered on drugs (RD, N =12)
× — — — × Not recovered on combination treatment (NRCOM, N = 3)
● — — — ● Not recovered on cognitive therapy (NRCT, N = 5)
△ — — — △ Not recovered on drugs (NRD, N = 8)
1/2 1/3 Change from occasion 1 to occasion 2, change from occasion 1 to occasion 3
*P <.05 (F-test); √ P <.05, √√ P <,01 (Scheffé's a-posteriori test)
†Reproduced from 'Pattern of Change in mood and cognition with cognitive therapy and pharmacotherapy' in "Current Issues in Clinical Psychology", (in press), ed. E Karas, with kind permission of Plenum Publishing Corp.

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superior to D (no significant differences located) and for view of the future, COM was superior to CT and again the drug group did worse (no significant differences located).

The changes in view of premorbid self and in view of ideal self were minimal, as could be expected, for all treatment groups. In the hospital group, the change scores in the other variables, hopelesssness, discrepancy between ideal self and self and discrepancy between premorbid self and self, though not significantly different, consistently showed that the drug group did worse than the combined treatment group, the cognitive therapy group varying in their performance. The general practice treatment groups showed the same pattern on these variables.

Pattern of change in two level of severity variables and the main cognitive variable

The variables for which pattern of change over course of treatment was analysed were: HRS–D, BDI, Hopelessness and view of self, the world and the future.

Figs. 1a-f show the changes in two severity variables and four cognitive measures over course of treatment, using cumulative percentage change scores.

The pattern of response on the *Hamilton Rating Scale for Depression* (HRS–D) is show in Fig 1a. It can be seen that responders on combination treatment (RCOM) had the highest rate of response at the beginning of treatment, though from the fifth occasion of testing onwards their response was very similar to that of responders on cognitive therapy alone (RCT). Responders on drugs (RD) had a lower rate of response throughout. The differences in rate of response were significantly different on the third occasion of testing ($F = 3.3$, $P < .05$), but *a-posteriori* tests (Scheffé's) failed to locate the significant differences. The significant differences at fourth ($F = 5.92$, $P < .01$), 5th($F = 4.62$, $P < .05$) and seventh occasions ($F = 4.63$, $P < .01$) were located, as indicated by the ticks on the Fig. At fourth testing, the responders on combination treatment had improved significantly more than drug responders ($P < .01$) and cognitive therapy responders had improved more than drug responders ($P < .05$), while fifth and seventh testing, cognitive therapy responders had improved more than drug responders ($P < .05$).

Among non-responders, the drug group (NRD) and the combination treatment group (NRCOM) were similar in their pattern of response, obtaining a mild response which decreased over time. The non-responders on cognitive therapy (NRCT) actually got worse from the start of treatment. The differences among non-responders did not reach significance.

Fig 1b shows the pattern of response on the *Beck Depression Inventory* (BDI). Again, it can be seen that responders on combination treatment (RCOM) had the edge over the other two groups of responders at the start of treatment and the drug group responded at a slower rate, but at the end of treatment, there was no difference among groups. There was no significant difference in responses among the groups of responders at any point of testing.

The non-responders on cognitive therapy (NRCT) again deteriorated with treatment, while the non-responders on drugs (NRD) and on combination treatment (NRCOM) had a mild response which decreased over time. Significant differences were obtained at the fifth occasion of testing ($F = 4.81$, $P < .05$), where NRCOM differed significantly from NRCT at the .05 level and sixth occasion of testing ($F = 4.72$, $P < .05$) where NRD differed from NRCT at the .05 level.

The next four Figs show the pattern of change on cognitive variables. In Fig 1c, change in *hopelessness* follows the same pattern global variables. The drug responders, at the end of treatment, remained more hopeless (42 per cent improvement) than the responders on combination treatment (44 per cent improvement) and the responders on cognitive therapy (69 per cent). The drug responders had a lower level of response throughout treatment, which was not significantly different from that of the other two groups of responders at any point.

No significant differences were located among non-responders, though again the non-responders to cognitive therapy did worst of all.

Changes in the three concepts of the cognitive triad, view of self, the world and the future, as measured by the semantic differential, are shown in Figs 1d, e and f. In Fig 1d showing the percentage change in *view of self*, it can be seen that responders to combination treatment had a higher level of response throughout treatment than the other two groups and that responders to cognitive therapy improved their view of self quicker than responders to drugs, with no difference at the end of treatment. Significant differences were seen at second occasion of testing ($F = 3.89$, $P < .05$) where the combination group was significantly different from the drug group ($P < .05$), at 3rd ($F = 3.43$, $P < .05$) and 4th ($F = 3.24$, $P < .05$) occasions of testing where differences were not located.

No significant differences were found among non-responders, though non-responders to cognitive therapy did worse than the other two groups, having deteriorated by the end of treatment.

Fig 1e shows the same pattern of response for *view of the environment,* responders to combination treatment improved to a higher level and more rapidly (over 100 per cent), followed by responders to cognitive therapy,

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while responders to drugs changed the way they view their environment only minimally and very slowly (50 per cent at the end of treatment). Significant differences were obtained at third occasion of testing ($F = 5.98$, $P < .005$), with the combination group differing from the drug group at the .01 level, and at the fourth occasion ($F = 4.91$, $P < .05$) where the combination group differed from the drug group at the .05 level.

There were no significant differences among the non-responders, where the non-responders to drug did best, and the non-responders to cognitive therapy did worst, remaining near base line throughout treatment.

Fig 1f shows again the same pattern for change in *view of the future*. Responders to combination treatment had a better and quicker response than the other two groups (over 100 per cent) and though response on cognitive therapy and on drugs was similar at the end of treatment, response on cognitive therapy was more rapid at the beginning of treatment than on drugs. Significant differences were obtained at second occasion of testing ($F = 3.94$, $P < .05$) where combination treatment was significantly better than drug treatment ($P < .05$), on third occasion ($F = 4.4$. $P < .05$) where combination treatment differed from drug treatment ($P < .05$), on third occasion ($F = 4.4$, $P < .05$) where combination treatment differed from drug treatment ($P < .05$) and on fourth occasion ($F = 3.19$, $P < .05$).

Among non-responders, those on combination treatment were clearly separated from the other two groups throughout treatment, with a significant difference ($F = 4.21$, $P < .05$) at the last occasion of testing; while non-responders to drug and to cognitive therapy showed minimal improvement (less than 20 per cent) throughout treatment, non-responders to combination treatment responded at a high level, sometimes undiscriminated from responders, showing a relatively high increase in optimism.

Discussion

The hopelessness scale used in this study is a well validated measure (Nekanda-Trepka *et al*, 1983) and the semantic differential scales used to measure other aspects of depressed thinking were shown to be valid by their correlations with scales of general severity of depression (concurrent validity), by changing in the expected direction with recovery and by change scores correlating significantly with changes in level of depression (conceptual validity). An indication that subjects were using the scales with discrimination and that a general halo effect was not operating was seen in the low correlations between scales measuring concepts not expected to vary much with depression and a self-rating scale of depression level; the correlations between the BDI and view of premorbid self and of ideal self respectively were .01 and .05.

The relative changes in cognitive variables at the end of treatment were similar to changes in mood and general pathology reported by Blackburn *et al* (1981). In the hospital out-patient group, the patient receiving pharmacotherapy showed less improvement on all variables than patients receiving cognitive therapy alone or the combined treatment, significant treatment effects being obtained on views of self, the world and the future. The combined treatment group showed the best response, the only located *a-posteriori* significant difference being in view of self between the combined treatment group and the drug group. View of premorbid self and of ideal self only changed minimally for all groups, tending to decrease with treatment, that is being less idealistically inflated. The decrease in discrepancy scores between premorbid self and self and between ideal self and self, again more marked in the combined treatment group, reflect the more positive view of self and perhaps more realistic view of previous and ideal self.

With the general practice patients also, the same pattern was seen in change in cognitive variables as in mood and severity measures. Again the drug group showed the least improvement, with very little difference between combined treatment and cognitive therapy alone. For the three significant treatment effects, a significant difference was located on view of self where both cognitive therapy and combined treatment were superior to the drug group. In view of the world, the combined treatment showed the same improvement as the cognitive therapy group, whereas in view of the future the combined treatment showed the greater change (non-significant). The changes in view of premorbid self and of ideal self were minimal as for the hospital group and the discrepancy scores showed the same pattern of decreasing by the end of treatment.

Thus, the negative cognitive triad, expressed as low self-esteem, perceived discrepancies from personal ideal and pre-morbid self-image, as a negative view of one's world and environment, and as pessimism and hopelessness, was shown to be a relevant and sensitive parameter of depressive illness which responds differentially to treatment. As outcome on cognitive variables mirrored that on mood and severity measures, the results are in agreement with the conclusions reached by Zeiss *et al* (1979) and McLean and Hakstian (1979) that there is no treatment-specific effect. To quote McLean (1982): "A treatment either works or does not work, and when it works, it does so rather uniformly across response domaines". Since pharmacotherapy improves symptoms and mood as well as particular cognitions, and cognitive therapy, which is

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focussed on cognitions and attitudes, changes cognitions as well as symptoms and mood, one must assume a feed-back between cognition and mood in a two-way process. It appears that in a circular system involving mood, cognitions and biochemical changes, at whatever point one enters the system, that is whatever the medium of intervention is, all these functions will change to the same degree depending on the efficacy of the intervention. This interpretation seems an apt explanation for the process of treatment efficacy, and does not purport to be a causal theory of depressive illness as treatment response cannot identify causal links. In the population studied here, greater improvement was effected on all parameters with cognitive methods than with pharmacological agents and the combination of both methods of treatment was more effective in one of the samples, namely the more chronically ill and more symptomatic hospital out-patients.

The pattern of response over course of treatment, as reflected in the cumulative percentage change scores, indicated that the results obtained at outcome were mirrored by progress throughout treatment. The combination of cognitive therapy and anti-depressant drugs gave on the whole a quicker and greater rate of improvement than either treatment on its own and cognitive therapy was superior to drugs alone. Again, this pattern applied both to total severity measures and to cognitive variables. The graphic representations of the slope of improvement showed clearly that, if rapid improvement is desirable, the optimal treatment for depressed out-patients should be the combined treatment. In depression in particular, a significant change early in treatment in hopelessness and pessimism about the future is often a question of life and death, as hopelessness has been found to predict suicide better than level of depression (Minkoff *et al*, 1973).

The pattern of response over course of treatment also indicated that, on the whole, it is possible to predict response from the second or third assessments, that is about 3–4 weeks after the onset of treatment. This applied in particular to the general depression measures, the cognitive variables appearing to differentiate responders and non-responders later, that is by fourth and fifth assessments, i.e. at about 6–8 weeks. This would seem to indicate, contrary to Rush's *et al* (1981) findings that cognitions in all three treatments, tended to change after changes in general severity and mood. However, the assessments in this study were found not frequent enough to be able to answer the question of what changes first in recovery. The separation of responders on general depression scales at about 4 weeks agrees with biological clinical practice and experience, a change of medication being often considered after about 3–4 weeks if no response is seen on current treatment. It must be remembered, however, that the number of non-responders on each treatment was very small, so that caution must be exercised in interpreting the results.

Bearing in mind this caveat, the consistently poorer response of the non-responders to cognitive therapy on all variables, is striking. A practical conclusion seems to be that if a patient does not respond to cognitive therapy in 2–4 weeks, it is better to offer him an alternative treatment or to prescribe antidepressants as a combined treatment with cognitive therapy. Theoretically, it may be that cognitive therapy responders differ from non-responders in specific ways. Detailed studies of non-responders are needed to clarify this point.

In conclusion, it was shown that outcome in cognitive variables in a treatment trial of cognitive therapy, pharmacotherapy and a combination of the two, mirrored changes in mood and severity of depression measures, in that in both a hospital and a general practice group, the drug patients showed less less response than the other two treatment groups, and while there was little difference between cognitive therapy and combined treatment in the general practice, combined treatment tended to be superior in the hospital out-patients. This differential response was seen throughout the course of treatment, with no specific effect for the different treatments.

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