

The Self-Schema and Subjective Organization of Personal Information in Depression¹

Henry Davis, IV²

University of Calgary and Calgary Family Service Bureau

This paper tests Beck's theory that depressives uniformly have stable cognitive patterns for interpreting environmental information. Specifically, it is questioned whether depressives have schemata for interpreting (or distorting) information relative to their beliefs and self-attitudes. Thirteen depressives were compared with 13 nondepressives in the subjective organization of self-descriptive adjectives on multitrial free recall as well as in the clustering of words on final free recall. As expected, level of depression was negatively related to the subjective organization of adjectives but held no systematic relationship with the subjective organization of abstract nouns. Likewise, depression was associated with lower category cluster on final free recall. These results suggest that some depressives may lack stable cognitive schemata for interpreting personal information. Implications are discussed relative to Beck's cognitive model, to Seligman's learned helplessness reformulation, and to cognitive behavior therapy.

INTRODUCTION

Low self-esteem (the tendency to make negative self-references) has been seen as an important symptom of depression for some time (e.g.,

Appreciation is expressed to W. R. Unruh and one anonymous reviewer for encouragement and assistance in the preparation of this research. Appreciation is also extended to R. Murphy for his assistance in the collating of data. The research was carried out as a pilot study for the author's doctoral dissertation. An Izaak Walton Killam Memorial Scholarship partially supported its execution, while the Calgary Family Service Bureau supported its preparation.

Address all correspondence to Henry Davis, IV, Division of Clinical Research, Calgary Family Service Bureau, 120 - 13th Avenue S.E., Calgary, Alberta, Canada T2G 1B3.

Bibring, 1952; Freud, 1955). As a demonstration of the continuing importance of this symptom to theorists of depression, Beck (1967) included low self-esteem in the negative cognitive triad. Further, the Seligman group (Abramson, Seligman, & Teasdale, 1978) revised the initial learned helplessness model, in part, to account for the low self-esteem associated with what they have termed "personal helplessness." Beck and Rush (1978) invoked the concept of "schema" to explain low self-esteem among depressives. Schemata were defined as stable cognitive patterns of response to similar types of events. Thus, where a depressive might consistently make a negative self-reference following the negative evaluation of behavior, Beck and his associates have reasoned that a stable schema is used to negatively bias such evaluations and self-references. Such negative bias, or cognitive distortion, has consistency by virtue of its guiding schema; the result is a consistent set of negative self-references.

More recently, however, Davis (1979) proposed that many depressives may not use schemata to guide self-referencing; he thus distinguished between schema- and non-schema-based self-reference in depression. It was suggested that non-schema-based self-references might emanate from attributions about life stressors or from uncertainty in describing one's behaviors and personal attributes. This suggestion was based on the finding, in a depth of processing study, that depressed subjects had lower incidental recall than the nondepressed subjects for adjectives that had earlier been encoded under self-reference instructions. (Subjects had rated yes or no to the question: Does this word describe you?). Yet, where subjects had first rated whether they understood the meaning of an adjective (semantic encoding), there were no group differences in incidental recall. The self-reference encoding data on depressives also stands in contrast to that of undergraduate "normals" in the original depth of processing study of self-schema (Rogers, Kuiper, & Kirker, 1977). Davis inferred that depressed subjects (short-term depressives, in particular) lacked schemata to represent the relationship between personal adjectives and their perceived attributes and behaviors. In other words, although they used negative referents in their self-descriptions, these referents did not reflect consistent organization of environmental information. As a function of this low organization, incidental recall of adjectives was relatively low on a self-reference task.

A more direct method for estimating whether persons use schemata to organize personal information (e.g., self-descriptive adjectives) would be to assess subjective organization on multitrial free recall of adjectives relative to abstract nouns. Subjective organization (SO) refers to the imposition of a consistent word order on a randomly ordered list. On multitrial free recall, subjects are presented a group of words, one at a time, over several trials;

each trial has a random word order. Subjective organization is observed when a subject consistently recalls the words in clusters. From an individual's unique pattern of contiguous word recall it is inferred that the subject has encoded the to-be-recalled words on the basis of word interrelationships that he, and not the experimenter, has perceived. On multitrial free recall (MFR), Sternberg and Tulving (1977) have noted the well-established finding that the order of recall of randomly ordered word lists increases over trials as a function of SO. Further, developmental studies suggest that SO itself increases as a function of "experience" with the semantic processing of words on a given list, i.e., as a function of a schema of word meaning. Bjorklund, Ornstein, and Haig (1977) showed that the ability to organize words for recall increases as a function of experience with the words. Presumably, then, the greater the variety of contexts in which a word has been encountered, the more elaborated its meaning schema becomes, and thus the more likely it is that the word will be organized among others on recall.

In the special case of self-descriptive adjectives, if persons have organized and stable self-descriptions, that is, if they have described themselves with similar terms over different contexts and over a period of time, it is likely that they have also developed schemata to represent the relations among self-reference adjectives prior to a recall task. For example, if for several years a given person attributed his "cooperativeness" to his state of "happiness," he might group these two words in recall on the basis of this subjective relationship. A self-schema, i.e., a superordinate schema of self-adjectives integrating cooperativeness and happiness, would be invoked to explain such SO. It is logical, then, that as a function of the development of such a self-schema, a subject could subjectively organize adjectives more than abstract nouns, for which presumably no prior schema of word relatedness would exist. On the other hand, if a depressive lacked a stable self-schema, it is expected that he would not show significant differences in the SO of adjectives and nouns.

The present study used SO in MFR to assess more closely the suggestion that short-term depressives lack a well-organized schema of those adjectives that might best be used for self-description. It was expected that depression would predict the SO of self-descriptive adjectives but not of abstract nouns. Nondepressed subjects should perceive self-descriptive adjectives as words distinctively different from nouns. A supportive hypothesis, therefore, was that organization on final free recall would be significantly greater for nondepressives than for depressives: this organization would be achieved by clustering adjectives and nouns within their respective word groups.

METHOD

Subjects

Thirteen depressed and 13 nondepressed male and female education undergraduates, screened by scores above 5 on the Beck Depression Inventory-Short Form, volunteered for 1 hour of testing on "the way people think." The short form of the BDI is composed of those 13 items having the highest correlations with the total scores on the unabridged form. In a concurrent validity study, the short form showed a correlation of .96 with the total score on the unabridged form and a correlation of .61 with clinician ratings of depression (Beck & Beamesderfer, 1974). For depressives (BDI $M = 7.92$), the mean age was 25.0; there were 12 females and 1 male. The nondepressives (BDI $M = .25$) had a mean age of 25.35; there were 10 females and 3 males. Depressed subjects were asked to estimate the duration of the current depressive episode. The mean duration estimate was 5.8 months ($SD = 11.9$). Finally, all depressed subjects were screened in an interview to meet the "Feighner criteria" for definite depression (Feighner, Robins, Guze, Woodruff, Winokur, & Munoz, 1972). No attempt was made in this study to differentiate between primary and secondary affective disorder. Therefore, the screening criteria for the presence of definite depression required, first, that subjects show evidence of dysphoric mood, and second, that subjects meet five of eight symptom criteria. It should be added in this context that no subject showed, or had a history of having showed, the delusions, hallucinations, and disorganized verbal production characteristic of schizophrenia.

Materials

Subjects were tested for incidental recall, multitrial free recall, and final free recall of 48 adjectives and 24 abstract nouns. The adjectives (e.g., *extravagant*, *awful*, *successful*) were those used first by Rogers et al. (1977) with the single substitution of *bothersome* for *pretentious* as made by Davis (1979). (This substitution was required because the original word was not understood by many clinical subjects of earlier research.) The nouns (e.g., *moment*, *tendency*, *opinion*) were selected for abstractness in order that they would be comparable to the adjectives. All nouns fell below the mean on the imagery norms of Paivio, Yuille, and Madigan (1968). (Imagery correlated .94 with concreteness.) Finally, to ensure that the words were of comparable word frequency in standard English, average Thorndike-Lorge (1952) frequencies per million were compared for the set of 24 nouns and 48

adjectives. These frequencies were 18.25 and 18.31, respectively. (Three adjectives were not listed and thus were not included in the average.)

Procedure

Subjects completed semantic and self-reference processing of 48 adjectives and structural processing of 24 abstract nouns. On the adjectives, subjects first gave a semantic "yes" or "no" rating according to whether they understood the word meanings. Following this, they rated the "yes" adjectives according to how each described them on a 7-point Likert scale. Next, on the nouns, subjects gave structural "long" or "short" ratings according to their judgements of the relative word lengths of 24 nouns. To obtain an estimate of the ability to recall and to organize words in recall, subjects were asked to record as many of these nouns as possible within a 3-minute period. (This ability estimate was used later as the covariate in a stepwise regression analysis.) In keeping with the 2:1 ratio of list length, subjects spent a mean of 215.7 seconds rating the longer adjective list and a mean of 109.4 seconds rating the shorter noun list.

Three groups of 8 words were derived from these ratings and were used on MFR: self-descriptive adjectives, moderately descriptive adjectives, and abstract nouns. The 8 self-descriptive adjectives are randomly chosen from those 16 adjectives rated as most self-descriptive. The adjectives chosen as self-descriptive appeared to be equivalently meaningful for both groups. All adjectives chosen for this category had a Likert rating of either a 6 or a 7. The mean self-descriptive adjective Likert ratings were 6.4 for depressives and 6.3 for nondepressives. The 8 moderately self-descriptive adjectives were randomly chosen from those 16 adjectives falling in the mid-range of the Likert ratings. The 8 nouns were randomly selected from the list of 24 nouns.

Six random orders were generated for the presentation of word groups. There was no effect due to word order ($F(10,38) = 1.14, p = .3$). The words in each group were given five random order presentations with 3-second interword intervals and 45 seconds for recall. Instructions emphasized that the words were to be recalled in any order.

Following MFR, subjects were orally given two simple arithmetic problems in addition; the answer to each problem was given prior to its administration. Subjects were told to verify for themselves that the answer was as given; in addition, they were required to recall the second number in each problem. This task took 2 minutes and preceded final free recall in which subjects were given 4 minutes to list in any order as many of the multitrial free recall adjectives as they could.

The pair frequency (PF) measure (Sternberg & Tulving, 1977) was used to compute subjective organization on multitrial free recall. The PF measure represents the number of paired words on adjacent lists as corrected for the number that would be expected by chance. Words are considered in bidirectional pairs (i.e., in the form of a:b or b:a). Frankel and Cole's (1971) *Z* score of (word) category cluster was used as the measure of organization on free recall. This measure normalizes the clustering score for recall lists of differing lengths. A list of optimal category cluster would show nouns clustered separately from adjectives.

RESULTS

A multivariate multiple regression supported the major hypothesis. The level of depression as the independent variable predicted subjective organization in the multitrial free recall of self-descriptive adjectives, moderately self-descriptive adjectives, and abstract nouns ($F(3,22) = 3.02$, $R^2 = .21$, $p = .05$). Table I contrasts the SO means for depressives and nondepressives. It is important that while depression correlated negatively with SO self-adjectives ($r = -.44$, $p < .05$), depression did not correlate with SO nouns ($r = .05$, $p > .05$). Thus, although Table I reveals group differences in all levels of SO, only the SO of self-adjectives was systematically related to the level of depression.

Since a univariate analysis revealed a nonsignificant relation between depression and the SO of moderately descriptive adjectives ($r = -.13$, $p = .5$), a second multivariate analysis used only the two most important word groups as dependent variables: self-descriptive adjectives and abstract nouns. In this analysis, shown in Table II, depression again accounted for a significant proportion of the variance in the dependent variables ($F(2,23) = 4.61$, $R^2 = .19$, $p < .02$). Most importantly, the step-down *F* ratios revealed again that depression accounted for a significant proportion of the

Table I. Mean SO of Adjectives and Nouns

Groups	Self-descriptive adjectives		Moderately self-descriptive adjectives		Nouns	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Depressives	.45	.48	.42	.31	.59	.38
Nondepressives	.84	.52	.74	1.11	.90	1.44

Table II. Multivariate Multiple Regression of Depression on SO Adjectives and Nouns

Variables	Univariate		df	Step-down <i>F</i>	<i>R</i> ²
	<i>df</i>	<i>F</i>			
Noun SO	1,24	.07	1,24	.06	.003
Self-descriptive adjective SO	1,24	5.65 ^a	1,23	9.12 ^b	.19
Multivariate <i>F</i>	(2,23)	4.61, <i>R</i> ² = .19, <i>p</i> ≤ .02			

^a*p* < .05.^b*p* < .01.

variance in self-descriptive adjective SO ($F(1,23) = 9.12, p < .01$) but held no systematic relationship with SO for nouns.

The related final free recall (FFR) hypothesis was also supported. In a multiple regression analysis, the level of depression predicted organization in FFR ($F(1,24) = 5.74, R^2 = .19, p < .02$). An analysis of covariance showed that this variance prediction was stable with the effects of an ability factor (the ability to organize and recall nouns in free recall) removed ($F(1,22) = 7.0, R^2 = .39, p < .01$). The mean category cluster in FFR for depressives was $Z = 2.71$ as compared with $Z = 3.43$ for nondepressives.

DISCUSSION

The present study was designed to determine whether or not short-term depressives lack well-organized schemata of those adjectives that might best be used for self-description. It was hypothesized that depression would predict the SO of the self-descriptive adjectives but not of abstract nouns. A supportive hypothesis was that nondepressives would show greater organization than depressives on final free recall.

The results support those of earlier studies (Davis, 1979, Note 1) and suggest that among the present sample of depressives a self-schema is not an active agent in the organization for memory of personal adjectives. This conclusion received direct support from the main effect due to depression in the multiple regression: in undergraduate depressives, the level of depression was systematically related both to the SO of personal adjectives and to the clustering of adjectives separate from nouns on final free recall. Increases in the BDI level of depression were related to lower levels of organization and clustering in recall. Observed differences in SO do not appear to be attributable to motivational differences between depressives and nondepressives because the multiple regression results showed that de-

pression was only systematically related to adjective SO. A task-specific motivational deficit would have been implied if the level of depression had been systematically related to *both* adjective and noun SOs.

These results suggest that, for depressives, there is little to distinguish self-descriptive adjectives from abstract nouns. In debriefing, nondepressives typically related that it was subjectively "easier" to recall personal adjectives than abstract nouns. The subjective difference is possibly related to the observed differences in SO and clustering. It is inferred here that these differences in organization occurred because the nondepressives were *familiar* with their respective self-descriptive adjective lists prior to the task as a function of their having regularly used such words in overt and covert self-description. Further, as a function of an organizing self-schema the self-descriptive adjectives were implicitly *interrelated*. The depressives, on the other hand, tended to have short-term depressions, and it is inferred that they had not yet developed stable self-schemata. That is, the words rated as self-descriptive may only have received such a rating for as long as those subjects had been idiosyncratically distorting personal information to fit a negative bias, i.e., for as long as they had been depressed. Consequently, the short-term depressives may have lacked a familiarity advantage with such words, may not have begun interrelating these words, and may have shown deficits in organization as the result. A study by Bellezza, Cheesman, and Reddy (1977) supports this reasoning. They factorially varied organization and semantic elaboration before concluding that beyond word comprehension it was within-list word-relatedness that improved recall. In the present context, this would mean that persons who relate one personal attribute to another, e.g., cooperativeness to happiness, would have an enhanced probability of self-descriptive adjective recall.

Several problems are inherent in these inferences. First, the depressives used in the present study were analogue depressives, and, second, possibly as a result of this nonclinical status, the mean duration of depression was short as compared with subjects of earlier research. For example, Davis (1979) found a mean duration of 10 months. Subjects of the present study had been depressed for roughly half that period. Depue and Monroe (1978) point out that it is not clear whether nonclinical depressed individuals are qualitatively different from their clinical counterparts. The present data suggest that one differentiating feature between clinical and nonclinical depressed states may be the duration of depressive episode. As a result, it is still unclear whether the present results pertain to short-term depression or to nonclinical depression.

There is some basis, however, for arguing that these results apply to short-term clinical depression. First, all of the present subjects had met the "Feighner criteria" (Feighner et al., 1972) for depression. Further, the

present data directly support the conclusions of the earlier research based on clinical subjects. The issue requires clarification, however, because duration of depression was not related to recall of the adjectives, whereas it had been in the earlier research. Whether this fact disconfirms the results of the earlier study or can be taken as a consequence of low duration variability in the present sample is the subject of research in progress. This most recent study includes outpatient clinical depressives (Davis, Note 2).

Presuming that the present results can be generalized to short-term clinical depressives and that they are not artifacts of analogue data, the current series of studies suggests that short-term depressives have not developed a stable schema of self. Although this conclusion is tenuous in light of 80% variance unaccounted for, it holds several important implications. First, the cognitive therapy of depression (Beck, Rush, Shaw, & Emory, 1978) has not taken account of the possibility that short-term depressives do not describe themselves consistently. At present, there are no strategies for reducing variability in self-reference. Second, it may be that Beck's theory itself (Beck & Rush, 1978) will require minor modification since it states that depressives employ relatively stable negativistic schemata for interpreting (or distorting) information relative to, say, one's behaviors or attributes. This theory makes no distinction between short- and long-term depression. The current series of studies by Davis does not wholly support the present state of Beck's cognitive model and leaves open the additional possibility that, for some, stable schemata for interpreting *environmental* information are also lacking. The proposed developmental extension to Beck's theory should be seen as a refinement rather than as a revision because Beck has acknowledged that, as a cognitive theory, his may be integrated with theories of cognitive development (Kovacs & Beck, 1977). The present series of studies represents an attempt to achieve this integration; these studies suggest that the self-schema develops as do other schemata, with experience and time.

Finally, if for some patients a lowered self-esteem is a symptom of depression, as suggested by Abramson et al. (1978) and Beck and Rush (1978), it can no longer be assumed that such patients will even retain self-esteem deficits as a symptom if they have been depressed for only a short term. It remains possible that short-term depressives will be those who will vacillate most in making attributions for the causes of helplessness and depression. They may, in fact, show continuous shifts within the "stable-unstable," "internal-external," "global-specific" dimensions outlined by Abramson et al. (1978). For example, after a poor Graduate Record Examination (GRE) performance, a given short-term patient might in one instance make the "internal:stable:global" attribution that the exam was failed because of a lack of intelligence. Later, however, while still de-

pressed, the same patient might drop his negative self-references to make an "external:stable:global" attribution that the Educational Testing Service gives unfair tests.

Each of these implications deserves attention in the light of the present data.

In conclusion, the present data are taken as further evidence that short-term depressives lack negativistic schemata for interpreting personal information. It may be most accurate to describe such patients as confused and uncertain about themselves.

REFERENCE NOTES

1. Davis, H. *Self-reference as related to 17-hydroxycorticosteroid secretion in adult depression*. Izaak Walton Killam Archives, University of Calgary, 1979.
2. Davis, H. *Memory for personal adjectives in adult depression*. Unpublished doctoral dissertation, University of Calgary, 1979.

REFERENCES

- Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology*, 1978, 87, 49-74.
- Beck, A. T. *Depression: Causes and treatment*. Philadelphia: University of Pennsylvania Press, 1967.
- Beck, A. T., & Beamesderfer, A. Assessment of depression: The depression inventory. In P. Pichot (Ed.), *Psychological measurements in psychopharmacology* (Vol. 7). Basel: Karger, 1974.
- Beck, A. T., & Rush, A. J. Cognitive approaches to depression and suicide. In G. Serben (Ed.), *Cognitive deficits in the development of mental illness*. New York: Brunner Mazel, 1978.
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emory, G. *Cognitive therapy of depression: A treatment manual*. Philadelphia: A. T. Beck, 1978.
- Bellezza, F. S., Cheesman, F. L., & Reddy, G. Organization and semantic elaboration in free recall. *Journal of Experimental Psychology: Human Learning and Memory*, 1977, 3, 539-550.
- Bibring, E. The mechanism of depression. In P. Greenacre (Ed.), *Affective disorders*. New York: International Universities Press, 1965.
- Bjorklund, D. F., Ornstein, P. A., & Haig, J. R. Developmental differences in organization and recall: Training in the use of organizational techniques. *Developmental Psychology*, 1977, 13, 175-183.
- Davis, H. Self-reference and the encoding of personal information in depression. *Cognitive Therapy and Research*, 1979, 3, 97-110.
- Depue, R. A., & Monroe, S. M. Learned helplessness in the perspective of the depressive disorders: Conceptual and definitional issues. *Journal of Abnormal Psychology*, 1978, 87, 3-20.
- Leighner, J. P., Robins, E., Guze, S. B., Woodruff, R. A., Winokur, G., & Munoz, R. Diagnostic criteria for use in psychiatric research. *Archives of General Psychiatry*, 1972, 26, 57-63.
- Frankel, F., & Cole, M. Measures of category clustering in free recall. *Psychological Bulletin*, 1971, 76, 39-44.

- Freud, S. Mourning and melancholia (1917). In J. Strachey (Ed. and trans.), *The standard edition of the complete psychological works of Sigmund Freud*. London: Hogarth Press, 1955.
- Kovacs, M., & Beck, A. T. An empirical-clinical approach toward a definition of childhood depression. In J. G. Schulerbrandt & A. Raskin (Eds.), *Depression in childhood: Diagnosis, treatment, and conceptual models*. New York: Raven Press, 1977.
- Paivio, A., Yuille, J. C., & Madigan, S. A. Concreteness, imagery, and meaningfulness values for 925 nouns. *Journal of Experimental Psychology Monograph*, 1968, 76(1, Pt. 2), 1-25.
- Rogers, T. B., Kuiper, N. A., & Kirker, W. S. Self-reference and the encoding of personal information. *Journal of Personality and Social Psychology*, 1977, 35, 677-688.
- Sternberg, R. J., & Tulving, E. The measurement of subjective organization in free recall. *Psychological Bulletin*, 1977, 84, 539-557.
- Thorndike, E. L., & Lorge, I. *The teachers word book of 30,000 words*. New York: Bureau of Publications of Columbia University, 1952.