Journal of Personality and Social Psychology
1988, Vol. 54, No. 6, 925-939

0022-3514/88/$00.75

Context-Dependent Automatic Processing in Depression: Accessibility of Negative Constructs With Regard to Self but not Others

John A. Bargh and Mary E. Tota
New York University

The existence of automatic negative self-referential thought in depression was examined by using the concurrent memory load paradigm. Depressed and nondepressed subjects judged each of a series of depressed- and nondepressed-content adjectives as to its descriptiveness of the self or of the average other person. While making each judgment, some subjects held six digits in working memory, whereas the remaining subjects had no concurrent memory load. We found that the memory load manipulation resulted in a reliably smaller increase in depressed subjects' self-referential judgment latencies for depressed content than for nondepressed content, with the reverse being true of nondepressed subjects. For all subjects, however, the load effect on other-referential judgment latencies was smaller for nondepressed-content adjectives than for depressed-content adjectives. The results suggest an automatic, unintentional component in the depressed person's use of negative social constructs in self-perception but not in other-perception, indicating a context-dependent form of automatic processing.

Social cognitive factors have come to play an increasingly important role in models of depression. Both Beck's (1967, 1976; Beck, Rush, Shaw, & Emery, 1979) notion of a depressive schema and the attributional reformulation of the learned helplessness model (Abramson, Seligman, & Teasdale, 1978; Peterson & Seligman, 1984) conceptualize depression in terms of a pattern of interpretation of environmental events that results in negative emotional experiences. Whereas the revised learned helplessness approach focuses on how the depressed person reaches conclusions regarding the causes of bad events and how such attributions affect his or her behavior and emotional state, Beck and his colleagues emphasize the earlier, perceptual stage of processing as differentiating between depressed and nondepressed people.

Beck et al. (1979) contend that as the disorder of depression proceeds, the depressive schema becomes an evermore intrusive influence on the interpretation of experience, assimilating an increasingly inappropriate range of events as validating instances of a negative self-concept. Furthermore, it is argued that the depressive schema is invoked without the person's intent or control, so that the depressed person is unaware of the negative bias in his or her interpretation of experience (Beck, 1976). Our intent was to investigate possible differences between depressed and nondepressed individuals in their on-line, immediate perception of information about themselves and others.

The general notion of an automatic force in the perceptual interpretation of social events is supported by recent theory and research on social construct accessibility influences in social perception, which have emphasized the chronic or long-term influences of frequently used social constructs (e.g., Bargh, Bond, Lombardi, & Tota, 1986; Bargh & Pratto, 1986; Higgins & King, 1981). Constructs are assumed to be relatively permanent components of one's perceptual structure, abstracted out of considerable experience in a particular environmental domain. Moreover, it is assumed that the more often a construct is used, the more accessible it becomes, that is, the more likely the construct is to be used in the future and the wider the range of stimulus features that will be taken to be instances of it. Several studies have found such chronically accessible constructs to become activated automatically by relevant environmental stimuli, even when attentional resources are in short supply (Bargh & Thein, 1985) or the person is actively trying to ignore the event (Bargh, 1982; Bargh & Pratto, 1986).

Although these findings are consistent with Beck's central hypothesis in that they demonstrate automatic influences in the perception of people in general, Beck et al.'s (1979) notion of a depressive self-schema assumes that automatic negative thinking is specific to the self-concept. Because models of social construct accessibility have assumed that constructs are applied to social behavior more generally, whether that of oneself or another person (Bargh, 1984; Higgins, King, & Mavin, 1982), it is not clear whether depression is associated with differences in the chronic accessibility of these more general social constructs. Rather, depressive cognition may be characterized by stronger associative links between the self-concept and negative constructs, relative to nondepressive cognition, such that the context of self-reference is a necessary precondition for the automatic activation of the negative constructs.

This research was supported by National Science Foundation Grant BNS-8404181 to John A. Bargh. Portions of this research were presented at the 1985 meeting of the Eastern Psychological Association in Boston, Massachusetts.

We are grateful to Gordon Logan, Tory Higgins, and two anonymous reviewers for their extensive and valuable comments on an earlier version of this article. We also extend our appreciation to Concepcion Jusino, Jr., and Cathy LaFata for serving as the experimenters for the study.

Correspondence concerning this article should be addressed to John A. Bargh, Department of Psychology, New York University, 6 Washington Place, 7th Floor, New York, New York 10003.

The findings of recent depression research are largely consistent with a context-dependent model. Rhodewalt and Agustsdottir (1986) instructed depressed and nondepressed subjects to present themselves to an interviewer either favorably or unfavorably, and subsequently measured their self-esteem. Some subjects engaged in self-reference as part of this presentation (i.e., they answered the interviewer's questions about themselves truthfully), whereas other subjects did not engage in self-reference (i.e., they were given the positive or negative responses to make by the experimenter beforehand). It was found that when nondepressed subjects gave self-enhancing presentations to the interviewer, their self-esteem was increased in the self-reference condition but not under the non-self-reference condition. Moreover, the self-esteem of nondepressed subjects in the self-deprecating condition was not influenced by the self-reference manipulation. The self-esteem of depressed subjects, on the other hand, showed a greater effect of self-reference in the deprecatory condition than in the enhancement condition. Apparently, self-referential thought made the self-concepts of subjects more accessible, resulting in the activation of negative characteristics for depressed subjects and positive features for nondepressed subjects. Rhodewalt and Agustsdottir (1986) concluded that this differential accessibility of positive and negative constructs led to the subsequent self-enhancement by nondepressed subjects and self-deprecation by depressed subjects.

This conclusion is congruent with the outcome of related studies of the self-concept and of depressive cognition. Fenigstein and Levine (1984) assumed that having subjects use first-person pronouns (*I, me*) in a preliminary task would activate the self-concept, and found that having subjects think in first-person terms resulted in greater self-attributions in a subsequent task than having subjects use third-person pronouns. Brown and Taylor (1986) obtained results that showed self-descriptive trait concepts to be more accessible and likely to be retrieved from memory in an incidental recall task if they are consistent in valence with the subject's temporary mood state. On the basis of such findings, Pyszczynski, Holt, and Greenberg (1987) argued that the influence of the depressive self-schema occurs only when the individual is made self-aware (i.e., when the depressed constructs are preactivated); their Study 2 showed that depressed subjects' tendency to be pessimistic about the future largely disappeared when their attention was focused away from the self. Similar findings of the necessity of preactivation of latent cognitive vulnerabilities for the experience of negative emotional symptoms have been reported by Higgins and his colleagues (Higgins, 1987; Higgins, Bond, Klein, & Strauman, 1986; Strauman & Higgins, 1987).

Thus, depressed individuals appear to differ from nondepressed individuals mainly in the content of their self-referential thought and not so much in the content of their more general social–perceptual constructs. The greater accessibility of negative concepts in depression seems to be conditional on the activation of the self-concept; that is, upon the context of self-referential thought. There is evidence that the negative thought of the depressed person is confined to the self and does not extend to thinking about other people (Pietromonaco & Markus, 1985; Pyszczynski et al., 1987; Sweeney, Shaeffer, & Golin, 1982; but see Tabachnik, Crocker, & Alloy, 1983). Thus, for depressed individuals, we expected to find negative constructs becoming active relatively automatically in self-referential thought, but for other-referential thought to be associated with relatively automatic positive constructs. As for nondepressed people, several studies of general social perceptual processes have found that people tend to use the same dimensions to evaluate other people as to evaluate themselves (e.g., Fong & Markus, 1982; Higgins et al., 1982; Markus & Smith, 1981; Markus, Smith, & Moreland, 1985). Thus, we expected nondepressed people to automatically apply the same positive, nondepressed-content constructs in both other- and self-perception.

In line with Beck's (1967, p. 275) structural assumptions, we conceived of the depressive self-concept as clusters of attitudes or concepts associated with the self. We assumed that the depressed individual possesses both depressed and nondepressed concepts (i.e., has them available; see Higgins & King, 1981; Tulving & Pearlstone, 1966) but that the degree of association between these constructs and the self-concept may vary. This is consistent with the cognitive model of the self proposed by Kihlstrom and Cantor (1984, p. 16), who argued that the strength of links between the self-concept and associated attributes is variable, with the centrality of the concept to the self a function of the strength of the associative pathway. As Kihlstrom and Cantor (1984) and others (e.g., Markus, 1977; Rhodewalt & Agustsdottir, 1986) have noted, the self as a node in the larger network of memory representations is weakly or indirectly linked to a large amount of related information, but the totality of this self-knowledge is not what is commonly understood as the self-concept. In line with this reasoning, we delineate the self-concept as "those nodes that are more or less directly linked to the node that represents the self" (Kihlstrom & Cantor, 1984, p. 21).

The difference between strong and weak associations is that activation spreads much more easily across the strong associative links than the weak (and may eventually spread automatically across very strong connections), a distinction that has been made in models of perceptual learning (e.g., Hebb, 1949; Shiffrin & Schneider, 1977), associative memory (e.g., Raaijmakers & Shiffrin, 1981; Srull, Lichtenstein, & Rothbart, 1985; Wyer & Carlston, 1979), development of cognitive structures (e.g., Fiske & Dyer, 1985; Hayes-Roth, 1977), and attitude formation (Fazio, Powell, & Herr, 1983; Fazio, Sanbonmatsu, Powell, & Kardes, 1986). Thus, in the process of making self-judgments, only those constructs with strong and direct associations to the self-concept would be activated automatically, whereas all others would require at least some attentional processing to become active.

Figure 1 depicts five possible structural relations between depressed-content and nondepressed-content constructs and the self-concept. Figure 1a shows the strong associative links between the self and nondepressed concepts, with no linkages at all between the self and depressed concepts. This structure was expected to characterize nondepressives. In Figure 1b, relatively weak associative links exist between the self and the depressed constructs, with the strong connections to the nondepressed constructs remaining. Figure 1c shows the strong associations between the self and the depressed constructs as well as between the self and nondepressed constructs. In Figures 1d and 1e, the strong links between the self and depressed constructs remain, but in Figure 1d the self–nondepressed con-

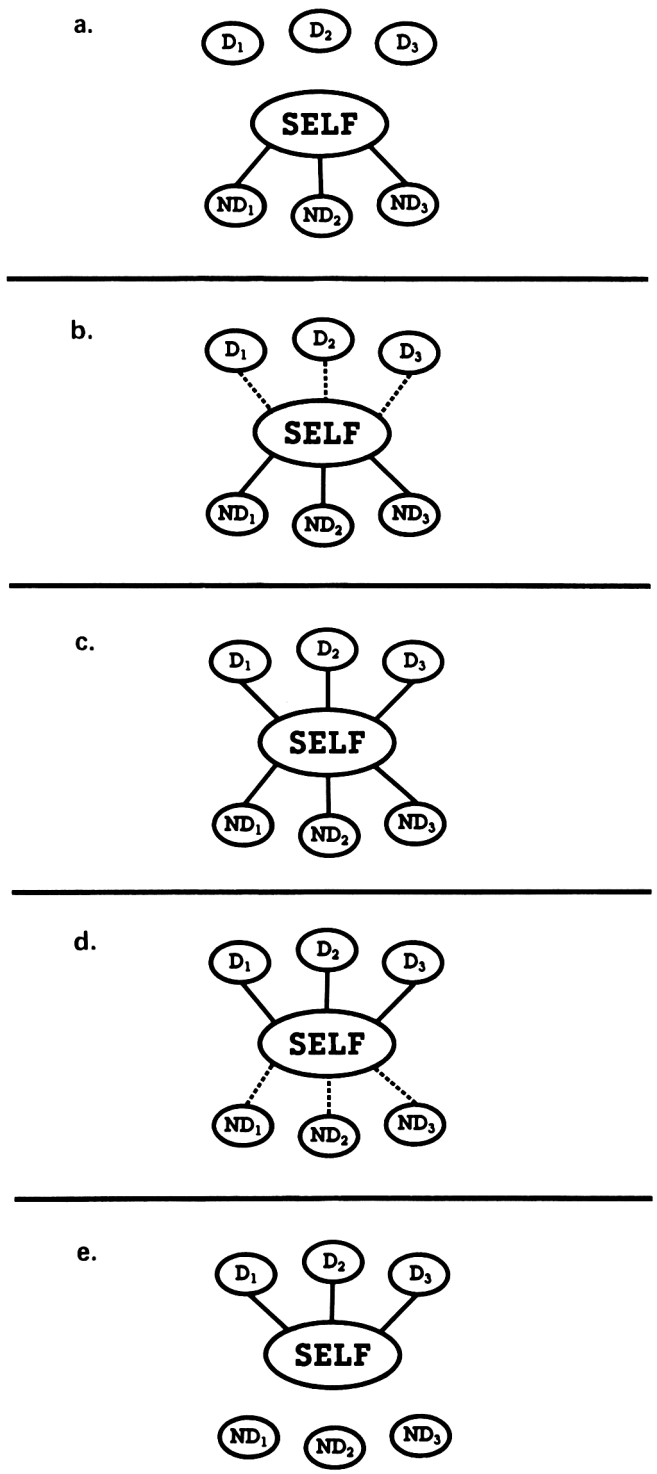

Figure 1. Five possible relations between the self-concept and social constructs related to depression (D_{1-3}) and nondepression (ND_{1-3}). (D = depressed, ND = nondepressed. Subscripts denote distinct concepts within a type of content; the number of each type depicted [three] was arbitrary. Solid lines indicate strong, automatic associative linkages; dotted lines indicate weaker, nonautomatic associations. The absence of any line connecting the self-concept and a given social construct represents the absence of any associative link.)

structs links are weak and in Figure 1e they have disappeared altogether. The central issue addressed in this article is which of these structures best describes the depressive self-concept.[1]

As the results of the Brown and Taylor (1986) and the Rhodewalt and Agustsdottir (1986) studies suggest, and as those authors concluded from their findings, the self-concept is somewhat malleable, and its most accessible content at any given time is influenced by current moods and recent experiences. Thus, to assess the relatively permanent content of the depressive self-concept, one must be careful not to temporarily activate features of the self-representation prior to that assessment because temporary activation states produce effects that are quite similar to those of chronic, long-term activation states (Bargh et al., 1986; Logan, 1980). Unfortunately, the two previous studies that bear directly on the issue of automaticity in depressive cognition (Gotlib & McCann, 1984; MacDonald & Kuiper, 1985), as well as most recent studies of depressive cognition (Derry & Kuiper, 1981; Kuiper & MacDonald, 1982; Pietromonaco & Markus, 1985; Pyszczynski et al., 1987; Rhodewalt & Agustsdottir, 1986; Sweeney et al., 1982), have confounded the examination of long-term differences in processing by administering a depression assessment questionnaire (e.g., the Beck Depression Inventory) to subjects just before the critical experimental trials. Having subjects consider the self-relevance of many questionnaire items related to depression just before the experimental trials is tantamount to a strong temporary priming manipulation, and as several studies have shown (Higgins, Bargh, & Lombardi, 1985; Lombardi, Higgins, & Bargh, 1987; Srull & Wyer, 1979), the more frequently a given concept has been used in the recent past, the longer that concept remains active.

Let us assume for the moment that depressed subjects are characterized by the structure schematically represented in Figure 1b and nondepressed subjects by the structure in Figure 1a. Having both groups think extensively about the self-descriptiveness of statements describing depressive ideation and behavior (by completing a depression inventory just prior to the critical experimental trials) will prime or preactivate the depressed-content subset of the self-concept (see Brown & Taylor, 1986) for depressed subjects but not for nondepressed subjects because it is not a subset to begin with. For depressed subjects, then, but not for nondepressed subjects, the temporary activation state of the depressed constructs associated with the self-concept will cause these constructs to become active automatically during self-referential thought, just as situationally primed social constructs are automatically applied in subsequent perceptual activity (Higgins & King, 1981; Wyer & Srull, 1986). In other words, whether these depressed-content concepts are used automatically, across situations and in the absence of strong priming events, is left unanswered by these studies (see Wyer & Gordon, 1984).

This experiment investigated whether depression is characterized by automatic activation of negative social constructs and, if so, under what conditions such activation occurs. Depressed and nondepressed subjects judged depressed-content

[1] The diagrams in Figure 1 do not assume any schematic structure or interrelatedness among the individual concepts, only direct links (if any) between them and the self-concept (see Wyer & Gordon, 1984).

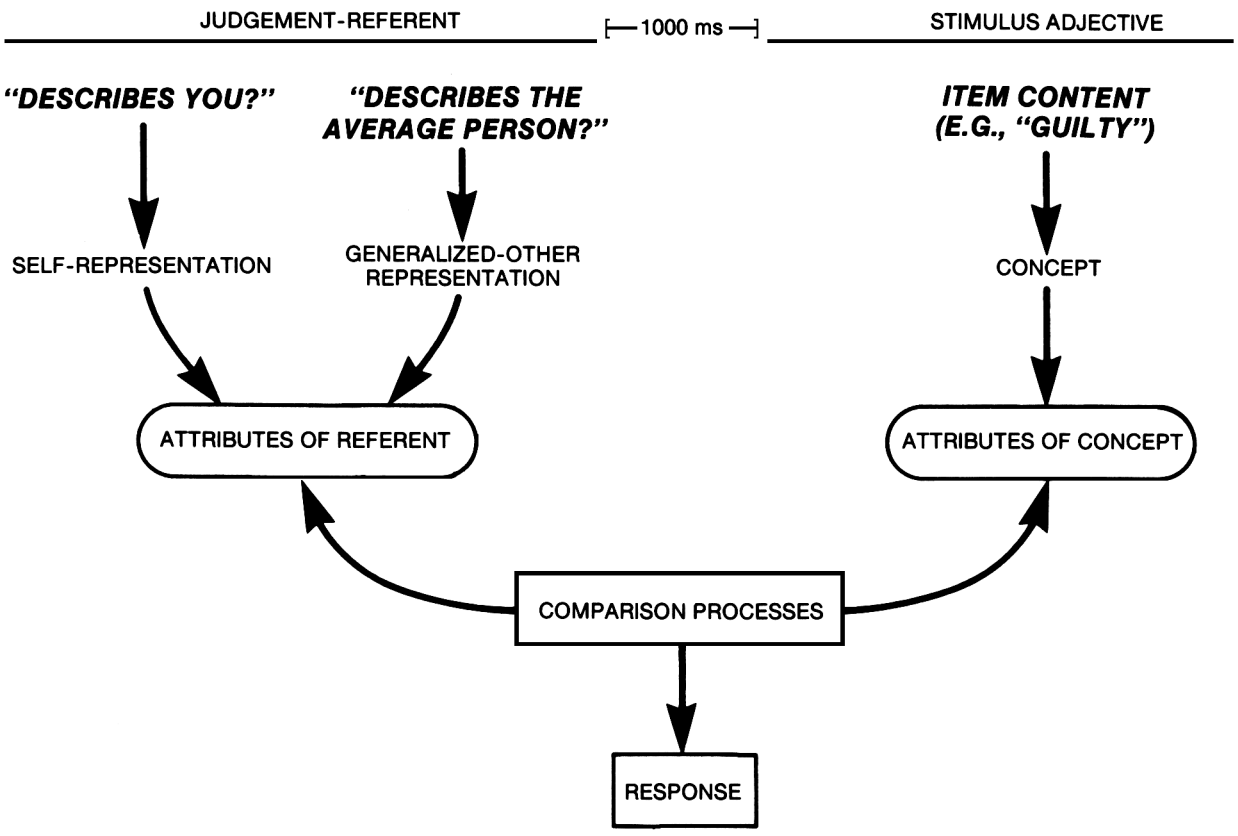

Figure 2. Schematic representation of the cognitive processes assumed to be involved in the answering of self-referential and other-referential questions in this experiment.

and nondepressed-content adjectives as to whether they described the self or the average person. The amount of attention subjects required to make these judgments was assessed by measuring how much a concurrent load on attentional resources slowed down the time to make them. A concurrent load on attentional resources interferes with judgments to the extent attention is needed in the judgment process (Logan, 1979, 1980).

To assess what aspects of the judgment process require attention and how these attentional requirements might differ as a function of depression group and judgment referent, it is useful to analyze the steps involved in the subject's task of answering the self- and other-referent questions (see Figure 2). According to models of sentence comprehension and verification (e.g., Anderson, 1976; McCloskey & Glucksberg, 1979), the truth or falsity of statements is assessed by the degree of overlap between the features of the sentence subject and those of the predicate. Anderson's (1976) ACT model, for example, posits that activation spreads from the subject and predicate concepts along pathways to associated items in memory, with the amount of intersection in this spread used as the basis for answering the query. McCloskey and Glucksberg (1979) proposed that some form of probabilistic decision processes then operate on the feature-overlap and nonoverlap evidence, resulting in the yes or no response.

In the present case, we assumed that the queries "Describes you?" and "Describes the average person?" would result in the activation of the self-concept and generalized-other concept, respectively.[2] As a direct consequence of the activation of the self-concept or other-concept, all strongly associated features of that concept would become active automatically. One second later, the stimulus adjective to be judged would be presented. We assumed that the presentation of this item would result in the activation of the corresponding concept in memory. To the extent that a given construct is directly linked to the self-concept or other-concept, it would become active automatically on presentation of the appropriate judgment referent (indicated by the questions "Describes you?" and "Describes the average person?"), so that the automatic activation of that same construct by the item content would greatly reduce the amount of attentional processing needed to make the response. To the extent that a construct is not a constituent feature of the to-be-judged referent (self or other), a longer, more attention-demanding memory search must be undertaken in order to provide evidence as to the amount of overlap between the referent and the target concept (see Logan, 1980). Thus, the load manipulation

[2] The existence of a self-concept is a widely held assumption, but that of the generalized other requires some elaboration. We assume that the features of the average or prototypical person are linked to a person concept, with the constituent features corresponding to an individual's chronically accessible social constructs (i.e., the social-perceptual framework; see Bargh & Pratto, 1986).

should have increased response latencies less, relative to the no-load condition, to the extent that the social construct corresponding to the target item became active automatically in the course of self- or other-reference.[3]

A second possible locus of load-effect differences between depressed and nondepressed subjects can be identified from Figure 2. If depressed and nondepressed subjects differ as to the chronic accessibility of the depressed-content and nondepressed-content constructs, independently of their degree of association with the self- or other-concepts, these differences would result in greater ease of activation of the concept by the presentation of the stimulus adjective (see the rightmost column of Figure 2). Bargh and Pratto (1986) have demonstrated such an effect of chronic accessibility in the Stroop color-naming task, which involves no social reference whatsoever. More generally, frequency of use of a concept is theoretically related to its ease of activation (e.g., Morton, 1969). Therefore, we also assessed the chronically accessible constructs of subjects in order to test for differences in the content of such constructs between depressed and nondepressed subjects that might alternatively produce greater processing efficiency in the judgment task.

The concurrent memory load paradigm was used to measure the relative automaticity of depressed-construct and nondepressed-construct activation instead of measuring judgment latencies per se (i.e., in the absence of any memory load) as some previous studies have done (Derry & Kuiper, 1981; MacDonald & Kuiper, 1985).[4] Self-judgment latencies are not an appropriate measure of the efficiency or automaticity of the underlying relevant constructs because such latencies are also influenced by the amount of attentional processing given the task. The interpretational ambiguity of a decision latency for the issue of the automaticity of the decision-relevant constructs is that one cannot tell from the latency alone how much of it was due to the (relatively automatic) construct activation stage and how much of it was due to the (relatively attentional) decision and response selection stage (see Fisk & Schneider, 1984a; Logan, 1980; Rogers, 1974). The contribution of the attention-demanding response selection stage varies as a function of situation-specific goals and strategies (Wyer & Gordon, 1984).

For example, when the judgments concern negatively valenced characteristics (as they do in studies of the depressive self-concept), self-presentational forces within the experimental situation may well influence response times. Moreover, just as there may be group differences between depressed and nondepressed individuals in the automaticity of negative social constructs, there is evidence of such group differences in self-presentational concerns: Depressed individuals appear to be more concerned about self-presentation and social comparison than nondepressed individuals (Pagel & Becker, 1987; Tabachnik et al., 1983; Weary, Elbin, & Hill, 1987). Such concerns work to increase the time taken to select a response, thus lengthening response latencies. The advantage of the concurrent memory load technique over response latencies in assessing automaticity in depression is that any such situational influences on response latencies in the no-load condition would also be expected to operate in the load condition and thus not be a source of differential load effects. (The sensitivity of judgment latencies to situational influences and their consequent unreliability as indicants of automatic processing are illustrated by the different response-time patterns obtained as a function of depression group and adjective content in the Derry & Kuiper, 1981, and the MacDonald & Kuiper, 1985, studies.[5])

---

[3] Our hypothesis contains the assumption that the memory load task and the judgment task both draw on the same limited, general pool of attentional resources (e.g., Kahneman, 1973; Norman & Bobrow, 1975). This assumption has recently been called into question by evidence suggesting that there are several distinct types of cognitive resources (e.g., verbal, motor). Thus, the concurrent memory load task may or may not interfere with the primary task in an experiment depending on whether the two tasks draw on the same specific resource pool or combination of pools (e.g., Navon & Gopher, 1979). In this study, the effectiveness of the memory load task in reducing processing resources available to the judgment task may be demonstrated by a reliable reduction in incidental recall of the judged adjectives, as interference with short-term memory has been argued to indicate greater attention demand (Fisk & Schneider, 1984b; Logan, 1979).

[4] MacDonald and Kuiper (1985) performed the only previous study that has used the concurrent memory load paradigm to study the issue of automaticity in depression. They found no differences in the size of the load effect as a function of depression group and adjective content. However, there are difficulties in interpreting these results (in addition to the depression-inventory potential priming confound; see also Footnote 5). First, subjects made only self-judgments throughout, so that an active set for making self-judgments (i.e., the subject expected to make them on each trial) could have developed and overridden automatic effects (e.g., Logan & Zbrodoff, 1979; Neely, 1977). Second, response latencies were measured to the nearest second. In cognitive chronometry, differences of 20 ms can be reliable indicators of processing differences (e.g., Bargh & Pratto, 1986; Gotlib & McCann, 1984; Posner, 1978). Thus, the absence of differential load effects obtained in the MacDonald and Kuiper (1985) study may have been caused by insensitivity of measurement.

It should be noted that MacDonald and Kuiper (1985) argued that their finding of an unreliable interaction between memory load, depression group, adjective content, and judgment referent actually supported their hypothesis that the depressive schema operates automatically. However, what such a null interaction shows is that there was no difference in the amount of attention required by the judgments as a function of the depression group, adjective content, and referent factors (see Logan, 1979). Thus, the obtained null interaction in the MacDonald and Kuiper study means either that all judgment types involved an automatic component for all subjects, or that all judgment types were nonautomatic and equally attentional. To distinguish between these two alternatives requires additional evidence; it cannot be made on the basis of the null interaction alone. As MacDonald and Kuiper (1985) conclude that their results demonstrate automaticity only in the processing of schema-congruent content (i.e., depressed-content adjectives for depressed subjects, nondepressed content adjectives for nondepressed subjects), and not in the processing of schema-incongruent content, their finding of a null interaction (i.e., equivalent attention demands for all judgments for all subjects) would appear to contradict their conclusion.

[5] Derry and Kuiper (1981) found no response-time differences in making self-judgments as a function of whether the subject was depressed or nondepressed, whether the adjective being judged was depressed or nondepressed in content, or whether the subject responded yes or no; they concluded that the lack of response-time difference supported the hypothesis of an efficient self-schema in depression. Yet MacDonald and Kuiper (1985), using the same paradigm, found some evidence that depressed subjects processed schema-congruent content faster than incongruent content and concluded that this finding supported the existence of the depressive self-schema. Thus, both the ab-

Method

Subjects

Sixty-three male and female students enrolled in the introductory psychology course at New York University participated in the experiment in partial fulfillment of a course requirement. They were chosen on the basis of their scores on the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), which was administered to all introductory psychology students at the beginning of the semester as part of a mass testing demonstration. The BDI is a 21-item self-report measure on which scores can range from 0–63, with 63 indicating extreme depression. Our initial selection criterion for depression was a score of 16 or above; for nondepression, a score of 0 or 1. The criterion for depression of 16 or above on the BDI corresponds to Beck's (1976) standard for moderate depression. Subjects meeting one or the other of these criteria were contacted and asked to participate in the study.

To ensure that subjects still met criteria for depression or nondepression at the time of the experimental session (held 3–6 weeks after the initial test administration), all participants completed the BDI for a second time at the end of the experimental session. There was a slight shift downward in BDI scores at the second testing. Of the original sample of 32 depressed subjects, 10 scored below Beck's (1976) suggested minimum criterion for mild depression (BDI = 10); data from these subjects were excluded from the analyses.

Of the remaining 22 depressed subjects, the second BDI scores for 9 fell in Beck's (1976) range for mild depression (BDI = 10–15), 6 fell in the range indicating moderate depression (BDI = 16–23), and 7 fell in the severely depressed range (BDI = 24+). The second BDI score for 1 nondepressive subject exceeded our final criterion for nondepression of 0–4; his data were also excluded from the analyses. Thus, our final sample consisted of 52 subjects (22 depressed and 30 nondepressed). The mean BDI score was 18.7 for the depressed group (SD = 6.0; range = 10–28) and 0.6 for the nondepressed group (SD = 1.0; range = 0–4). The mean BDI score of 18.7 (at the second time of measurement) for our sample of depressed subjects compares with those of 15.8 for the depressed university students in the Gotlib and McCann (1984) study, 13.3 for the depressed students in the Kuiper and MacDonald (1982) study, 22.1 for the clinically depressed sample in the Derry and Kuiper (1981) experiment, and 25.7 for the clinically depressed subjects in the MacDonald and Kuiper (1985) study.

Apparatus and Materials

All experimental instructions and stimuli were presented to subjects via the display of a cathode-ray tube (CRT) monitor, which was under program control of an Apple II Plus microcomputer situated in a separate control room. Subjects indicated their responses by pressing a button labeled *yes* or one labeled *no* on a response box directly connected to an input port of the computer. The content (yes vs. no) and latency (in ms) of each response for each subject was automatically recorded by the computer.

The experimental room was 2.7 m × 3 m and contained a chair and table on which were located the CRT monitor and response box. In the memory load condition, a small microphone was placed in front of where the subject would be seated. This microphone was connected to a tape recorder and speaker located in the control room (not visible to subjects) and allowed the experimenter to keep track of the subject's performance on the digit repetition task without having to remain in the experimental room with the subject.

The 30 depressed-content adjectives and 30 nondepressed-content adjectives that subjects judged during the experimental session were taken from those developed by Derry and Kuiper (1981) in their normative study. An additional 6 depression-neutral words (e.g., *athletic, liberal*) served as buffer trials, with 3 neutral words at the beginning of the stimuli list and 3 at the end. Dependent measures for these 6 buffer words were not analyzed.

Subjects' chronically accessible constructs were assessed using the free-response measure developed by Higgins et al. (1982), which was administered to all introductory psychology students in the early semester mass testing demonstration. On this measure, subjects listed up to 10 characteristics that they felt best described each of five different types of people: those they frequently encountered, sought out, avoided, liked, and disliked. Following Higgins et al.'s (1982) operationalization of chronic accessibility (validated further in studies by Bargh et al., 1986; Bargh & Pratto, 1986; and Bargh & Thein, 1985), those characteristics listed first for the sought-out, avoid, like, and dislike targets, and those listed first and second for the frequently encounter target, were considered the subject's chronic constructs; that is, those that first came to mind when thinking about these types of people.

Procedure

Subjects participated one at a time. On entering the laboratory, the subject was greeted by the experimenter and seated in front of the CRT monitor. The subject first read about the procedure to be followed in the experiment and gave his or her consent to be a participant. Next, the experimental instructions were displayed on the monitor screen. Subjects were informed that they were to make yes–no decisions regarding each of a series of adjectives. For each adjective, one of four types of decisions would be requested: structural (i.e., "Contains the letter *x*?" where *x* is a given letter), semantic (i.e., "Means the same as *xxxx*?" where *xxxx* is a word), other-descriptive (i.e., "Describes the average person?"), or self-descriptive (i.e., "Describes you?"). The subject was told that it was important to make the correct response to each question but also to respond as quickly as possible.

The subject was informed that these four types of questions would occur in a random order, so that he or she would not know what question would be asked until it was displayed on the screen. To prevent the occurrence of temporary activation or active expectancy influences as much as possible, we randomly ordered the self-judgment and other-judgment trials among the semantic and structural judgment trials. Therefore, subjects could not anticipate which of the four types of judgments (two of which were nonsocial in nature) they would be making on each trial. In this way we prevented subjects from developing an active expectancy or strategic set for a particular type of judgment, so that the corresponding judgment-relevant mental structures would not be preactivated in readiness throughout the task and thereby confound the assessment of automaticity (see Kahneman & Treisman, 1984).[6]

sence and the presence of reliable self-judgment response-time differences was claimed to demonstrate the efficiency of depressive schematic processing.

[6] Because Bargh, Bond, Lombardi, and Tota (1986) found that chronic and temporary sources of construct activation combined additively, one might argue that such temporary priming would not mask existing differences in chronic structure. That study was concerned with the accessibility level of social constructs per se, however, whereas our focus is on the existence or nonexistence of strong associative links between the self-concept and specific social constructs. In other words, the issue is whether self-referential thought, through a process of spreading activation, automatically activates the concept in question. Theoretically, it can if and only if there exists a strong associative link. Thus, temporary priming effects may not be equally possible for depressed and nondepressed subjects and therefore would not result in a constant increment in construct activation for all subjects.

Each target word was judged only once. The order of the questions was counterbalanced so that the 10 depressed-content and 10 nondepressed-content adjectives judged as to self-reference by some subjects were judged as to other-reference by the other subjects, and vice versa. Thus, self-referent versus other-referent differences in our latency and recall findings cannot be attributed to the idiosyncratic characteristics of the judged adjectives themselves. A second set of 5 depressed-content and 5 nondepressed-content adjectives was judged by all subjects as to structural features, and a third set of 5 depressed and 5 nondepressed adjectives was judged according to semantic properties.

For subjects in the no-memory-load condition, each trial proceeded as follows: The subject was notified that the next trial was about to begin by the message "Next trial follows" appearing for 1 s on the CRT screen. After a 1 s pause during which the screen was blank, the question to be answered regarding the upcoming adjective was presented at the top of the screen. The adjective to be judged on that trial was presented beneath the question 1 s later (which remained on the screen during the judgment task).[7] The subject made his or her response and, after a pause of between 2 s and 5 s (so that the total duration of each trial was 7 s), notification of the forthcoming trial was given.[8] This cycle was repeated until all 66 trials had been completed.

For subjects in the memory-load condition, the trial cycle was the same except that immediately following the notification of the trial, a message to "remember these digits" was presented at the top of the screen. A series of six digits was presented below that message 1 s later. The digits remained on the screen for 2 s, after which the screen display was cleared. Following a 1 s pause, the question to be answered regarding the upcoming adjective was presented. The adjective appeared below this question 1 s later. After the subject made his or her response, the screen display was cleared and there was a pause of 1 s before a message on the screen requested the subject to repeat the digit string out loud into the microphone. Subjects then had 4 s to repeat the digit string before the notification of the next trial appeared on the screen.

As soon as the 66 judgment trials were completed, an incidental free recall task was administered to the subject. Subjects had 3 min to write down as many of the words they had judged as they could remember. Next, the subject was asked to complete the BDI. Following this, he or she was debriefed fully and thanked for participating.

Results

Memory Load Effects

The amount of time taken to judge adjectives with reference to the self and the average other person was subjected to a repeated-measures analysis of variance (ANOVA), with depression (depressed vs. nondepressed) and memory load (no load vs. load) the between-subjects factors and referent (self vs. other) and adjective content (depressed vs. nondepressed) the within-subjects factors. This analysis revealed a reliable main effect for referent, $F(1, 48) = 34.92$, $p < .001$, with self-judgments (M = 1,312 ms) made more quickly overall than other-judgments (M = 1,531 ms). The interaction between depression and adjective content was also reliable, $F(1, 48) = 6.56$, $p = .014$, and the three-way interaction between memory load, referent, and content proved marginally significant, $F(1, 48) = 3.77$, $p = .06$. All of these reliable effects were qualified by the significant Depression × Memory Load × Referent × Adjective Content interaction, $F(1, 48) = 4.07$, $p < .05$. No other main effect or interaction approached reliability.

Table 1 presents the mean response latencies for the four-way interaction, and Figure 3 depicts the net increase in decision latency due to the load manipulation (i.e., the load condition M minus the no-load condition M) for all combinations of the other three factors. Post hoc analyses of the significant components of this interaction revealed that the simple three-way interaction between depression, memory load, and adjective content was reliable for self-reference judgments, $F(1, 48) = 5.24$, $p < .03$, but not for other-reference judgments, $F < 1.0$. It can be seen from Figure 3 that, as hypothesized, the effect of memory load on self-referential judgment latencies for depressed subjects was smaller for depressed-content adjectives than for nondepressed-content adjectives, whereas the reverse was true for nondepressed subjects. For other-reference judgments, the simple Memory Load × Adjective Content interaction was reliable, $F(1, 48) = 6.18$, $p < .02$, indicating that for both depressed and nondepressed subjects, the effect of memory load on decision latencies was smaller for nondepressed-content adjectives than for depressed-content adjectives.

Table 1
Mean Decision Latencies by Depression, Memory Load, Referent, and Adjective Content

Subjects	Judgment type: Self-referent, Depressed-content adjectives	Self-referent, Nondepressed-content adjectives	Other-referent, Depressed-content adjectives	Other-referent, Nondepressed-content adjectives
Depressed				
Load	1,554	1,523	1,764	1,621
No load	1,425	1,220	1,464	1,529
Nondepressed				
Load	1,241	1,264	1,574	1,567
No load	1,054	1,215	1,307	1,431

A comparison of the load effect on depressed subjects' latencies to make self/depressed-content judgments with the load

[7] Because the question corresponding to the type of decision to be made on each trial was presented for 1 s prior to the presentation of the adjective to be judged, it is possible that the subject would have enough time to strategically activate the judgment-relevant material in memory (e.g., the self-representation). The accrual of such strategic anticipations has been shown to require about 700 ms (Neely, 1977). Some degree of forewarning concerning the nature of the judgment to be made is unavoidable, of course; otherwise, response latencies to the target adjective (in the context of the judgment-referent) would be contaminated by the time taken to read the probe question (e.g., "Describes you?") We believe that our procedure minimizes the possible influence of any such active set concerning the judgment-reference as much as is possible; note that the expected duration of such brief, single-prime influences is much less than that for the extensive priming resulting from completing a depression inventory or making only self-referential judgments (see, e.g., Higgins, Bargh, & Lombardi, 1985).

[8] On each trial in the no-load condition, the computer program subtracted the subject's response latency from 6,000 ms and then paused for that amount of time following the mandatory 1 s pause that immediately followed every subject response. This was to ensure that the intertrial interval in the no-load condition was the same as that in the load condition, which included the additional task of digit-retention.

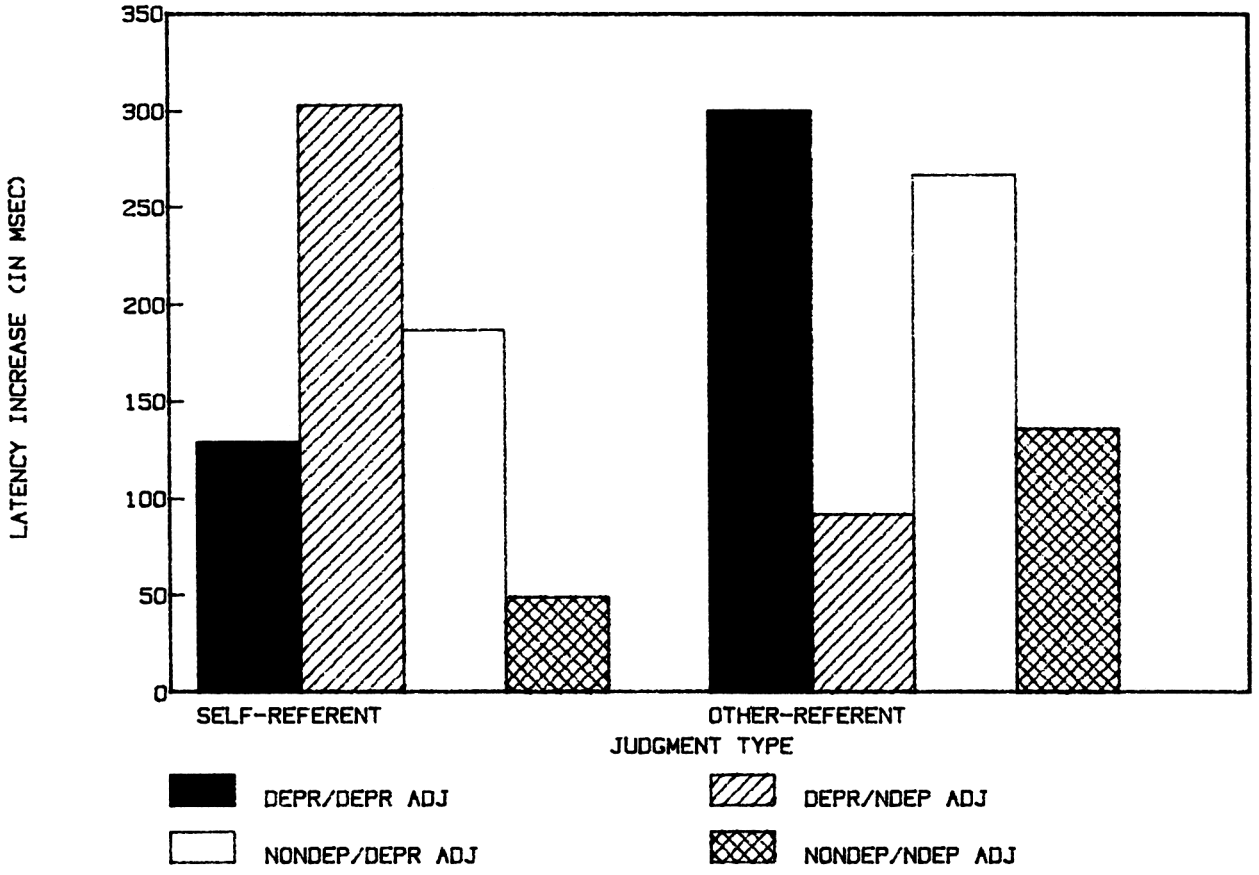

Figure 3. Net effect of memory load on decision latencies (the mean latency for the no-load condition subtracted from the mean latency for the load condition).

effect on nondepressed subjects' latencies to make self/nondepressed-content judgments revealed no reliable difference, simple Depression × Load interaction, $F < 1.0$.

Decision Latencies in the Absence of a Memory Load

Another perspective on the four-way interaction is the differential simple Depression × Referent × Content interaction within the two memory-load conditions. In the load condition, this simple three-way interaction was unreliable, $F < 1$, as only the simple main effect of referent proved significant, $F(1, 48) = 21.21$, $p < .001$. In the no-load condition, the simple Depression × Referent × Content interaction was reliable, $F(1, 48) = 4.80$, $p < .05$. Further analysis revealed it to be attributable to depressed subjects taking longer to make depressed-content than nondepressed-content self-judgments, whereas the opposite pattern occurred in the other three depression/referent combinations (see Table 1). MacDonald and Kuiper (1985, p. 180) also found depressed patients to take longer to respond to depressed-content adjectives than to nondepressed-content adjectives.

To better understand this finding, we computed the self-judgment response latencies in the no-load condition separately for yes and no responses (see Table 2).[9] It can be seen that nondepressed subjects' quick responses to depressed-content adjectives were all fast rejections of that content; nondepressed subjects were also faster to say yes than no to the nondepressed-content adjectives. Depressed subjects, however, were slower to say yes than no to depressed content and to say no than yes to nondepressed content. (In the MacDonald & Kuiper, 1985, study, depressed patients took about the same amount of time to say yes or no to nondepressed-content adjectives and to say yes to depressed-content adjectives [*M*s ranging from 2.9 to 3.0 s] but appreciably longer [3.6 s] to say no to depressed-content adjectives.) One possible explanation for these findings is that depressed subjects had self-presentational concerns about admitting in public to socially undesirable characteristics and to the lack of desirable ones, in line with other research indicating the heightened self-presentational concerns of depressed people (e.g., Tabachnik et al., 1983; Weary et al., 1987). Such concerns work to increase the time taken to select a response, as described in the beginning of this article, thus lengthening re-

[9] Because of the very low *N*s in many cells, we could not include response type as a factor in the within-subjects latency analysis of variance. For the same reason, we caution against placing too much emphasis on the mean latencies in Table 2. Even some of the mean latencies based on a reasonably large *N* may be unstable because the individual subject mean latencies for that response type were based on very few responses.

Table 2
Mean Self-Judgment Latencies (in Milliseconds) in the No-Load Condition by Depression Group, Adjective Content, and Response Type

Subjects	Depressed-content adjectives		Nondepressed-content adjectives	
	Yes	No	Yes	No
Depressed	1,545	1,358	1,190	1,526
N	9	10	10	8
Mean number of responses[a]	3.2	7.1	8.3	2.1
Nondepressed	—	1,054	1,205	1,296
N	0	15	15	12
Mean number of responses[a]	0.0	10.0	8.0	2.5

[a] Mean number of yes or no responses made by the subjects contributing latencies to the response latency mean for a particular judgment type, out of a possible 10.

sponse latencies. One should note that all such influences on response latencies in our no-load condition would also be expected to operate in the load condition as well, and thus not be a source of the differential load effects shown in Figure 3. On the other hand, the lack of differences obtained in the load condition does suggest some potential artifacts that might have produced the net load effects. We now turn to a consideration of these alternative explanations.

Alternative Interpretations of the Load Effects

Ceiling effect? One possible interpretation of the lack of differences due to adjective content in the load condition latencies (see Table 1) is that a ceiling effect problem in the load condition may have prevented these latencies from varying as freely as they might have. The load effect pattern in Figure 3 would thus be a trivial mirror image of the no-load condition latency means, produced by subtracting them from the artifactually homogenized load condition means.

The reliable simple effect of referent (self vs. other) in the load condition, however, contradicts the ceiling effect hypothesis. As can be seen in Table 1, the mean response latencies were uniformly and substantially higher for other-referent judgments than for self-referent judgments, and the same subjects produced both. Therefore, the self-referent judgments would not seem to be constrained by any ceiling on response time. Yet it is in this self-referent condition that one finds the predicted reversal in load effect as a function of depression group and adjective content. Furthermore, there is no reason to believe that the latencies for the other-judgments themselves are bumping into a ceiling, because subjects' response times were not limited in any way by the experimental procedure. No matter how long a load-condition subject took for any given response, there was always a 1 s pause before he or she was asked to repeat the digit string.

Automatic processing or attention-switching? For the differential effect of memory load on decision latencies to be interpreted in terms of self-referential construct automaticity, it must also be demonstrated that the memory load manipulation was equally effective in taking attentional resources away from the judgment task for depressed and nondepressed subjects, and across the different types of judgments. It is possible that the pattern of load effects on latencies shown in Figure 3 is attributable to a switching of attentional resources away from the digit-rehearsal task to the judgment task. Under this alternative explanation, depressed subjects may have switched conscious attention away from the digit task to the judgment task when making self-judgments on depressed-content adjectives and when making other-judgments on nondepressed-content adjectives. Nondepressed subjects may have switched more attention away from the digit task when making judgments on nondepressed-content adjectives, for both self- and other-judgments.

We tested this alternative hypothesis by examining performance on the digit task for subjects in the memory load condition. The series of six digits that a subject repeated after making each judgment was scored as correct if all six digits were given in the same order as they were presented. Omission or substitution of one or more digits, or repetition of the correct digits in an incorrect order, resulted in that digit set being scored as incorrect.

To assess whether digit task performance varied as a function of referent or adjective content, we calculated the proportion of correct digit repetitions for subjects in the load condition for each of the four referent by adjective content judgment combinations. These proportions were entered into an ANOVA with depression as the between-subjects factor and adjective content and referent as the within-subjects factors. The only (marginally) reliable effect was the adjective content main effect, $F(1, 25) = 3.69$, $p = .07$. Overall, depressed-content adjectives corresponded to better digit task performance (M proportion correct = .77) than did the nondepressed-content adjectives (M = .72). More important, the three-way interaction between depression, referent, and adjective content was unreliable, $F < 1$ (see Table 3). The pattern of digit performance thus did not vary as a function of referent or adjective content, and so does not correspond to the pattern of the load effects, as would be expected from an attention-switching explanation.

We also examined the correlation between digit performance and decision latency across all 27 load condition subjects as well as separately for the 10 depressed and the 15 nondepressed load condition subjects. These correlations were computed between

Table 3
Mean Proportions of Digits Recalled in the Memory Load Condition by Depression Group, Adjective Content, and Judgment Referent

Subjects	Judgment type			
	Self-referent		Other-referent	
	Depressed-content adjectives	Non-depressed-content adjectives	Depressed-content adjectives	Non-depressed-content adjectives
Depressed	.40	.38	.38	.35
Nondepressed	.38	.34	.39	.37

the mean proportion correct digit repetitions and the mean decision latencies, first across all judgments and then separately for the individual referent by adjective content judgment combinations. None of these correlations were reliable; all $ps > .25$. Moreover, all of the correlations were slightly negative, such that faster judgment latencies tended to be associated with better digit task performance; thus, the smaller load effects on the judgment task were not produced by a strategic switching of attention away from the digit-retention task.

Did latencies differ as a function of the nature of the response? Another possibility is that memory load increases no response latencies more than yes response latencies in general, and that our pattern of load effects in Figure 3 merely reflects the endorsement rates for the different judgment types rather than efficiency in processing the adjectives themselves. According to this line of reasoning, yes responses are easier to make and therefore less attention-demanding in general, and no responses are more effortful and thus more attention-demanding (see Smith & Miller, 1983, p. 497). This is perhaps because it is easier to detect the presence or addition of features than to detect their absence or deletion (Agostinelli, Sherman, Fazio, & Hearst, 1986; Treisman & Souther, 1985; Wason & Johnson-Laird, 1965). A shortage of attentional resources, therefore, might lengthen all no response latencies relative to yes response latencies, regardless of adjective content. Thus, if depressed subjects endorse more depressed-content adjectives as self-descriptive than do nondepressed subjects, the depressed subjects' load effects corresponding to those adjectives might be artifactually lower on the average when collapsed across response type.

The appropriate test of this alternative interpretation involves including response type (yes vs. no) as a within-subjects factor in the latency analysis to test whether the load effect was greater for no than for yes responses. It was not possible to include response type in the overall within-subjects latency ANOVA reported earlier because no nondepressed subject responded yes to any of the depressed-content self-judgments (see Table 2 and Footnote 9). It was possible to include response type as a within-subjects factor in an analysis of depressed subjects' response latencies, however. This ANOVA had memory load as a between-subjects factor and referent, adjective content, and response type as within-subjects factors. The results showed that whether depressed subjects answered yes or no made no difference as to the load effect (all Fs involving both the response type and the memory load factors < 1).

For nondepressed subjects, we conducted an ANOVA on other-judgment latencies, with memory load the between-subjects factor and adjective content and response type the within-subjects factors. Again we found that whether the subject answered yes or no, the load effect was not affected (Fs < 1). Thus, the pattern of load effects reported in Figure 3 did not differ as a function of the nature of the response, enabling us to rule out this alternative explanation.

Speed–accuracy trade-off? A final alternative is that the differential load effect pattern was caused by subjects in the load condition trading accuracy of response for speed under the strain on their processing resources. Subjects who have a task strategy to be accurate will make fewer errors but will have longer response times. Subjects using a strategy to respond quickly will have shorter response times but will tend to make more errors (see Srull, 1984). In this experiment, subjects may have attempted to deal with the concurrent memory load by not considering the self-judgment and other-judgment questions as fully and carefully as did subjects in the no-load condition, thus sacrificing some of the accuracy of their answers for greater response speed. The similar latencies in the load condition across the depression group and adjective content factors (with only the referent main effect reliable) are consistent with this alternative explanation.

The prediction made by the speed–accuracy trade-off explanation for the load effect pattern is that more errors were made in the judgment conditions that showed smaller load effects than in those that showed larger load effects. We could not, strictly speaking, measure error rates in responses because we were essentially asking for the subject's opinion regarding the self- and other-descriptiveness of the adjectives. However, there was every indication that subjects were responding accurately. First of all, their pattern of yes and no responses across adjective content, depression group, and referent replicated those of previous studies (e.g., Derry & Kuiper, 1981). Moreover, degree of depression, as measured by the BDI taken at the end of the experimental session, correlated positively with the number of yes responses to depressed-content self-judgments, $r(19) = .47$, $p < .05$; correlations with all other referent/content combinations were nonsignificant at $p > .10$. Most important, subjects' response patterns across adjective content, depression group, and referent were nearly identical for the two memory load conditions; all effects involving the memory load factor were unreliable, Fs < 1. Thus, whatever the absolute accuracy of our subjects' responses, they were equally as accurate under a concurrent memory load as under no memory load. Our obtained pattern of load effects would not seem to be accountable in terms of less careful responding in the memory load condition.

Summary. The results of the decision latency analyses showed that depressed subjects were less affected by the concurrent memory load when making self-judgments on depressed-content adjectives than on nondepressed-content adjectives, whereas the reverse pattern was obtained for nondepressed subjects. For other-judgments, both groups of subjects showed less of an increase in latencies due to memory load for the nondepressed-content adjectives than the depressed-content adjectives. Several potential artifacts in the production of this pattern of load effects were considered and found to be unsupported by the relevant aspects of our data. Therefore, we conclude that the relatively smaller load effects are attributable to the automatic activation of social constructs associated with the concept of the judgment referent (self or other), with this automatic activation process reducing the amount of attentional effort required for the judgment.

Chronic Construct Differences

The similar load effect patterns for other-judgments by depressed and nondepressed subjects suggest that these subject groups do not differ in the content of their chronically accessible constructs for the perception of other people. To provide a further test of this conclusion, we computed the proportion of chronically accessible constructs that corresponded to the sets of depressed-content and nondepressed-content constructs de-

veloped by Derry and Kuiper (1981) and used as the stimulus adjectives in this study. (We counted a construct as being depressed-content or nondepressed-content if it or a synonym—as determined by consulting a standard thesaurus—appeared in the Derry and Kuiper sets.) Depressed and nondepressed subjects did not differ on either the proportions of depressed constructs (M = .03 for both groups, $t < 1$) or nondepressed constructs (Ms = .27 and .30, respectively, $t < 1$) that they gave in the free-response measure of chronically accessible constructs. It is notable that all but one of the depressed-content constructs for which subjects were chronically accessible were used in describing either the disliked or avoided target person in the free-response measure of chronicity.

Because about 70% of our subjects' chronic constructs did not appear in the Derry and Kuiper (1981) sets, we assessed whether depressed and nondepressed subjects differed in the overall valence of their chronic constructs. To convert the constructs into valences, we assigned those that appeared in Anderson's (1968) list of 555 trait adjectives the likability score from Anderson's normative study. We were able to so classify 282 (90.4%) of the total of 312 chronic constructs (52 subjects × 6 constructs each), again using synonyms if necessary. An ANOVA was conducted on these likability scores, with subject group (depressed subjects vs. nondepressed subjects) as the between-subjects factor and the person-type (frequently encounter, like, dislike, seek out, avoid) for which the subject gave the construct as the within-subjects factor. There were no reliable differences in construct valence as a function of depression group; both the main effect of subject group and the Subject Group × Person-type interaction were nonsignificant, Fs < 1. The overall likability means were virtually identical for depressed subjects (3.31) and nondepressed subjects (3.29) on Anderson's (1968) 0 (*dislikable*) to 6 (*likable*) scale. The quite similar content (in terms of valence and proportion of depressed and nondepressed content) of depressed and nondepressed subjects' chronically accessible constructs underscores the similarity between the two groups in their framework for perceiving other people. It is also further evidence against an alternative interpretation of the load effects in terms of general construct accessibility differences between depressed and nondepressed subjects; that is, that load effects might be smaller because of differences in the efficiency of perceiving the target adjectives per se.

Adjective Endorsement Rates

For each of the referent (self, other) by adjective content (depressed, nondepressed) combinations, we calculated the mean number of yes responses for each subject individually. These means were then subjected to a repeated-measures ANOVA, with depression and memory load the between-subjects factors and referent and adjective content the within-subjects factors. Table 4 presents the mean number of yes responses by depression and judgment type, collapsed across the memory load factor because all effects involving it were unreliable, Fs < 1.

Reliable main effects for depression group, $F(1, 48) = 12.33$, $p < .001$, and adjective content, $F(1, 48) = 243.60$, $p < .001$, were qualified by the reliable Depression × Adjective Content interaction, $F(1, 48) = 13.18$, $p < .001$. For both self- and other-judgments, depressed subjects endorsed more depressed-content adjectives than did nondepressed subjects, whereas the two depression groups endorsed about the same number of nondepressed-content adjectives. There was also an interaction between referent and adjective content, $F(1, 48) = 7.24$, $p < .01$. This was due to subjects in general endorsing more nondepressed-content adjectives as self-descriptive than as other-descriptive, while using about the same number of depressed-content adjectives to describe self and other. The Depression × Referent × Adjective Content interaction did not achieve significance, $F(1, 48) = 1.59$, $p = .21$.

Table 4
Mean Number of Yes Responses by Depression Group, Adjective Content, and Judgment Referent

	Judgment type			
	Self-referent		Other-referent	
Subjects	Depressed-content adjectives	Non-depressed-content adjectives	Depressed-content adjectives	Non-depressed-content adjectives
Depressed	3.3	8.1	2.1	5.9
Nondepressed	0.1	8.3	1.1	6.7

Note. Means could range from 0 to 10.

Whereas depressed subjects did endorse more depressed-content adjectives than did nondepressed subjects, as expected, depressed subjects nonetheless endorsed more nondepressed-content adjectives than depressed-content adjectives as both self- and other-descriptive. Most previous studies have, in fact, found depressed subjects to think about themselves more positively than negatively, albeit more negatively than do nondepressed subjects (Derry & Kuiper, 1981; Kuiper & MacDonald, 1982; Pietromonaco & Markus, 1985; Pyszczynski et al., 1987; Sweeney et al., 1982; see review by Coyne & Gotlib, 1983).

Incidental Recall of Judged Adjectives

The proportion of adjectives correctly free-recalled was calculated separately for the four referent by adjective content judgment types. These proportions were entered into a repeated-measures ANOVA, with depression and memory load the between-subjects factors and adjective content and referent the within-subjects factors. There was a main effect of memory load, $F(1, 48) = 7.12$, $p = .01$, with subjects in the no-load condition recalling a greater proportion of adjectives (M = .21) than did subjects in the load condition (M = .16). The overall decrease in incidental recall of the adjectives caused by the memory load manipulation verifies its function to increase demands on attentional resources for the judgment task (e.g., Logan, 1979; see Footnote 3). The main effect of adjective content also proved reliable, $F(1, 48) = 27.85$, $p < .001$, as subjects recalled more nondepressed-content adjectives (M = .23) than depressed-content adjectives (M = .14).

More adjectives judged in reference to oneself were recalled (M = .22) than adjectives judged in reference to the average other person (M = .15), $F(1, 48) = 15.15$, $p < .001$. This finding

Table 5
Mean Proportion of Adjectives Recalled, by Depression Group, Adjective Content, and Judgment Referent

	Judgment type			
	Self-referent		Other-referent	
Subjects	Depressed-content adjectives	Non-depressed-content adjectives	Depressed-content adjectives	Non-depressed-content adjectives
Depressed	.18	.27	.11	.15
Nondepressed	.15	.26	.13	.22

replicates most previous research on the self-reference effect on incidental recall, in which adjectives judged in reference to oneself are better recalled than those judged in reference to an unknown or prototypical other person, regardless of the actual self-descriptiveness of the adjective (see review by Higgins & Bargh, 1987). Interestingly, we found that this self-reference effect was stronger for depressed subjects than for nondepressed subjects, as the Depression × Referent interaction was reliable, $F(1, 48) = 3.96$, $p = .05$, and this interaction was the same for both depressed-content and nondepressed-content adjectives (three-way interaction, $F < 1$; see Table 5). Depressed subjects recalled more adjectives judged as to self-reference ($M = .23$) and fewer adjectives judged as to other-reference ($M = .13$) than did nondepressed subjects (Ms = .20 and .17, respectively).

Discussion

The results confirm the prediction of automatic negative self-referential constructs in depression. Depressed-content constructs appear to become active automatically in the process of self-reference by depressed subjects, whereas positive, nondepressed-content social constructs are automatically activated in nondepressed subjects' self-referential thinking. Moreover, the depressed subject's negative perceptual frame of reference concerning the self does not generalize to other people; both depressed and nondepressed subjects possess predominantly positive accessible constructs with which to perceive other people.[10]

Our confidence that the load effect differences reflect differences in the long-term or chronic accessibility of self-referential constructs between depressed and nondepressed subjects is strengthened by the consideration of four alternative interpretations of the load effect results and their subsequent invalidation by the relevant aspects of our data. It is also strengthened by the fact that our other results—the decision latency pattern within the no-load condition, the endorsement rates for the depressed-content and nondepressed-content adjectives, and the self-reference effect on incidental recall of the adjectives—were consistent with those of relevant previous experiments.

This interpretation hinges on the assumption that the memory load and the judgment tasks used the same (general or specific) limited pool of attentional resources. Navon (e.g., 1985) has presented arguments against the necessity of concluding from such findings that resource limitations exist. For example, the interference might instead be due to a sharing of the same processing structure by the memory load and judgment task processing. Thus, it should be noted that the validity of our interpretation of the pattern of load effects shown in Figure 3 may be contingent on the validity of the resource limit assumption itself.

Implications for the Nature of Automatic Processing

An important difference between our evidence of automatic construct activation and previous such evidence (e.g., Bargh & Pratto, 1986; Bargh & Thein, 1985) is that the automatic activation of negative self-referential constructs in depression requires a preceding controlled processing event (i.e., to think in terms of the self). In other words, it appears from our study that the automatic activation of constructs in depression is contingent on the current content of thought. When the self is the focus of the decision, negative constructs become activated automatically; when the generalized other person is the focus, positive constructs are automatically activated. This automatic spread of activation is unintentional and uncontrollable, and the person is unaware both of the activation per se and its potential subsequent influence on affect and judgments. Thus, the process demonstrated in our study appears to satisfy all of the standard criteria for an automatic process (Logan, 1980; Posner, 1978; Shiffrin & Schneider, 1977).

However, because such automaticity depends on the subject's processing objective (i.e., self-reference vs. other-reference), it is not set in motion directly by environmental stimulation alone, the criterion suggested by Bargh (1984) for an automatic process in the strictest sense of the term (see also Kahneman & Treisman, 1984). Our findings of context-dependent automaticity—those that depend on the current context of controlled thought to occur—should be distinguished from the preconscious variety of automaticity, which refers to the considerable amount of cognitive analysis of environmental stimuli that takes place before the products of that analysis reach awareness (Bargh, 1984; Lazarus, 1982; Neisser, 1967; Werner, 1956). Such preconscious or preattentive analysis of the environment, whether it be social or nonsocial in nature, furnishes its information without any need for the intervention of controlled

[10] It should be noted that it is highly unlikely that all 30 of the depressed-content constructs are activated relatively automatically in depressed subjects' self-referential thinking and all 30 of the nondepressed-content constructs are likewise automatized in the nondepressed subjects' self-focused thought. Just as there are sizable individual differences in the social constructs that are chronically accessible and relatively automatic in perception for people in general (e.g., Bargh & Pratto, 1986), there are most probably individual differences as to which of the sets of depressed and nondepressed constructs used in this study are contained in the self-concepts and other-concepts of our subjects. Our data demonstrate only relative differences in the automaticity of depressed and nondepressed constructs between depressed and nondepressed subjects. We would expect our obtained differences to be even stronger with stimulus contents that better matched the idiosyncratic nature of the individual subject's self-concept and other-concepts, or that in any way better matched the actual content of the mental representations of self and other held by depressed and nondepressed individuals.

thought processes. Context-dependent automaticity, on the other hand, is one form of what might be termed postconscious automaticity: the unintended consequences of intended thought (Bargh, in press). These postconscious processes are dependent on the intervention of conscious or controlled processing in order to occur. It may prove useful to further delineate varieties of automaticity as a function of the preconditions necessary for their unintentional and uncontrollable effects on cognition to occur (see Bargh, in press).

The Nature of Self- and Other-Perception in Depression

Across the variety of dependent measures taken in this experiment, a consistent pattern emerges. When judging the average other person, depressed and nondepressed subjects did not differ appreciably in the effect of a concurrent memory load on their decision times for depressed-content and nondepressed-content adjectives, the content and valence of their chronically accessible constructs, their adjective endorsement rates, or their incidental adjective recall patterns. Thus, the content and accessibility of the conception of other people are about the same for depressed and nondepressed subjects.

With regard to the self-concept, however, there appears to be some similarity in content but not in the relative accessibilities of that content. Both depressed and nondepressed subjects showed better incidental recall of the nondepressed-content adjectives than the depressed-content adjectives judged in reference to self, and both subject groups endorsed more nondepressed-content than depressed-content adjectives as self-descriptive. Moreover, depressed subjects endorsed as self-descriptive and recalled as many nondepressed-content adjectives as did nondepressed subjects. Thus, it would seem that both depressed and nondepressed individuals possess self-concepts organized to some extent around constructs related to the condition of nondepression. On the other hand, depressed subjects recalled a (nonsignificantly) greater number of depressed-content adjectives and endorsed more depressed-content adjectives as self-descriptive than did nondepressed subjects. The pattern of the adjective recall and endorsement measures, therefore, is consistent with a model in which depressed individuals retain the links between the self-concept and nondepressed constructs while at the same time possessing additional and even stronger links to depressed constructs. Such a structure is schematically represented by Figure 1c; nondepressed individuals would appear to be best characterized by the structure shown in Figure 1a.

The greater self–other difference in incidental adjective recall by depressed subjects, which held for both depressed-content and nondepressed-content adjectives, is consistent with the model of depression as a maladaptive self-focusing style recently proposed by Pyszczynski and Greenberg (1987). According to this model, the greater frequency of self-thought by depressed people than by nondepressed people, focusing on an initially negative self-concept resulting from a negative life event, plays a crucial role in the maintenance of depression. The more that thought is focused on the negative aspects of the self-concept (in an attempt to resolve the discrepancies between the negative and positive content; see also Higgins, 1987), the more accessible these negative self-constructs become. A negative spiral is then set up, as the accessible negative constructs would play an ever-greater role in the interpretation of life events, resulting in self-blame and still lower self-esteem. Thus, our findings of both greater accessibility of negative constructs in depression and of greater accessibility of the self-concept in general (as evidenced by the larger self–other incidental recall difference) are in line with Pyszczynski and Greenberg's (1987) process model.

Beck (1976, pp. 107–111) also noted the vicious cycle nature of depressive cognition, with automatically furnished negative interpretations of oneself further eroding self-esteem and reinforcing the accessibility of the negative interpretational mechanism. It is possible that this cycle could be checked either by a theory-driven or internal change in the accessibility of perceptual constructs, as through therapy (Beck et al., 1979), or by a data-driven or external change in informational input caused by more positive life circumstances. If not so checked, the automatic operation of the negative self-referential and positive other-referential constructs would likely continue to demarcate the self as different from other people, and thus deepen the depressed person's feelings of isolation and inferiority. To the extent that depression is characterized by the automatic application of negative constructs in the interpretation of one's behavior in social contexts, and in thinking about oneself more generally, the depressed person is unlikely to be aware of the biasing influence of these constructs. He or she may trust implicitly the validity and accuracy of the automatically furnished negative meanings, without questioning them or realizing that alternative interpretations are possible, just as people in general take for granted the accuracy of mundane nonsocial perceptual processes.

References

Agostinelli, G., Sherman, S. J., Fazio, R. H., & Hearst, E. S. (1986). Detecting and identifying change: Additions versus deletions. *Journal of Experimental Psychology: Human Perception and Performance, 12,* 445–454.

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87,* 49–74.

Anderson, J. R. (1976). *Language, memory, and thought.* Hillsdale, NJ: Erlbaum.

Anderson, N. H. (1968). Likableness ratings of 555 personality trait words. *Journal of Personality and Social Psychology, 9,* 272–279.

Bargh, J. A. (1982). Attention and automaticity in the processing of self-relevant information. *Journal of Personality and Social Psychology, 43,* 425–436.

Bargh, J. A. (1984). Automatic and conscious processing of social information. In R. S. Wyer, Jr., & T. K. Srull (Eds.), *Handbook of social cognition* (Vol. 3, pp. 1–43). Hillsdale, NJ: Erlbaum.

Bargh, J. A. (in press). Preconscious and postconscious automaticity in social perception. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought.* New York: Guilford Press.

Bargh, J. A., Bond, R. N., Lombardi, W. L., & Tota, M. E. (1986). The additive nature of chronic and temporary sources of construct accessibility. *Journal of Personality and Social Psychology, 50,* 869–878.

Bargh, J. A., & Pratto, F. (1986). Individual construct accessibility and perceptual selection. *Journal of Experimental Social Psychology, 22,* 293–311.

Bargh, J. A., & Thein, R. D. (1985). Individual construct accessibility,

person memory, and the recall–judgment link: The case of information overload. *Journal of Personality and Social Psychology, 49,* 1129–1146.

Beck, A. T. (1967). *Depression: Clinical, experimental, and theoretical aspects.* New York: Harper & Row.

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders.* New York: New American Library.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression.* New York: Guilford Press.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4,* 561–571.

Brown, J. D., & Taylor, S. E. (1986). Affect and the processing of personal information: Evidence for mood-activated self-schemata. *Journal of Experimental Social Psychology, 22,* 436–452.

Coyne, J. C., & Gotlib, I. H. (1983). The role of cognition in depression: A critical appraisal. *Psychological Bulletin, 94,* 472–505.

Derry, P. A., & Kuiper, N. A. (1981). Schematic processing and self-reference in clinical depression. *Journal of Abnormal Psychology, 90,* 286–297.

Fazio, R. H., Powell, M. C., & Herr, P. M. (1983). Toward a process model of the attitude–behavior relation: Accessing one's attitude upon the mere observation of the attitude object. *Journal of Personality and Social Psychology, 44,* 723–735.

Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C., & Kardes, F. R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology, 50,* 229–238.

Fenigstein, A., & Levine, M. P. (1984). Self-attention, concept activation, and the causal self. *Journal of Experimental Social Psychology, 20,* 231–245.

Fisk, A. D., & Schneider, W. (1984a). Consistent attending versus consistent responding in visual search: Task versus component consistency in automatic process development. *Bulletin of the Psychonomic Society, 22,* 330–332.

Fisk, A. D., & Schneider, W. (1984b). Memory as a function of attention, level of processing, and automatization. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 10,* 181–197.

Fiske, S. T., & Dyer, L. M. (1985). Structure and development of social schemata: Evidence from positive and negative transfer effects. *Journal of Personality and Social Psychology, 48,* 839–852.

Fong, G. T., & Markus, H. (1982). Self-schemas and judgments about others. *Social cognition, 1,* 191–204.

Gotlib, I. H., & McCann, C. D. (1984). Construct accessibility and depression: An examination of cognitive and affective factors. *Journal of Personality and Social Psychology, 47,* 427–439.

Hayes-Roth, B. (1977). Evolution of cognitive structures and processes. *Psychological Review, 84,* 260–278.

Hebb, D. O. (1949). *Organization of behavior.* New York: Wiley.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94,* 319–340.

Higgins, E. T., & Bargh, J. A. (1987). Social cognition and social perception. *Annual Review of Psychology, 38,* 369–425.

Higgins, E. T., Bargh, J. A., & Lombardi, W. (1985). Nature of priming effects on categorization. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 11,* 59–69.

Higgins, E. T., Bond, R. N., Klein, R., & Strauman, T. (1986). Self-discrepancies and emotional vulnerability: How magnitude, accessibility, and type of discrepancy influence affect. *Journal of Personality and Social Psychology, 51,* 5–15.

Higgins, E. T., & King, G. (1981). Accessibility of social constructs: Information-processing consequences of individual and contextual variability. In N. Cantor & J. F. Kihlstrom (Eds.), *Personality, cognition, and social interaction* (pp. 69–121). Hillsdale, NJ: Erlbaum.

Higgins, E. T., King, G. A., & Mavin, G. H. (1982). Individual construct accessibility and subjective impressions and recall. *Journal of Personality and Social Psychology, 43,* 35–47.

Kahneman, D. (1973). *Attention and effort.* Englewood Cliffs, NJ: Prentice-Hall.

Kahneman, D., & Treisman, A. (1984). Changing views of attention and automaticity. In R. Parasuraman & D. R. Davies (Eds.), *Varieties of attention* (pp. 29–61). New York: Academic Press.

Kihlstrom, J. F., & Cantor, N. (1984). Mental representations of the self. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 17, pp. 1–47). New York: Academic Press.

Kuiper, N. A., & MacDonald, M. R. (1982). Self and other perception in mild depressives. *Social Cognition, 1,* 223–239.

Lazarus, R. S. (1982). Thoughts on the relations between emotion and cognition. *American Psychologist, 37,* 1019–1024.

Logan, G. D. (1979). On the use of a concurrent memory load to measure attention and automaticity. *Journal of Experimental Psychology: Human Perception and Performance, 5,* 189–207.

Logan, G. D. (1980). Attention and automaticity in Stroop and priming tasks: Theory and data. *Cognitive Psychology, 12,* 523–553.

Logan, G. D., & Zbrodoff, N. J. (1979). When it helps to be misled: Facilitative effects of increasing the frequency of conflicting stimuli in a Stroop-like task. *Memory & Cognition, 7,* 166–174.

Lombardi, W. J., Higgins, E. T., & Bargh, J. A. (1987). The role of consciousness in priming effects on categorization. *Personality and Social Psychology Bulletin, 13,* 411–429.

MacDonald, M. R., & Kuiper, N. A. (1985). Efficiency and automaticity of self-schema processing in clinical depressives. *Motivation and Emotion, 9,* 171–184.

Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology, 35,* 63–78.

Markus, H., & Smith, J. M. (1981). The influence of self-schemas on the perception of others. In N. Cantor & J. F. Kihlstrom (Eds.), *Personality, cognition, and social interaction* (pp. 233–262). Hillsdale, NJ: Erlbaum.

Markus, H., Smith, J. M., & Moreland, R. L. (1985). Role of the self-concept in the perception of others. *Journal of Personality and Social Psychology, 49,* 1494–1512.

McCloskey, M., & Glucksberg, S. (1979). Decision processes in verifying category membership statements: Implications for models of semantic memory. *Cognitive Psychology, 11,* 1–37.

Morton, J. (1969). Interaction of information in word recognition. *Psychological Review, 76,* 165–178.

Navon, D. (1985). Attention division or attention sharing? In M. I. Posner & O. S. M. Marin (Eds.), *Attention and performance XI* (pp. 133–146). Hillsdale, NJ: Erlbaum.

Navon, D., & Gopher, D. (1979). On the economy of the human information processing system. *Psychological Review, 86,* 214–255.

Neely, J. H. (1977). Semantic priming and retrieval from lexical memory: Roles of inhibitionless spreading activation and limited-capacity attention. *Journal of Experimental Psychology: General, 106,* 226–254.

Neisser, U. (1967). *Cognitive psychology.* New York: Appleton-Century-Crofts.

Norman, D. A., & Bobrow, D. G. (1975). On data-limited and resource-limited processes. *Cognitive Psychology, 7,* 44–64.

Pagel, M., & Becker, J. (1987). Depressive thinking and depression: Relations with personality and social resources. *Journal of Personality and Social Psychology, 52,* 1043–1052.

Peterson, C., & Seligman, M. E. P. (1984). Causal explanations as a risk factor for depression: Theory and evidence. *Psychological Review, 91,* 347–374.

Pietromonaco, P. R., & Markus, H. (1985). The nature of negative thoughts in depression. *Journal of Personality and Social Psychology, 48,* 799–807.

Posner, M. I. (1978). *Chronometric explorations of mind.* Hillsdale, NJ: Erlbaum.

Pyszczynski, T., & Greenberg, J. (1987). Self-regulatory perseveration and the depressive self-focusing style: A self-awareness theory of reactive depression. *Psychological Bulletin, 102,* 122–138.

Pyszczynski, T., Holt, K., & Greenberg, J. (1987). Depression, self-focused attention, and expectancies for positive and negative future life events for self and others. *Journal of Personality and Social Psychology, 52,* 994–1001.

Raaijmakers, J. G. W., & Shiffrin, R. M. (1981). Search of associative memory. *Psychological Review, 88,* 93–134.

Rhodewalt, F., & Agustsdottir, S. (1986). Effects of self-presentation on the phenomenal self. *Journal of Personality and Social Psychology, 50,* 47–55.

Rogers, T. B. (1974). An analysis of two central stages underlying responding to personality items: The self-referent decision and response selection. *Journal of Research in Personality, 8,* 128–138.

Shiffrin, R. M., & Schneider, W. (1977). Controlled and automatic human information processing: II. Perceptual learning, automatic attending, and a general theory. *Psychological Review, 84,* 127–190.

Smith, E. R., & Miller, F. D. (1983). Mediation among attributional inferences and comprehension processes: Initial findings and a general method. *Journal of Personality and Social Psychology, 44,* 492–505.

Srull, T. K. (1984). Methodological techniques for the study of person memory and social cognition. In R. S. Wyer, Jr., & T. K. Srull (Eds.), *Handbook of social cognition* (Vol. 2, pp. 1–72). Hillsdale, NJ: Erlbaum.

Srull, T. K., Lichtenstein, M., & Rothbart, M. (1985). Associative storage and retrieval processes in person memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 11,* 316–345.

Srull, T. K., & Wyer, R. S., Jr. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology, 37,* 1660–1672.

Strauman, T. J., & Higgins, E. T. (1987). Automatic activation of self-discrepancies and emotional syndromes: When cognitive structures influence affect. *Journal of Personality and Social Psychology, 53,* 1004–1014.

Sweeney, P. D., Shaeffer, D., & Golin, S. (1982). Attributions about self and others in depression. *Personality and Social Psychology Bulletin, 8,* 37–42.

Tabachnik, N., Crocker, J., & Alloy, L. B. (1983). Depression, social comparison, and the false-consensus effect. *Journal of Personality and Social Psychology, 45,* 688–699.

Treisman, A., & Souther, J. (1985). Search asymmetry: A diagnostic for preattentive processing of separable features. *Journal of Experimental Psychology: General, 114,* 285–310.

Tulving, E., & Pearlstone, Z. (1966). Availability versus accessibility of information in memory for words. *Journal of Verbal Learning and Verbal Behavior, 5,* 381–391.

Wason, P. C., & Johnson-Laird, P. N. (1965). *Psychology of reasoning: Structure and content.* London: Batsford.

Weary, G., Elbin, S., & Hill, M. G. (1987). Attribution and social comparison processes in depression. *Journal of Personality and Social Psychology, 52,* 605–610.

Werner, H. (1956). Microgenesis and aphasia. *Journal of Abnormal and Social Psychology, 52,* 347–353.

Wyer, R. S., Jr., & Carlston, D. E. (1979). *Social cognition, inference, and attribution.* Hillsdale, NJ: Erlbaum.

Wyer, R. S., Jr., & Gordon, S. E. (1984). The cognitive representation of social information. In R. S. Wyer, Jr., & T. K. Srull (Eds.), *Handbook of social cognition* (Vol. 2, pp. 73–150). Hillsdale, NJ: Erlbaum.

Wyer, R. S., Jr., & Srull, T. K. (1986). Human cognition in its social context. *Psychological Review, 93,* 322–359.

Received September 3, 1985
Revision received October 1, 1987
Accepted October 15, 1987 ■

APA Buys *Clinician's Research Digest*

APA has acquired the *Clinician's Research Digest* and will take over formal publication of the digest as of July 1, 1988. Presently published by the California-based Relational Dynamics Institute, *CRD* offers practitioners brief summaries of clinically relevant research findings and other clinical information.

Clinton W. McLemore, PhD, president of Relational Dynamics, founded *CRD* in 1983. McLemore will continue to serve as *CRD* editor through June 30, 1988. A new editor, to be selected, will take over as of July 1, 1988.

The *CRD* acquisition was proposed by the ad hoc Committee on Practitioner Publications (PPC), chaired by Charles D. Spielberger. From 1984 to 1987, the PPC, established by the P&C Board at the behest of the BOD's Subcommittee on the Future of Professional Education in Psychology, made several recommendations for practice-oriented publications tailored for health service providers, school/educational psychologists, and I/O psychologists—including the development of monograph series for each group.

A continuing education program, which has also been acquired by APA, is offered in conjunction with the *CRD*. RDI will continue to operate the program under license from APA.

For the present, information on subscriptions to *CRD* and the *CRD* CE Program can be obtained from Clinical Information Services, P.O. Box 61025, Pasadena, California 91106-9990. *CRD* will be issued monthly beginning in January 1988. 1988 subscription rates: individuals, $48; institutions, $62.