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Causal Patterns in Depression

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CAUSAL PATTERNS IN DEPRESSION

by

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VITA

The author, William Phillips Reich, is the son of Lewis Willard Reich and Ellen Jane (Phillips) Gallejos. He was born December 3, 1944 in Chicago, Illinois.

His elementary education was obtained in the public schools of Skokie, Illinois. His secondary education was received at Loyola Academy in Wilmette, Illinois, and at Pioneer High School in San Jose, California, where he graduated in 1962.

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INTRODUCTION

It has become increasingly clear traditional theoretical approaches and research strategies employed in psychology are unable to adequately address questions concerning certain classes of psychosocial phenomena. Notable here are processes developing over time and involving reciprocal dependencies among psychosocial variables. Processes of this type are often referred to as feedback loops, vicious circles, snowball effects, and the like.

The reductionistic theoretical perspectives and experimental paradigms favored in many quarters during most of this century, while enormously productive in many significant areas of investigation, have not been successful in coming to grips with these molar units of interest, largely because these phenomena involve multidirectional patterns of causality not readily studied using traditional methods.

The development and remission of depressive symptoms can be seen as involving multidirectional causality. It has been hypothesized (Reich, note 1) that a process occurs in depression in which a person's intrapersonal (affective, cognitive, psychobiological, etc.) state leads to certain overt behaviors characteristic of depression. Unhappily, these behaviors in turn tend to evoke from the social

environment the very kinds of responses which perpetuate or strengthen the depressive quality of the person's intrapersonal state; and a vicious circle is initiated.

From a clinical point of view the above hypothesis has the interesting corollary that useful therapeutic interventions might be made at any or several points in the circle. Thus a clinician might usefully plan interventions aimed at changing the patient's emotional, cognitive or biological state, altering the patient's overt behavior, or influencing the patient's environment, with the reasonable expectation that such changes would lead, in addition, to a reduction in the intensity of the overall circular process.

Following from these considerations, the purposes of the project described here were:

1. To articulate a model of psychosocial functioning emphasizing circular causal processes; this will be an extension of the "vicious circle" model previously suggested (Reich, note 1).

2. To begin the formulation of a research strategy which might be useful in the evaluation of psychosocial phenomena assumed to involve reciprocal causality.

3. To employ this methodology and the "vicious circle" model in an analysis of the development

and alleviation of depressive symptoms.

4. To examine the clinical implications of this analysis for the treatment of depression.

5. To identify other psychosocial phenomena which might be fruitfully studied using the "vicious circle" model.

CHAPTER I

UNIDIRECTIONAL AND MULTIDIRECTIONAL CAUSALITY

Unidirectional Causality - a Problematic Assumption

Psychological theory and research have traditionally had at their roots the assumption that cause and effect relationships are unidirectional in character. Within the context of a given empirical study or a particular theoretical concept, therefore, variables have usually been seen as either independent or dependent, cause or effect. For example: Excessive parental control causes rebelliousness. Perceived similarity in attitudes increases personal attraction. Inadequate nutrition hampers intellectual development.[1] A causes B or B causes A in a more or less straightforward unidirectional fashion.

Traditional data analysis techniques assume that variables are ordered in an unidirectional manner. The t -test, analysis of variance and regression techniques, mainstays of psychological research, force the researcher to make the assumption, conscious or otherwise, that one variable is cause and the other effect.

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[1]The reader may notice that each of these classic causal statements might make equal sense if the "independent" and "dependent" variables were switched.

Correlation and other measures of association, although they do not in themselves force such an assumption, nevertheless are traditionally interpreted as if causality must run in one direction or another. Minium and Clarke (1982), for example, authors of a recent undergraduate statistics textbook, in discussing correlation and causality state

> When X and Y are found to vary together, several explanations are possible. Variation in X could be responsible for variations in Y, Y could be the cause of X, or there could be a third factor (or complex of factors) that affects both X and Y. Poor grades and poor attendance often go together, but lack of interest may be the cause of both (p. 121).

This traditional outlook on the possible interpretations of associations between variables obscures the strong possibility that poor grades and poor attendance may operate in a vicious circle, in which each causes the other.

Thus we have environmental determinists, seeking to understand the conditions under which independent external variables affect behavior; and personal determinists, looking to internal conditions such as traits, drives, cognitive style and the like for the causes of the variation in human behavior. Even the so-called interactionists, who attempt to accomodate both intrapersonal and situational variables in their explanatory constructs, generally regard individual and group differences in behavior as the effects of a unidirectional collaboration of internal and external causes (Ekehammar, 1974; Bandura, 1977, 1978).

The concept of unidirectional causality, and the research methods which both reflect and maintain it, have served psychology well, and have yielded huge amounts of important data. Increasingly, however, it appears that many important phenomena are inadequately studied using these methods. Accordingly, a variety of more elaborate ideas about causality which have in common the notion of reciprocal influence have emerged in recent years. These conceptions stress the idea that many relationships in nature can be more readily understood when causality is seen as a bidirectional or circular process, in which variables influence one another over time. The concepts of cause and effect, as well as those of variable independence or dependence, are viewed as relative[2] and research methods employing these concepts are generally viewed as inadequate for many important purposes.

Bidirectional Causality

Simonton (1982), for example, in commenting on the external validity of laboratory experiments, notes that "One-way experimentation does not prove one-way causation (p. 1404)". Just because a given experiment shows variable

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[2]It should be stressed the argument here is not with the notion of causality itself, but with the idea that causal power is invested in one variable or the other and flows unidirectionally. The views described here are fully compatible with a deterministic philosophy.

A to have causal power with respect to variable B, does not mean that is all there is to it. In real-life settings there might be reciprocal causality involved. The social scientist must, according to Simonton, conduct a second experiment in which the dependent and independent variables are switched before making interpretations about causal directionality. In the event this second look suggest the causal pattern might be more complex, Simonton urges the use of advanced correlational techniques such as the cross-lagged panel analysis (Crano, Kenny, & Campbell, 1972, for example) to estimate the relative causal potency of the two variables involved.

Barchas, Akil, Elliott, Holman and Watson (1978) reviewed "compelling evidence (p. 964)" for bi-directional causality in the relationship between neurochemistry and human behavior. Each can cause a change in the other over time. These authors also point to the need for new methods to deal with this sort of phenomenon

> As the mutual interactions of neurochemistry and behavior become clearer, the field probably will need to develop new concepts to recognize, characterize and analyze these interrelations. Formerly we have focused mainly on the effects of neurochemistry on behavior, tending to discount the importance of reciprocal influences (p. 968).

Similar points have been argued by Patterson and Cobb (1971) in a study of the dyadic behavior of aggressive boys; Crano, Kenny and Campbell (1972) pertaining to the relation-

ship of intelligence and achievement; Patterson (1975) re-
garding the interaction patterns of families with aggres-
sive children; Lichtenberg and Hummel (1976) relating to
client/therapist communication; Thomas and Martin (1976)
with respect to parent-child interactions; Billings and
Moos (1982) concerning the relationship of stressful life
events and psychiatric symptoms; and others.

Feedback Loops

To one degree or another, each of the dyadic relation-
ships mentioned in the previous section involve the communi-
cation of information from each element of the relationship
to the other and back again. The idea of information commu-
nication becomes more explicit in the concept of the feed-
back loop. Additionally, however, a feedback loop often
involves more than two elements. The heating system in the
typical modern home is a good example. The temperature's
dropping below a certain point causes the thermostat to
complete an electrical circuit which results in the furnace
being turned on. This in turn causes heat to be sent to
the various rooms in the house. As the temperature reaches
the preset point, the thermostat breaks the signal circuit
and the furnace turns off. If a person who knew nothing
about heating systems wanted to understand what was going
on here, only part of the picture could be clarified with
an analysis of the individual causal elements involved.
Indeed, in the larger view, it makes little sense to speak

of cause and effect in other than relative terms here. Each of the elements in the loop, thermostat, furnace and temperature, operate as both cause and effect in the overall process.

The concept of the feedback loop has long been employed in physiology to explain, for example, homeostatic mechanisms in hunger (e.g., Friedman & Stricker, 1976) and blood sugar level. The idea is also employed regularly in cybernetics (e.g., Hofstadter, 1979) to characterize the flow of information in both logical and analogical systems.

The view that extended concepts of causality may be needed for an understanding of the subject matter of psychology is only beginning to become tolerated, much less popular. Several important forays into this territory have been made within psychology, however, and it is to these that we now turn.

Self Fulfilling Prophecies

In a much publicized and hotly debated study of Merton's (1948) concept of the self-fulfilling prophecy, Rosenthal and Jacobson (1968) concluded that teachers' expectations regarding students' abilities strongly influenced the students' actual performance. In spite of the controversy surrounding this concept, it now appears that teachers' attitudes can indeed effect their students' academic performance (Crano & Mellon, 1978) and that the psychological

mechanisms involved can be generalized to other social situations as well (Darley & Fazio, 1980). According to the latter authors, the sequence of events involved in the process includes: a) a perceiver's formation of an expectancy about a target person; b) his or her behavior congruent with the expectancy; c) the target's interpretation of this behavior; d) the target's response; e) the perceiver's interpretation of this response; and f) the target's interpretation of his or her own response. In other words, person A forms an impression about person B based on data other than person B's behavior. This impression finds its way into A's behavior in relation to B, which in turn leads B to modify his or her behavior in ways which tend to correspond to A's impression. A and B both subsequently evaluate this behavior. Ultimately B's behavior as well as B's self-impression come to reflect A's original expectation.

Although the specifics will certainly vary from situation to situation, the message in the present context is clear: the cause and effect relationships are very muddy indeed. No simple independent or dependent variables may be clearly identified once the sequence gets started. Causality seems to rest in the process that is, in the dynamic relationship among the variables rather than in the variables themselves. This concept, that causal potency rests in the process rather than in the elements that make it up will be examined in more detail in the next chapter.

Reciprocal Determinism

Bandura's (1977, 1978) concept of "Reciprocal Determinism" is an extremely important one in the present context. Bandura posits a "continuous reciprocal interaction between behavioral, cognitive and environmental influences (1978, p. 345)" in psychological functioning. It is important to note that Bandura does not use the term "interaction" in what might be called the ANOVA sense of the word. In an analysis of variance, the dependent variable is often found to be sensitive to an "interaction" of factors and/or covariants, in the sense that the latter conspire, as it were, to produce varying levels of the dependent measure. This is not what Bandura means by interaction:

> In...reciprocal determinism...behavior, internal personal factors, and environmental factors all operate as interlocking determinants of one another...the process involves a triadic reciprocal interaction (1978, p. 346).

Bandura points out that, although traditional experimental methods can add to our understanding of the molecular elements which make up complex social phenomena, new approaches to understanding the "interactions between (sic) the triadic, interdependent factors within the interlocking system" must be developed (1978, p. 346).

Other Extended Views

A variety of other authors have discussed ideas similar to those described above. Bateson, Haley, Jackson, Watzlawick, Weakland and their associates at the Mental Research

Institute in Palo Alto, have argued the need for a circular
view of causality in describing the "Interactional View"
(Watzlawick & Weakland, 1977) of family process. Jackson
(1977) for example, points out linear views of causality
"artificially abstract...events from the intricate time
sequence in which they occur (p. 5)" and that conceptual
models including the concept of feedback are necessary to
fully understand real life family processes.

Lewinsohn's (1974) behavioral discussion of the forma-
tion of depressive symptoms includes the idea that reduced
environmental reinforcement leads to reduced levels of
responding on the part of the depressed person. This in
turn may lead to further reduction in environmental rein-
forcement, and hence to a reciprocal process.

Finally, Horney (e.g., 1950), to whom the author owes
a substantial intellectual debt, has described a process by
which psychopathology can be developed by means of a vicious
circle. As an example of the way Horney sees this, let
us imagine a woman with strong unresolved dependency needs
(a favorite topic for Horney). This person is likely to
attach clingingly to a man she unconsciously hopes might
gratify her dependency. This, unhappily, is precisely the
wrong thing to do because the man is likely to reject her
excessive demands. As a consequence, the woman becomes
angry and even more dependent, and the vicous circle is
complete.

The above ideas have all been influential in forming the conceptual foundation of the project described in this dissertation. That foundation will be elaborated in more detail in Chapter III. At present, however, we must devote some time to the substantive subject of this project: Depression.

CHAPTER II

CONTEMPORARY THEORIES OF DEPRESSION

Depression, in its various forms, is certainly one of
the most prevalent psychiatric disorders of our times. Davi-
son and Neale (1982) have cited Schuyler and Katz' (1973)
estimate that at least 12 percent of the adult population
have a bout with depression serious enough to warrant pro-
fessional help. Seligman (1973) has called it "the common
cold of psychopathology". Depression's prevalence is re-
flected in its popularity among researchers. Few topics
have received the amount of empirical and theoretical atten-
tion paid in recent years to this class of disorders. Psy-
chological and psychiatric journals are full of articles on
the topic; the January, 1983 issue of Psychological Abstracts
(American Psychological Association, 1983), for example,
lists no fewer than 50 new studies involving depression. It
is probably reasonable to conclude that at least several
hundred studies appear each year on the topic. As of March,
1983 the Loyola University of Chicago library card catalogue
contained 101 entries under the heading of "depression,
mental".

This discussion will therefore be confined to a brief
summary of the major views currently held with respect to

the development of depression, as required to lay the groundwork for the line of thought to be presented in the next chapter.

Physiological Perspectives

Although they do not agree on the exact details, most researchers who have looked at the question agree there is substantial evidence, much of it based on studies of concordance rates in mono and dyzygotic twins, to indicate genetic involvement in the etiology of some depressive disorders. Morever, it appears the identification of some specific genetic factors implicated in the development of the more chronic forms of affective disorder is in the offing (White & Watt, 1981). Genetic factors may make it more likely for some individuals to develop certain forms of affective disorder. Details concerning the number of individuals so effected, the specific mechanisms involved and the role of environmental influences in mediating genetic predispositions are unclear at this point.

More specific physiological theorizing concerns the role of biochemical factors in the determination of activity levels in the central nervous system. In particular, the well-known "catacholamine hypothesis" (e.g., Schildkraut & Kety, 1967) describes how a deficiency of norepinephrine at certain important neurotransmission sites in the brain may lead to depression. The catacholamine hypothesis is sup-

ported by results such as those of Judd, Hubbard, Janowski, Huey, and Attewell (1977) which show that drugs such as lithium carbonate (which is known to effect norepinephrine metabolism) have a measureable effect on mood in both normal and depressed subjects; as well as by studies which show changed blood and urine levels of catacholamine metabolites corresponding to mood and motoric activity levels in psychiatric patients (e.g., Schildkraut, 1978; cited in White & Watt, 1982).

In spite of the evidence relating affective state to the biochemical status of the central nervous system, it is at least premature and probably inappropriate to speak of biochemical causes of depression in any ultimate sense. A more likely scenario has biochemistry acting as a mediator between psychosocial stressors and mood change (Barchas, et. al., 1978), or as a latent predisposer requiring actualization by certain types of environmental circumstances (Schildkraut & Kety, 1967). Accordingly, we turn now to perspectives emphasizing psychosocial factors in the pathogenesis of depression.

The Psychodynamic View

Psychodynamic theories tend to regard depression in one of two ways: As the consequence of hostility turned inward, or as a reaction to object loss. Traditional formulations of psychodynamic theory see depression as a sort of defen-

sive tactic. In this view, frustrated dependency needs
give rise to oral/sadistic aggression directed at the object
of the dependency. The experience of strong hostility
toward a needed object, however, arouses considerable anxi-
ety. As a result, the individual identifies with and intro-
jects the object; and hostile impulses are directed towards
the introject, rather than towards the external world. (Fen-
ichel, 1945; Munroe, 1955; Laughlin, 1979).

Partly as a reaction to the observation that many de-
pressed people can be seen to be expressing hostility out-
wardly, this view has been revised substantially. Increas-
ingly, psychodynamic thinkers tend to see depression as a
more direct consequence of object loss. The concepts of
frustration of early dependency needs and fixation at the
oral stage are still invoked, but in this version the empha-
sis is on the regression to a stage in development where
dependency needs were more powerful than needs for self-
assertion. The passive impotence of the depressed person
is thus seen as a reflection of an oral stage need to be
nurtured, (e.g., Cameron, 1963).

Behavioral Approaches

A variety of behavioral theorists have described de-
pression as a consequence of changes in the social environ-
ment. Lazarus (1968), Lewinsohn (1974) and Eastman (1976)
all argue that the reduced behavioral output seen in depres-

sion stems from a reduced level of environmental reinforcement. In this view, depression is essentially a reflection of the extinction of normal adaptive responses (Price & Lynn, 1981).

Beck and his colleagues (Beck, 1970a, 1970b; Beck, Rush, Shaw, & Emery, 1979) have described depression from the cognitive behavioral viewpoint. This perspective emphasizes certain negative beliefs held by the depressed person. According to this view: 1) a negative conception of the self 2) negative interpretations of one's experiences and 3) a negative outlook on the future comprise a "cognitive triad" which predispose certain individuals to become depressed. Underlying these beliefs are certain "disorders of thought" such as overgeneralization, arbitrary inferences, inappropriate labeling and the like.

Another of the more popular, and controversial, theories of depression in recent years is that advanced by Seligman (1973, 1974, 1978). According to this viewpoint, many depressed individuals are victims of "learned helplessness". As a result of experiences in which they apparently had no control over the reinforcement or punishments they received, these individuals abandon the attempt to engage in adaptive behaviors and become passive. The animals in the experiments on which this theory was based show, in addition, an impaired ability to learn from experience, weight loss,

reduction in sexual drive and other symptoms reminiscent of human depression.

Criticisms of the generality of the learned helplessness approach led Abramson, Seligman and Teasdale (1978) to propose a modification of the theory. This version specifies that the tendency for an individual to learn helplessness as a consequence of events in which he or she has little control depends to a large degree on the attributions the individual makes regarding the noncontingency between actions and outcomes. To the extent the individual perceives the causes of this noncontingency to be global, stable and internal to him or herself, the sense of helplessness, and hence the depression, will be more pervasive.

The foregoing theories of depression have all contributed substantially to our understanding of this all too common disorder; and, more importantly, to our ability to treat it clinically. No doubt each of them is valid with respect to the specific aspect of depression they address. By virtue of their being specific, however, none of them can shed light on more than a piece of the picture. In a sense it is like trying to understand the heating system mentioned in the previous chapter by detailing the mechanics by which thermostats respond to temperature, or by an exposition of the thermodynamics of steam radiators. It is trying to appreciate a panorama by looking at a snapshot. The conceptual

approach outlined in the following chapter will attempt to tackle the problem from a different perspective. At the cost of a considerable loss in resolution, we will attempt to come to terms with a larger portion of the picture.

CHAPTER III

THE VICIOUS CIRCLE MODEL

Elements and Examples

Reich (note 1) has suggested that a particular form of
circular causality might be involved in the formation of
psychopathological symptoms. According to this model, three
basic types of factors, intrapersonal, behavioral and socio-
environmental, which are seen as points on a circle, commu-
nicate over time and lead to the development and/or perpetu-
ation of symptoms. Figure I, for example, illustrates a
vicious circle that might be involved in the formation of
paranoid symptoms. The individual in this simplified exam-
ple: a) experiences anxiety and suspicion (intrapersonal
factors); b) behaves in an overly guarded manner by, for
instance, watching everybody carefully and talking in whis-
pers (behavioral factors) which, quite naturally; c) leaves
his associates wondering what in the world he is up to, and
eyeing him with increasing suspicion (socio-environmental
responses). This attitude on the part of others amplifies
the mistrust and anxiety the individual experiences; and we
are right back where we started, except that the individual
involved has experienced an increment in symptom severity
which can, if unarrested, contribute to increasingly mala-
daptive behavior, etc., leading ultimately to decompensa-
tion.   21

FIGURE I

A VICIOUS CIRCLE IN PARANOIA

Intra-Personal Factors

Anxiety, Suspicion;
Anal Stage Issues

Socio-Environmental Responses

Suspiciousness

"What's he up to?"

Behavioral Factors

Guarded Manner;

Excessive Watchfulness
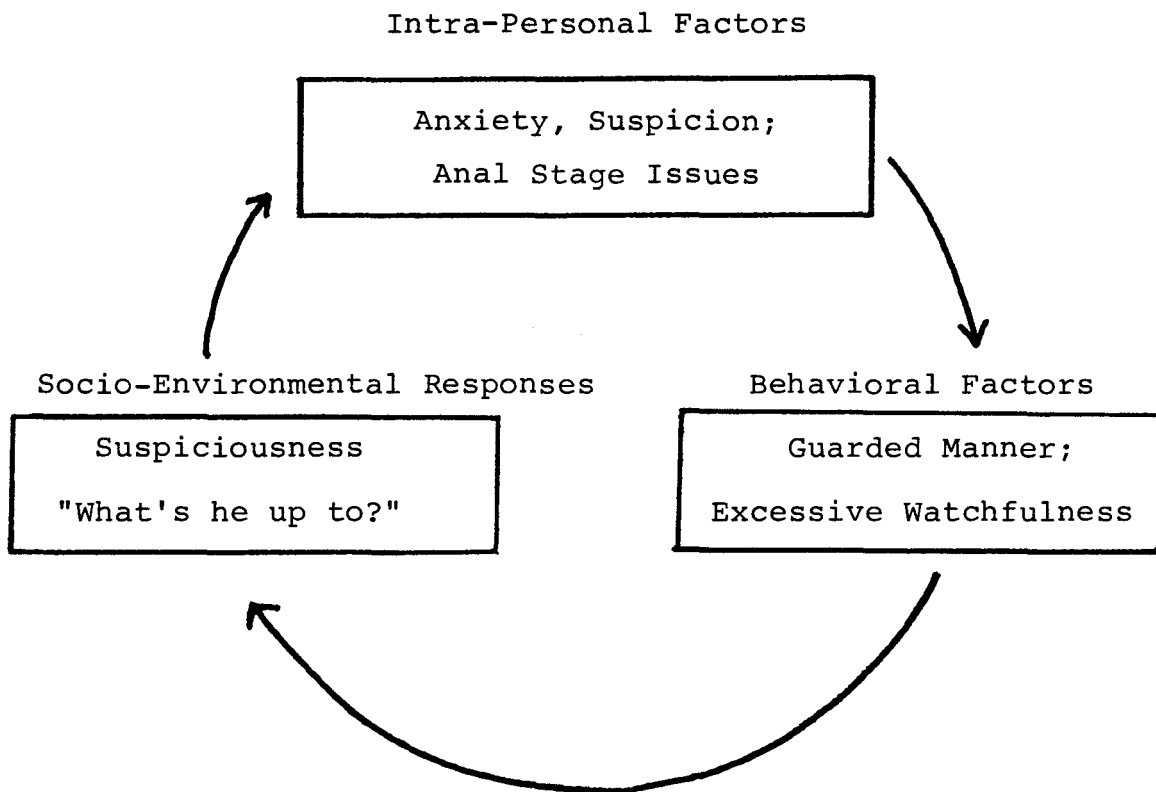
Alcoholism might be viewed in a similar way. Intraper-
sonally, the alcoholic experiences, for example, memory loss
and other cognitive deficits; as well as reduced self esteem,
a sense of loss of control, and anxiety. These factors
are reflected in his or her behavior, which is characterized
by attempts to disguise the intellectual deficits and to
escape anxiety through alcohol. The people in the alcohol-
ic's life respond to this behavior with some mixture of
pity, concern, scorn and resentment; all of which have the
potential for exacerbating the person's intrapersonal
malaise.

The reader may note that the flow of events leading to
the deteriorating condition of the people in the above ex-
amples does not always follow the sequence in the three
point circle described. For example, the alcoholics's con-
sciousness of an impairment in cognitive functioning may
very well lead to an increase in anxiety, which in turn may
interfere with cognitive processes; the heightened anxiety
may lead to an increased desire to drink which, again, leads
to further deterioration in cognition, not to mention other
problems. Small vicious circles can appear, that is, within
the larger pattern. The three-point circle model is not in-
tended to account for all the variation in the downward
spiral, but many of the forces involved can be seen to
follow this pattern.

On the positive side, the same processes can lead to improvement in functioning. The reduced drinking behavior of the recovering alcoholic, for example, may lead to improved social relations, which in turn bolster self esteem, etc. Furthermore, from a clinical point of view, the perception of the alcoholic's problem from this perspective leads to an increase in treatment options. Interventions focused on intrapersonal factors, such as self esteem, concrete behaviors or the social environment (such as dealing with family responses to an alcoholic family member), can all be expected to contribute to an reduction in the intensity of the overall circular process.

Vicious Circle Model Distinguished
from Similar Concepts

The general model outlined above contains many ideas borrowed from the authors mentioned in Chapter I. There are important differences, however, and a discussion of some of them will help to further elaborate some key ideas involved.

1. Bandura's (1977, 1978) concept of Reciprocal Determinism might be seen as a general model of which the vicious circle is a specific type. Central to the concept of the vicious circle, however, is the idea that certain sequences of intrapersonal, behavioral and socio-environmental events, as in the case of the paranoid and alcoholic individuals described above, tend

to become crystallized. The sequence becomes self-sustaining because the elements which make it up have the property of "feeding into" one another in such a way that each step elicits from the subsequent step the very kind of response required to sustain or strengthen the prior step. Thus intrapersonal state S generates the type of behavior needed to evoke the particular socio-environmental responses R which will sustain or strengthen S. This process is not explicitly described by Bandura, although it may be seen as a natural outgrowth of his thinking.

2. The concept of the Self-fulfilling Prophecy while it does describe a specific relation-ship between a person, his behavior and the enviornment, focuses attention particularly on the prior (and, typically, initially un-founded) expectation of one person within the victim's social environment. As such, it specifies the social environment as the cause of the resulting behavior. The vicious circle model makes no such assumption.

3. Lewinsohn's (1974) description of the role played by reduction in environmental rein-forcement in the development of depression

is similar to the vicious circle model in
that each reduction in reinforcement tends
to lead to a further decrease in adaptive
responding by the depressed individual.
This decrease, of course, has the potential
to further reduce environmental reinforce-
ment. Lewinsohn, however, downplays the
role played by intrapersonal factors in this
process. Furthermore, Lewinsohn, like the
authors who describe self-fulfilling pro-
phecies, but unlike the vicious circle model,
implies that the social environment precipi-
tates the sequence.

4. The "Interactional View" (Watzlawick & Weakland,
    1977) stress that the only level at which
    cause ought to be sought is the systemic,
    molar level. The vicious circle model empha-
    sizes the molar level but also acknowledges
    that many significant phenomena worthy of
    study occur at the more molecular levels.

5. The views of Horney (1950), while not described
    in detail, may be the closest to the vicious
    circle model. Horney, however, reflecting
    her roots in the psychoanalytic tradition,
    emphasizes intrapsychic factors as the basic
    causal elements involved in getting the whole

process started. As mentioned above, the
vicious circle model makes no assumptions
about the way the process begins. Such
assumptions are, in fact, viewed as limit-
ing the utility of the model.

Vicious Circle Model as an Integrating Concept

The vicious circle model can be seen as incorporating
several classical and contemporary approaches to the study
of psychosocial functioning. In this view, for example,
psychodynamic, phenomonological, psychobiological and in-
formation processing perspectives are all seen as appropriate
for the detailed, relatively molecular study of the intra-
personal factors involved in the overall circular process.
Similarly, behavioral and environmental points of view are
seen as useful outlooks regarding the nature of the specific
behaviors and environmental influences involved in the
larger process.

The Vicious Circle and Depression

That the vicious circle model can serve as an inte-
grating concept can be seen with respect to an attempt to
understand the overall process involved in the formation
and exacerbation of depressive symptoms.

Intrapersonally, depression can be seen as involving

many of the elements described in Chapter II. Psychobiolo-
gical factors, unconscious hostility, dependency, pessimis-
tic perceptions and a sense of helplessness may all be
involved. The individual experiencing one or more of these
is quite likely to behave in ways which are socially mala-
daptive, for example by withdrawing, clinging or displaying
subtle or not so subtle signs of hostility. In response,
the people in the person's social environment are likely
to be rejecting or otherwise non-reinforcing, leading to
further intrapersonal problems for the individual. More
specifically, the following hypotheses can be derived from
a consideration of the vicious circle model with respect to
depression. Depression typically involves a dysphoric
mood (a behavioral factor) and low levels of social rein-
forcement (environmental factor). The vicious circle model
emphasizes that these factors operate together in a pattern
of circularity.

1. One would therefore expect that synchronous
    measures of mood, social outreach behavior
    and socio-environmental reinforcement would
    be positively associated.

2. It was further expected the causal pattern
    among these variables would prove to be
    circular in nature. Thus a causal sequence
    originating in, say, mood would ultimately
    be shown to return to mood at some later

point in time.

3. It was further expected that a particular temporal sequence in these variables would be observed, in which changes in mood would tend to preceed corresponding changes in social behavior, which themselves would be followed by changes in social reinforcement patterns.

4. Finally, closing the loop, it was expected changes in social reinforcement would be followed by the correlated changes in mood.

CHAPTER IV

METHOD

Subjects

A total of 173 volunteer subjects (112 female and 61 male) was recruited from two sources:

1. The Loyola University Psychology 101 subject pool and

2. The author's and others' upper division psychology classes.

Subject pool volunteers participated in the study as part of the requirements for a course in introductory psychology. These subjects chose this study from among several they could have chosen. They also had the option of completing a series of journal article reviews instead of participation. The subjects from the upper division psychology courses received extra course credit for their participation.

Measures

Three brief "paper and pencil" measures were used, each defining one of the three points on the "vicious circle".

1. The Beck Depression Inventory, BDI, (Beck, 1970b), a widely used measure of depression was used to assess the subject's mood, the intrapersonal point

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on the vicious circle. The BDI, although origi-
nally developed as a measure of severity of de-
pressive symptoms in a clinical population, has
been validated in use with subjects in a univer-
sity setting. Bumberry, Oliver, and McClure,
(1978), for example, found the BDI to correlate
strongly with psychiatric estimates of depression
level in college students.

2. As a measure of 'social outreach behavior', the
behavioral point on the vicious circle, subjects
completed a questionnaire (the Social Outreach
Behavior Scale - SOB) designed by the author to
assess the degree to which a person has been
active in "reaching out" to others in his/her
social milieu. The SOB consists of 16 items
which ask the respondent to self-report whether
he or she has engaged in certain social outreach
behaviors (such as making a personal phone call
or asking for a date) in the previous 24 hours.
These items, while having some of the drawbacks
associated with self-report items, have the
virtue that they refer to specific, objective
behaviors; leaving a reduced chance for error or
misinterpretation. Subjects responded "yes" or
"no" to each of the 16 items and the score on
the scale consists of the total number of "yes"

responses. A 17th item in the scale asked for the respondent's self-evaluation of his or her "out-goingness" and serves as a subjective comparison to the more objective preceeding 16 items. This item was scored separately and constitutes a separate variable in data analysis, "Social Outreach Behavior (Subjective)" (SOS). Values for this variable range from "Much less (outgoing) than usual" to "Much more (outgoing) than usual". Please see Appendix A for a copy of this scale.

3. A similar scale, the Social Environmental Response Scale - SER, geared toward measuring the degree to which people in the social environment have reached out to the subject, constituted the third measure used. The items in SER are counterparts to those in the SOB scale described above. That is, where the social outreach scale identifies behaviors which the subject has made in contacting others, this scale deals with ways in which the social environment has reached out to the subject ("have you received a personal phone call", for example). This scale also contains a 17th item, scored separately, which is the counterpart to the SOS variable described above, and which is identified as "Social Environmental Response (Subjective)"

(SES). See Appendix A for a copy of this scale.

Procedures

Each of the subjects was randomly assigned to one of three groups. Group A subjects (N = 86) were asked to complete each of the three measures described above each week for eight consecutive weeks, beginning in February, 1982 and ending in April. Group B subjects (N = 44) were asked to complete the BDI for the first seven weeks, and all three measures on the eighth week. The remaining 43 subjects were to do the SOB and the SER for seven weeks and all three measures on the last week. These procedures were designed to allow an analysis of the patterns of causality occurring over time among the variables, as well as to control for the reactive effect of completing the scales on multiple occasions.

In an initial introductory session, each of the subjects met with the experimenter and was given complete written instructions detailing the procedures to be followed in participating in the study. There were separate instructions for each of the three groups. Appendix B contains a copy of each of the sets of instructions. The procedures were then explained verbally to the subjects and they were given an opportunity to leave. None did. Each participant was then given a packet of eight computer answer sheets which they were to use to record their responses to the

questionnaires. Subjects were also given a number 2 pencil with which to fill out the answer sheets. Participants were told to fill out one answer sheet each Friday, and to deposit the completed sheet in a box left for that purpose in the psychology department reception area.

Each week the experimenter picked up the completed answer sheets and determined which, if any, of the participants had failed to turn one in. Subjects who had failed to turn in a sheet were contacted by telephone and urged to do so. The number of days late was recorded on these sheets.

CHAPTER V

RESULTS AND DISCUSSION

Characteristics of the Sample

The sample consisted of 61 males and 112 females ranging in age from 17 to 34 years of age (mean = 19.49, σ = 2.15). Although subjects were free to terminate participation in the data collection process at any time, only eight of the original 173 did so. Each week there was a small number of subjects who failed to provide data, but this number was never greater than 10. No subject provided fewer than six weeks of completed data. Since no data analysis tecnhique requiring list-wise deletion was used, incomplete records were included in all analyses except where a subject's score on the particular variable being examined was missing.

Subjects' mean scores on the five basic variables for each of the eight weeks are presented in Table I. There was considerable variation among subjects each week for each of the measures, but little variation in the mean scores on the various measures across the eight weeks. Paired comparison t values were computed between the week-1 and week-8 scores on each of the five variables. Only the comparison for the BDI was significant (t = 3.40, df = 118, p < .001). The

TABLE I

WEEKLY MEANS AND STANDARD DEVIATIONS (IN PARENTHESES)

FOR BDI, SOB, SOS, SER, SES*

WEEK	BDI	SOB	SOS	SER	SES
1	7.7(5.8)	6.5(2.5)	3.0(.92)**	7.3(2.9)	3.2(.67)
2	7.5(6.5)	7.5(2.6)	2.9(1.0)	7.8(2.8)	3.1(.66)
3	7.2(6.2)	6.5(2.7)	3.0(.85)	6.7(2.8)	3.2(.66)
4	7.2(6.8)	6.9(2.7)	2.9(.89)	7.1(2.8)	3.1(.77)
5	6.3(6.1)	6.8(2.8)	3.0(.87)	6.7(3.0)	3.2(.71)
6	6.4(6.8)	6.7(2.6)	3.1(.88)	6.7(2.8)	3.2(.55)
7	5.7(6.8)	6.6(2.9)	3.2(.83)	6.9(3.3)	3.2(.81)
8	5.7(6.6)	6.4(2.7)	3.1(.86)	6.7(3.1)	3.2(.66)

* BDI: Beck Depression Inventory
  SOB: Social Outreach Behavior Scale
  SOS: Social Outreach Behavior (Subjective)
  SER: Social Environmental Response Scale
  SES: Social Environmental Response (Subjective)

** for SOS and SES; 1 = much less than usual, 2 = somewhat

   less, 3 = about the same, 4 = somewhat more, 5 = much

   more.

mean BDI dropped steadily from 7.68 at week-1 to 5.68 at
week-8. Both these values lie within the normal "not de-
pressed" range on the BDI (Beck, 1970b). The difference
could have been due to any one or a number of factors. One
possibility concerns the change in seasonal weather which
occurred during the course of the data collection. The
project began at the end of a particularly hard Chicago
winter, and ended as the spring weather was just taking hold.
A reasonable hypothesis is that subjects' moods improved
slightly along with the weather. In any event, it is un-
likely the small difference in BDI scores effected the data
analyses in any important way. There was probably enough
variability in scores on all the variables to provide
statistical power, and enough stability in the data to per-
mit analyses across time.

Synchronous Relationships among the Variables

The first hypothesis advanced in Chapter III is that
there would be positive synchronous relationships among the
variables. Pearson correlations were therefore computed for
each possible pair of variables for each of the eight weeks.
The smallest and largest coefficient obtained for each are
presented in Table II.[1]

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[1]For purposes of this and all following correlational
analyses BDI scores were treated as negative values. Once
transformed, therefore, algebraically higher BDI scores de-

TABLE II

MINIMUM AND MAXIMUM SYNCHRONOUS CORRELATIONS

OBTAINED OVER AN EIGHT WEEK PERIOD

BETWEEN BDI, SOB, SOS, SER, SES*

	SOB	SOS	SER	SES
BDI[1]	-.35[4]/-.03	.12/.43[4]	-.31[3]/-.02	.01/.31[3]
SOB	--	-.40[4].-.15	.65[4]/.78	-.37[4]/-.07
SOS	--	--	-.37[4]/-.08	.27[3]/.62[4]
SER			--	-.46[4]/-.09

[1] obtained BDI scores were treated as negative values in computing $\underline{r}$'s.

[2] $\underline{p} < .05$

[3] $\underline{p} < .01$

[4] $\underline{p} < .001$

all others n.s.

*see footnote to Table I, page 36 for full title of measures.

A strong positive relationship was found between SOB and SER (r s ranged from .65 to .78) and a reasonably strong relationship (r s ranged from .27 to .62) was found between SOS and SES. Subjects reports concerning the extent to which they reached out to others were similar to their reports about the degree to which others reached out to them. This similarity is expressed both in the relatively objective SOB and SER and in the more subjective SOS and SES. Paradoxically, however, the subjects' objective report of their social behavior was negatively associated with their subjective perception. This can be seen in the correlations between SOB and SOS (r s ranging from -.40 to -.15). The same situation is evident in the relationship between SER and SES (r s from -.46 to -.09). This could be construed to indicate poor validity in the measures themselves. If this were in the case, however, one would expect to find zero rather than negative correlations. A more likely possibility is that the subjects' perception of their social "outgoingness", as well as of the social environment's treatment of them, is associated more with their mood than with objective reality as measured by the SOB and SER scales. This interpretation is consistent with the finding that BDI scores (expressed as negative values) correlated

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note less depression, or better mood. In Table II for example, a positive correlation between BDI and SOS means that as mood improved so did SOS scores.

weakly but positively with both SOS (r s from .12 ro .43 and SES (r s from .01 to .31).

The positive relationships between SOB and SER and between SOS and SES are consistent with hypothesis #1 above. The remainder of the observed correlations, however, are not. In general it must be said the synchronous correlations found run counter to the first hypothesis. In itself this does not bear on the further hypotheses since the latter pertain not to synchronous associations but to relationships over time.

Across Group Time-lagged Relationships

One place in which an indication of circular causality (and thus support for hypothesis #2) might be found is in an analysis of the change over time in association among variables. For example, Figure II depicts two hypothetical graphs in which strength of association between two sets of measurements (represented by r) is plotted against the amount of time in weeks (lag) separating the measurements. The association could be between the scores on two variables or between the scores on the same variable obtained at different times.
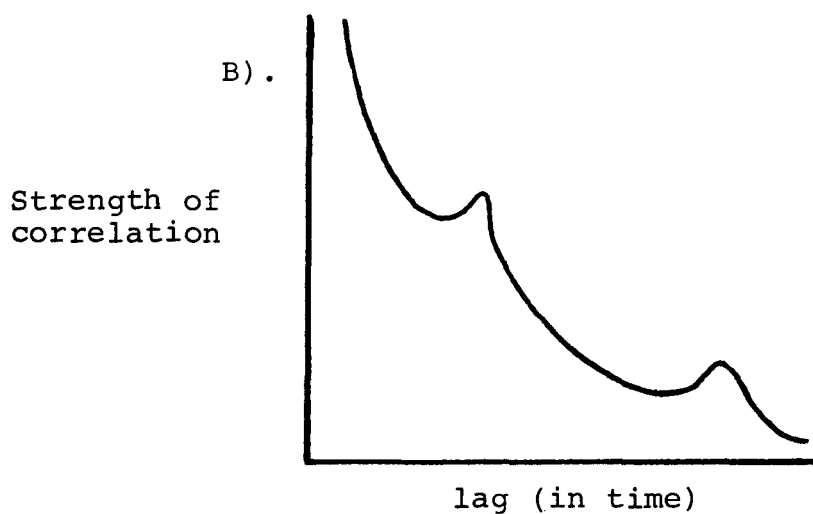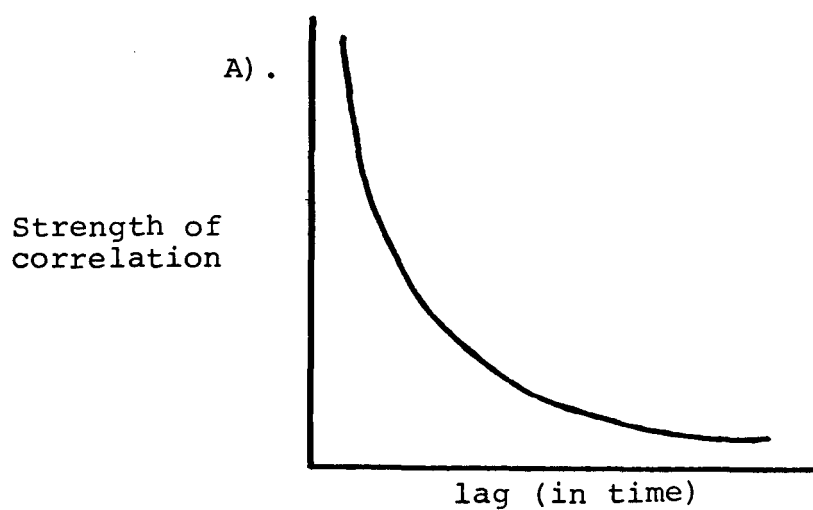
Since the null hypothesis predicts no reciprocal causality involved in the relationship between the sets of scores, the plot should be similar to Figure IIa. Let us

FIGURE II

HYPOTHETICAL PLOTS OF STRENGTH OF CORRELATION

AGAINST TIME LAGS UNDER

A) NULL HYPOTHESIS   B) HYPOTHESIS OF CIRCULAR CAUSALITY

suppose, for example, we are plotting the association between sets of BDI scores observed over eight consecutive weeks, as in the present study. The lag-0 r should be +1.0 since we are pairing scores with themselves. The lag-1 thru lag-7 r's represent (under the null hypothesis) the progressively deteriorating test-retest reliability of the measure.

Figure IIb depicts a plot that might result under the hypothesis that circular causality is involved in the process of which mood measured by BDI represents a part. In this case there is a 'peak' at some point in the otherwise decaying association portrayed by the plot. The peak results because causal impact, and thus association of scores, 'pulses' through the process. In the vicious circle model, for example, causal force originating in, let us say, the individual's mood, cycles through his or her behavior-the socio-environmental response, and back to the individual's mood. The observation of 'peaks' in these plots, therefore, would support the hypothesis of a circular process.

The relationships between the various measures in the present project were studied in this way. For each of the 25 possible pairs of variables (each variable paired with itself and with the other four variables) a graph of the strength of association plotted against lag was generated. These plots were then visually compared to the idealized

plots in Figure II. Results failed to support the research hypothesis. None of the 25 plots contained peaks deviating from the decay curve more than might reasonably have been expected by chance.

This result can be explained in at least three ways. First, the vicious circle model does not accurately represent the pattern of causality in depression. A second possibility is that the basic relationships among the measures used in this study were not strong enough to find abstract relationships of the kind sought by this analysis technique. Some information is lost in any abstraction process. Third, it is possible the basic causal sequences hypothesized were represented in the raw data, but obscured by the use of group data analysis techniques. For example, if individuals cycle through the vicious circle pattern at different speeds, the pattern, however strong, could be obscured by the use of correlations with group data.

Autocorrelational Analyses

In an effort to test this third possibility, autocorrelations between each of the 25 variable pairs, for all lags less than 6 weeks, for each of the subjects were generated. A total of approximately 13,000 autocorrelations was produced by a computer program written especially for the purpose. No autocorrelations were produced for lags greater than 5 weeks because the number of pairs of scores would

have been two or less, and computation would have been im-
possible.

The next step conceptually was to plot the relation-
ship of autocorrelation against lag in a manner similar to
that used with the group correlations. There were 2150 of
these plots however[2] and it was obviously impractical to do
this visually. The coefficients were therefore grouped into
sequences of 6, each sequence containing the lagged auto-
correlations pertaining to one variable pair for a particu-
lar subject. Each of these sequences was thus a digital
representation of an autocorrelation X lag plot. A computer
technique was developed which searched for 'peaks' in these
sequences in a manner analogous to that employed with the
group data. Since each sequence represented data from only
one subject, it was hoped any peaks which had been obscured
in the group data would emerge.

A first step in analysing the autocorrelation sequen-
ces was to determine which of them fit the general linear
pattern from which a peak might protrude. Figure III por-
trays the six possible linear patterns an autocorrelation
sequence might follow. Only sequences conforming to pattern
#2 would permit unambiguous determination and interpretation

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[2]Approximately 350 autocorrelations could not be com-
puted because of missing data.

FIGURE III

POSSIBLE LINEAR CONFIGURATIONS FOR PLOTS OF VALUE OF

AUTOCORRELATIONS BY LENGTH OF LAG-TIME
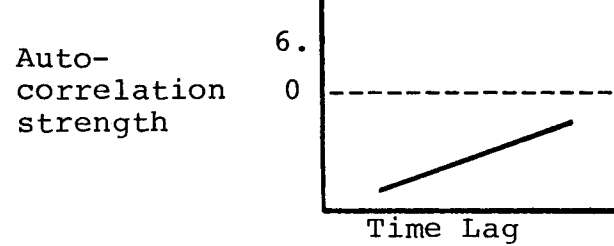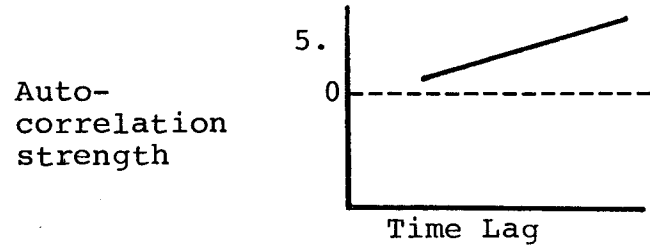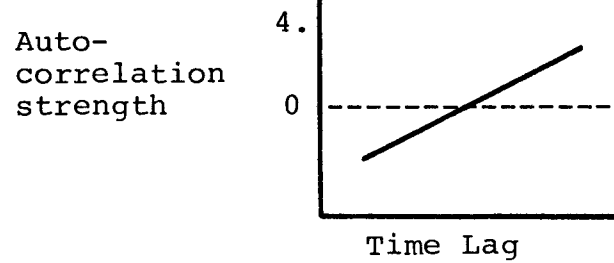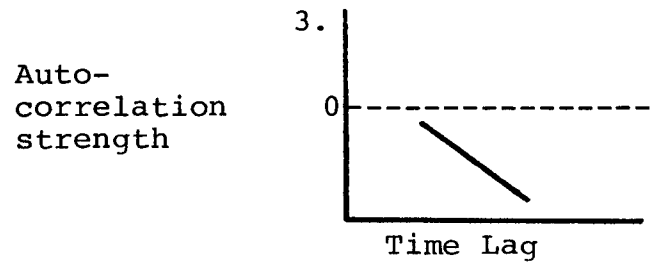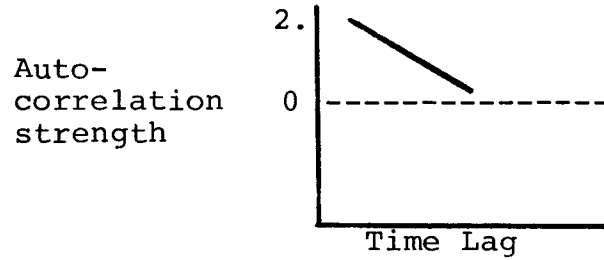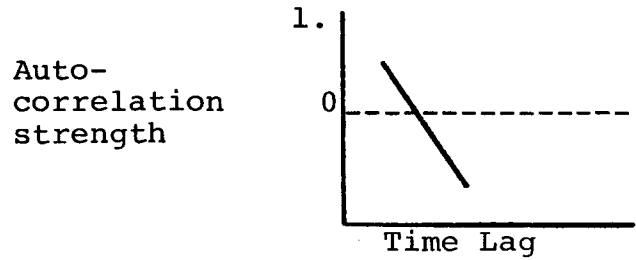
of peaks. A preliminary scan of the 2150 sequences reveal-
ed that only 15% of them conformed to this pattern. Since
this is approximately the number one would expect to find
by chance alone, this finding did not auger well for the
analysis.

Nevertheless, the sequences which did follow the pat-
tern were next examined for peaks. This was accomplished
by determining, for each sequence separately, whether the
central portion of the sequence was higher than would be
expected based on the calculation of a straight line run-
ning from the first to the last point in the sequence. Re-
sults did not support the research hypothesis that a signi-
ficant majority of the sequences would show peaks, in fact
only approximately 5% did.

This result can be explained in several ways. First,
it must be acknowledged there is a strong possibility the
subjects simply did not behave in accordance with the
vicious circle model. There are alternative explanations,
however. For one thing, the procedure outlined above is an
extremely conservative one. Peaks were sought with refer-
ence to a straight line proceeding from the first to the
last point in the sequences. The null hypothesis might
conceivably have been characterized as a negatively
accelerated decay curve running from the first to the last
point. Since such a curve would have considerably more

area above it than the straight line, the probability of finding peaks would be increased. Furthermore, the random sampling distribution of r is such that there was a greater probability of finding r's below the line than above it. For these reasons there is a considerable probability of type II error involved in the peak finding procedure described. Nevertheless, we must at this point accept the null hypothesis that there is no circular causality apparent in these data.

Testing the hypothesis that the causal sequence among the variables followed the order predicted by the vicious circle model required another step. This involved comparing the 'peaks' in the various r by lag plots described above. Thus, for example, the peak in the plots of r's between BDI and SOB or between SOB and SER should occur at a shorter lag than those between BDI and SER. This would happen because, according to the vicious circle model, mood impacts upon behavior directly and behavior effects environmental response directly; but the relationship between mood and environmental response is one step removed. Thus we could expect more time to pass between changes in mood and the correlated changes in environmental responses than between changes in mood and in behavior.

Given the failure of the peak-finding techniques to identify any peaks in the relationship among the variables,

however, it was meaningless to carry out these further comparisons.

Implications for Future Work

The results described above cast doubt on the efficacy of the methods used to detect patterns of circular causality. At a minimum, therefore, several considerations should be borne in mind before proceeding to investigate the vicious circle model further.

Looking for patterns in "r by lag" plots of the sort described above is in many ways an extention of the cross-lagged panel analysis technique (Crano, Kenny, & Campbell, 1972; Crano & Mellon, 1978), in that the relationship among lagged correlations is examined in order to determine if a causal pattern can be inferred. If certain "boundary conditions" are not met in such an analysis, it is unlikely to afford interpretable results. The conditions include "stationarity", i.e., a stability in the synchronous correlations over time, as well as sufficient strength in these correlations in the first place. While the stability shown by the correlations in this study may have been sufficient, the strength probably was not. Future work of this kind, therefore, should proceed only after a determination that the basic relationships among the variables are strong.

The finding that subjects' mood was negatively corre-

lated with reports of their social outreach behavior
and of other's behavior towards them is hard to understand
if these variables are assumed to have a linear relation-
ship. If such is the case we can only infer that subjects
became less socially involved as their moods improved.

Another possibility is that the variables are related
in some non-linear fashion. For example, it might be that
at normal mood levels people are moderately active socially,
but when slightly depressed they become more outgoing in an
effort to find some solace in social interaction - the mis-
ery loves company effect. At more severe levels of depres-
sion, however, they become less outgoing, and ultimately
withdraw. A similar relationship might be supposed to
exist between an individual's mood and the response of
people in the social enviornment. As a normally happy per-
son becomes mildly depressed his or her friends "rally
round" to provide support. At increasing levels of depres-
sion however, people begin to tire of this and tend to
draw back. The graph of a relationship such as this might
look similar to Figure IV. One particularly interesting
feature of this function in the present context is the
"dip" in the center. If one's sample were confined primari-
ly to subjects whose BDI scores were close to normal, which
was the case in this study, a correlational analysis might
show a negative association between BDI and social behavior,

FIGURE IV

HYPOTHETICAL PLOT OF CURVILINEAR RELATIONSHIP

BETWEEN MOOD AND SOCIAL BEHAVIOR

Social
Behavior

"Normal"
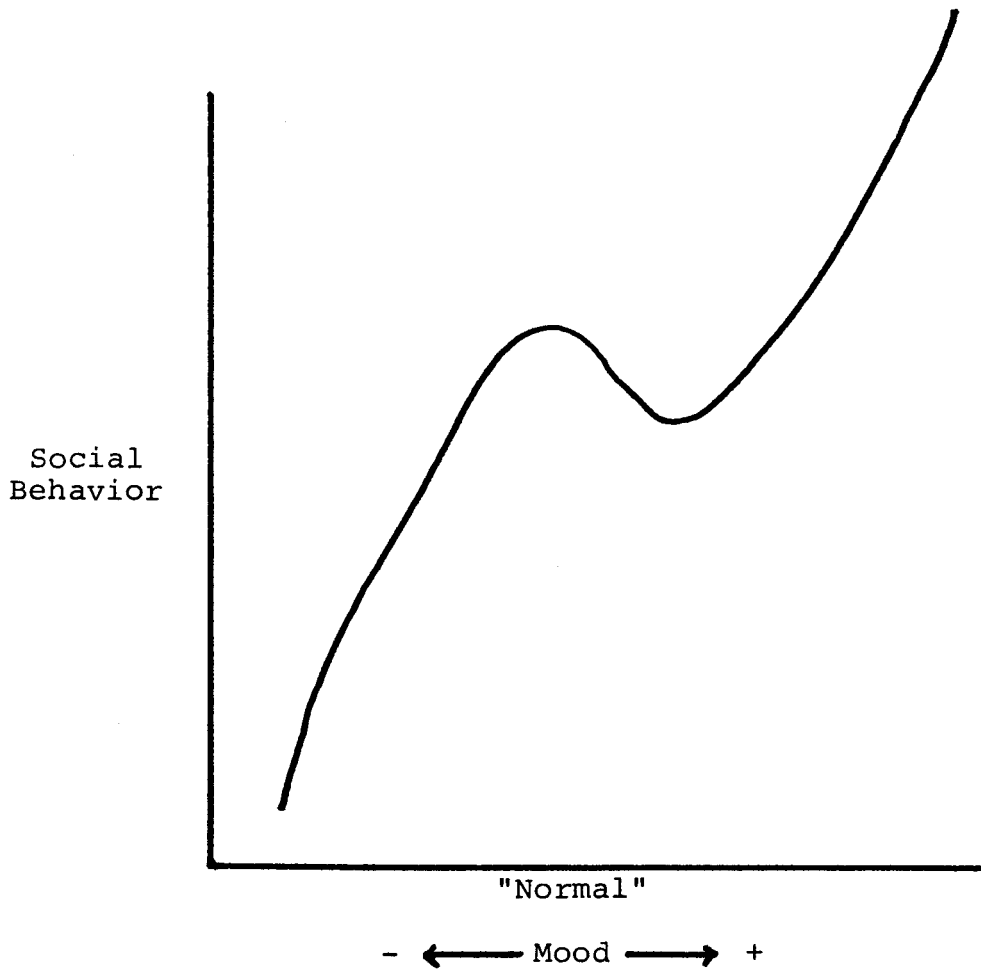
− ⟵ Mood ⟶ +

even though the overall association in the population at large is positive. Future research might therefore address the question whether there are significant nonlinear trends in the relationship between mood and social behavior. If so, a series of analyses similar to those described above, but based on nonlinear techniques, might provide much different results especially if the sample used included subjects who were more at the extremes of mood.

Finally, the autocorrelational technique used in the present study was greatly hampered by the small number of measurements used and the resultant high error in the coefficients obtained. Future researchers might consider using a smaller number of subjects, but measuring them more frequently. The use of a clinical population might provide this opportunity, as well as assuring a wider variation in mood.

Summary and Conclusion

We must conclude that either the data in the present study did not contain evidence of circular causality, or that the analysis techniques used were not sufficiently powerful to detect the evidence, or both. A great deal has nonetheless been learned, and boundary conditions for future research have been set.

The nature of causal patterns in depression and in

personality and psychopathology more generally must receive
increasing attention. I am convinced it is possible to
conduct research which is methodologically sound and which,
at the same time, addresses the complexities of real life.
I am also convinced this is the course we must follow if we
are to understand and alter the processes which cause so
many people so much suffering.

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APPENDIX A

QUESTIONNAIRE REGARDING OTHERS' BEHAVIOR TOWARDS YOU

Part I.
Directions: Please read each item and decide whether the activity described has occurred. If it <u>has</u>, enter A on your answer sheet. If it <u>has</u> <u>not</u>, enter B on your answer sheet.

Please note the following:

A. These are behaviors which others initiate. For example, item #1 asks if someone has made a personal phone call to you, not if you made one to someone else. Please don't confuse this with the "Questionnaire regarding your behavior toward others" which asks the opposite type of question.

B. Only those things which have happened in the past 24 hours count.

Has anyone, in the last 24 hours: (A = Yes; B = No)

18. made a personal phone call to you?

19. given you a gift?

20. asked you for a date?

21. started a personal conversation with you?

22. paid you a compliment?

23. wished you a happy _____(birthday, anniversary, day, etc.)?

24. invited you to participate in a sporting activity?

25. called on you in class?

26. told you a joke?

27. sent you a letter or a note? (Mark A if you received it in the last 24 hours regardless of when it was sent)

28. done you a favor or offered you help?

29. sought you out as a meal companion?

30. asked you for advice or help?

31. smiled at, waved at, or greeted you?

32. touched you (e.g., shaken hands, patted you on the back, etc.)?

33. wished you good luck?

Part II.
34. Compared to how people usually treat you, how friendly have others been to you in the past 24 hours? (Please mark the proper letter on your answer sheet #34).

A = Much less friendly than usual
B = Somewhat less friendly than usual
C = About the same as usual
D = Somewhat more friendly than usual
E = Much more friendly than usual

QUESTIONNAIRE REGARDING YOUR BEHAVIOR TOWARDS OTHERS

Part I.

Directions: Please read each item and decide if you have performed the activity described. If you have, enter A on your answer sheet. If you have not, enter B on your answer sheet.

Please note the following:

A. These are behaviors which you initiate. For example, item #1 asks if you made a personal phone call, not if you received one; please don't confuse this with the "Questionnaire regarding others' behavior towards you" which asks for the opposite.

B. Only those activities which you have done in the last 24 hours count.

Have you, in the last 24 hours: (A = Yes; B = No)

1. made a personal phone call?

2. given someone a gift?

3. asked someone for a date?

4. started a conversation with someone?

5. paid someone a compliment?

6. wished anyone a happy _____(e.g., birthday, anniversary, day, etc.)?

7. invited anyone to participate in a sporting activity?

8. asked a question in class?

9. told a joke?

10. written a letter or note?

11. done someone a favor or offered someone help?

12. sought someone out as a meal companion?

13. asked someone for advice or help?

14. smiled at, waved at, or greeted someone?

15. touched someone (e.g., shaken hands, patted on the back, etc.)?

16. wished someone good luck?

Part II.

17. Compared to how you usually are, how outgoing (that is, friendly, extroverted) have you been in the last 24 hours? (Please mark the proper letter on your answer sheet #17).

- Much less outgoing than usual
- Somewhat less outgoing than usual
- Aoub the same as usual
- Somewhat more outgoing than usual
- Much more outgoing than usual

APPENDIX B

PROJECT SPRINGTIME

Instructions to Participants

Thank you very much for agreeing to participate in this study. You are part of an important project designed to give psychologists significant information regarding peoples' personality changes over time. Unlike most psychological studies you've read about or taken part in, this one "tracks" peoples' changing behavior and feelings over an extended period - in this case eight weeks.

This study will provide information to psychologists which will help them help other people; so please pay careful attention to the instructions and do your best to answer the questionnaires honestly.

Your part in this project involves answering questionnaires by filling out computer answer sheets. In this packet you'll find two different questionnaires (one with questions numbered 1-34 and another with questions numbered 35-55); you'll also find 8 computer answer sheets. Please check now to see that you have the 2 different questionnaires and the 8 answer sheets. (If not let the experimenter know immediately.)

On the next page you'll find specific instructions about when to fill out the questionnaires. It is very important to follow these instructions carefully - the success of this project depends on it.

Instructions - page 2

There are several different groups in this study.

You are in group A.

Every participant has a "participant number."

Yours is _____.

On each of the dates listed below, please answer all the
questions on both questionnaires by filling out a computer
answer sheet. Between the two questionnaires there are 55
questions - answer them all for each date listed:

3/5   3/12   3/19   3/26   4/2   4/9   4/16   4/23

Instructions - page 2

There are several different groups in this study.

You are in group B.

Every participant has a "participant number."

Yours is _____.

----

1.   On the following 7 dates:

3/5, 3/12, 3/19, 3/26, 4/2, 4/9, 4/16

Please answer only the questionnaire which has
numbers 35-55 by filling out answers 35-55 on an
answer sheet. Leave all other answer spaces blank.
It is best if you don't even look at the other
questionnaire.

2.   On 4/23 please answer both questionnaires by filling
out numbers 1-55 on an answer sheet.

Instructions - page 2

There are several different groups in this study.

You are in group C.

Every participant has a "participant number."

Yours is _____.

----

1.   On the following dates:

        3/5, 3/12, 3/19, 3/26, 4/2, 4/9, 4/16

        Please answer only the questionnaire which has
        numbers 1-34, by filling out answers 1-34 on an
        answer sheet. Leave all other answer spaces blank.
        It is best if you don't even look at the other
        questionnaire.

2.   On 4/23 please answer both questionnaires by filling
        out numbers 1-55 on an answer sheet.

Instructions - page 3

You will, obviously, be answering the same questions over and over again. It is very important that you "start fresh" each week. Don't try to remember how you answered the time before. We expect your answers to change from week to week, please do your best to answer fresh each time. Please do not mark the questionnaires themselves - put your answers on the answer sheet only.

-- One answer sheet each week for 8 weeks.

-- Answer sheets will be computer scored, so please use only a #2 pencil.

-- Do not put your name on the answer sheet.

-- Do put your "participant number" in the first 3 spaces of STUDENT NUMBER grid - fill in the grid too.

-- Please put the date on the top where it says "TEST _____".

-- Turn your answer sheet in each week, to the Psychology Department Receptionist on the 6th floor of Damen Hall.

THANK YOU

APPENDIX C

PROJECT SPRINGTIME

Participants in Project Springtime will be asked to complete
a short psychological test and two questionnaires concerning
certain behaviors such as telephone call, personal conversa-
tions, etc. Some participants will complete these forms
weekly for eight weeks, some less frequently. Total time in-
volved is approximately 4 hours.

To safeguard confidentiality, the completed forms will be
identified only with the participant's Subject Number, not
his or her name. For purposes of data compilation, a separ-
ate Identification Key, which matches participants' names with
their Subject Numbers will be maintained. This Identification
Key will be kept locked in the investigator's office, separate
from the test and log forms. Only the investigator will have
access to this Identification Key. After data compilation is
completed, no later than June 30, 1982, the Identification Key
will be torn apart and disposed of, thus rendering the test
and log forms impossible to identify.

Participants may, at any time, for any reason and without
penalty, discontinue participation in the project, and may re-
quest their names be removed from the Identification Key and
their test and log forms destroyed.

I, _____ , certify I am 18 years of age
or older and that I understand the procedure outlined above.
I agree to participate in Project Springtime.

X_____   Date _____
   (participant)

X_____   Date _____
   (witness)

PROJECT SPRINGTIME

Name _____   Participant Number _____

Age _____

Sex   M   F   Source _____

During the course of this project it may be necessary
for us to reach you. Please give us the following
information:

(1) Local Address or Dorm: _____

(2) Local Phone Number: _____

(3) Work Telephone Number: _____

    Is it OK for you to receive a brief personal phone
    call at work?   Yes   No

(4) Other telephone where you can be reached: _____

(5) Home Phone Number if different from #2 above _____

    _____

APPROVAL SHEET

The dissertation submitted by William P. Reich has been
read and approved by the following committee:

>Dr. Robert C. Nicolay, Director
>Professor, Psychology, Loyola
>
>Dr. Alan S. DeWolfe
>Professor, Psychology, Loyola
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The final copies have been examined by the director of the
dissertation and the signature which appears below verifies
the fact that any necessary changes have been incorporated
and that the dissertation is now given final approval by
the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfill-
ment of the requirements for the degree of Doctor of
Philosophy.

19 April 83

Date

Robert C. Nicolay Ph.D.

Director's Signature

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