The Effects of Subliminal Aggressive and Symbiotic Stimulation on Ego Functioning in Two Subtypes of Schizophrenics

Lori Kay Loveland

College of William & Mary - Arts & Sciences

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THE EFFECTS OF SUBLIMINAL AGGRESSIVE
AND SYMBIOTIC STIMULATION ON EGO FUNCTIONING
IN TWO SUBTYPES OF SCHIZOPHRENICS

A Thesis
Presented to
The Faculty of the Department of Psychology
The College of William and Mary in Virginia

In Partial Fulfillment
Of the Requirements for the Degree of
Master of Arts

by
Lori Kay Loveland
1977
APPROVAL SHEET

This thesis is submitted in partial fulfillment of the requirements for the degree of

Master of Arts

Lori Kay Loveland

Approved, December, 1977

Virgil V. McKenna, Ph.D.

Glenn D. Shean, Ph.D.

Peter L. Derks, Ph.D.

Elizabeth Williams, M.A.
Eastern State Hospital
Williamsburg, Virginia
To My Loving Parents
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ABSTRACT

The present investigation was designed to examine the effects of subliminal aggressive, subliminal neutral, and subliminal symbiotic stimulation on ego functioning in reactive paranoid and process nonparanoid schizophrenics.

Prior to the experimental situation, the subjects' level of self-mother differentiation was assessed. Measures of pathological thinking, accuracy of recall, and non-verbal pathology were obtained before and after the subliminal presentation of the experimental stimulus in each condition.

Both subtypes of schizophrenics responded to the aggressive stimulus, which was intended to stimulate unconscious conflict, with heightened thought pathology. In addition, the results suggested that aggressive stimulation may lead to greater exacerbation of ego disorganization in process nonparanoids than in reactive paranoids.

While there was no evidence of a differential effect of the subliminal conditions on the measures of recall accuracy or non-verbal pathology, the analysis of variance did reveal that the recall accuracy of process nonparanoid subjects significantly decreased from each pre-experimental to each post-experimental assessment across all stimulus conditions. This finding, along with the data indicating a differential effect of the aggressive stimulus on the two subtypes of schizophrenics, was viewed as being consistent with the concept that process patients possess less ego strength and poorer adaptive capacities than reactive patients.

The presentation of the stimulus, which had a content suggestive of the theme of symbiotic merging, was intended to reduce unconscious conflict, but it failed to provide a therapeutic effect on ego functioning in either subtype of schizophrenic. Also, there was no evidence of a relationship between the measure of self-object differentiation and level of pathology in any of the stimulus conditions. These results represent a failure to replicate the findings of Lloyd Silverman and his associates, whose research data has provided support to the view that level of differentiation and symbiotic experiences are related to ego pathology in schizophrenia.

The finding that subliminal aggressive stimulation leads to intensification of thought pathology, however, is consistent with the data reported by Silverman, and is seen as offering further support to the formulation of Robert Bak and other psychoanalytic writers that implicates unconscious conflict over aggression as underlying ego disturbance in schizophrenia.
THE EFFECTS OF SUBLIMINAL AGGRESSIVE
AND SYMBIOTIC STIMULATION ON EGO FUNCTIONING
IN TWO SUBTYPES OF SCHIZOPHRENICS
INTRODUCTION

According to psychoanalytic theory, psychopathology emerges as a reaction to the presence of unconscious conflictual libidinal and aggressive drives. This model further postulates that when ideational and affective components of these drives are threatening, the individual tries to ward off these "drive derivatives" by utilizing various defensive operations. In some cases these operations are unsuccessful and anxiety or more complex pathological symptoms may emerge. In the case of symptoms, specific relationships are posited between the particular drives, anxiety and defensive operations. (Silverman, 1976)

While Freud applied his theory and techniques primarily to neurotic patients, other psychologists have broadened the scope of psychoanalytic thinking through elaborations of the development and functioning of the ego in the normal as well as the psychotic personality. Some functions normally subsumed under the heading of the ego are defensive operations, thought, language, and relationships with persons.

Defects in these functions have been noted to be characteristic of the schizophrenic disorder. Hartmann (1953) for one,
emphasizes the impairment of the ego's role as a mediator between the drives and reality, and maintains that what is most obviously lacking in the schizophrenic is the organized, ego-integrated stability of the defenses as compared to what is found in neurotic and normal persons.

Hartmann (1953) and Bak (1954) further contend that much of the ego disturbances in schizophrenia is a result of inability to successfully cope with aggressive impulses. According to their formulation, instinctual energy undergoes a process of neutralization, whereby it is modified (deaggressivized) and is available to the ego for its defense against the instinctual drives. Citing symptoms as evidence, Hartmann (1953) and Bak (1954) proposed that the schizophrenic individual's capacity for neutralizing aggressive energy is impaired. They further contend that this unneutralized aggressive energy may be turned against the self resulting in a destructive effect on the ego.

Other psychoanalytic writers such as Pious (1949) and Cohen (1954) have linked the schizophrenic's ego pathology to emotional representations of the aggressive impulses - hatred and the allied emotions. They view schizophrenic symptomotologies to be indicative of a defensive tendency to ward off aggressive impulses toward other persons. Klein (1948) proposes that the schizophrenic predisposition toward conflict associated with the aggressive drives stems from early fixation in the oral aggressive stage.
More recently, Spotnitz (1973) has presented the view that schizophrenia is an intricately structured but psychologically unsuccessful defense against destructive behavior. Citing clinical documentation as evidence, Spotnitz maintains that the schizophrenic's aggressive urges are inhibited so as to preserve objects (i.e. other persons) because of fear of retaliation or loss of love. The operation of this defense, however, entails the disruption of the psychic apparatus.

The theoretical notions presented thus far, relating schizophrenic ego pathology to the aggressive drives, have dealt with the syndrome primarily from a developmental perspective. However, Silverman and his associates have over the last decade, investigated a dynamic corollary of this assumption, namely: after the schizophrenic illness has developed, aspects of ego pathology will become heightened when aggressive drive derivatives are triggered (Silverman, 1967; Silverman, 1976). More specifically, Silverman and his co-workers have studied the relationship between the aggressive drive and repressive thinking. This term here refers to thinking that is unrealistic, illogical, or loose which alternately has been referred in the psychoanalytic and psychiatric literature as pathological thinking, primary process thinking, archaic thinking, etc. (Silverman, 1967).

As psychoanalytic theory posits that psychopathology is a result of unconscious conflict, Silverman and associates have sought to trigger aggressive drive derivatives that are outside of the individual's conscious awareness. The experimental technique
that they have developed involves the tachistoscopic presentation of drive-related stimuli at subliminal levels. Drawing on previous research which indicates that subliminal registration has been demonstrated beyond reasonable doubt (see Dixon, 1971), Silverman and his co-workers reasoned that one could capitalize on such registration for stirring up drive derivatives, without disturbing their status as unconscious phenomena. They contend that when a stimulus containing drive-related properties is perceived subliminally, it should first make contact with derivatives of the related drive that are currently active in the individual. They further point out that it seems unlikely that the drive derivatives would reach awareness or be experienced in the form of a conscious impulse, and that this would be the case especially for those individuals in whom the drive was unacceptable in the first place, and whose psychopathology was based on that drive. They further contend that the derivatives could be expected to press for expression without the person's awareness. As previously mentioned, it is under such circumstances that psychanalytic theory postulates that pathology would ensue.

While Silverman and his associates have investigated the effects of arousing various drives in different psychiatric populations, the great majority of the studies have been conducted using schizophrenic patients (Silverman, 1966; Silverman and Candell, 1969, 1970; Silverman and Goldweber, 1966; Silverman and
In each of these investigations the method has taken the same general format. Subjects are seen individually for an "aggressive session" on one day and a "control session" on another, with half the subjects being in the aggressive session first and half being in the control. On each day, a "baseline" measure of the individual's propensity for pathological manifestations is obtained by administering one or more psychological tests. In different experiments such tests as Rorschach, word-association test and a story-recall task have been utilized for this purpose. The subject is then asked to look through the eye-piece of a tachistoscope and is told he will be shown a few flashes of light which he is to describe. Four exposures of either a picture with a relatively neutral content or one with aggressive content follow, each for a four msec. duration, a period during which conscious recognition of any content is impossible (Silverman, 1964). There then follows a "critical" series of whatever test or tests were given in the baseline series, this allowing for a determination of how the subjects have been affected by the particular stimulus that has been exposed. The laboratory arrangement is such that the experimenter who works the tachistoscope and administers the assessment of procedures never knows which of the stimuli is being exposed.

In all ten investigations of schizophrenics conducted by Silverman and his associates, subliminal aggressive stimulation
was found to intensify pathological thinking, pathological non-verbal behavior, or both.

In addition to the dynamic formulation thus far presented, Silverman has come to view the need to merge self and object representation as an intermediate link between the press of aggressive impulses and regressive thinking. According to Silverman, the characteristics of the pathological thinking that has appeared in his studies consistently reflects a loss of what could be described as the boundary of ideas. That is, the impairment seemed to be in the individual's ability to maintain ideas separate from contexts in which they did not belong (Silverman, 1970; Silverman and Candell, 1970). The conceptualization of pathological thinking as a loss of boundaries, Silverman views as consistent with the thinking of some psychoanalytic writers, particularly Robert Bak (1954). For Bak not only proposed that ego disturbance in schizophrenia is the result of a defense against aggression, but also the specific defense he implicated is regression to "primary narcissism." This term refers to the state in which the very young infant presumably experiences himself and the external world as merged, or in other terms, a time during which a sense of separateness of what can be referred to as the boundaries of the self have not yet developed. Thus, according to Silverman, the schizophrenic can be seen as returning to this merged state in order to defend against aggression — that is, against the impulse to destroy an
object (a significant figure in the external world) and the fear of being destroyed by the object in retaliation. The protection against aggression that such a state seems to offer is that when the self and the significant figure are experienced as part of a single entity, for one to destroy the other simultaneously means its own destruction (Silverman, et al., 1969).

Viewing pathological thinking as a loss of ideational boundaries and seeing it as rooted in the schizophrenic's loss of self-boundaries, has also been proposed by Freeman, Cameron and McChie, 1958 (as reported by Silverman, 1970). They point out that many aspects of schizophrenic pathology such as perceptual disturbances and memory disturbances, as well as thought disturbances can be seen as involving a loss of boundaries, which they view as having its origin in the schizophrenic's loss of boundaries between self and the external world. While these writers view pathological thinking and other overt disturbances as extensions of the need to merge self with objects, Silverman favors the position that loss of ideational boundaries substitutes for a loss of self-boundaries, symbolically expressing a need to merge, and has presented experimental findings in support of this notion (Silverman, 1970; Silverman, et al., 1969; Silverman, et al., 1971).

In this formulation, Silverman contends that pathological thinking possesses the same structure as do neurotic symptoms.
"Not only does it result from a conflict over an impulse, a quality which psychoanalytic theory postulates as characterizing all neurotic symptoms, but it involves compromise formation and the substitute gratification of a need." (Silverman, et al., 1969, p. 41)

In accordance with the formulation that pathological thinking substitutes for the need to merge, Silverman has proposed that if the latter receives some gratification, substitute expression should become unnecessary. That is, when a schizophrenic fantasizes himself as merged with a significant object, pathological thinking will diminish. This hypothesis was stimulated by reports in the clinical literature from a few psychoanalytic investigators. (Freeman, Cutler, Englehart and Margolis, 1967; Searles, 1965) who have worked extensively with schizophrenics. They have reported that for at least some patients with this diagnosis, noteworthy clinical improvements took place when the presence of such a fantasy was in evidence. Silverman's specific prediction has been that the subliminal presentation of a stimulus depicting merging, or a verbal message of this nature will lead to less pathological thinking than will appear after subliminal neutral stimulation. In an attempt then to reduce conflict through activation of a fantasy of symbiotic gratification, Silverman has used the subliminal presentation of the verbal message, "MOMMY AND I ARE ONE," accompanied by a congruent pictorial stimulus. In these investigations with schizophrenic patients (Silverman and Candell, 1970; Silverman, Candell, Pettit and Blum, 1971;
Silverman, Spiro, Weissberg and Candell, 1969) a consistent finding has emerged. For those subjects that were relatively differentiated from their mothers (as defined by a measure of self-object differentiation to be described in the subsequent section), the presentation of a subliminal symbiotic stimulus had a therapeutic effect; that is, it led to a decrease in primary-process ego pathology. Silverman accounts for the lack of therapeutic effect in the less differentiated subjects (those that already experience themselves as more merged) by proposing that when the fantasy of merging goes beyond a certain point, it no longer serves the defensive function that motivate it in the first place. He maintains that "rather than protecting against the fear that the object and self may be destroyed, it stimulates fear since a total merging can be conceived of as eliminating self and object. For the initially less differentiated subjects then the merging stimulus may have been threatened to 'push' them beyond this critical point while for the initially more differentiated, such a threat did not arise." (Silverman, et al., 1969, p. 48).

With regard to effects of the aggressive or symbiotic stimuli, Silverman has found that the respective increase or decrease in pathology is dependent on the stimuli being presented at a subliminal level. In each of three studies (Silverman and Goldwater, 1966; Silverman and Spiro, 1968; Silverman and Candell, 1970) there were conditions in which the wish-related stimuli were presented supraliminally, with subjects aware of the contents.
In none of these was any intensification or reduction in pathology evidenced. These findings provide further evidence for the central psychoanalytic proposition that psychopathology is rooted in unconscious conflict.

In a re-examination of the data collected on the schizophrenic subjects, Silverman (1971) noted that the acute-chronic dimension (defined here as length of hospitalization) was a relevant variable. In particular, it was found that the aggressive stimulation produced a considerably broader effect in the samples of long-term patients than in the short-term patient samples studied. Not only was the pathology more apt to emerge in both the thinking and non-verbal behavior realms, but also its emergence was less apt to be limited to the later task administered. For the short-term schizophrenic patients then, there appeared to be a delayed effect with increased pathology emerging primarily only on the later task, and even here it was rarely manifested on all measures. This difference has been attributed to the generally held assumption that short-term schizophrenics have more ego resources available to them than do long-term patients and thus are more able to fend off the encroachment of pathology. (Silverman and Candell, 1970; Silverman, 1971).

In addition to length of hospitalization, a number of authors have cited evidence which highlights the importance of separating schizophrenics along the process-reactive dimension when carrying out research (e.g. Herron, 1962; Higgins, 1969;
Davison and Neale, 1973). The process-reactive distinction is based on the patient's life history and/or prognosis. Process schizophrenia involves a long-term progressive deterioration of adjustment patterns with little chance of recovery; while reactive schizophrenia indicates a good prognosis based on a history of general adequate social development with notable stress precipitating the psychosis (Kantor and Herron, 1966). In terms of ego strength then, the process schizophrenic may be considered to have less ego resources available to him than the reactive schizophrenic.

Not only can patients be classified on the process-reactive continuum, but they may also be divided on the basis of paranoid status. In fact, it is perhaps more appropriate to subdivide them on the basis of combinations of these dimensions than on any of them singly (Davison and Neale, 1974). These two dimensions are not unrelated; rather they are interdependent. Premorbid adjustment has been found to be related to whether or not the patient has delusions (Goldstein, Held and Cromwell, 1968; Zigler and Levine, 1973). Patients with good premorbid adjustment have been found to be about equally divided between those who do and those who do not exhibit symptoms of paranoia, but almost all patients with poor premorbid adjustment have been found to have no paranoid delusions (Davison and Neale, 1974).

Thus reactive paranoid and process nonparanoid schizophrenics will be used as subjects in an experimental procedure
similar to that described by Silverman and Spiro (1967), and the effects of subliminal aggressive, as well as subliminal symbiotic stimulation will be assessed. To make these assessments, two sequential recall tasks will be used in all baseline measurements and experimental conditions. This particular task was chosen as it proved to be the most reliable measure in past research (Silverman, personal communication).

As process nonparanoid subjects may be viewed as having less ego strength and weaker defenses, it is hypothesized that they will manifest greater induced ego pathology after aggressive stimulation than reactive paranoid patients, and that any effect on the latter will be delayed until the second task. Furthermore, it is expected that reactive paranoids will be more differentiated from their mothers, since previous research has suggested that differentiated subjects are more often than not, short-term patients (Kaden and Lipton, 1960; Silverman, et al., 1975; Wilensky, 1959). As it is only these relatively more differentiated subjects that exhibit a decrease in pathology as a result of symbiotic stimulation, it is predicted that the reactive paranoid patients will manifest a greater therapeutic reaction to the subliminal merging stimuli than will process nonparanoid subjects. Thus this investigation will be conducted not only as an attempt at replication of the results obtained by Silverman and his co-workers, but also as an effort toward further specification of the psychodynamic relationships involved in psychopathology.
METHOD

Subjects. Twenty male subjects participated in the experimental study. All were patients from Eastern State Hospital (Williamsburg, Virginia) carrying the diagnosis of schizophrenia. Patients were selected and subclassified as either reactive paranoid or process nonparanoid schizophrenics on the basis of the Ullman - Giovanonni Scale (1964) and clinical assessment made by psychologists and psychiatrists. A score of thirteen or higher was the criterion for classification in the reactive group; to be selected for the process group, a score of ten or below on the Ullman - Giovanonni Scale was required. All patients who had poor vision as assessed by a Snellen eye chart or who were severely thought disordered as determined by experimenter interview were excluded from the study. Half the patients in each group were black and half were white. All other individual and group data concerning pertinent subject characteristics are reported on Table 1.

Stimuli and Tachistoscope. Stimuli similar to those used in the study by Silverman and Spiro (1970) were employed in this investigation. The aggressive stimulus was a picture of a
### TABLE 1

**CHARACTERISTICS OF EACH SUBJECT IN THE TWO GROUPS OF SCHIZOPHRENIC PATIENTS**

<table>
<thead>
<tr>
<th>REACTIVE PARANOID SCHIZOPHRENICS</th>
<th>HIGHEST LEVEL OF EDUCATION ACHIEVED (yrs)</th>
<th>LENGTH OF HOSPITALIZATION</th>
<th>DRUG DOSAGE (mg/day)</th>
<th>SCORE ON ULLMAN GIOVANNONI SCALE</th>
<th>LEVEL OF SELF-OBJECT DIFFERENTIATION</th>
<th>SUBLIMINAL THRESHOLD (msec)</th>
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<tr>
<td><strong>S 1</strong></td>
<td>22</td>
<td>10</td>
<td>2 yr, 6 mo.</td>
<td>110</td>
<td>14</td>
<td>30.0</td>
</tr>
<tr>
<td><strong>S 2</strong></td>
<td>21</td>
<td>10</td>
<td>1 yr</td>
<td>1890</td>
<td>14</td>
<td>30.5</td>
</tr>
<tr>
<td><strong>S 3</strong></td>
<td>33</td>
<td>7</td>
<td>2 yr</td>
<td>1000</td>
<td>18</td>
<td>23.5</td>
</tr>
<tr>
<td><strong>S 4</strong></td>
<td>32</td>
<td>12</td>
<td>3 yr</td>
<td>200</td>
<td>14</td>
<td>14.0</td>
</tr>
<tr>
<td><strong>S 5</strong></td>
<td>34</td>
<td>12</td>
<td>3 yr</td>
<td>200</td>
<td>14</td>
<td>17.5</td>
</tr>
<tr>
<td><strong>S 6</strong></td>
<td>19</td>
<td>11</td>
<td>1 yr</td>
<td>--</td>
<td>14</td>
<td>24.5</td>
</tr>
<tr>
<td><strong>S 7</strong></td>
<td>19</td>
<td>11</td>
<td>6 mo.</td>
<td>1055</td>
<td>13</td>
<td>19.5</td>
</tr>
<tr>
<td><strong>S 8</strong></td>
<td>35</td>
<td>14</td>
<td>3 yr, 6 mo.</td>
<td>1200</td>
<td>14</td>
<td>28.0</td>
</tr>
<tr>
<td><strong>S 9</strong></td>
<td>32</td>
<td>12</td>
<td>3 mo</td>
<td>800</td>
<td>17</td>
<td>32.0</td>
</tr>
<tr>
<td><strong>S 10</strong></td>
<td>23</td>
<td>12</td>
<td>5 mo</td>
<td>470</td>
<td>14</td>
<td>36.0</td>
</tr>
<tr>
<td><strong>MEAN</strong></td>
<td><strong>27</strong></td>
<td><strong>11.1</strong></td>
<td><strong>1 yr, 9 mo.</strong></td>
<td><strong>----</strong></td>
<td><strong>14.6</strong></td>
<td><strong>25.5</strong></td>
</tr>
</tbody>
</table>

**PROCESS**

**NONPARANOID SCHIZOPHRENICS**

| **S 1**                          | 31                                       | 5                         | 4 yr                  | 200                              | 2                                    | 21.5                     | 21                      |
| **S 2**                          | 31                                       | 6                         | 3 yr                  | 900                              | 6                                    | 29.5                     | 24                      |
| **S 3**                          | 37                                       | 7                         | 4 yr                  | --                               | 4                                    | 31.0                     | 19                      |
| **S 4**                          | 37                                       | 7                         | 3 yr                  | 172                              | 9                                    | 31.0                     | 20                      |
| **S 5**                          | 38                                       | 10                        | 9 mo.                 | 800                              | 4                                    | 19.0                     | 22                      |
| **S 6**                          | 41                                       | 12                        | 2 yr, 6 mo.           | --                               | 4                                    | 27.0                     | 25                      |
| **S 7**                          | 40                                       | 4                         | 6 yr                  | 572                              | 4                                    | 23.5                     | 19                      |
| **S 8**                          | 52                                       | --                        | 15 yr                 | 200                              | 1                                    | 27.0                     | 20                      |
| **S 9**                          | 24                                       | 12                        | 1 yr, 4 mo.           | 2000                             | 11                                   | 43.0                     | 15                      |
| **S 10**                         | 33                                       | 10                        | 3 yr, 6 mo.           | --                               | 1                                    | 29.5                     | 13                      |
| **MEAN**                         | **36.4**                                 | **8.1**                   | **4 yr, 4 mo.**       | **----**                          | **4.6**                              | **28.15**                | **19.8**                |
man about to stab a woman, accompanied by the verbal message, "DESTROY MOTHER." The symbiotic stimulus was a drawing of a man and woman standing together with the lines demarcating one from the other deleted, such that they appeared to be joined like Siamese twins. This stimulus picture was accompanied by the verbal message, "MOMMY AND I ARE ONE." The control stimulus was a drawing of two men facing each other with bland expressions along with the verbal message, "PEOPLE ARE TALKING." (Critical stimulus pictures are presented in Appendix A.) The neutral stimuli for the baseline measures were similar to the control stimulus picture and were accompanied by the verbal messages, "PEOPLE ARE LOOKING," "PEOPLE ARE STANDING" and "PEOPLE ARE THINKING" for baseline I, II, and III respectively.

The stimuli were shown through an electronically-controlled tachistoscope. Subjects looked through an eye-piece at a blank field with the stimuli exposed from a second field. The viewing distance was approximately 20 inches. Because the speed of exposure of the tachistoscope was not fast enough to insure that all presentations were subliminal, a .70 Wratten density filter was placed inside the apparatus about five inches in front of the stimulus card. The exposure times ranged between approximately nine and twenty milliseconds depending on the individual threshold level determined for each subject. Exposures were given at five milliseconds less than the thresholds which appear on Table I and remained constant for each individual throughout the study.
Procedure. Prior to the experiment proper, the experimenter met with potential subjects individually to administer a test for visual acuity and other pre-test measures. The patients were introduced to the session in the following manner:

I am doing psychological research here in the hospital and am trying to learn as much as possible about the patients who are here. Your name was given to me by the nurse in your building as someone who is cooperative and willing to help. Thus I am going to ask you to engage in some task that will give me some information I am looking for. The first thing I'm going to ask you to do is stand behind this line and tell me what letters you see.

Following the short visual examination, patients were administered the Ullman - Giovanonni Scale (1964). Those who did not meet the selection criterion were thanked and asked to return to their building. The remaining individuals were given the Adjective Check List (devised by Silverman and his associates, 1969) to assess their level of self-object differentiation. In this procedure the subject is asked to rate himself on a six-point scale for the degree to which each of twenty descriptive adjectives applies to him—e.g. how honest, social, irritable, etc. he is. Then he is presented with a picture of a relatively expressionless woman intended as a mother figure and is asked to rate her for the same twenty characteristics "on the basis of what she looks like in the picture." Following this, the patient is then requested to rate his own mother using the same adjective check list. Thus the extent to which the last two ratings are similar
... to those made to the self can be assumed to reflect the extent to which the patient experienced himself as symbiotically merged with the mother/mother figure. The differentiation scores which appear on Table I are the means of the sums of the differences between self and picture ratings and self and mother ratings. This measure was employed, as it had been found that the average of the two differentiation scores provides a more useful measure than either one alone (Silverman, personal communication).

Following this assessment, the patients' subliminal threshold was determined. Each subject was told that he would be shown a blank flash of light, a picture (a drawing), or words and he was asked to report what he saw, even if he was not completely certain of the specific stimulus content. Three ascending and three descending series were presented. The stimuli used were the pictures and verbal messages that were employed in the baseline series of the experiment. They were shown in a random sequence during each series. The flash durations of trials within each series increased or decreased in two millisecond intervals. The point at which the subject could identify any major aspect of the stimulus (e.g. he reports seeing words, but not necessarily all of the words in the message or seeing a person's face instead of the upper portion of two men's bodies) fifty percent of the time was designated as his subliminal threshold.

At the end of the pretest session, the participants were...
I would like to get some information. However, in order to do this, I will need to meet with you on three different occasions. Each session will take about an hour and I will ask you to look at some flashes of light, and listen and respond to some short stories. At the end of the last session you will be paid three dollars for devoting your time to this research. Would you be interested in participating?

The experimental procedure was similar to that outlined by Silverman and Candell (1970). The three experimental sessions (aggressive, control and symbiotic) were held on separate days, with each subject serving as his own control. In each session there was a "baseline" and "critical" assessment of the patient's functioning with a change from the former to the latter reflecting the effects of the particular condition for that day.

The assessments of pathological thinking for all baseline and critical series were made with the use of a story recall task. This consists of four taped passages, the immediate recall of which was requested from the subject. Each of the passages (24 all together) contains a simple and brief narrative account of some more or less bland event. Sixteen of the stories were written by the aforementioned authors, and eight comparable stories were made up by the present author. (All passages used in the story recall task are presented in Appendix B.)

The study was conducted by one female (E1) and one male (E2) experimenter. Experimenter 1 conducted all pre-testing, and story recall tests. Experimenter 2 selected and presented all stimuli on the tachistoscope and recorded non-verbal pathological behavior during each session. The stimuli were inserted into the tachistoscope
by Experimenter 2 in such a way that Experimenter 1 (who scored all responses) was unaware of what condition the subject was in.

At the beginning of the first session, Experimenter 1 introduced the co-experimenter and read the consent form (see Appendix C) to the subject. He was instructed as follows:

(E1) - As you have heard, I am going to ask you to look through the eyepiece of the machine next to you and you will see some flashes of light. My assistant will explain to you what he would like you to do.

(E2) - Please put your eyes against the eyepiece. I will say "ready, get set" and then press a button. Right afterward, tell me what you have seen as "a flash of light" or anything else that appears.

The subject was then given eight exposures, four of the Baseline I picture, and four of the corresponding verbal message, in an alternating sequence. There was a two to four second interval between the picture and message exposures, and a fifteen second interval between the picture-message pairs. All stimulus presentations were preceded by the words, "ready, get set." The participant was then given the following instructions:

(E1) - Now I am going to play a short passage on this tape recorder. I would like you to listen carefully and when it's over, give back as much of the passage as you can remember.

A passage was played and the subject's recall was recorded on a different tape recorder. Immediately following this, a second passage was played, and recall was recorded. A few minutes later, the
subject was given eight more "refresher" flashes of the same stimuli in identical sequence, and two more stories were presented and recorded. In order to facilitate future discussion, the first two story recall tasks will be designated as Story Recall Test I or Test I, and the second two will be referred to as Story Recall Test II or Test II.

The subject was then asked to look into the tachistoscope again, and the same procedure was repeated as had taken place earlier, except a critical stimulus pair was presented. Seven of the subjects were given the aggressive condition, six were given the control condition, and seven were given the symbiotic condition. The experimenter then administered to the subject two more passages for recall, eight refresher flashes, and two more passages.

The procedure is summarized in Table 2. Session II and Session III followed the same format, with other forms of the same baseline and critical tests given. The sessions were conducted on subsequent days with at least a one-day interval between sessions. The order in which the three critical conditions were administered was counter-balanced.

**Scoring of Responses.** Six scores for each baseline and critical series were obtained, two from Story Recall Test I, two from Story Recall Test II, and two assessments of pathological non-verbal behavior to be described subsequently.

**Story recall accuracy score:** This consists of words (exclusive of prepositions and articles) that are correctly recalled
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Four flashes of neutral stimulus</td>
</tr>
<tr>
<td>2</td>
<td>Baseline Story Recall Test I</td>
</tr>
<tr>
<td>3</td>
<td>Four refresher flashes of same neutral stimulus</td>
</tr>
<tr>
<td>4</td>
<td>Baseline Story Recall Test II</td>
</tr>
<tr>
<td>5</td>
<td>Four flashes of critical stimulus (aggressive, control, or symbiotic)</td>
</tr>
<tr>
<td>6</td>
<td>Critical Story Recall Test I</td>
</tr>
<tr>
<td>7</td>
<td>Four refresher flashes of same critical stimulus</td>
</tr>
<tr>
<td>8</td>
<td>Critical Story Recall Test II</td>
</tr>
</tbody>
</table>
from the two stories. Two scores were obtained: the mean of the first two stories (Test I) and the mean of the second two passages (Test II).

**Story recall pathology score:** This is the mean of the ratings given to the two stories for the amount of pathological thinking that appeared (irrespective of the amount recalled). A ten point scale was used for these ratings. Pathological thinking refers to the intrusions of material which are not in the original story and the organization of the recall, that is, how confused or other poorly organized it is. In giving ratings, the total length of recall was taken into account so that for stories containing equal amounts of pathological thinking, the shorter the recall, the higher the pathology rating. Once again, two scores were obtained, one for Story Recall Test I, and one for Story Recall Test II.

**Pathological non-verbal behavior:** During each of the tasks, Experimenter 2 recorded the occurrence of inappropriate laughter, blocking mannerisms, odd behavior, etc., designating its intensity and duration. The measure of pathological non-verbal behavior is a rating given during Test I and Test II of each baseline and critical series on a ten-point scale, based on the recorded notes.

Since the verbal pathology scores are based on rater judgments, their reliability was sought by having another scorer blindly rate the protocols from three of the subjects in each group. The reliability coefficient yielded was .72. Although reliability was not computed for the measure of non-verbal pathology, the scorer
consulted the original observer, to maximize the accuracy of the ratings.

Treating each of the six scores separately, the score for each baseline series was subtracted from the score for the corresponding critical series, producing a "change score" for each of the experimental sessions.

**RESULTS**

A three-way analysis of variance with three repeated measures was conducted on each of the dependent measures: story recall pathology change scores, story recall accuracy change scores, and nonverbal pathology change scores.

A summary of the results of the analysis on verbal pathology scores appears on Table 3. Cell and marginal means for this measure are presented on Table 4. The only significant finding obtained from these scores was a main effect of the subliminal stimulus condition (F = 4.4, p = .019). A comparison of the marginal means for this factor indicate that change scores for pathological thinking were significantly greater under the aggressive stimulus condition than in the control or symbiotic condition and that there was no difference between the mean scores obtained for the latter two conditions.

Although the analysis did not yield a significant stimulus condition x subject type interaction, inspection of Figure 1 suggests
### Table 3

**Analysis of Variance Summary Table for the Measure of Verbal Pathology**

<table>
<thead>
<tr>
<th>Source</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between subjects</td>
<td>19</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Type of schizophrenic (A)</td>
<td>1</td>
<td>6.769</td>
<td>2.697</td>
<td>.118</td>
</tr>
<tr>
<td>Subjects within group</td>
<td>18</td>
<td>2.509</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Within subjects</td>
<td>100</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Subliminal stimulus condition (B)</td>
<td>2</td>
<td>7.169</td>
<td>4.414</td>
<td>.019 *</td>
</tr>
<tr>
<td>A x B</td>
<td>2</td>
<td>1.931</td>
<td>1.189</td>
<td>.316</td>
</tr>
<tr>
<td>B x subject within group</td>
<td>36</td>
<td>1.624</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Time of test (Test I, Test II) (C)</td>
<td>1</td>
<td>.019</td>
<td>.0099</td>
<td>.922</td>
</tr>
<tr>
<td>A x C</td>
<td>1</td>
<td>2.552</td>
<td>1.749</td>
<td>.261</td>
</tr>
<tr>
<td>C x subjects within group</td>
<td>18</td>
<td>1.892</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>B x C</td>
<td>2</td>
<td>.394</td>
<td>.372</td>
<td>.692</td>
</tr>
<tr>
<td>A x B x C</td>
<td>2</td>
<td>.315</td>
<td>.297</td>
<td>.745</td>
</tr>
<tr>
<td>BC x subjects within group</td>
<td>36</td>
<td>1.061</td>
<td>-----</td>
<td>-----</td>
</tr>
</tbody>
</table>
TABLE 4

MEAN VERBAL PATHOLOGY CHANGE SCORE UNDER EACH CONDITION

<table>
<thead>
<tr>
<th>TYPE OF SCHIZOPHRENIC</th>
<th>SUBLIMINAL AGGRESSIVE</th>
<th>SUBLIMINAL CONTROL</th>
<th>STIMULUS AGGRESSIVE</th>
<th>STIMULUS CONTROL</th>
<th>CONDITION SYMBOITIC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TEST I</td>
<td>TEST II</td>
<td>TEST I</td>
<td>TEST II</td>
<td>TEST I</td>
</tr>
<tr>
<td>REACTIVE PARANOID</td>
<td>.80</td>
<td>.50</td>
<td>.30</td>
<td>.15</td>
<td>.05</td>
</tr>
<tr>
<td>PROCESS NONPARANOID</td>
<td>1.35</td>
<td>1.25</td>
<td>-.05</td>
<td>.45</td>
<td>.40</td>
</tr>
</tbody>
</table>
Figure 1. Mean verbal pathology change score as a function of subliminal stimulus condition and type of schizophrenic
that the effect in the aggressive condition was carried primarily by the process nonparanoid patients. (While it is routinely inappropriate to make mean comparisons without a significant interaction, these tests revealed that there was significant difference between aggressive and control conditions for process patients, but not for the reactive patients.) Furthermore, there seemed to be a trend toward increased pathological thinking in the symbiotic condition for these patients. It can be noted that the mean verbal pathology score here is close to that obtained by the reactive paranoid subjects in the aggressive stimulus condition.

There were no significant main or interaction effects on verbal pathology obtained from the third factor, time of recall. There does appear to be a slight trend in the direction of decreased pathological thinking from Test I to Test II for reactive paranoid patients, and a reverse trend for the nonparanoid process schizophrenics, as is depicted in Figure 2. However, the difference in scores for reactive and process patients on Story Recall Test II is only of marginal significance (p = .07).

The other measure used to assess pathology was non-verbal or overt behavior. Unlike the measure of pathological thinking, this dependent variable failed to yield significant results in terms of the effect of the subliminal stimulus condition. There was an effect of marginal significance (F = 4.02, p = .06) obtained for the time of testing, indicating that pathology change scores were generally higher for Test I than Test II. The only other effect of statistical signifi-
Figure 2. Mean verbal pathology change scores as a function of time of testing and type of schizophrenic
cance revealed was a relatively uninterpretable third order interaction. However, there are several reasons why the author feels that these results do not warrant serious consideration. First of all, the experimenter recording the behaviors was aware of the experimental hypothesis and the condition each subject was in. This would leave room for the effects of experimenter bias on the results. Furthermore, the fact that almost all of these change scores, regardless of condition, are in a positive direction, and that scores tend to decrease from Test I to Test II, suggest that the significant effects obtained may be more a function of the experimenter's pattern of recording, than of the independent variables themselves. Also, the meaningfulness of the three-day interaction is tenuous when considering the finding that the greatest difference in scores between subject types and time of test occurs in the control condition where minimal differences would be expected.

A summary of the data obtained for the third measure, story recall accuracy, appears in Table 5. As indicated by the results of the analysis reported in Table 6, there was no evidence of a differential effect of the subliminal stimulus conditions on recall accuracy. However, the results do reveal a significant difference in overall functioning between the two groups of schizophrenic patients ($F = 8.198$, $p = .01$). From the graphic representation of the data in Figure 3, it can be observed that the process nonparanoid subjects manifested a relatively consistent loss in accu-
<table>
<thead>
<tr>
<th>TYPE OF SCHIZOPHRENIC</th>
<th>SUBLIMINAL AGGRESSIVE</th>
<th>SUBLIMINAL CONTROL</th>
<th>STIMULUS</th>
<th>STIMULUS CONTROL</th>
<th>CONDITION</th>
<th>CONDITION SYMBOITIC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TEST I</td>
<td>TEST II</td>
<td>TEST I</td>
<td>TEST II</td>
<td>TEST I</td>
<td>TEST II</td>
</tr>
<tr>
<td>REACTIVE PARANOID</td>
<td>1.45</td>
<td>-0.60</td>
<td>2.15</td>
<td>-1.45</td>
<td>-1.95</td>
<td>0.43</td>
</tr>
<tr>
<td>PROCESS NONPARANOID</td>
<td>-1.92</td>
<td>-2.25</td>
<td>-1.95</td>
<td>-1.25</td>
<td>-2.10</td>
<td>-0.93</td>
</tr>
</tbody>
</table>
TABLE 6

ANALYSIS OF VARIANCE SUMMARY TABLE FOR THE MEASURE OF STORY RECALL ACCURACY

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>DEGREES OF FREEDOM</th>
<th>MEAN SQUARE</th>
<th>F</th>
<th>PROBABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between subjects</td>
<td>19</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Type of schizophrenic (A)</td>
<td>1</td>
<td>86.356</td>
<td>8.198</td>
<td>.010 *</td>
</tr>
<tr>
<td>Subjects within group</td>
<td>18</td>
<td>10.574</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Within subjects</td>
<td>100</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Subliminal stimulus condition (B)</td>
<td>2</td>
<td>2.090</td>
<td>.167</td>
<td>.847</td>
</tr>
<tr>
<td>A x B</td>
<td>2</td>
<td>8.096</td>
<td>.648</td>
<td>.529</td>
</tr>
<tr>
<td>B x subjects within group</td>
<td>36</td>
<td>12.500</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Time of test (C)</td>
<td>1</td>
<td>2.945</td>
<td>.207</td>
<td>.655</td>
</tr>
<tr>
<td>A x C</td>
<td>1</td>
<td>21.334</td>
<td>1.498</td>
<td>.237</td>
</tr>
<tr>
<td>C x subjects within group</td>
<td>18</td>
<td>14.233</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>B x C</td>
<td>2</td>
<td>33.818</td>
<td>2.033</td>
<td>.146</td>
</tr>
<tr>
<td>A x B x C</td>
<td>2</td>
<td>20.023</td>
<td>1.204</td>
<td>.312</td>
</tr>
<tr>
<td>BC x subjects within group</td>
<td>36</td>
<td>16.632</td>
<td>-----</td>
<td>-----</td>
</tr>
</tbody>
</table>
Figure 3. Mean story recall accuracy change score as a function of subliminal stimulus condition and type of schizophrenic transmission.
racy from the baseline to the critical session, regardless of the stimulus condition. The performance of the reactive paranoid patients, on the other hand, generally remained unchanged from baseline to critical assessments across all conditions.

DISCUSSION

The results reported in Tables 3 and 4 offer support for the conclusion drawn in earlier studies (Silverman, 1975) that when aggressive drive derivatives are stirred in schizophrenics, aspects of their ego disturbance intensify. The particular aspect of pathology examined here includes manifestations of thinking disorder revealed in the Story Recall Test. It was noted, however, that significant results in the hypothesized direction were limited to only this highly structured test, and that there was no evidence of increased pathology on the less structured assessment of gross overt behavior. While pathological thinking and overt pathological behavior have served as "carriers" of the effect of subliminal aggressive stimulation in previous experiments (Silverman and Spiro, 1968), the absence of such an effect with regard to the behavioral measure has been reported in another study (Silverman, et al., 1969). Thus, this failure of replication is not a unique event. Also, there were several inadequacies in the way that non-verbal pathology was assessed in the present experiment. Therefore, no definitive conclusion can be drawn with regard to the effects of subliminal aggressive stimulation on non-verbal pathology.
The hypothesis that nonparanoid process patients would evidence a greater increase in ego pathology after aggressive stimulation than reactive paranoid patients received only partial support in this investigation. Although the differences in scores between the two groups was in the predicted direction, it did not achieve statistical significance. However, additional inspection of the data reveals that while only two out of ten reactive paranoid subjects attained an average increase in pathology of plus one or more (on a ten point scale) in the aggressive condition, seven out of ten process nonparanoid subjects yielded scores at this level or beyond. Although the Chi Square test did not quite reach statistical significance, these results suggest that there may indeed be a differential effect of the aggressive stimulus on these two sub-types of schizophrenics.

A more limited effect on the part of the reactive paranoid patients had been anticipated in view of the fact that these schizophrenics, by definition have had a better premorbid adjustment pattern, and therefore, should have more ego resources available to them to fend off the encroachment of pathology. A parallel finding, namely that the pathological effects of aggressive stimulation are notably more limited for groups of short-term patients than long-term patients, has been reported in previous research (Silverman, et al., 1969; Silverman, 1971) and also has been attributed to the commonly held notion that chronic patients have less ego resources available to them.
Evidence has also been produced in earlier studies which suggests that short-term patients may avoid reacting with increased pathological thinking on the recall test by withdrawing from the situation. This effect was reflected in the finding of a significant decrease in time spent on the story recall in the aggressive session as compared to the control session (Silverman, et al., 1969). However, there was no evidence of such a relationship on the part of the less chronic (reactive paranoid) subjects in the present experiment.

Another finding that has revealed itself through accumulation of past research, is that exacerbation of pathology in the aggressive condition often emerges as a delayed effect (Silverman, 1971). Intensification of pathology only occasionally occurred during the first test administered, and it regularly emerged on the second task given. Silverman also noted that this delay effect occurred most often when the subjects used in the experiment were short-term schizophrenic patients. When the samples studied were comprised primarily of long-term patients, the effect was generally broader in the sense that the pathology was more apt to emerge in both the thinking and non-verbal behavioral realms, and its emergence was less apt to be limited to the later task administered. In view of the assumption that reactive paranoid schizophrenics possess greater ego strength and that they are more often than not, short-term patients, it was anticipated that these subjects would manifest this delayed effect, whereas the process nonparanoid subjects would demonstrate a more consistent effect from Test I to Test II in the
aggressive condition. The results in the present experiment, however, fail to show any significant differences in functioning between the early and late test administered for either group in the aggressive condition. Although the expected result did not materialize, the data do suggest that there was a trend across all stimulus conditions, toward a decrease in pathological thinking from the early to late task for the reactive paranoid subjects, and toward an increase in pathology from Test I to Test II for the process patients. This finding is consistent with the notion that the reactive patients possess a greater adaptive capacity than process schizophrenics.

It should be mentioned at this point that, while any results that have been suggestive of a differential trend between subtypes have been attributed to the subject's position on the process-reactive dimension and their inferred level of ego strength, it can be noted from Table 2 that these two groups of schizophrenics also differed considerably on several other characteristics. There was a significant difference in the ages ($T = 2.67, p \leq .01$) and level of education ($T = 2.67, p \leq .025$) between the two types of schizophrenics. However, there was no relationship between these characteristics and performance in the aggressive condition within each one of the groups (Pearson $r$ values fell below .15).

It is also evident that these two groups were unequal with regard to length of hospitalization ($T = 1.94, p \leq .05$). A longer period of hospitalization on the part of the process patients is consistent with the view that such patients generally have a poorer prog-
nosis. In order to ascertain what relationship this variable has to manifest pathology in the experimental session, correlations were calculated for each group individually as well as for the total sample. The Pearson r values for the reactive and process patients were an insignificant .29 and .26 respectively. For the total group of subjects there was a significant correlation (r = .47, p ≤ .05) between length of hospitalization and verbal pathology scores in the aggressive condition. This finding is consistent with the results of earlier research in which greater induced ego pathology has been found on the part of more chronic patients (Silverman and Candell, 1969; Silverman, 1971).

In addition to these variables, it is obvious from their respective designations, that the two groups differed with regard to paranoid status. It is interesting to note that in an earlier experiment conducted by Silverman and his associates, a post hoc evaluation of the data revealed that all of the subjects which did not show an increase in verbal pathology had been given a diagnosis of paranoid schizophrenia. Furthermore, it was found that those who did not show increased ego disorganization, demonstrated an increase in paranoid manifestation (inferred from an increase in attribution of aggressive threatening qualities in Rorschach responses and sudden exacerbation of guardedness) in reaction to the aggressive stimulus. Moreover, this increase was significantly greater than the increase in paranoid manifestations for both nonparanoid
schizophrenics and the paranoid schizophrenics who did not show heightened ego disorganization (Silverman, 1970). The implication of these findings as Silverman interprets them, is that for schizophrenics who habitually express their disturbance through nonparanoid modes, the subliminal aggressive stimulation may constitute a sufficient condition for increased ego disorganization; but for the paranoid subjects, increase in projection may be an alternative mode of expression. In light of these findings, it seems possible that reactive paranoid patients demonstrated somewhat less induced pathology in the aggressive session than did nonparanoids because they had a greater propensity toward this projective mode of expression. However, the present experiment cannot offer any further evidence to support this conjecture because there was no measure of the degree of projection or paranoid manifestations taken during the experimental sessions.

In contrast to verbal pathology, the measure of story recall accuracy revealed no significant effects of the subliminal stimulus conditions. It had been anticipated that the nonparanoid subjects would manifest greater impairments in recall accuracy in the aggressive condition than in the control or symbiotic conditions, and that this decrease in accuracy would be greater than that shown by the nonparanoid subjects. Although previous research (Silverman and Spiro, 1967) has obtained such a pattern of results, the present experiment did not lend any confirmation to these findings.
It was noted that the two groups of schizophrenics did not react to the experimental situation in a strikingly different manner. While the paranoid patients demonstrated relatively consistent performance from the baseline to critical assessments across all conditions, the nonparanoid schizophrenics manifested a significant loss of accuracy during each session. Viewing the accuracy of story recall as a measure of intellectual efficiency, these results can be seen as consistent with the clinical observation that paranoid schizophrenics often show little, if any, general intellectual impairment, while most other kinds of schizophrenics usually manifest noteworthy impairments. While this statement refers to the functioning ordinarily exhibited by these two sub-types of schizophrenics, the story recall data bear on the temporary change in functioning that occurred during each experimental session (regardless of the stimulus condition). The present results indicate that as a consequence of a presumably anxiety arousing situation, the already impaired functioning of the nonparanoid process patients was further exacerbated, while for the generally more intact reactive paranoids, intellectual efficiency remained unaffected. These findings are also consistent with the notion that the former schizophrenics have fewer adaptive resources available to them than do the latter.

In accordance with Silverman's (1970) formulation and research findings, it had been predicted that the subliminal presentation of a merging stimulus would lead to less pathological
thinking than would appear after subliminal neutral stimulation. The reasoning here is that if thought pathology is a substitute expression for the need to merge self and object representations, then the gratification of this need (with the use of stimulus that would trigger off the fantasy that the schizophrenic was already in a symbiotic relationship with his mother) would temporarily dissipate or reduce his need to merge. Thus, the manifest pathology - the symbolic substitute for this symbiosis - could be given up for the time being (Silverman, 1970). However, the results of the present study failed to provide support for this hypothesis. While there was a slight and nonsignificant reduction in pathology shown by the reactive paranoid subjects, there appeared to be a trend toward increased pathological thinking on the part of the process patients. One possible explanation for such a result is that the process patients may be more threatened by maternal cues and therefore, be more predisposed to responding with heightened thought pathology than reactive. Much recent work has suggested that process and reactive schizophrenics are differentially sensitive to parental figures, the process patient being more threatened by maternal cues and the reactive by paternal cues. (Cicchetti, D. V., et al., 1967; Farina, A. and Dunham, R. M., 1963; Goodman, D., 1964; Heilgrun, A. B., 1973; Jackson, N. L., 1972; Margo, P. A., 1969)

Another interpretation of this finding is suggested by a part of the formulation presented by Silverman and his associates
which refers to the danger of the merging going "too far." They postulate that excessive merging, rather than leading to a symbiotic experience, can result instead in a loss of distinction between self and object, which some psychoanalytic writers have referred to as the undifferentiated state (e.g. Searles, 1959; Mahler, 1952). They further contend that in such a state, the object is perceived as destroyed rather than preserved, and when it threatens, the movement toward symbiosis is aborted and reversed and a "demerging" takes place. They then maintain that since the need to merge is still present, a substitute expression for it is sought. The manifest pathology involving loss of boundaries (e.g. the merging of ideas, images, experiences, etc.) then can serve as a substitute, symbolically expressing the new too threatening wish to merge self with objects. (Silverman, et al., 1969; Silverman, 1970)

These authors have presented several lines of evidence which support these notions. One finding that has appeared consistently in the experimental data, is that the therapeutic effect of the symbiotic stimulus is dependent on the schizophrenic's level of differentiation. Research has revealed that only when subjects are relatively differentiated to begin with (as measured by the adjective check list previously described), is there a sharp reduction in pathological thinking after the presentation of the symbiotic stimulus (Silverman, 1970; Silverman and Candell, 1970; Silverman, et al., 1969). Furthermore, it
has been noted in our experiment that for the initially less differentiated, the merging stimulus led not only to an absence of therapeutic effect, but to an opposite reaction - an increase in pathological thinking (Silverman, et al., 1969). In another experimental investigation, Silverman (1970) offers further evidence which supports the view that merging beyond the point of symbiotic relatedness is not therapeutic. In this study the same pictorial stimulus was used as was employed in the present investigation, only it was accompanied by the verbal message, "I AM MOMMY." This message was contrasted with the message, "MOMMY AND I ARE ONE," the latter of which Silverman viewed as implying that the two representations were only partially merged. The results showed that while there was a decrease in pathology with the message, "MOMMY AND I ARE ONE," there was an increase in manifest pathology when the message used was, "I AM MOMMY."

Thus there is a considerable amount of data which supports the notion that thought pathology is a substitute expression for the need to merge, and that merging beyond a certain point may itself be threatening and, therefore, nontherapeutic. Extrapolating from these findings and interpretations to the present study, it seems conceivable that for these subjects the merging stimulus may have threatened to push them beyond this critical point, and hence there was no reduction in pathology. This analysis would appear to be especially pertinent to the performance of the process patients who demonstrated a trend toward
increased pathology in the symbiotic stimulus condition. However, to be completely consistent with this proposition, it would be expected that most of the subjects that participated in this experiment initially had a high proclivity toward merging and that this would be reflected by low scores on the measure of self-object differentiation. Inspection of Table 2 reveals that contrary to this expectation, six out of the ten subjects in each group received scores of 24 or higher, which is the criterion that Silverman and Candell (1970) have used for selection of "relatively differentiated schizophrenics." Furthermore, there was no evidence of any relationship between the subjects' scores on the measure of self-object differentiation and level of pathology in the aggressive condition. (The Pearson correlation between these two variables was .04.)

What explanation can be offered to account for these rather discordant findings? One possibility is that the assessment of self-object differentiation that was made in the early pre-test session did not accurately reflect the subjects' degree of merging just prior to the symbiotic session of the experiment. This seems likely in view of the fact that for some subjects, the pre-testing session occurred over two weeks prior to the presentation of the symbiotic stimulus. Furthermore, it has been noted that an individual's level of differentiation may vary in accordance with experimental manipulations, therapeutic changes, and other experimental situations. More specifically, it has been found
that subjects respond to subliminal aggressive and symbiotic stimulation with significant changes in body boundary intactness (Silverman and Candell, 1970). Research has also indicated that for subjects that respond positively to treatment, such as drug intervention, there is a significant decrease in self-object differentiation, whereas there is no such difference for subjects who did not evidence a therapeutic change (Silverman, et al., 1971). There is also evidence that pathology reduction brought about by shock treatment is accompanied by reduced self-object differentiation (Silverman, et al., 1969; Silverman, et al., 1971).

In conjunction with these reports, it has been found that it is the initially more differentiated schizophrenics who are most likely to benefit from therapeutic intervention (Silverman, et al., 1971; Silverman, et al., 1975). Other authors have reported results consonant with these. Wilensky (1959) as reported by Silverman, et al., (1971), employed a differentiation measure based on Rorschach responses and found it to be highly correlated with response to social training. Similarly, Kaden and Lipton (1960) also used a Rorschach assessment and found that the initially more differentiated schizophrenics were better able to maintain their improvement and remain in the community upon being discharged from the hospital than the initially less differentiated patients.

In terms of the process-reactive dimension, these results, relating level of differentiation and response to therapy,
would suggest that reactives who generally have a better prognosis, would tend to be characterized by greater self-object differentia-
tion than the less well-adjusted process patients. If this is indeed the case, then it would follow that the process patients would evidence less of a reduction in pathology as a result of symbiotic stimulation than would reactive patients. Furthermore, process patients might even be expected to show a tendency toward heightened pathology as was suggested by the results of the present study. However, this line of speculation does not account for the lack of a therapeutic effect on the part of the reactive schizophrenics.

To better evaluate the relationship of self-object differentiation to the process-reactive dimension and to levels of induced (or reduced) pathology, it would be helpful to examine a larger group of subjects and employ a measure of differentiation as a dependent variable in each baseline and critical session. This would not only enable one to better assess the reliability of this measure, but would also yield information as to how each subject's degree of symbiotic relatedness is effected by the subliminal stimulus conditions.
APPENDIX A
AGGRESSIVE STIMULUS
CONTROL (NEUTRAL) STIMULUS
SYMBIOTIC STIMULUS
APPENDIX B
Passages Used in Story Recall Test

SESSION I

Baseline Story Recall Test I

Passage (a): John Baxter, fastest long distance runner in history, won the gold medal yesterday for the mile run at the International Outdoor Track Meet, held in Sidney, Australia. He ran the mile in a fast 3-1/2 minutes, and finished about 100 yards ahead of second place Don Johnson, of the United States. In other events, the U. S. took first place in the pole vault and half mile run, and finished third in the low hurdles.

Passage (b): When Johnny woke up at 8:00, the sun was already shining, and he knew that he'd have to rush if he was going to get to school on time. Today was a special day for this fifteen-year-old lad. It was the day of the big parade, and his teacher, Mr. Brown, had chosen him to lead it. He wanted to look his best so he put on his new blue suit, his striped tie and his black shiny shoes.

Baseline Story Recall Test II

Passage (a): Eight hundred and fifty passengers on the Queen Mary, bound from London to New York, spent the night on board ship ten miles out of port, due to a tugboat strike which began at 5:00 P.M. yesterday. Three hundred workers walked off their jobs,
leaving boats in New York harbor without escort service. The only reason given for the strike was stated by John Thomas, head of Local 121, who said that the workers were demanding a 15 cents per hour wage increase.

Passage (b): "Land ahead," the old man shouted as he stood at the front of the boat, looking through his telescope. This was a very exciting moment for Don Jones, the captain of the sailing ship. Don and his crew of five, had been looking many months for a special island in the Pacific which they now believed they had found. Someplace on this island, as an old story tells it, is buried treasure of gold, emeralds, rubies, and rare coins.

Critical Story Recall Test I

Passage (a): Arnold Tompkins and his family of five were driving west on Route 101 toward Butte, Montana. It was a warm summer day; the beginning of their summer vacation. John, the oldest boy who was 16, had just graduated from Willow Park High School, and was particularly looking forward to the trip because he had a group of friends in Butte whom he had met last summer. Everyone hoped that it would be an enjoyable summer and all looked forward to parties, swimming and boating.

Passage (b): Ambassador Garcia of Mexico arrived today at the International Airport in Washington, D. C. He will meet with Steward Udall, Secretary of the Interior, and with Edmund Brown,
Secretary of Foreign Affairs, to discuss plans for the building of irrigation canals which would extend from Texas to about 50 miles south of The Rio Grande River. This is the first of four scheduled meetings on this topic, and if all goes as is expected, construction will begin in the spring of 1968.

Critical Story Recall Test II

Passage (a): Yesterday was an important day for the residents of the city of Mulberg, located in Ulster County, New York. It was election day. All of the ballots have not been counted yet, but enough have been so that some predictions can be made. Sam Larsen, who is running for city councilman, leads his opponent by about 6,000 votes, and is expected to win. However, in the race for mayor, Tom Bronxon leads Lester Brown by only 200 votes, and who will win is anybody's guess.

Passage (b): James Harper, president of the Walker City Board of Trade, announced yesterday that there would be a fund-raising campaign beginning next Tuesday to raise money for the annual fair which is usually held the first Saturday in July. About $6,000 is expected to be contributed by the local businesses plus an additional $2,000 which is usually given by the residents. The big event this year will be a display of modern farming equipment including tractors, jeeps, and other tools by the Clark Manufacturing Company.
SESSION II

Baseline Story Recall Test I

Passage (a): At 6:00 P.M. last night, rush-hour traffic leaving New York for New Jersey over the George Washington Bridge was backed up about three miles. The reason was that two of the automatic change machines stopped working. Four employees rushed to the scene and in about a half hour the machines were working properly. However, it wasn't until 7:15 P.M. that traffic was flowing normally again. This had been the fifth traffic tie-up of the month.

Passage (b): Harold got up at 7:00 A.M. and quickly got ready for school. He took his special package, and left the house. This warm spring Monday morning he and the other kids in his class were bringing their pets from home. Mr. James, the teacher, had promised to give a ticket to the baseball game to the boy with the most interesting pet. Harold had an odd looking turtle, with a gold and black shell with diamond shaped designs.

Baseline Story Recall Test II

Passage (a): At 11:05 this morning, a major power failure at the Jamaica Station of the Long Island Railroad curtailed all westbound service. Fortunately, being after the rush hour, only four trains were affected. The situation was not remedied until
1:00 P.M., and in the meantime all of the 120 passengers were forced to walk two miles back to the station in cold winds and freezing rain. The cause of the failure is believed to have been a faulty switch.

Passage (b): Larry sat in his seat quietly as he heard the pilot's voice over the loudspeaker, "We'll be arriving in Los Angeles in 20 minutes; the weather is clear." He was very excited because his old friend, Frank Simmons, was meeting him at the airport. They were going to spend about a month camping in the Sierra Mountains, prospecting and looking for gold. They were to leave Friday morning at 5:00 A.M. Larry had brought four suitcases with him, filled with clothes, camping equipment and digging tools.

Critical Story Recall Test I

Passage (a): At about 9:00 P.M. tonight, all planes leaving LaGuardia Airport were grounded, and all incoming flights were detoured to Logan Field in Boston, Massachusetts. The reason for this was the rapid formation of a heavy fog which now surrounds the airport and other nearby areas. The fog is expected to last through the night. As a service to passengers who must travel, several of the airlines have arranged charter bus service to nearby air terminals in Newark and Philadelphia.

Passage (b): It was 5:00 P.M., only six hours after the four men had reached the peak of Potter Mountain. They were making
their way down and still had about 3,000 feet to go, when they de­
cided to rest for the night. Joe Petterson, leader of the group, 
picked a good spot, facing away from the cold winds, to make camp. 
They all looked forward to the next day, because when they reached 
the bottom, they would be met by their friends who were planning to 
give them a large party.

Critical Story Recall Test II

Passage (a): "America," the United States entry in the 
Atlantic Races, won the gold cup yesterday finishing about 200 yards 
ahead of second place "Mariner" which was England's entry. The At­
lantic Races is the yachting classic which is held every year on the 
first Saturday in May. In an interview after the race with Henry 
Jackson, owner and skipper of the "America," he described the eight­
mile course as challenging and difficult due to the many turns which 
he had to follow.

Passage (b): It was a nice fall morning, the leaves were 
just beginning to change color. Jimmy left his house at 8:30, and 
walked quickly to school because he wanted to be there when class 
started at 9:00. Today his sixth grade class was going to the Brook­
lyn Art Museum; he looked forward to the trip very much. They 
were going by bus and train, and planned to return by 4:30 P.M.
SESSION III

Baseline Story Recall Test I

Passage (a): Pete Rieley and his brother Tom had only two days left in Colorado before they had to return to their home in Pennsylvania. They had spent the last three weeks there in the mountains looking for rocks and semiprecious stones, and hoped to spend the last two days searching the river beds in the valley. Because they had so much luck on this trip, they planned to keep thirty of the best specimens for their own collection and sell the rest to Nicky's Rock Store for an estimated profit of $375.

Passage (b): Last Thursday Steve and two of his schoolmates took a four-hour drive to Elk Mountain in the Poconos to go skiing for the day. They had only been there two hours when the lift they were on broke down due to a mechanical failure. After waiting about an hour and a half, Steve and 67 other skiers were let down from the chair lift by cable and were reimbursed $11 for their lift ticket when they got back to the lodge.

Baseline Story Recall Test II

Passage (a): It was a warm sunny day in the first week of April and Billy was now ready to plant the seeds in his little vegetable garden he had prepared in the back yard. He put on his
boots, grabbed his shovel and box of seeds and went out to his plot of land that measured about 15 feet by 20 feet. By four o'clock that afternoon, he had planted one row of carrots, two rows of green beans and four rows of corn.

Passage (b): At 11:30 A.M. George was in a hurry. He was carrying a suitcase with his books and clothes in it trying to get to the Harrisburg train station. On the way he stopped at a fast food restaurant to get a cheeseburger and French fries, but he decided to eat them on his way to the station that was about a half mile down the road. George didn't want to miss the train taking him to his cousin's house because the next one did not leave until 6:00 that evening.

Critical Story Recall Test I

Passage (a): Even with the sunny blue sky warming his face, Donald could not forget that tomorrow was the day of the season's first basketball game. Jim, their star player, had hurt his leg from slipping on the ice last Friday, but the coach said that they should beat their opponents from Springfield by at least ten points anyway. The whole school would be there to see if the three weeks of hard training had turned the players into champs.

Passage (b): A week of hard studying had prepared James for the chemistry test that morning. Although it had been scheduled to last from 9:00 A.M. to 12:00, he was a fast worker and finished in an hour and a half. James walked down Chestnut Street
and mailed a letter at the main post office on 10th Street, then watched television waiting for his classmates to get out of the test. When everyone arrived there would be a small party to celebrate the end of the semester.

Critical Story Recall Test II

Passage (a): There was a thunder storm coming to central Ohio that afternoon and Lisa had decided to look for butterflies in the meadow just above Roosevelt Junior High. She had heard that the beautiful range and Black Monarch butterflies became active just before such storms and enjoyed fluttering in the strong winds. She carried a camera, several lenses and extra rolls of film, hoping to get some pictures and return home without getting her equipment wet.

Passage (b): Kevin was excited when he woke up at 9:00 Saturday morning and looked out of the window to see over three inches of snow on the ground. It was the first snowfall of the winter which meant that he would finally get to use his shiny new red and blue sled. As soon as he got dressed, he went over to Danny's house to go sledding with him on the big hill in their back yard. By noon they were cold and went inside to have hot chocolate and sandwiches.

Note: Stories used in Sessions I and II were written by Silverman and his co-workers. The stories in Session III were written by the present author.
APPENDIX C
FORM OF CONSENT TO RESEARCH

Research conducted by: Lori K. Loveland
Research assistant: William Gray

Participating in this study involves looking into a piece of equipment in which flashes of light will be seen. After each series of flashes, the participant will listen to some short stories, and will be asked to recall what he/she can of each. This procedure will take place in two sessions on different days. The total time involved will be about two hours, and at the end of the last session, the individual will be paid three dollars for his participation.

This research is not expected to be directly therapeutic. Rather, the immediate purpose of this investigative study is to increase scientific knowledge.

On occasion, individuals have reported feeling uncomfortable after seeing some flashes of light. If you wish to talk about any feelings or reactions, a psychologist will be available to discuss these with you. Also, the Patient's Protection Committee now exists and Chaplin Morgan is the liaison to this committee. The committee operates independently of administrative restraints and its purpose is to approve of and monitor research of the sort being participated in. Any complaints or questions may be referred to the Committee which exists solely for the benefit and protection of the patient.

Your participation in this study is purely voluntary and you may refuse to answer any questions or refuse to take part in any portion of the study. All that takes place in the two sessions will remain wholly confidential and will not be disclosed to hospital staff. The responses you give will in no way affect your treatment or release.

Feel free to ask questions at any point during the two sessions.

I, the undersigned, give my consent to participate in this research.

Name: ___________________________ Date: ________________
REFERENCES


