Disordered Thinking in Schizophrenia: Intermingling and Loss of Set

by Martin Harrow, Ilene Lanin-Kettering, Mel Prosen, and Joan G. Miller

Abstract

In a study of schizophrenic thought pathology, potential loss of set and intermingling were examined. The responses of 36 acute psychiatric patients who showed intermingling were analyzed. Intermingling, frequently seen in the speech and thinking of schizophrenic patients, involves the blending of personal material from one's experiences into one's thinking and communication, leading to bizarre and inappropriate speech. The results indicated that intermingling frequently leads to some loss of goal-directed thinking, but not usually to complete loss of set. Patients adopt new sets based partly on the original topic and partly on their own personal idiosyncratic concerns. The apparent "looseness" of schizophrenic patients is based on thematic shifts to idiosyncratic ideas, often from the beginning of their responses, rather than on word-to-word associative looseness. Intermingling of personal concerns typically occurs in a nonfragmented fashion. Schizophrenics and other psychotic patients show significantly more intermingling of personal material in open and undisguised fashion, as though they do not recognize how inappropriate their intermingling appears. The results suggest that although the intrusion of personal material is task inappropriate, it still represents a form of systematic, goal-oriented thinking.

The specific processes involved in the speech and thought pathology of schizophrenic and psychotic patients are still poorly understood. In the past, various types of speech and thought pathology have been observed in schizophrenic patients. Some types of disordered thinking (e.g., bizarre or unusual thinking, and loose associations) have been viewed as positive symptoms, since many feel that they involve a pathological augmentation of thinking. The current research involves an analysis of certain types of positive thought disorder. Other types involve an absence of normal functioning. Such symptoms have been called deficit or defect state symptoms (e.g., concrete thinking, poor intellectual functioning, and psychomotor retardation), and specific symptoms from among this group of deficit state symptoms have been labeled as negative symptoms (e.g., impoverished thinking) (Andreasen 1979; Chapman and Chapman 1973; Fish 1962).

The different views of thought disorder have played a large role in theoretical discussions of psychosis and major psychopathology (Bleuler 1950; Arieti 1974). Countless alternative theories of schizophrenic thought disorders have been proposed, but there is still little consensus in the field (Goldstein 1944; Kasanin 1944; Bleuler 1950; Vygotsky 1962; Rapaport, Gill, and Schafer 1968; Storms and Broen 1969; Maher 1972; Chapman and Chapman 1973; Arieti 1974; Cohen, Nachmani, and Rosenberg 1974; Holzman 1978; Johnston and Holzman 1979; Rochester and Martin 1979; Harrow and Miller 1980).

One approach to the study of speech and thought pathology that might prove useful involves analysis of some of the specific mechanisms which may be involved. The intention is to provide a fuller description of specific types of...
cognitive processes that might interfere with the thought process of schizophrenics. The current research was designed to study more closely one specific behavior, intermingling of personal material into one's thinking and speech. The present investigators have previously proposed intermingling to be an important aspect of disordered schizophrenic cognition (Harrow and Prosen 1978, 1979). The particular focus in the current study of intermingling is its relation to loss of set, or loss of goal-directed thinking. Observations about the potential impairment in goal-directed thinking have been central to several major theories of schizophrenia (Bleuler 1950; Shakow 1962, 1979).

Recently, the current research team has proposed two key factors that may be involved in impaired speech production and thought disorders in schizophrenia and in other major psychiatric disorders (Harrow and Prosen 1978, 1979; Harrow and Miller 1980; Lanin et al. 1981). These factors are: (1) a tendency to blend material that comes from one's own past or recent experiences into current thinking and communication. Intermingling has been defined as the bizarre blending of personal material into one's thinking and speech. To be considered intermingling, the personalized material must enter into the response in a manner that makes it appear strange or inappropriate to the current speech situation. (2) The second and even more important factor, which may be a central component of psychotic thinking, concerns impaired perspective (Harrow and Miller 1980).

Perspective refers to a person's general ability to recognize in global fashion, and in terms of broad consensual standards, what particular verbal and nonverbal behaviors are appropriate and resourceful to a given social and task situation. As such, it plays an important cognitive control function. Among the several ways in which impaired perspective differs from intermingling is that it is viewed as a higher level cognitive mechanism and represents an important aspect of the executive control processes constituting metacognitive behavior. In contrast, intermingling is a specific type of interfering cognitive-verbal behavior. We have suggested that impaired perspective may be an underlying factor involved in several key types of disordered speech and thought disorders, and may also play a key role in other aspects of psychosis such as delusions (Harrow and Miller 1980).

Intermingling, the first factor described above, was found to be a prominent verbal behavior in a series of investigations of disordered speech in early phases of psychiatric disturbance (Harrow and Prosen 1978, 1979). These studies provided evidence which suggested that one mechanism involved is the tendency for disturbed patients inappropriately to mix into their speech content from their own recent and/or past experiences at a point, and in a manner, where it is disruptive and/or inappropriate to do so. Theoretical constructs bearing some similarity to our views on intermingling have been proposed by a number of previous investigators (e.g., Cameron 1944; Bleuler 1950). Intermingling might well be a specific type of loose association. However, instead of being based on nonaffective and arbitrary semantic associations, intermingling is quite specific and nonrandom in its direction, involving particular personal concerns. Although in some scoring systems intermingling might fit under categories such as "tangentiality" or "derailment," its cognitive basis might be different from other behaviors labeled "loose."

Our data have suggested that the mechanisms involved in the above phenomenon of intermingling may not be exclusive to schizophrenia, since intermingling and impaired perspective occur in the speech of some disturbed nonschizophrenics as well (Harrow and Prosen 1979). The tendency to intermingle one's needs and concerns into speech and thinking has the communicative effect of making the verbalization seem odd or ill-formed to the listener. Much normal speech can be influenced, to a limited extent, by the speaker's needs and concerns. However, we label verbalizations as involving intermingling only when they appear strange. The bizarreness seems to be a product of everyday internal preoccupations being verbalized in an intrusive, and at times goal-changing manner, without their relevance to the current context being well-explained. Other evidence from our research suggests that the patient frequently does not have perspective to recognize how inappropriate his own comments sound to other people who do not have access to the patient's fuller "internal context." Thus, adequate perspective may be one mechanism that keeps the intermingling tendency in check in normal thinking.

After finding evidence that intermingling of personal needs and concerns is a factor involved in much (but not all) pathological schizophrenic speech and thinking, the next step, as described in the current report, involves a detailed analysis of the nature of intermingling. This includes an examination of what factors might be involved in intermingling and of the cognitive charac-
teristics of intermingling. To understand more fully the nature of thought disorder, a thorough analysis of its behavioral characteristics might provide evidence about interfering pathological aspects of the thought process. With respect to intermingling, we are interested in exploring in greater detail the relation between loss of response topic or cognitive set and the tendency to intermingle.

As we have noted, impaired set and a disturbance in goal-directed speech have been a focus of several major theories of schizophrenia (Bleuler 1950; Shakow 1962, 1977, 1979), although there have only been a limited number of direct, systematic empirical investigations of this type of pathological thinking (Reilly et al. 1975; Andreasen 1979). Discourse topic, a construct in psycholinguistics and cognitive psychology that is related to set, has recently been described as playing a determining role in influencing what ideas are typically brought up in a conversation (Ervin-Tripp 1968; Keenan and Schieffelin 1976; Li 1979) and what is relevant and appropriate to talk about within a particular topic domain. The objective topic acts as a shared focusing device for thought and speech (Deese 1978). It plays an important role in utterance and discourse planning, and typically dictates the limits of semantic association.

The current research focused on cognitive processes of speech production based on the premise that the core of pathological thinking appears in situations in which the patient himself must spontaneously organize and express situationally appropriate, goal-directed ideas in a cohesive and understandable fashion.

To conduct a detailed analysis of major characteristics of intermingling and how it interferes with normal response behavior, we studied the speech behavior of a group of schizophrenic and nonschizophrenic patients who intermingled. The research was designed to focus primarily on characteristics of disturbed patients' intermingling and concomitant characteristics of their disordered speech and thinking, rather than to focus on diagnostic differences. Diagnostic comparisons in relation to schizophrenia were also conducted, but were not the primary theoretical focus of the research.

Overall, the present research focused on structural aspects of disordered speech and thought, attempting to use a sample classified according to modern diagnostic criteria. The research addressed the following specific questions: (1) When intermingling occurs, does it result in the schizophrenic patient's losing his original objective response set or topic and shifting instead to his personal idiosyncratic thought and experiences? (2) Does such intermingled material influence the schizophrenic patient's speech from the very beginning of his response, or does personal material intrude only later in the verbalization, making the patient appear "loose" in terms of response triggered word-to-word associations? (3) Is intermingled material inserted into the response so that it is related to the general thematic structure of the response, or does it occur as a fragmented and totally irrelevant intrusion? (4) Is the intermingled material inserted subtly and in a disguised intrusion, or is it explicitly and openly included?

**Methods**

**Patient Sample**

The present research represents part of a larger program, based at Michael Reese Hospital, the University of Chicago, and the Illinois State Psychiatric Institute, studying schizophrenic thought pathology and psychosis longitudinally over different phases of the schizophrenic disorder (Bromet and Harrow 1973; Harrow and Silverstein 1977; Silverstein and Harrow 1978, 1981; Harrow, Silverstein, and Marengo, in press), and exploring mechanisms that may be involved in schizophrenic thought pathology (Harrow and Quinlan 1977; Harrow and Prosen 1979; Harrow and Miller 1980; Lanin et al. 1981).

The patient sample included 53 hospitalized psychiatric inpatients studied shortly after admission to the Illinois State Psychiatric Institute. Based on the Research Diagnostic Criteria (RDC) (Spitzer, Endicott, and Robins 1978), the sample included 28 schizophrenics, 15 other psychotic patients, and 10 nonschizophrenic, nonpsychotic patients. The data for the current study are derived from 36 of these patients, in whose speech there was sufficient intermingling of personal material to allow us to analyze the cognitive and verbal properties of intermingling more extensively. The resulting sample of 36 patients included 19 schizophrenics, nine other psychotic patients, and eight nonschizophrenic, nonpsychotic patients. The schizophrenic group included nine paranoid schizophrenics, one disorganized, eight undifferentiated, and one residual schizophrenic. Along the dimension of chronicity, six were subacute or acute schizophrenics, and 10 were subchronic or chronic schizophrenics, with three patients unspecified along this dimension. The patient subgroup diagnosed as psychotic but nonschizophrenic included four schizoaffective depressed patients, one schizo-
affective manic patient, one psychotic manic patient, one psychotic depressed (bipolar) patient, and two patients with unspecified functional psychotic disorders. The nonschizophrenic, nonpsychotic sample included five unipolar depressed patients and three other psychiatric disorders.

The mean age of the overall patient sample was 22.9 years. The original sample included 34 males and 19 females. Twenty-seven of the 28 schizophrenics (96 percent) were taking phenothiazines or phenothiazine-like medications (e.g., Haldol) at the time of assessment. The mean educational level of the sample was 12.4 years. When the Information Scale of the Wechsler Adult Intelligence Scale (WAIS) was used to obtain an estimate of intelligence, the mean raw score of the sample was 16.2, which falls within the average range of intelligence. There were no significant differences between the schizophrenic and nonschizophrenic samples on age, education, or intelligence (p > .10).

As illustrated in table 1, subjects who intermingled did not differ from those who did not in verbal ability, education, age, sex, race, or number of previous hospitalizations. On the other hand, the interminglers showed significantly more positive types of thought disorder (e.g., bizarre-idiiosyncratic thinking) than the noninterminglers.

The initial assessment of all but a few of the patients occurred during the first 2 weeks of hospitalization in order to provide data on disordered speech behavior during an active stage of psychiatric illness.

**Table 1. Demographic variables and extent of thought disorder: Interminglers vs. noninterminglers**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Interminglers</th>
<th>Noninterminglers</th>
<th>Significance tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic variables</td>
<td>Mean</td>
<td>n</td>
<td>Mean</td>
</tr>
<tr>
<td>WAIS Information (scaled score)</td>
<td>10.72</td>
<td>36</td>
<td>9.41</td>
</tr>
<tr>
<td>Educational level</td>
<td>12.58</td>
<td>36</td>
<td>12.00</td>
</tr>
<tr>
<td>Race (% Caucasian)</td>
<td>(75%)</td>
<td>36</td>
<td>(85%)</td>
</tr>
<tr>
<td>Sex (% male)</td>
<td>(84%)</td>
<td>36</td>
<td>(53%)</td>
</tr>
<tr>
<td>Age at testing</td>
<td>22.53</td>
<td>36</td>
<td>22.82</td>
</tr>
<tr>
<td>Marital status (% never married)</td>
<td>(77%)</td>
<td>36</td>
<td>(71%)</td>
</tr>
<tr>
<td>Number of prior hospitalizations</td>
<td>1.47</td>
<td>36</td>
<td>1.53</td>
</tr>
<tr>
<td>Thought disorder indices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proverbs: Bizarre thinking</td>
<td>8.27</td>
<td>33</td>
<td>3.80</td>
</tr>
<tr>
<td>Composite Index: Bizarre thinking (based on 3 tests)</td>
<td>3.86</td>
<td>36</td>
<td>2.71</td>
</tr>
</tbody>
</table>

1 p < .01.  
2 p < .001.
fuller understanding of, and ideas involved in giving, each particular response. Thus, patients were asked about their thinking concerning specific responses they had given during the previous week. The interviewer first reread each question and response, and then asked a series of questions about each individual response, such as “Do you remember what you were thinking when you gave that answer?” and “What led you to make that response?”

After the standardized interview, the tape of the session was reviewed and rated by at least two members of the research team.

Ratings of Intermingling
For the focus of the current investigation, the patients were first rated on whether intermingled personal material from their past or current experience was a factor in making their responses idiosyncratic and/or inaccurate. Ratings of intermingling were assigned primarily on the basis of the patient’s original responses (i.e., whether they contained intermingled material), and secondarily on the subsequent interview which included the patient’s specific elaboration or thoughts about each of the eight responses.

The presence of intermingling was scored on a 3-point scale (3 = very clear evidence, 2 = mild evidence, 1 = no overt evidence of intermingling). Intermingling was scored only when the personal material that intruded into the response did not fit neatly with the typical consensual answer to that particular proverb or question. Interrater reliability for intermingling was \( r = 0.71 \), on a sample of 21 patients scored without knowledge of diagnosis. Two examples of responses containing intermingled material follow:

(Q) Don’t cast pearls before swine.  
(A) Don’t give your good things to bad people. They might turn around and use your good things to make you sad. That’s a good poem for this hospital ‘cause people are depressed.  
(Q) A stream cannot rise higher than its source.  
(A) The source, it’s self. It’s the source of being the self. Interpersonal self. What you are in society can be no better than what you are basically as a man alone.

After each of the subject’s responses was rated for the occurrence of intermingling, the responses of 36 patients (19 schizophrenic and 17 nonschizophrenic patients) with sufficient intermingling to warrant further analysis were rated on four major cognitive dimensions to learn more about this verbal behavior. Each of the following cognitive characteristics was systematically assessed: (1) The first characteristic focused on whether the intermingled content led to topic continuation or loss of set. A 4-point scale assessed to what degree the patient continued to focus on the original topic in spite of intermingling or switched to focus more completely on the intermingled concern. (2) The second characteristic focused on whether there was initial or later intrusion into the response of the personal experience or idea. This rating assessed, on the basis of verbal evidence, whether personal material was intermingled as a result of the initial question or seemed to intrude only later, as a product of associations produced while giving the response. In the latter type of intermingling, patients typically first began to give an interpretation of the question and only then began to intermingle. An example of this type would be:

(Q) Strike while the iron is hot.  
(A) Take advantage of your opportunities when you get them. What I haven’t done up to now or I wouldn’t be here now. You know, they say I am the Messiah but I totally renounce it. It is a candid admission on my part. . . .

(3) The third characteristic focused on whether the intermingled material was brought into the response in a systematic manner or occurred as a fragmented intrusion. This dimension was rated on the basis of whether the intermingled content was brought into the response such that the associative relevance to earlier content was clear, versus the intrusion of content which seemed totally unconnected or irrelevant to what had already been said. This assessment was based on the semantic link between the intermingled material and the current verbal context. (4) The fourth characteristic focused on whether the intermingled, personal material was inserted in a subtle, indirect fashion or with an open and direct self-referential style. A 3-point, continuous rating scale was scored on the basis of the nature of the linguistic evidence for intermingling.

The 3-point continuum ranged from 1 = inserted subtly to 3 = inserted openly and undisguised. A direct and undisguised score for intermingling was assigned whenever the patient became overtly self-referential and used pronouns such as “I” or “my.” This can be seen in the example cited above involving a patient’s thoughts as to whether he is the Messiah. Less direct references to the self or instances in which the content was clearly of personal relevance but stated more generally (i.e., second or third person statement) were given an intermediate rating on this dimension. An example of a response that would receive an intermediate rating on this dimension follows:

(Q) Don’t swap horses when
crossing a stream. (A) You shouldn’t switch decisions or switch friendships with another just because he seems friendly—he might not be. May only be pretending. Stand your ground.

In contrast, a rating for even less overt (or more subtle) intermingling was given on those responses in which the rater suspected intermingling from the response content but could only confirm the intermingled nature of the problematic response from the interview segment. An example of a less direct, more subtly intermingled response would be:

(Q) The wife is the key to the house. (A) Without a wife, you really have no home. They are inseparable, men and women, that is.

Later, during the interview about the response, the personal nature of the comment became clearer.

Raters had no knowledge of diagnosis at the time of scoring. Interrater reliabilities of .80, .58, .76, and .83 were obtained for the ratings of topic continuation or change, subtle versus disguised intermingling, beginning versus later occurrence of intermingling in the response, and fragmented versus smooth theme shift, respectively. Because the various cognitive dimensions were assessed using nonparametric, nominal categories, chi-square analyses were used for group comparisons. However, the major focus was on the percent of patients showing particular characteristics associated with intermingling (e.g., the percent of patients for whom intermingling led to their losing the original objective response set or to loss of goal-directed thinking).

Results and Discussion

The data indicate that the verbalizations of 68 percent of the patients were either mildly or strongly influenced in a detrimental way by an intermingling of personal material (see table 2). The responses of the 36 patients for whom intermingling led to disordered speech, and who showed sufficient instances of intermingling for further analysis, were then studied in greater detail. This analysis was conducted to determine more about the nature of intermingling and to provide clues on how it interferes with patients’ thought and speech.

It is important to clarify that intermingling is only one of several component behaviors which may be involved in bizarre speech and thought, although it is one of the most frequently occurring types. As described earlier, intermingling involves the speaker’s inappropriately bringing a personal concern into the response task. This leads to a response which is judged to be at least minimally bizarre.

Although the current study is mainly focused on the specific type of bizarre speech behavior involved in intermingling, overall level of bizarreness was also analyzed for potential group differences irrespective of intermingling. It was found that the schizophrenic patients showed significantly more thought pathology in terms of bizarre-idiosyncratic thinking than the combined nonschizophrenic sample ($t = 2.54, p < .02$). However, select nonpsychotic patients did tend to show severe bizarre-idiiosyncratic thinking, while a number of patients from the group of “other psychotic patients” did not show severe levels of thought disorder. As expected, based on previous research, the patients who intermingled showed significantly more overall bizarre-idiiosyncratic thinking than the patients who did not intermingle ($t = 3.26, p < .01$). Much of their bizarre thinking may be influenced by their tendency to intermingle, although other factors may also influence the overall level of bizarre thinking.

In the examination of specific aspects of intermingling that follows, more specific analyses were directed at determining: (1) whether an appreciable loss of “set” or loss of goal-directed thinking was observed once personal material was intermingled; (2) whether the personal material which the speaker intermingled entered into the response from the beginning of the verbalization or only intruded later in

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Very clear evidence of intermingling</th>
<th>Minor evidence of intermingling</th>
<th>No evidence of intermingling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenics ($n = 28$)</td>
<td>46%</td>
<td>21%</td>
<td>32%</td>
</tr>
<tr>
<td>Other psychotic patients ($n = 15$)</td>
<td>47%</td>
<td>13%</td>
<td>40%</td>
</tr>
<tr>
<td>Nonpsychotic patients ($n = 10$)</td>
<td>50%</td>
<td>30%</td>
<td>20%</td>
</tr>
</tbody>
</table>

$X^2 = 1.57, p = NS.$

1 Reports the percent of patients in each diagnostic group for whom intermingling of personal needs or concerns led to test responses that appear strange, bizarre, or inaccurate.
response production; (3) whether the intermingled material was brought into the response in a relevant and connected topic shift or, alternatively, intruded in an abrupt and fragmented topic switch; and (4) whether the intermingled material was included subtly and in a disguised fashion or was openly and explicitly included in response structure and content.

**Topic Continuation or Change—Potential Loss of Set**

Table 3 reports the results on whether the intermingling of personal material results in an appreciable loss of the original response set. These data can shed further light on issues concerning potential loss of goal-directed thinking and potential loss of set. Bleuler (1950) regarded the loss of task objective and purposive communication as the core feature of schizophrenic thought disorder, yet little empirical research has directly addressed this important theoretical assumption.

The current analysis suggests that the majority of those schizophrenics who did intermingle (68 percent) continued to show some adherence to the original objective response set or almost complete adherence to it. However, 32 percent of those schizophrenics with this behavioral tendency showed a more appreciable loss of the original response set, with their subsequent guiding ideas being more purely a product of the intermingled idea set (rather than of the objective response topic).

The data do not suggest that after intermingling occurs there typically is a complete loss of the "objective set" and the introduction of a new, highly personalized one. Rather, detailed analyses suggest that the idea set which guides the remainder of the response is based on some combination of the objective and personal (more idiosyncratic) set. There are at least two possible interpretations concerning the cognitive basis for these results. One of these is that after intermingling, the speaker's response is guided by two different sets with which he is simultaneously, but separately operating. An alternative view is that a new set is created which involves the fusion of the two sets. The new expanded set would be triggered by the original topic and maintain some relevance to it, but would simultaneously be relevant to the speaker's personal experiences and concerns. Although the issue cannot be completely resolved on the basis of the present data, the latter possibility appears more likely. In the majority of instances, what seemed to happen was that the proverb question would stimulate a personal concern which, along with the original objective topic, would then become the cognitive focus of the response.

In support of the second explanation proposed above, a detailed analysis of patients' individual responses raised the possibility that for the patient, the intermingled material falls within, and is stimulated by, the same cognitive domain or a closely related topic area as the original question. Therefore, for the patient, the response may be viewed as relevant and appropriate to the original set. During the subsequent interview, the patient was encouraged to elaborate more fully the relationship between the ideas included in the response and the original question. In most instances in which there was a question about the link between the two externally disparate ideas, after the subject supplied additional material, it was fairly easy to see how, when looked at from the subject's point of view, the two themes were closely related.

In analyzing potential diagnostic differences, we have already noted that although most of the schizophrenic patients showed some adherence to the original topic after intermingling, there was a trend for some of them (32 percent), and for some of the psychotic patients as well (22 percent), to show a complete or nearly complete loss of set. This was in contrast to the nonpsychotic patients who also intermingled but still did not show complete loss of set, even after intermingling personal material. The overall diagnostic differences were not significant when those schizophrenic patients who showed intermingling were compared to the nonpsychotic patients who

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Mainly guided by appropriate set</th>
<th>Tend to lose appropriate set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenics (n = 19)</td>
<td>68%</td>
<td>32%</td>
</tr>
<tr>
<td>Other psychotic patients (n = 9)</td>
<td>78%</td>
<td>22%</td>
</tr>
<tr>
<td>Nonpsychotic patients (n = 8)</td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>

χ² = 3.24, p = NS.
also showed intermingling. The current results involve comparing the disordered verbalizations of those schizophrenic and psychotic patients who showed intermingling with the disordered verbalizations of those nonpsychotic patients who also showed signs of both speech pathology and intermingling. Previous data of ours using other types of tasks suggested significant schizophrenic/nonschizophrenic differences concerning maintenance of ideas or topic or set (Reilly et al. 1975) when schizophrenics were compared to unselected samples of disturbed nonschizophrenic patients rather than to those nonschizophrenic patients who showed intermingling and pathological speech as done in the current analysis.

Onset of Intermingling—Intermingling From Beginning of Response or Later Intrusion of Personal Material

Table 4 presents data on whether the patients’ responses were guided from the very beginning by intermingled material from their personal experiences or whether the intermingled material intruded only later, in the midst of an otherwise appropriate verbalization. The second possibility supports the more popular conception of the locus of disordered speech in which verbalizations are thought to become “loose” as a product of response-produced stimuli which interrupt the initially appropriate cognitive set.

The data presented in table 4 indicate that in the responses of 75 percent of those patients who intermingled, intermingling occurred from the very beginning of their verbalizations. Thus, when patients intermingled, the initial guiding thought or idea set with which they began their disordered responses was often already inappropriately influenced by their own personal concerns and experiences, making their verbalizations appear strange or inappropriate with respect to the original topic question. Schizophrenic speech has often been described as “loose” and characterized as based on a word-to-word associative looseness. The present results were not a consequence of this type of superficial word-to-word associative process. Instead, the data may best be interpreted as suggesting that the occurrence of intermingled, disordered speech results from idiosyncratic concepts or ideas that the speaker puts forward as a result of thoughts generated by the entire proverb question. This interpretation is supported by the results which indicate that for the large majority of patients who intermingled, their responses were guided by personalized ideas and concepts from the very beginning of response production.

Fragmentation

Table 5 presents the data on the number of subjects who typically produced fragmented versus nonfragmented responses. The intermingled content was scored as entering into the response in fragmented fashion when the main theme which the speaker had been developing up to that point was suddenly interrupted or abruptly changed so that the intermingled concern was only vaguely related or completely unexpected in light of the principal response theme. The results suggest that the majority of the schizophrenic (68 percent) and the majority of the nonschizophrenic patients (88 percent) produced nonfragmented verbalizations in which the intermingled content fit

Table 5. Does fragmentation occur with intermingling?

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Slight or no fragmentation</th>
<th>Moderate or severe fragmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenics (n = 19)</td>
<td>68%</td>
<td>32%</td>
</tr>
<tr>
<td>Other psychotic patients</td>
<td>89%</td>
<td>11%</td>
</tr>
<tr>
<td>(n = 9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonpsychotic patients</td>
<td>88%</td>
<td>13%</td>
</tr>
<tr>
<td>(n = 8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\chi^2 = 2.04, p = \text{NS.}$

Table 4. Onset of Intermingling: Where in patient’s response does intermingled material first intrude?

<table>
<thead>
<tr>
<th>Subjects</th>
<th>From beginning of verbalization</th>
<th>In middle of verbalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenics (n = 19)</td>
<td>84%</td>
<td>16%</td>
</tr>
<tr>
<td>Other psychotic patients</td>
<td>56%</td>
<td>44%</td>
</tr>
<tr>
<td>(n = 9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonpsychotic patients</td>
<td>75%</td>
<td>25%</td>
</tr>
<tr>
<td>(n = 8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\chi^2 = 2.67, p = \text{NS.}$
into the general thematic structure of the response and was also locally cohesive (i.e., in the links between consecutive words and ideas). An example follows of an intermingled response which is cohesive and nonfragmented.

(Q) When the cat’s away, the mice will play. (A) When you’re not watched, try to get away with more. When you have no one over you, when you feel someone stronger than you is no longer bothering you or is no longer there, you in turn become the stronger.

Only a relatively small percentage of the patients from the total sample gave responses in which intermingled material was introduced or intruded in such a way as to be totally fragmented, and the majority of the schizophrenics produced responses which did not show major signs of fragmentation.

Overall, the results suggest that when a patient intermingles his own personal concerns into his responses, it is usually done in a systematic and relevant way, although intermingling may potentially occur in a variety of verbal forms. As we have noted above, analysis of the responses suggests that the personal concern which is intermingled frequently appears to be at least somewhat related to the response topic when it is verbalized, although it is clearly inappropriate to the specific task goal and overall social context of speech in which it occurs.

Our results on fragmentation should be considered in conjunction with those reported earlier concerning topic continuation or change. These two cognitive dimensions address important related aspects of how intermingling may or may not affect one’s ongoing verbalization: (1) intermingling may or may not bring about topic change, and (2) topic change toward the less appropriate set may occur in a relevant smooth transition (i.e., in a nonfragmented manner) or in a loose, abrupt, and disorganized fashion (i.e., in a fragmented manner). The current findings suggest that although intermingling may result in varying degrees of change in response topic or set, this change usually is accomplished in a relatively systematic way. The focus is transported to the personal concern from the original “objective” focus. With only a few exceptions, predominantly in verbalization from the schizophrenic sample, one’s personal focus or set does not abruptly and intrusively come totally to dominate thought and speech.

Is Intermingled Material Inserted Openly or In a More Disguised Fashion?

The data presented in table 6 address the issue of whether material which patients intermingled was inserted in a subtle, relatively indirect fashion, or appeared in a form which made its intermingled nature easily apparent to the interviewer. The data indicate that for most patients the material which made their responses appear strange or inappropriate did not tend to enter into their responses in a subtle fashion. For some patients (36 percent) the intermingled concern was included quite overtly. For example, to the proverb: “The wife is the key to the house,” one subject responded: “My mother would always let me in. My father would always let me in, and I would let him in.” This type of very overt intermingling was not, however, frequent among the nonpsychotic patients. Thus, the nonpsychotic patients tended to verbalize their personal concerns significantly less directly and in more disguised fashion than the combined samples of schizophrenic and other psychotic patients (p < .05).

It is possible that more overt and more socially unacceptable intermingling by the psychotic patients (i.e., schizophrenics and other psychotic patients) was a product of poorer perspective and greater difficulty in monitoring their own verbalizations. In other words, psychotic patients seem to be less self-reflective about their tendency toward intermingled thinking, both in the preverbalization stages of speech planning and even later when evaluating them postverbally. All groups of subjects may have a tendency to bring personal material into thinking, but adequate perspective, we would propose, serves to limit the overt appearance

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Inserted subtly</th>
<th>Intermediate</th>
<th>Inserted openly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenics (n = 19)</td>
<td>5%</td>
<td>58%</td>
<td>37%</td>
</tr>
<tr>
<td>Other psychotic patients</td>
<td>0%</td>
<td>33%</td>
<td>67%</td>
</tr>
<tr>
<td>Nonpsychotic patients</td>
<td>25%</td>
<td>75%</td>
<td>0%</td>
</tr>
</tbody>
</table>

*χ² = 10.25, p < .05.*
of this tendency in normals and most nonpsychotic speakers.

The intermingling of the nonpsychotic patients, who appeared to have better perspective than the psychotic subjects, was more subtle and was usually less flagrant in the response. Since the intermingling of the nonpsychotic patients was better disguised, it would tend to appear less strange or bizarre. This is borne out empirically by the lower bizarre-ness scores for this group of intermingling patients. An example of more subtle, covert intermingling of personal material by a nonpsychotic patient is illustrated in the following response: (Q) “Barking dogs seldom bite.” (A) “Nervous people are only looking for attention.” Whether this response was simply inaccurate or was the product of an intermingled concern would be somewhat inferential if evaluated only on the basis of the response alone. However, information obtained during the subsequent interview portion of the procedure clearly indicated that there were background personal concerns about the respondent’s own personality trait of being extremely nervous and aggressive. The subject likened himself to a “barking dog” in his aggressive tendencies. Thus, the entire response was guided by personal concerns triggered by the original proverb question, although this was sufficiently disguised that it would not have been absolutely clear without further inquiry.

**Implications**

Recent results of ours have indicated that one frequently observed behavior in the bizarre verbalizations of most schizophrenic speech is an inappropriate and disruptive intermingling of material from personal experience into speech (Harrow and Prosen 1978, 1979).

The current phase of this research attempted to explore in fuller detail the characteristics of intermingled material frequently produced by schizophrenics, as well as other thought-disordered patients. The research was conducted to advance knowledge about the nature of intermingling, with a focus toward finding specific ways that the tendency to intermingle can result in particular deviations from more typical cognitive processes.

As we have noted, the current report selected a sample of patients who showed evidence of certain features of thought pathology, in order to study select characteristics of their disordered thinking. Intermingling constitutes only one form of bizarre thinking. Although it appears to be a rather frequently occurring type of bizarre thought and speech in the verbalizations of the current populations, we have found schizophrenic and nonschizophrenic patients who produce bizarre speech which contains no signs of intermingling. The research was designed to focus on intermingling and particular cognitive mechanisms which might be involved in thought disorder in both schizophrenic and nonschizophrenic patients rather than to study diagnostic differences. Within the current framework, with a focus on select characteristics of thought disorder, the results could be viewed from several vantage points.

**Cognitive Set, Loss of Goal-Directed Thinking, and Intermingling**

The present research provides some data with which to address the theoretical issue of loss of set in schizophrenia, which has been discussed by Bleuler (1950) and more recently by Shakow (1962, 1977, 1979). While the between-group differences were not significant, analysis suggested that schizophrenic patients and psychotic patients in general were more likely than nonpsychotic patients to move further away from the original response topic. However, our findings suggest that most schizophrenic speakers were able to maintain a degree of relevance to the original set. Analysis indicated that there was not frequent fragmentation in cognitive set (intermingling of material which involved a sudden intrusion in one’s thinking).

When these results are considered together, they suggest that the intermingling tendency usually leads to some topic shift for most schizophrenic patients but does not result in complete loss of set. Although the theme may be inappropriately shifted to a personal concern, thinking still appears to be organized and holistic. The problem lies in the apparent internal shift in the response theme which guides the remainder of the response. Thinking is still largely topic oriented, although it is guided only partially by the original, externally prescribed response topic and partly by the speaker’s intermingled personal concern. For the majority of speakers, when response material was examined from their point of view or fuller internal context, the intermingled material seemed to be stimulated by, and somewhat related to, the theme of the objective question.

In relation to major hypotheses about loss of set in schizophrenia, the present results are mixed. Despite some difficulty, most of these relatively early schizophrenics did maintain part of the original task purpose. However, the results could
fit in with hypotheses such as Shakow's concerning segmental set, if one views the specific intermingled personal concerns of a particular schizophrenic patient as a departure toward a segmented set, which from an objective point of view does not fit with the more generalized objective set (Shakow 1977, 1979).

**Loss of Set and Loose Word Associations**

The current results, which deal with how the intermingling process influences major aspects of the schizophrenic patient's cognitive set, suggest that intermingled ideas typically tended to affect the response topic from the beginning of response planning and verbalizing. The intermingled concern tended to be introduced early into the patient's set and immediately modified the topic question, thereby resulting in varying degrees of topic shift.

These results may not be surprising if we view response mechanisms or verbal processes for most normal speech as being determined by focal ideas which the person has in mind when he first begins his verbalization. In short verbal responses to questions, the response or verbalization process would not be viewed as based on a simple word-by-word development of the response, with the earlier part of the response or verbalization process serving as the major stimulus for the ideas expressed in the latter part of the verbalization. Rather, the probability is that for short to intermediate length verbalizations, a general outline of most of the intended response would be "mapped out" as the speaker begins to verbalize. This higher level of discourse planning has recently been pointed out by a number of cognitive psychologists (e.g., Deese 1978). However, it is possible that in less well-defined response situations which call for longer, multisentence responses by a disturbed schizophrenic patient, there may be more frequent disruption of speech by the patient, due to the immediate response's serving as a guide or stimulus (response-produced stimuli) and thereby changing the original set or goal. Preliminary data of ours on multi-utterance responses of schizophrenics to open-ended questions suggest somewhat more frequent disruption of topic as a consequence of response-produced stimuli (Lanin, Berndt, and Harrow 1981; Lanin et al. 1981).

The current analysis could suggest another view to those theories of associative looseness which focus on loose word associations as the basic dysfunction of disordered speech in schizophrenia. Results suggest that one primary locus of the difficulty is at the level of the ideas which are thought about and verbalized during the course of the patient's verbalizations. These ideas often are bound, connected, or attached in systematic fashion to a combination of: (1) the original objective topic, and also (2) a topic of subjective concern and importance to the patient. The patient's ideas are not usually loose in random fashion and so do show some constraints. However, they are only partly a function of the consensual external topic, and partly a function of the patient's more internal topic, with other evidence of ours suggesting some loss of perspective by the patient about the difference between the two.

**Cognitive Shifts and the Construct of Perspective**

The current detailed examination of the intermingling process could support a view we have recently proposed that a major factor in psychopathological disturbances in language behavior and other forms of disordered cognition (i.e., delusions) involves an impairment in "perspective" about one's own speech and thinking (Harrow and Prosen 1979; Harrow and Miller 1980), although alternate interpretations of these data are also quite possible. We have defined perspective as "the ability to recognize in global fashion and in terms of broad consensual standards, which particular verbalizations and behavior are appropriate for a particular situation" (Harrow and Miller 1980, p. 717). We should note that perspective bears some similarity to the concept of insight, but perspective involves a dynamic aspect of metacognitive control. It has a fundamental guiding role in every act of speech planning. It can be viewed as the patient's ability to use his active register of shared social rules for verbal and nonverbal social behavior. These patterns are acquired over time, stored in long-term memory, and actively used in every speech act.

Perspective could be seen as one important aspect of metacognitive or executive control processes. The data from the current study could be interpreted as consonant with a view that impaired perspective underlies almost all instances of intermingling because it allows patients to intrude their own personal concerns in a task-inappropriate context, without clear awareness of how inappropriate this may appear to other people. We have previously suggested that disordered thinking fits along a continuum extending from normal thinking to various kinds and degrees of thought disorder (Harrow and Quinlan 1977). The present study provides some preliminary clues that impaired perspective may also be of
a continuous nature. Thus nonschizophrenic, nonpsychotic, and psychotic patients alike demonstrated frequent intermingling during the more disruptive, acute stages of their disorders. However, the data on the relatively direct versus more subtle intrusion of such material suggest that even in exhibiting this same behavioral tendency (i.e., intermingling), nonpsychotic patients maintained a greater degree of perspective than did either of the psychotic subgroups ($p < .05$), with their intermingling being somewhat less obvious to the observer.

Thus, the present data could support a view that impaired perspective, an aspect of metacognitive control mechanisms of thinking and communicating, is a major factor involved in disordered functioning during the intermingling process. The inference from the data that more severe forms of intermingling are partly due to some degree of impaired perspective is supported by the finding that intermingling frequently occurred in psychotic patients in a relatively direct and undisguised fashion, with few immediate self-corrections or self-editing comments. Furthermore, patients showed little reflective awareness of the inappropriateness of what they had said immediately after verbalizing it. Thus, there was little evidence of qualification in the form of metacommunicative remarks during the initial response task to suggest careful monitoring, or even an immediate, postverbal awareness of the inappropriateness of their intermingled material to the discourse task. Similar observations have been reported by Andreasen (1979), who noted that schizophrenic speakers who produce verbalizations scored for disordered thought, language, or communication rarely seemed to be aware that their speech did not communicate well to others.

Our evidence suggests that if the patient's cognitive set was defined by his own internal topic and fuller speech context, independent of the objective task goal, speech often appeared less strange and idiosyncratic and other evidence of ours would support this conclusion (Gordon, Silverstein, and Harrow 1982). The problem appears to reside (1) partly in an impaired ability to ensure that one's own thinking and speech are guided only by the objectively defined goal and to constrain verbalizations with respect to those expectations; and (2) partly in recognizing and maintaining perspective about the objective topic and about what ideas are consensually relevant to it.

Other evidence of ours, addressing other aspects of psychosis (i.e., delusions), suggests that an impairment in perspective, as a general cognitive control mechanism, is one factor involved in much delusional thinking (Stoll et al. 1980). If adequate perspective is seen as one automatic mechanism which keeps thinking consensually valid and oriented to a particular cognitive goal, an improvement in perspective might be expected to occur during partial and complete recovery from psychosis. Indeed, such improvement would be an important factor in a return to a more consensually valid ideational framework. We are currently attempting to assess this possibility with a longitudinal research design.

Evidence of ours collected on other samples has suggested that as schizophrenic and other patients begin to emerge from the most acute phase of their disorder, they show improvement in variables related to intermingling (Adler and Harrow 1974) and improvement in overall severity of thought pathology (Harrow et al. 1973; Harrow and Quinlan 1977).

Is Disordered Thinking Unique to Schizophrenia?

To summarize the schizophrenic versus nonpsychotic comparisons, there were significant differences on select variables, with the schizophrenic patients showing a more severe overall level of bizarre- to other diagnostic comparisons. However, the major results for the other variables, however, did not show significant diagnostic differences. It should be emphasized that when the current sample is divided diagnostically, the resulting relatively small subsample sizes warrant caution in drawing inferences about diagnostic comparisons. However, the main objective of the article was to describe a particular mechanism which is often involved in thought disorder, with a view toward understanding how it deviates from more typical cognitive patterns. The extent of thought disorder displayed by particular diagnostic groups, including nonschizophrenic as well as schizophrenic patients, has been the focus of several separate reports from our research team (e.g., Adler and Harrow 1974; Harrow et al. 1982).

The present analysis of diagnostic differences associated with intermingling could fit in with the reports of others and of our own, suggesting that while acute schizophrenics do show severe thought pathology, disordered thinking is not unique to schizophrenia (Andreasen and Powers 1975; Harrow and Quinlan 1977; Andreasen 1979; Harrow et al. 1982). On those occasions when
nonschizophrenics do show pathological verbalizations, many of the same characteristics and cognitive mechanisms may be involved.

References


Cameron, N. Experimental analysis of schizophrenic thinking.


Fish, F.J. Schizophrenia. Bristol: John Wright and Sons Ltd., 1962.


Harrow, M.; Silverstein, M.; and Marengo, J. Disordered thinking: Does it identify nuclear schizophrenic Archives of General Psychiatry, in press.


Acknowledgment

This research was supported, in part, by Grant Nos. MH-26341 and MH-30938 from the National Institute of Mental Health, Grant No. SIMH-8039 from the State of Illinois Department of Mental Health and Development Disabilities, and a research grant from the John D. and Catherine T. MacArthur Foundation.

The Authors

Martin Harrow, Ph.D., is Director of Psychology, Michael Reese Hospital and Medical Center, and Professor, Department of Psychiatry, University of Chicago. Ilene Lanin-Kettering, M.A., is Research Associate, Michael Reese Hospital and Medical Center, and Committee on Cognition and Communication, University of Chicago. Mel Prosen, M.D., is Associate Chairman and Associate Professor of Psychiatry, Rush-Presbyterian-St. Luke's Medical Center, Chicago. Joan G. Miller, Ph.D., is Research Associate, Michael Reese Hospital and Medical Center, and Committee on Human Development, University of Chicago, Chicago, IL.