

CHAPTER 7

Ambivalence

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INTRODUCTION

Although ambivalence is usually considered to be a normal phenomenon of everyday life, many clinicians might be surprised to learn that it was initially also a key element of the description of schizophrenia. Eugen Bleuler (1911/1950) coined the term *ambivalence* in the same text in which he coined the term *schizophrenia*. He defined ambivalence as the "tendency to endow the most diverse psychisms with both a positive and negative indicator at the same time" (p. 53). Bleuler argued that ambivalence was one of the four fundamental symptoms of schizophrenia, along with loosening of associations, autism, and inappropriate affect. (A fundamental symptom was thought to be present in all schizophrenics, in contrast to accessory symptoms such as delusions or hallucinations, which are present in some but not all schizophrenics.)

Despite receiving fundamental symptom status from Bleuler, ambivalence has received little attention from theoreticians and researchers compared with the other fundamental symptoms. One reason for this limited progress is that the concept of ambivalence has been used in so many different contexts that it no longer has a precise definition. The term now refers to a range of internal states, some pathological and some normal. A second reason is that measuring ambivalence has inherent problems which have limited the empirical research, even while the concept of ambivalence has been used in both clinical and theoretical work. Thus, a potentially useful construct has never been fully elaborated.

Because almost all the major theorists who have discussed ambivalence have defined it differently (Sincoff, 1990), it is necessary to establish a working definition before discussing this topic. In this chapter, ambivalence will be defined as a *state of simultaneous and antithetical emotional tone and action tendency*. This definition intentionally does not endorse any theory of etiology, but rather is descriptive of the affective and behavioral experience.

We will explore the current status of ambivalence as it relates to schizophrenia and schizophrenic spectrum disorders beginning with a brief overview of the early

theoretical conceptualizations of ambivalence. In the second section, the theoretical and empirical work relating ambivalence and schizophrenia will be discussed as well as the special problems of measuring ambivalence. The third section will develop the relationship between ambivalence and schizophrenic spectrum disorders in the work of Kernberg, Meehl, and Raulin. Finally, we will discuss the future of the concept of ambivalence in schizophrenia and will show how a new paradigm of psychopathology research, connectionist modeling, could explain the existence of a uniquely schizophrenic ambivalence.

EARLY THEORETICAL CONCEPTUALIZATIONS OF AMBIVALENCE

Bleuler's Conceptualization

From a strictly linguistic standpoint, the history of ambivalence began with the creation of the term by Eugen Bleuler (1911/1950). But the experience of ambivalence predates its definition even though there may not have been a term for it. Schizophrenics behaved in much the same way before and after Bleuler coined the terms ambivalence and schizophrenia; Bleuler added terms to highlight and give implicit meaning to the behaviors of these patients. As a theorist, Bleuler worked within the historical context of psychoanalysis, which tended to focus on internal states and conflicts as the driving forces of behavior. Bleuler's ideas were influenced by the writings of Freud and Jung. Thus, it should not be surprising that in his attempts to explain the bizarre behavior of schizophrenics, the internal conflict of emotions known as ambivalence would emerge as a key idea.

Although Bleuler identified ambivalence as a fundamental symptom of schizophrenia, and thus present in all schizophrenics, he argued that the concept of associative slippage was the key to understanding the pathology of schizophrenics. Bleuler identified four fundamental symptoms of schizophrenia, which have come to be known as the "Four As" (association, affect, autism, and ambivalence). Bleuler felt that these four symptoms were near pathognomonic for the disorder. He believed, however, that loosening of associations was the central deficit in schizophrenia, possibly accounting for all the others. Bleuler argued that the mind functioned by making associations among concepts, objects, and situations. The use of these associations enables people to react quickly and appropriately to a variety of situations in everyday life. An associative network of ideas, thoughts, and feelings is built up over a lifetime of experiences, providing the foundation for thought and communication. Bleuler felt that normal communication relied on this tremendous wealth of associative connections to provide structure and organization for communication. Bleuler argued that many of these associative threads are broken in schizophrenics. As a result, the schizophrenic is unable to construct coherent thoughts and communicate them to others. With some critical associative threads broken, the schizophrenic is forced to rely on other, less appropriate associative connections in forming ideas. Consequently, the schizophrenic patient produces bizarre statements characterized by loose and inappropriate associations.

Ambivalence is a natural extension of the concept of loose associations. Whereas Bleuler described ambivalence as fundamental (i.e., present in all schizophrenics), he also argued that ambivalence was secondary, that is, not directly a result of the disease process itself. Rather, ambivalence was a special case of associative slippage. Bleuler argued that everything has two sides. The normal individual is able to compare both the good and the bad of a given object or person, forming an integrated conceptualization. Bleuler (1911/1950, p. 374) used the example of a rose, a beautiful flower that has thorns, to demonstrate ambivalence. He felt that a normal individual would compare the beauty of the rose and the risk of being hurt by a thorn, eventually forming an integrated personal concept of a rose. The person might, for example, appreciate the beauty of a rose despite its thorns, or might conclude that the flower's beauty simply hides the risk associated with handling it. On the other hand, the schizophrenic, suffering from a loosening or breaking of associative connections, may not be able to hold the two pieces of the problem together. "He loves the rose because of its beauty and hates it because of its thorns" (Bleuler, 1911/1950, p. 374). Thus, one way to conceptualize ambivalence is as a breaking of threads of emotionally loaded associations. This results in multiple emotions about a single object coexisting in a single person. Bleuler did note that under some conditions normal people may also fail to integrate positive and negative valences for a given object, but they can achieve such integration in situations that demand it. The schizophrenic may not be able to do so.

Bleuler's concept of ambivalence is unique in that he did not think of it as a unitary construct pertaining exclusively to emotions. Rather, he distinguished three kinds of ambivalence in schizophrenics: affective ambivalence, ambivalence of the will, and intellectual ambivalence. Affective ambivalence is the subtype that has been adopted by later theorists; a single person or concept is the simultaneous object of both positive and negative feelings. For example, a husband can love his wife because she takes care of him but hate her because she reminds him of his mother. Bleuler also described an ambivalence of the will, the desire to do a certain thing accompanied by a desire not to do that thing, exemplified by a patient wanting to go home but not wanting to leave the ward. Probably most instances of ambivalence of the will can be reduced to underlying affective ambivalence toward one or more objects. Additionally, Bleuler talked about an intellectual ambivalence, where an idea appears simultaneously with its counteridea. To illustrate, a patient might answer, "Definitely not," to the question "Do you hear voices?" but then would respond to the follow-up question, "What do they say?" with the remark, "All sorts of things." Today, intellectual ambivalence would likely be classified as one of the thought disorders.

Classical Psychoanalytic Conceptualizations

Not long after Bleuler's book was published, Freud found that the construct of ambivalence was well suited to describe the condition where the opposing life and death instincts both sought fulfillment (cathexis) in the same person. Freud argued that the ego invests energy in an object to appease the desires of the id.

These could be desires to love the object or to destroy the object depending on whether they stem from the life or the death instinct. Occasionally, an object can fulfill both; in sadistic sexuality, the individual's partner serves both the desire to create (sex) and to destroy (beating, etc.). When both instincts react to a single object, the person feels simultaneous but opposite effects toward a single object. For Freud, ambivalence could only be directed at a person.

Freud considered ambivalence to be a normal and expected part of any relationship. Ambivalent conflicts only become pathological when the emotion is intense or the opposing feelings are approximately equal in strength (Holder, 1975). In Freud's (1912/1958) words:

In the curable forms of psychoneurosis it [negative transference] is found side by side with the affectionate transference, often directed simultaneously towards the same person. Bleuler has coined the excellent term "ambivalence" to describe this phenomenon. Up to a point, ambivalence of feeling of this sort seems to be normal; but a high degree of it is certainly a special peculiarity of neurotic people. (pp. 106–107)

Freud's adoption of the term ambivalence to describe a hypothesized normal developmental function shifted the concept of ambivalence away from the original description of a schizophrenic symptom. Bleuler had said that ambivalence was found in normal people, but Freud now said that it was expected, even necessary, that everyone experience ambivalence. This further normalization of ambivalence probably contributed to the lack of research into its role in schizophrenia.

Anna Freud continued her father's work and further specified the role of ambivalence in the development of personality. She said that ambivalence only appears with the development of ego-object awareness. Ego-object awareness is the understanding that external objects exist independent of the self. Before this develops, the individual is not aware that his or her feelings are directed toward a specific object because objects are not differentiated from the self. Therefore, no conflict occurs. However, the ego must contend with opposite feelings toward an object as soon as it has recognized that it is one object. While the ego develops, there is a gradual integration of instinctive strivings. During this process, there is a realization of incompatibility of certain emotions. Thus, the presence of ambivalent conflicts and subsequent guilt feelings presupposes an advanced stage of ego development. The manner in which ambivalence is resolved depends on early object relations (the relationship with the mother in particular). The fusion of ambivalence, an unconscious fusion of separate love and hate feelings into a mature attitude comprising both feelings, is the desired outcome (Tarachow, Friedman, & Korin, 1958; Tarachow, Korin, & Friedman, 1957). An individual is then able to say, "I hate that my mother does this, but I love my mother" instead of "I love my mother, and I hate my mother." For Anna Freud, a principal symptom of unresolved ambivalence is untempered aggression (Freud, 1949). When angered, an individual without fusion of ambivalence cannot retain awareness of love feelings for the object of his or her anger. A complete breakdown of fusion is thought to occur in psychosis, and lesser degrees of disturbance are seen in neurosis.

Since the delineation of the role of ambivalence in development by Sigmund and Anna Freud, much of the focus of psychoanalytic work has been to understand the ways in which the individual attempts to cope with intolerable emotional ambivalence conflicts. For instance, many psychoanalytic theorists link ambivalence to depression. Sigmund Freud suggested that ambivalent object relations are internalized by depressed people. Blatt and Shichman (1983) further argued that ambivalent object relations lead to feelings of guilt and worthlessness and thus to depression. Others (Akhtar & Byrne, 1983; Juni, 1980) argued that ambivalence is a source of anxiety. Rituals, repression, and splitting (see following discussion of Kernberg) are hypothesized defenses against ambivalence (Holder, 1975). In repression, the individual may overcompensate for ambivalent feelings through reaction formation. Splitting may take two forms. Ambivalence may be split by object so that negative feelings for a person that is also loved are displaced onto a second, less threatening object. Alternatively, ambivalence may be split temporally, so that the individual expresses one feeling, then its opposite. Splitting is thought to be the core of narcissistic and borderline pathology (Akhtar & Byrne, 1983).

Meehl's and Kernberg's Conceptualizations

Paul Meehl and Otto Kernberg are two prominent theorists, who speculated about ambivalence and its role in a particular population. However, they disagreed on many things including how to label the population that they studied. As described later in this chapter, both studied a group of subjects once referred to as borderline schizophrenics. Actually, more than a dozen diagnostic labels had been proposed for this group of people thought to be on the border between neurosis and psychosis (Gunderson & Singer, 1975). Meehl was impressed by the increased risk for developing schizophrenia in this group, whereas Kernberg was impressed with how rarely the people deteriorated into psychosis. The theoretical writings of each author influenced the development of two current Axis II conditions: Schizotypal Personality Disorder and Borderline Personality Disorder.

Meehl included ambivalence as one of the core symptoms of schizophrenia in his American Psychological Association presidential address (Meehl, 1962). He adopted Bleuler's perspective by including ambivalence in his list. Like Bleuler, he offered several speculations about how the various primary and secondary symptoms of schizophrenia might be theoretically related. Unlike Bleuler, Meehl focused much of his theoretical attention on the nature of the individual who is at risk for developing schizophrenia. Meehl suggested that there is a genetic predisposing factor for schizophrenia, which he labeled *schizotaxia*. People who inherit this factor develop a particular personality organization that he labeled *schizotypy*. The term *schizotype*, which is short for schizophrenic genotype, was borrowed from Rado (1956). Meehl argued that only a portion of the schizotypes deteriorated to the point of being clinically schizophrenic. Meehl also argued that ambivalence was not only a core symptom of schizophrenia, but also a characteristic of schizotypes (i.e., a premorbid characteristic of schizophrenics and also

a sign of risk for schizophrenia in those individuals who never deteriorate). This model will be discussed more in the section on ambivalence in schizophrenic spectrum disorders.

Kernberg studied a population that was similar to the schizotypes described by Meehl. Kernberg, however, was impressed by how few of these patients deteriorated, although he did note that many of them showed dramatically fluctuating behavior, at times approaching psychosis. He used the phrase "stable instability" to describe this pattern of behavior. Although Meehl and Kernberg define their populations of schizotypes and borderlines differently, there is an almost 50% overlap between the two DSM-III-R Axis II disorders that currently represent these groups (Serban, Conte, & Plutchik, 1987).

Kernberg popularized the concept of splitting, a phenomenon observed frequently in borderline-personality-disordered patients. A patient is said to use the defense of splitting if he or she sees people or objects as all good, all bad, or sometimes all good and sometimes all bad. Kernberg argued that splitting is a primitive defense, which is characteristic of the borderline patient. It is important to realize that Kernberg's definition of splitting is similar to the concept of ambivalence as defined by Bleuler. Both Kernberg's splitting and Bleuler's ambivalence refer to the expression of contradictory feelings about a single object. To confuse matters more, Kernberg uses the term in a psychoanalytic tradition to explain the behavior of splitting (i.e., the individual splits objects when he or she cannot tolerate the feelings of ambivalence). This use of the term ambivalence in different ways by different theorists can easily confuse the casual reader.

Kernberg studied and theorized about a population that at least some people believe are at risk for the development of schizophrenia. Therefore, we have elected to include Kernberg's work in this review and will present his work in more detail in later sections.

Animal Models of Ambivalence

Finally, there is some evidence that ambivalence may be a psychophysiological phenomenon. Roberts (1958) and Olds (1960) found that both escape and self-stimulation behaviors can be learned when electrical stimulation is applied to certain areas of the medial hypothalamus. St. Laurent (1988) extended these observations by studying the self-stimulation behavior of rats with implanted electrodes at 18 different brain sites. Strong evidence of ambivalent behavior (i.e., a mixture of approach and avoidance of the self-stimulation) was obtained for 4 of the 18 sites. In addition, other sites showed less clearly defined ambivalent behavior. Even stimulation of the locus ceruleus, a structure normally associated with flight and implicated in panic disorders (Gorman, Liebowitz, Fyer, & Stein, 1989), eventually produced ambivalentlike, approach-avoidance behavior after prolonged stimulation. These findings suggest that electrical stimulation of several regions of the brain may produce ambivalent behavior in animals, and thus would be a good animal analogue of ambivalence. The presence of such brain

regions suggests the possibility that excessive ambivalence may have a biological etiology.

AMBIVALENCE IN SCHIZOPHRENIA

The role of the concept of ambivalence in describing and explaining schizophrenic pathology has diminished in recent times. The normalization of the concept of ambivalence has probably had a role in this. Perhaps the largest factor in the dissociation of ambivalence and schizophrenia, however, was its omission by Schneider (1959) when he developed his theory of first-rank symptoms. Schneider's work refocused theorists on the question of exactly what were the critical parts of the schizophrenic syndrome. For Schneider, at least, ambivalence was not a critical element. Lately, there has been growing dissatisfaction with the Schneiderian first-rank symptom classification (Kety, 1985). The relationship between ambivalence and theoretically psychosis-prone individuals suggests that there might be utility in resurrecting the concept of schizophrenic ambivalence.

Problems in Measuring Ambivalence

Other reasons for the dissociation of ambivalence and schizophrenia may have stemmed from the special problems that measuring ambivalence presents to researchers. One problem is the issue of how to measure ambivalence (Andreasen & Akiskal, 1983). Clinicians often assess psychopathology by using a self-report measure such as the Beck Depression Inventory (BDI). The implicit assumption in the use of the BDI is that the person is aware of the problem of his or her increased dysphoria. It is not clear, however, to what extent ambivalent persons are aware of their ambivalence. The intense ambivalence of schizophrenia seems to suggest a lack of awareness of the ambivalence; the schizophrenic expresses such contradictory feelings about a single object that most people would think that two objects were being discussed (Bleuler, 1911/1950). It is not clear whether the schizophrenic realizes that his or her contradictory feelings are attached to the same object. An alternative explanation is that the schizophrenic does realize that the same object is involved but does not realize that the feelings are contradictory. In either case, self-report measures could not be relied on to detect ambivalence. Further, Minkowich, Weingarten, and Blum (1966) note the danger of relying on a face-valid assessment technique, such as self-report, for a concept that theoretically should be affected by "dynamic unconscious and defense forces."

Instead of a self-report, a behavioral measure could be used to rate ambivalence. A behavioral measure would not require subjects to be aware of their ambivalence. A behavioral measure, however, makes the assumption that the internal conflict will be manifested as behavior. One problem is that there do not seem to be any behaviors that are unambiguously ambivalent. For example, you may see someone grab a piece of cheesecake at a luncheon counter and then immediately

return it to the display, apparently torn in a conflict between desire and guilt over the calories. The possibility exists, however, that this person was not ambivalent, but rather confused, disoriented, or distracted. Actions may lead us to infer ambivalent feelings because of our own experience with similar situations, but there is no guarantee that an alternative explanation is not more accurate. If we had used a different example, such as a person walking into a room, stopping, looking around, apparently indecisive, then walking out, we would tend to infer that the person simply forgot what he or she wanted to do in that room rather than was ambivalent about entering. Thus, behaviors that might appear to be ambivalent may be the result of other internal states. Our interpretation of these behaviors often depends on our own experiences in similar situations. Also, self-regulating mechanisms such as striving for consistency, could mask ambivalence by maintaining consistent behavior, again making it hard to measure.

A second problem in the behavioral measurement of ambivalence is the question of time. It is not possible linguistically to state contradictory feelings simultaneously, although they may be felt that way. Since we typically cannot express contradictory feelings simultaneously, measuring ambivalence behaviorally requires the analysis of emotions expressed over a block of time. This presents several new problems. First, the investigator cannot tell whether the emotions coexist or are simply fluctuating rapidly. In forming an operational definition, it is not clear at what point an observed fluctuation of emotion should be termed ambivalence and not simply a normal change in emotional state. Consequently, the researcher must define the maximum time interval in which emotions need to change before the fluctuation is termed ambivalence.

Approaches to the Measurement of Schizophrenic Ambivalence

The Intense Ambivalence Scale

Raulin (1984) developed a self-report measure of intense ambivalence based on Meehl's description of the construct. This work represents the most comprehensive study to date of schizophrenic ambivalence. Meehl (1962, 1964) had listed intense ambivalence as one of several behavioral indications of an underlying schizotaxia (i.e., genetic risk for schizophrenia). The description of ambivalence by Meehl (1964) seemed to suggest that schizotypes would be aware of their ambivalence. Therefore, a self-report measure seemed possible and much easier to accomplish than a behavioral measure. You might remember that Bleuler seemed to suggest that schizophrenics may not be aware of their ambivalence. Therefore, it was an open empirical question whether a self-report measure would be effective in measuring schizophrenic ambivalence. The original Intense Ambivalence Scale included 45 true/false items and was constructed to have high internal consistency reliability and minimal interference from response set biases such as social desirability and acquiescence. Effort was made in the development process to select items that would be applicable for both men and women, so that a single scale could be used. Because Meehl had emphasized the importance of not rating

the ambivalence as present and a sign of schizotypy unless it was intense, the scale-development process included another criterion to guarantee that the characteristics being measured were unusually strong, and therefore, relatively rare. Any item that was endorsed excessively (by more than 30% of the population) was assumed to be measuring a normal ambivalence and was automatically rejected. Many items had endorsement frequency much lower than 30% in a normal control sample. Even armed with the detailed description of intense ambivalence provided by Meehl, most of the initial items written had to be rejected because of high endorsement frequencies. It took considerable training to get item-writers to write items strong enough to tap the intense and relatively rare experience described by Meehl. After item statistics had been computed for a given sample and revisions to the scale made based on those item statistics, the procedure was repeated with a new sample on the revised scale. This process was continued until the scale showed satisfactory psychometric characteristics. Almost a thousand subjects were tested during this development phase and over 2500 subjects were tested as part of two cross-validation samples.

The efforts described in the previous paragraph to produce a high-quality psychometric measure of intense ambivalence appeared to be fruitful based on the initial validation data. Internal consistency reliabilities in the high .80s were reported for both men and women. Method variance was kept to a minimum. Social desirability accounted for only 9% of the variance, whereas acquiescence accounted for 6% of the variance. All these figures are based on cross-validation samples with very large sample sizes.

An interview study with college students selected on the basis of their scores on the Intense Ambivalence Scale provided support for the contention that the scale measured characteristics related to behavior. Seventy-two subjects were interviewed. Approximately half were high scorers and the other half scored in the normal range. The interviewer was blind to the Ambivalence Scale scores of the subjects during both the interview and later scoring. A carefully constructed structured interview was used. Subjects were questioned about their home and living situations, as well as relationships with roommates, friends, parents, and the opposite sex. The ordering of the questions was designed to permit the subject several opportunities to express feelings about a given social object. The expectation was that the intensely ambivalent individual would be more likely to report conflicting or contradictory feelings during these multiple opportunities to discuss their feelings. A content analysis of the interview transcripts confirmed this expectation. The subjects who scored high on the Intense Ambivalence Scale contradicted themselves during this brief interview more than twice as frequently as the control subjects. Ambivalence subjects contradicted themselves regarding their feelings approximately six times in the 20-minute interview. There was no difference between the groups on contradictions involving material other than feelings. This second measure (contradictions not involving feelings) was included as a control for possible cognitive slippage in the subjects; Carpenter (1983) later confirmed the lack of association between ambivalence and thought disorder. We also counted the number of times that subjects spontaneously described themselves

as ambivalent, changeable, or moody. Control subjects rarely used such terms to describe themselves, whereas the ambivalent subjects used such descriptive terms fairly frequently ($M = .71$). These descriptions of themselves as ambivalent were truly spontaneous in that no specific questions were designed to illicit such information and subjects were unaware that they had been selected on the basis of their Ambivalence Scale scores.

The first test of the Intense Ambivalence Scale with psychiatric groups included groups of schizophrenic patients, psychotically depressed patients, clients receiving outpatient psychotherapy, and a normal control sample. As much as possible, the comparison samples were selected to be similar in age, education, and social class to the schizophrenic sample. The prediction was that the schizophrenics would score the highest on the Intense Ambivalence Scale, but both the depressed and clinic samples should show some elevation on this scale relative to the control subjects. The rationale for the second part of this hypothesis was that a portion of the depressed patients and clinic clients would be schizotypic, and would therefore show this sign (ambivalence) of an underlying schizophrenic diathesis. The data fit this hypothesis perfectly, with one major glaring exception: The depressed patients were considerably more ambivalent than the schizophrenic patients. Table 7.1 summarizes the findings. Secondary analyses suggested that chronicity may have caused part of the difference between depressed and schizophrenic patients. We found empirically that the more chronic the disorder, the less ambivalent the subjects were. The depressed sample was much less chronic than the schizophrenic sample. Still, the data seriously questioned the Intense Ambivalence Scale as a measure of schizophrenic ambivalence.

The difference between the schizophrenic and normal control samples, although highly significant, represents a mean difference of less than one standard deviation. There was considerable overlap between the distributions. Less than a quarter of the schizophrenics were clearly more ambivalent than the controls, operationally defined as scoring two standard deviations or more above the normal control mean. Most of the schizophrenics showed no sign of increased ambivalence, as measured by this scale, relative to the control subjects. This finding contradicts Bleuler (1911/1950), who had listed ambivalence as a fundamental symptom of schizophrenia—a symptom presumably present in all schizophrenics.

TABLE 7.1. Mean Age, Education, Social Class, and Intense Ambivalence Scale Scores in Three Patient Groups and a Normal Control Sample

	Schizophrenics	Depressed Patients	Clinic Clients	Normal Controls
Sample size	85	30	192	139
Age	35.6	35.5	27.1	31.3
Education	12.1	13.2	14.5	13.2
Social class	49.5	47.9	—	43.4
Ambivalence scores	16.2	21.8	13.9	10.8

Note: Social class was computed using the Hollingshead (1957) two-factor index. Data taken from Raulin (1984).

Although it is possible that this self-report scale is not the best measure of schizophrenic ambivalence, these results cast doubt on the contention that ambivalence is found in all schizophrenics.

After publication of these data, some additional analyses were run and a new ambivalence scale was developed. By looking at the relative discrimination of each item for schizophrenic and depressed patients, Raulin (1986) was able to identify a subset of items on the Intense Ambivalence Scale that accurately measured the ambivalence reported by his schizophrenic sample. He was also able to identify another, somewhat larger subset of items that discriminated the depressed subjects more effectively. A content analysis of these two sets of items revealed some clear differences. The items that discriminated the ambivalence that was distinctive to schizophrenia had a matter-of-fact quality and seemed to emphasize either the simultaneous experience of contradictory emotions or the almost random change of emotions back and forth across time. A typical question was "Love and hate tend to go together." In contrast, the items that discriminated the depressed subjects had a strong emotional tone and typically described feelings that were changing from the positive to the negative. A typical question was, "I can think of someone right now that I thought I could trust, but now I know I can't." On the basis of this analysis, Raulin (1986) created a second ambivalence scale, termed the Schizotypal Ambivalence Scale to distinguish it from the original Intense Ambivalence Scale. This scale included the subset of items that had been found to discriminate schizophrenics from both normals and depressed patients. In addition, several new items were written with the same emotional and structural content as these discriminating items.

The experience with the Intense Ambivalence Scale is yet another example of the issue that was raised earlier in this chapter. The concept of ambivalence, in part because of the influence of psychodynamic writers and the incorporation of ambivalence into our popular literature, has taken on a popular meaning for most people quite different from that intended by Bleuler. This was reflected first in the difficulty that item-writers experienced in wording items strongly enough to capture a relatively unusual level of ambivalence presumed to be characteristic of schizophrenics and schizotypes. This is further reflected in the tendency to produce items that tapped the ambivalence characteristic of depression, rather than the ambivalence characteristic of schizophrenia. The item analyses done after the publication of the scale suggest that, even though we use the same term to describe the experience of both the schizophrenics and depressed patients, the psychological experience of ambivalence is different in these two groups, and apparently this difference can be measured psychometrically.

Carpenter (1983) investigated the relationship between three scales of schizotypal signs, including the Intense Ambivalence Scale, and the variables of premorbid social adjustment and level of thought disorder as measured by proverb interpretation in a chronic schizophrenic population. Although premorbid adjustment was strongly related to the level of thought disorder shown by these patients, the Intense Ambivalence Scale was unrelated to both premorbid adjustment and the level of thought disorder. This finding is consistent with the earlier behavioral

study (Raulin, 1984) of college students who scored high on the Intense Ambivalence Scale. The ambivalent students in this earlier study showed no increase in thought disorder relative to the control subjects.

Other Approaches to Measuring Schizophrenic Ambivalence

There are a few other studies of ambivalence in schizophrenia. These other studies represent a variety of theoretical perspectives and, as a consequence, use a variety of techniques to measure the construct of ambivalence.

Izard (1959) used a behavioral approach to measuring ambivalence. He had paranoid schizophrenics rate a pool of photographs on their impressions of the person shown. Ambivalence was scored by noting inconsistencies in the verbal description provided by the patient. He found that the patients gave significantly more inconsistent (ambivalent) descriptions of the photographs than the control subjects.

Knight, Reznikoff, and Tolor (1966) tested 39 newly admitted schizophrenic patients using three different measures of ambivalence: (a) a procedure similar to Izard (1959) except that TAT cards were used instead of photographs; (b) a variation of the semantic differential; and (c) a structured questionnaire (Tarachow et al., 1957, 1958). They also retested each patient after 13 weeks of hospitalization. They found modest-to-good stability in their three measures (test-retest reliability ranging from .51 to .75), but surprisingly, they found that these three measures were unrelated to one another at both the initial testing and the retesting. There was no nonschizophrenic comparison sample in this study.

Walters and Solomon (1982) indirectly studied ambivalence in schizophrenia in their investigation of the correlates of the "Scarlett O'Hara V" 4-5-6 MMPI profile in female psychiatric patients. This pattern is characterized by high *T*-scores on Scales 4 (psychopathic deviance) and 6 (paranoia) and a low *T*-score on Scale 5 (male/female). They had hypothesized that this pattern would be associated with ambivalent behavior. Their measure of ambivalence was based on a coding of chart records (it is not clear from the report if the coding was done blind). They found that evidence of ambivalent behavior was more prevalent in the charts of women with the Scarlett O'Hara V pattern compared with a control group of patients without the pattern. However, on a closer inspection of their profiles, they found that most of the effect was contributed by a small subgroup of subjects who showed a 2-8/8-2 high point pair superimposed on the 4-5-6. (Scale 2 is depression; Scale 8 is schizophrenia.) A 2-8/8-2 superimposed on a 4-5-6 Scarlett O'Hara V would produce a profile with elevations on Scales 2, 4, 6, and 8. Most of the high-point variations of these four scales produce schizophrenic profiles. For example, Marks, Seeman, and Haller (1974) report that 68% of 8-6 profiles are from psychotic patients (mostly paranoid schizophrenics), 71% of 8-4-2 profiles are from psychotic patients (again, mostly paranoid schizophrenics), and 70% of 8-2 profiles are from psychotic patients (either schizophrenics or schizoaffective patients). Therefore, the Walters and Solomon (1982) data actually suggest that strong ambivalence is more characteristic of schizophrenia than the personality pattern tapped by the Scarlett O'Hara V.

Chu, Sallach, Zakeria, and Klein (1985) studied racial differences in schizophrenic symptomatology, including schizophrenic ambivalence. They found some interesting racial and sexual differences in the level of ambivalence shown by schizophrenic patients. For example, they found that black female schizophrenics showed more ambivalence than white female schizophrenics, but that a similar racial difference was not apparent in the male patients. There was no comparison with nonschizophrenic controls, and the measure of ambivalence was not specified in this brief report. The measure apparently was based on data extracted by the researchers from clinical records and routinely conducted structured interviews.

Minkowich et al. (1966) studied ambivalence from a psychoanalytic perspective in both college students and chronic schizophrenics. Their measure of ambivalence was based on differences in ratings of key figures given by the subject in two testings a week apart or by contradictions in ratings given during the initial testing. They were not interested in ambivalence as a unitary construct, as was true with the preceding studies. Rather, they attempted to measure ambivalence toward each potential object (e.g., mother, father). Unfortunately, their findings are impossible to interpret because they relied heavily on a factor analysis with a sample size much too small to produce stable results.

Other promising approaches to the measurement of schizophrenic ambivalence were never applied to a schizophrenic population. For example, Kaplan (1972) suggested separating the two poles of a typical semantic differential scale. Normally, a subject would rate the target on a bipolar scale, as follows:

_____	_____	_____	_____	_____	_____	_____
(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)
Bad						Good

Kaplan argued that a score of zero on such a scale could represent either indifference or a combination of strong but opposite feelings (ambivalence). By requiring subjects to provide independent ratings of each target on both the positive and negative poles of a normally bipolar scale, the investigator could differentiate indifference (consistently near-zero ratings on both poles) from ambivalence (consistently large ratings on both poles). This strategy for measuring ambivalence is similar to the rating approach of Minkowich et al. (1966) and the behavioral measure used by Raulin (1984) in the initial validation of the Intense Ambivalence Scale. However, Kaplan's strategy is much simpler to carry out.

Summary

Looking at the pattern of results from all the studies on ambivalence in schizophrenia, the researcher is hard pressed to draw strong conclusions. Schizophrenics show a variety of behaviors, including self-report behavior, that seem to suggest they are on average more ambivalent than nonschizophrenics. However, the one study that included a direct comparison with other patient groups (Raulin, 1984) found that depressed patients were more ambivalent than the schizophrenics. Post hoc analyses of the data suggested that there may be a

unique schizophrenic ambivalence, although cross-validation of this finding has yet to be done. Furthermore, Knight et al. (1966) showed that there was no relationship between three commonly used measures of ambivalence. What these studies point out most clearly is that schizophrenic ambivalence, if it does exist, is elusive, and it will require considerable effort to find the most appropriate measure.

AMBIVALENCE IN SCHIZOPHRENIC SPECTRUM DISORDERS

Although little recent work on schizophrenia and ambivalence has been done, there is relevant research and theory on ambivalence and schizophrenia-related psychopathology. As discussed earlier in this chapter, ambivalence is a central construct in many psychoanalytic formulations—including theories of psychopathology. Another line of research is focused on ambivalence in schizophrenic spectrum disorders. The concept of schizophrenic spectrum disorders was popularized in the work on the Danish Adoption Studies (cf. Kety, Rosenthal, Wender, & Schulsinger, 1968). Spectrum disorders include both schizophrenia and schizophrenialike disturbances. Meehl's concept of schizotypy and the DSM-III-R schizotypal personality disorder would be included in the spectrum disorders. Even many of Kernberg's borderlines would likely qualify for a spectrum disorder diagnosis, although Kernberg himself might disagree with such a classification. The massive overlap of borderline and schizotypal diagnoses (Serban et al., 1987) suggests that at least some of the DSM-III-R borderlines fall within the schizophrenic spectrum. Thus, we turn now to a more in-depth discussion of the work of Kernberg and Meehl on ambivalence in schizophrenic spectrum disorders.

Kernberg, Splitting, and Borderline Personality Disorder

As the concept of ambivalence evolved, its meaning was gradually changed by successive theorists. Bleuler argued that ambivalence was a specific pathological process that was a fundamental characteristic of schizophrenia. Later psychodynamic theorists referred to ambivalence as an internal feeling state, which may or may not relate to specific behavior. This psychodynamic conceptualization has become part of our colloquial usage of the term ambivalence. Thus, when Kernberg began to study ambivalence and ambivalencelike phenomena in a group once known as borderline schizophrenics, he found the need to adopt a different term and selected the word *splitting*. The concept of splitting itself has a long history, with the term taking on many different meanings over the years (see following discussion). Although "splitting" (as defined by Kernberg) and "ambivalence" (as defined by Bleuler) are not interchangeable, they refer to roughly the same phenomenon—the production and acting out of simultaneous or rapidly fluctuating opposite emotions toward a single person or object. Just as the concept of ambivalence is related to splitting, the concept of borderline personality is related to the concept of schizotypal personality and both in turn to schizophrenia. There is

considerable confusion in the literature about the precise meaning of these terms, in part because the terms have meant different things at different times. We will begin this section by tracing the history of these concepts in an attempt to clear up some of the confusion.

History of the Term Borderline

Initially, *borderline* used to refer to a condition thought to be on the border between neurosis and psychosis. Terms such as borderline schizophrenia, latent schizophrenia, or pseudoneurotic schizophrenia were used to describe a group of individuals whose pathology appeared to be beyond typical neurosis but not psychotic (see Gunderson & Singer, 1975). In the 1950s, 1960s, and early 1970s, dozens of theorists proposed names for this group of patients, as well as diagnostic criteria. The proliferation of labels and the lack of agreement on diagnostic criteria make this literature almost impossible to interpret. It was never clear whether two researchers were referring to the same patients or whether the investigator could safely generalize findings from one group of borderline patients to another.

The persuasive writing of Kernberg (1967, 1977) and Meehl (1962, 1964) gradually led to a distinction between two subcategories in the group previously labeled borderline schizophrenia: Kernberg's borderlines and Meehl's schizotypes. These subcategories are formalized in the DSM-III-R Axis II diagnoses of Borderline Personality Disorder and Schizotypal Personality Disorder, respectively. What makes the choice of these diagnostic labels particularly confusing is that Meehl's Schizotypal Personality Disorder is closer to the original intended meaning of borderline than Kernberg's Borderline Personality Disorder. Thus, most of the early research on borderlines from the 1950s and 1960s likely included a mixed group of patients closer in composition to what we now call Schizotypal Personality Disorder. Furthermore, in spite of the effort to discriminate separate groups from the group originally dubbed borderline schizophrenics, the research shows that there is considerable overlap of these categories (Serban et al., 1987).

History of the Term Splitting

As with borderline, the term splitting has been used by different theorists to mean some very different things. Many psychoanalytic theorists use the term splitting. The concept was used by Freud (Breuer & Freud, 1895/1955) to describe a failure to integrate all aspects of the ego. More specifically, Freud argued that a portion of the ego could be deliberately split off from consciousness. Freud's usage was more in line with what today we would call repression. Bleuler also used the term splitting to describe the fragmentation of thoughts as a result of the breaking of association threads in schizophrenics. Although Bleuler never used the term in reference to ambivalence, he argued that the fragmentation of thoughts in schizophrenics is the basis for the symptom of ambivalence.

Fairbairn (1944) later expanded the concept of splitting into its present form, describing an active defense mechanism that preserves the positive aspects of

an image separate from the negative to minimize anxiety. Fairbairn argued that the ego's splitting of ambivalent feelings was a natural part of the maturation of the ego. Thus, Fairbairn's definition of splitting is very close to our modern sense of the term. For Fairbairn, however, splitting was a normal, not pathological, defense. Kernberg (1967, 1977) used Fairbairn's idea of splitting but considered it to be pathological. Kernberg (1967) argued that splitting was the primary symptom of borderline personality disorder.

Ambivalence, or Splitting, in Borderlines

The concept that is closest to Bleuler's original definition of ambivalence (i.e., splitting) is associated with the subgroup (Kernberg's borderlines) of borderline schizophrenics thought to not be at risk for schizophrenia. Kernberg was interested in more than just describing a group of patients with a history of volatile and unstable relationships. He wanted to explain how such a pattern could develop. His speculative etiological formulations (cf. Kernberg, 1967) were primarily psychodynamic. Even his suggested assessment strategies (cf. Kernberg, 1977) had a strong dynamic flavor. Although little in his writing would preclude the possibility of a genetic diathesis, such a diathesis was not a major focus for Kernberg.

According to Kernberg, one essential task in the development of the ego is the integration of new introjections and identifications with previous ones into a stable ego identity. Introjections and identifications are first developed separately, primarily because the child lacks the integrative capacity. There is a division between good and bad internal objects and positive and negative introjections. Later, there may be a division, not because of a lack of integrative capacity, but because of a defensive process. The purpose of this defense is to prevent the generalization of anxiety and to protect the part of the ego that is committed to the positive introjections. This is the mechanism of splitting. Normally it is used only in the early stages of ego development (the first year of life) and is replaced by higher level defenses. Splitting protects the ego from conflict by dissociating introjections and identifications that are incompatible.

Kernberg theorizes that the development of psychosis and borderline personality disorder involves a vicious cycle of projecting aggression and reintrojecting aggressively determined self and object images. He suggests that in psychosis the result is a regression to earlier levels and a new fusion of self and object images in which the patient cannot differentiate self from object. In borderline personality, the consequence is an intensification and fixation of the splitting process. So, although self is differentiated from object, good self and bad self are never integrated. The resulting behavior looks very similar to Bleuler's ambivalence. Kernberg, however, seems to argue that the splitting is a defensive maneuver, which if performed correctly, could minimize the chance of psychosis. Kernberg argues that these patients show a stable instability. The splitting creates the unstable interpersonal lives but stabilizes the internal psyche. To the best of our knowledge, Kernberg never invoked Bleuler's concept of the breaking of associative threads as the underlying factor necessitating the defense of splitting. However, it is easy to imagine that such a process forms the

driving force for at least some of the borderline patients (i.e., those with a genetic diathesis for schizophrenia). If the researcher accepts this speculation, then the concept of splitting, which is very close to Bleuler's ambivalence, is transformed from being a symptom of schizophrenia to being a defense against the emotional consequences of a subclinical schizophrenic deterioration. This is only speculative theorizing at this point, but it does suggest some interesting reinterpretations of a symptom long associated with schizophrenia.

Research suggests that DSM-III Borderline Personality Disorder patients may be at risk for psychosis, but primarily affective psychoses. Pope, Jonas, Hudson, Cohen, and Gunderson (1983) found that half of their sample of borderlines had either major depression or bipolar disorder. This would certainly suggest that the splitting of the borderlines is not particularly predictive of risk for schizophrenia, but rather seems to predict risk for affective psychosis.

Meehl and Schizotypy

Meehl's (1962) diathesis-stress model of schizophrenia hypothesizes that it is possible to identify individuals at risk for the development of schizophrenia. Meehl (1964) suggests that these at-risk individuals (schizotypes) can be identified by the presence of certain behavioral traits. One of the traits suggested by Meehl is intense ambivalence. Meehl argued that clinicians' mental status ratings of traits such as anhedonia, ambivalence, cognitive slippage, and interpersonal aversiveness should be objectified to permit systematic study of these symptoms and their hypothesized relationship to risk for schizophrenia. He even suggested in a technical report (Meehl, 1964) that a psychometric measure might be ideal. Meehl provided detailed descriptions of these and other diagnostic signs of this hypothesized risk for schizophrenia. He referred to this list as his Checklist of Schizotypic Signs (Meehl, 1964). Meehl's definition of ambivalence was similar to Bleuler's original description but used the adjective *intense* to distinguish the condition from "normal" ambivalence. Meehl had selected the symptoms for his checklist and developed descriptions for each of them based on a variety of data, but he also drew heavily from his own clinical practice over a 10-year period. Meehl warned in the Checklist Manual's introduction that rating patients on these symptoms requires considerable contact with the patient.

Drawing on Meehl's work, Loren and Jean Chapman, along with their students, developed self-report psychometric measures for many of Meehl's schizotypic signs. These represented one of the first attempts to scientifically validate the concept of schizotypy and to investigate the validity of Meehl's proposed signs. The development of the Intense Ambivalence Scale and its refinement into the Schizotypal Ambivalence Scale was discussed in detail earlier in this chapter. Chapman, Chapman, Raulin, and Edell (1978) proposed using these scales of schizotypic signs in a behavioral high-risk paradigm. Normal subjects who scored high on one or more of these scales are designated schizotypes and are compared in their performance on laboratory tasks with subjects who score in the normal range (controls). In the next section, we will review the available research using

the behavioral high-risk paradigm with subjects who score high on the Intense Ambivalence Scale and the Schizotypal Ambivalence Scale.

Empirical Research on Ambivalence in Spectrum Disorders

Raulin (1984) found that subjects who scored high on the Intense Ambivalence Scale described contradictory feelings in a structured interview more frequently than control subjects. Friedland, Raulin, and Rourke (1984) wanted to see what other clinical differences might differentiate ambivalent subjects from controls. They used a detailed structured interview to probe for social functioning, distractibility, interpersonal relationships, academic interests and concerns, and familial relationships. In addition, several of Meehl's schizotypic signs (cognitive slippage, different-from-others feeling, distrust, pan anxiety, and rage) were evaluated in the interview. Finally, the section of the SADS-L (*Schedule for Affective Disorders and Schizophrenia—Lifetime Version*; Spitzer & Endicott, 1977) that dealt with psychotic experiences was included. Forty-two college students (20 ambivalent subjects and 22 controls) were interviewed blindly, with ratings made from the interviews on each of the items described earlier by a rater who was also blind to the subjects' ambivalence scores. The ambivalent subjects reported significantly more cognitive slippage, distractibility, anxiety, different-from-others feeling, distrust, and disruption of family relationships. They also reported more disruptions in some areas of social functioning, but not all areas. There was little evidence of academic dysfunction, deviant body experiences, or anger dyscontrol. There was a tendency to report experiencing more psychotic or psychotictlike experiences, but the only variable that reached statistical significance was voice experiences.

Test-retest data suggest that ambivalence is a stable trait in both normal and schizophrenic populations. Raulin (1984) found a test-retest reliability in college students of .81 over a period of 10 to 12 weeks for the Intense Ambivalence Scale. Mahler, Raulin, O'Gorman, Furash, and Lowrie (1989) reported comparable test-retest reliabilities over periods up to one year in a chronic schizophrenic sample. The one-year reliability was .78 for the Intense Ambivalence Scale and .88 for the Schizotypal Ambivalence Scale.

A series of studies looked at other clinical aspects of the subjects who scored high on the Intense Ambivalence Scale. Raulin, Van Slyck, and Rourke (1983) found that the MMPI profiles for college students who scored high on the Intense Ambivalence Scale showed large elevations on Scales 2 (depression), 6 (paranoia), 7 (psychasthenia), 8 (schizophrenia), and 9 (mania) relative to controls. The elevations were particularly pronounced for the male subjects, who showed a mean *T*-score of 85 on Scale 8 (schizophrenia). DePalma and Raulin (1982) found that ambivalent students (defined by the Intense Ambivalence Scale) actually performed better than controls on certain subtests of a perceptual processing task (feature-specific inhibition; Santee & Egeth, 1980). They interpreted these findings to mean that the ambivalent subjects are better able and more likely to process perceptual material in parallel, which gave them an advantage in this

simplified laboratory task. DePalma and Raulin, however, hypothesized that this same tendency would be counterproductive in the more complex perceptual environment of the real world. They also noted that an inability to focus attention on a single stimulus object is a commonly reported symptom in acute schizophrenia (McGhie & Chapman, 1961) and that their ambivalent subjects seemed to be naturally predisposed to divide their attention between perceptual objects. Raulin and Henderson (1987) found that ambivalent students were less likely to share a common semantic network of trait relationships than controls. Levin and Raulin (1991) found that ambivalent subjects reported more frequent and more intense nightmares than controls, but that this effect was much stronger for women than men. Even though the Intense Ambivalence Scale identifies subjects from the general population who show some interesting clinical characteristics, it could not discriminate schizophrenics from hospitalized alcoholics or psychotically depressed patients (Trigoboff, Raulin, Watson, Henderson, & Propper, 1987). Finally, Propper et al. (1987) did a factor analysis of 10 schizotypy scales in a mixed psychiatric sample of 155 patients. They found that Schizotypal Ambivalence, but not Intense Ambivalence, loads on a factor that includes the Perceptual Aberration, Somatic Symptoms, Magical Ideation, Cognitive Slippage, and Social Fear Scales. Unfortunately, follow-up data on risk for schizophrenia are not available for either the Intense Ambivalence or the Schizotypal Ambivalence Scale.

These data taken as a whole are consistent with Meehl's hypothesis that ambivalence is characteristic of individuals at risk for schizophrenia but are not sufficient to support that contention. Furthermore, there is some indication that the trait of ambivalence may indicate risk for psychopathology in general, rather than a specific risk for schizophrenia. For example, the Intense Ambivalence Scale could not discriminate schizophrenics from other psychiatric patients (Raulin, 1984; Trigoboff et al., 1987), although comparable data are not available for the Schizotypal Ambivalence Scale. The Chapmans switched from using the term schizotypic to using the term *psychosis-prone* to describe the people with high scores on one or more of the scales of schizotypic signs. The Chapmans apparently were persuaded by their data that the measures of schizotypic signs may indicate general risk for serious psychopathology, but not necessarily specific risk for schizophrenia. Since data show that the ambivalencelike phenomenon of splitting as found in Borderline Personality Disorders may be more predictive of affective disorders than schizophrenia, investigators should be cautious about concluding that ambivalence is a uniquely schizophrenic phenomenon.

DIRECTIONS FOR FUTURE RESEARCH

A Shift in Theoretical Focus

Bleuler included ambivalence as one of the four primary symptoms of schizophrenia, yet it is rarely mentioned in discussions of schizophrenia today. What has happened to the concept? One possibility is that Bleuler was wrong and that

ambivalence as he defined it is not an integral part of schizophrenia. Ambivalence then might have rightfully disappeared as a clinical concern. A second possibility is that today's medications mask the symptoms of ambivalence. If so, the concept may still be central, even while the manifestations of ambivalence in schizophrenic patients are no longer as obvious. A third possibility is that schizophrenic ambivalence exists and is just as relevant as ever but has been lost as a meaningful construct. The shift in theoretical focus from Bleuler to Schneider may have reduced the salience of ambivalence for both clinicians and theorists. Further, the proliferation of conceptualizations of ambivalence makes it difficult for the casual reader to appreciate the significance of Bleuler's original observations of schizophrenic ambivalence.

For most of us, it is hard to imagine the patients that Bleuler studied and speculated about because we have rarely, if ever, seen such patients. When Bleuler was working with his patients, medication was nonexistent and schizophrenic ambivalence, as well as other psychotic symptoms, was likely much more dramatic than that seen in the medicated patients on today's wards. Bleuler probably based his conceptualization of ambivalence on both the introspective reports and the observed behavior of his patients. Ambivalence might well have been inferred from a variety of behaviors that we currently classify under different categories. A patient expressing very strong positive feelings about a person and moments later expressing equally strong negative feelings would seem to be ambivalent. However, many clinicians today, and even some theorists, might classify such behavior as thought disorder.

Is there a role for ambivalence in the future of schizophrenia? The answer depends on how the researcher interprets the question. There is almost universal agreement that a biopsychosocial diathesis-stress model provides the best explanation for the complex disorder of schizophrenia (Meehl, 1990). The role of ambivalence in such a model is not at all clear. Ambivalence is unlikely to be a direct causal factor in schizophrenia, although it could conceivably be a contributing factor by either increasing or decreasing a person's anxiety level. Schizophrenic ambivalence may be nothing more than a variation of schizophrenic thought disturbance, given a separate label only because of our strong tendency to differentiate thoughts from feelings. Meehl (1990) argues that the underlying biological component of schizophrenia must be a diffuse phenomenon, affecting many parts of the brain's functioning. Only such a diffuse phenomenon would explain the peculiar collection of symptoms that characterize schizophrenia. It is not likely that such a mechanism would discriminate neuromechanisms generating thoughts from those generating feelings. Ambivalence may well be a relevant part of the symptom picture for only a portion of schizophrenics. As such, it might well have relevance for nosology, diagnosis, and treatment. Finally, ambivalence may be better conceptualized as a reactive symptom in that it is a psychological response to a gradual, and probably very distressing, cognitive and emotional deterioration. Under certain conditions, such a psychological strategy may actually be protective in that it may defend against what would otherwise be overwhelming phylactic in that it may defend against what would otherwise be overwhelming

anxiety. Kernberg makes this argument for his concept of splitting in Borderline Personality Disorder patients.

Refinement of our measurement techniques is surely necessary before the relation between ambivalence and schizophrenia can be firmly established. The Schizotypal Ambivalence Scale (Raulin, 1986), a refinement of the original Intense Ambivalence Scale (Raulin, 1984), is the most promising move to date in this direction. Another method of measuring ambivalence, which was discussed earlier in this chapter, may hold promise. That method, proposed by Kaplan (1972), measures ambivalence by modifying the common seven-point bipolar Likert scaling technique. There are two potential advantages to this method. First, this method may allow us to measure ambivalence even if the subject is unaware of his or her ambivalence. Second, ambivalence can be assessed at the same time as content dimensions. A problem with this technique is that it may not differentiate schizophrenic from other forms of ambivalence, which has already proven to be problematic in the Intense Ambivalence Scale (Raulin, 1984). This technique has not yet been put to use in a clinical domain, so whether it will have utility remains an open question. When the technique has been used, it clearly differentiated attitude change from attitude oscillation (Kaplan, Firestone, Degnore, & Moore, 1974). Measured in this way, ambivalence has also been shown to be a moderator variable in the measurement of other constructs, such as the Attitude Towards any Practice Scale (Moore, 1980) and alcoholism assessment (Costello, Rice, & Schoenfield, 1974).

Connectionist Models of Schizophrenic Ambivalence

There is a paradigm in cognitive neuroscience that may well offer insight into phenomena as diverse as memory, language, and schizophrenic psychopathology. The paradigm is called Parallel Distributed Processing (PDP) but is also known as connectionist models or neuronetwoks. PDP models use mathematically based simulations, carried out on computers, to represent brainlike operations, although most PDP modelers are very careful about generalizing their results to the complex environment of the brain.

PDP models are represented as interconnected layers of cells or units. The strengths of the various interconnections between units in a given layer are represented in an $N \times N$ matrix (where N is the number of units in the layer). For example, S_{ij} might represent the strength of the connection from cell X_i to cell X_j . This connection would represent mathematically the synapse between the axon terminal of cell X_i and the dendrite of cell X_j . The stronger the connection, the more likely that the operation of one cell will influence the operation of the connected cell. Learning is represented by a gradual change in the strength of the matrix of connections, and information is stored, not in the cells, but in the relative strengths of interconnections between cells. Both input and output of information is represented by patterns of specific cell firings. Unlike more typical computer algorithms, PDP models are stochastic (i.e., probabilistic); therefore,

they do not always give the same answer each time. They are also dynamic in that the network gradually changes as the result of experience. Inputs and outputs are presented together, and the connections between the units are modified according to a predefined learning rule. Eventually, the structure will be able to reproduce the output given the input.

What makes connectionist models interesting is some of the properties they possess. They can arrive at the correct output even if the input is missing information or includes contradictory data. They can arrive at correct output despite having units removed; as in a real brain, knowledge is not localized but distributed. They can often correctly classify a novel stimulus based on common properties with known stimuli. All these results are achieved because the knowledge is stored in a pattern of weights between simple units instead of in a localized form (such as computer's memory, where information is stored in fixed addresses). Using massively parallel networks of these neuronlike units, researchers have developed good approximations of such basic human functions as learning past tenses of words (Rumelhart & McClelland, 1986) and reading (Rumelhart, 1977).

Connectionist models have also been used to model schizophrenic thought disorder. In working with these models, investigators discovered that under some circumstances, the output of the model is not one of the predefined end states. Rather, an identifiable combination of two or more end states may be generated (Crick & Mitchison, 1983). It has been suggested that combining output states would phenomenologically result in a mental picture that, in fact, combines two mental pictures, akin to what Exner (1986) would call a fabulized combination (Brenner, 1990). This phenomenon of fabulized end states may be a model of a particular type of schizophrenic thought disorder (Crick & Mitchison, 1983; Hoffman, 1987; Hoffman & Dobscha, 1989). The Hoffman and Dobscha (1989) model is particularly intriguing. Beginning with the observation of enlarged cerebral ventricles in some schizophrenics, they postulate that a process of axonal pruning is going on in the schizophrenic brain, insidiously reducing the number of neuronal connections. Their model shows that modest pruning of "axons" has little effect on performance, but massive pruning leads to these mixed end states, thus apparently simulating thought disorder.

If connectionist models can explain the process that fuses two defined end states, they will provide a potential model for ambivalence. Connectionist models are models of information; ambivalence is a phenomenon of affect. However, affect must somehow be coded in the brain and recalled when associated with appropriate objects. It might be the case that there are circuits in the brain for coding emotional state. It would certainly be possible to create a connectionist model where the input states are, say, people and the output states are the emotions felt toward those people. Any defect of the system that causes a combined end state would phenomenologically be experienced as a combination of simultaneous emotions—by definition, ambivalence. The key question is whether circuitry exists in the real brain representing emotions similar to that in the proposed model. If there is, then it is entirely likely not only that ambivalence exists in

schizophrenics, but potentially that it is a particular type of ambivalence which is etiologically similar to the neural malfunction in thought disorder.

CONCLUSIONS

The question of the role of ambivalence in schizophrenia certainly presents a challenge to scholars, who must carefully question the definitions of dozens of key terms to make any sense out of the literature. If we are to make progress on this question, we must agree on some basic operational definitions. There is some limited evidence of a relatively distinct schizophrenic ambivalence as measured by the Schizotypal Ambivalence Scale (Raulin, 1986). But this is still speculative and will remain so until the completion of more research. The real lesson from this review is that there are many ways to miss the target in this line of research. Progress will come only through careful theoretical analysis and precise operational definitions of the variables of interest.

Thus, the story of ambivalence might well be coming full circle. Initially a core concept in the understanding of schizophrenia, the attribute first became normalized and then was lost as a specific schizophrenic symptom. Now, work with hypothetically psychosis-prone individuals suggests that a certain intense ambivalence is related to the schizophrenia spectrum disorders. Recent advances in computer modeling techniques suggest that ambivalence might come about as a by-product of abnormal neural functioning. The role of schizophrenic ambivalence has remained primarily unexplored territory for 80 years; today, more signs than ever suggest that gold is to be found therein.

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