DISCONTINUITY THEORY: COGNITIVE AND SOCIAL SEARCHES FOR RATIONALITY AND NORMALITY—MAY LEAD TO MADNESS

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I. Overview

A theoretical framework is presented to understand the fundamental process of adapting to experiential discontinuities that are of personal significance to one's self-concept. The central dynamic of this approach is the motivation triggered by perception of a discontinuity, which is defined as a violation of expectation in any domain of functioning highly valued by the self. Such discontinuities may arise from the experience of failures, deficits, or transformations in intellectual, social, sexual, sensory, physical, or career domains. The motivation to understand the cause of a discontinuity, and to appear rational to one's self and others, generates a cognitive search process, while the motivation to appear normal, to be like others, generates a social search process. A behaviorally oriented search may be generated to take actions to suppress the arousal and deflect or ignore the distress associated with discontinuities. Although these three search processes are variants of what makes humans smart, connected, and functional, they may become biased in their operation in ways that distort their typically adaptive use. When that happens, various forms of social pathology and psychopathology may emerge in people without evident premorbid dispositions. These pathologies are referred to as aspects of "madness." This broad term is used to cover a continuum from ordinary irrationality, fears, anxieties, obsessions, compulsions, addictive behaviors, prejudice, and mass hysteria, to more extreme forms of mental disorders such as phobia, paranoia, and depression. Direct links are posited between the kinds of search process biases activated in some people and the specific forms of pathology that appear as people try to make sense of, or cope with, their discontinuity.

This chapter first details the assumptions and principles of Discontinuity Theory, elaborates on the search processes and their biases, and relates their rigid use to predictable symptom development in the first stages of the transformation of ordinary people becoming "mad." A variety of case studies then illustrate many of the interesting features and wide-ranging implications of this approach in everyday life. Next, a series of experimental investigations are presented that were designed to test predictions about the operation of several kinds of discontinuities and associated search biases. The chapter concludes by considering the ethical issues raised by this research and outlines procedures used to reconcile them.

The model I've developed blends constructs from cognitive and social psychology with those from clinical psychology, and its research foundation revives a dormant paradigm of experimental psychopathology (Kietzman, Sutton, & Zubin, 1975; Maser & Seligman, 1977). The reason for this integrated approach is that my starting point is the ordinary person faced with a serious challenge to his or her basic sense of self-identity and self-worth (Markus, Cross, & Wurf, 1990; Steele, 1988). That Actor resorts to a host of strategies and tactics to achieve the goal of re-establishing internal and external equanimity—actions that cut across any of our traditional disciplinary boundaries. A scientific understanding of them demands a holistic orientation based on a wide-ranging psychological foundation.

A paradox that emerges from this approach is that while innovation and scientific curiosity are induced by discontinuities that lead to seeking new meanings and understandings, some personal searches triggered by discontinuities may follow a twisted path that ends in madness of various kinds. It will be instructive to compare the objective search of the empirical scientist guided by the canons of the scientific method with the egocentrically biased search of a naive theorist seeking to confirm hypotheses with selected evidence and distorted validity checks (Ross & Sicoly, 1979; Skov & Sherman, 1986).

Before turning to the detailed exposition of this approach, let's consider its relevance in making sense of a recent report from the U.S. Secret Service about the profiles of political assassins (Dedman, 1998). This new study in "Preventing Assassinations" concludes that the 83 people who attacked or tried to attack an American political figure or celebrity in the past 50 years fit no common physical or psychological profile (Fein & Vossekuil, 1997). Rather, the strongest pattern that emerged from an analysis of their recent experiences is that nearly all had suffered from a recent trauma, such as a marital breakup or job loss. While these "discontinuities" are experienced daily by many ordinary people (see Meyer, 1995), they led to a "downward spiral" in the lives of those who became assassins. The report noted that "relatively few suffered from serious mental illnesses that caused their

attack behaviors" (Dedman, 1998, p. A6). Instead of labeling such individuals as "irrational" or "crazy," the Secret Service report argues that it is more productive and accurate "to examine a chain of thinking that leads a person to see assassination as an acceptable and necessary action, and to attend to behaviors that may precede an attack" (Dedman, 1998, p. A6).

Let's turn now to do just that, to examine chains of thinking and acting that may lead ordinary people to do extraordinary things in their lives as they grapple with significant personal discontinuities, such as loss of jobs, spouses, status, virility, and physical functioning, and of course, the divorce, illness, and death of loved ones.

II. Discontinuity Theory

Man never reasons so much and becomes so introspective as when he suffers: since he is anxious to get at the cause of his sufferings. . . . When [one] is happy, he takes his happiness as it comes and doesn't analyze it, just as if happiness were his right.
                                   —Luigi Pirandello, *Six Characters in Search of an Author*

Do you know what you have done? [Sherlock Holmes asked Sigmund Freud] You have succeeded in taking my methods—observation and inference—and applied them to the inside of a subject's head. [Freud replies to Holmes]: Yet, what I have surmised might be totally erroneous, for you yourself have noted the dangers of reasoning with insufficient data at one's disposal.
                                   —Meyer, *The Seven Percent Solution*

—Techniques need to be devised to discover and recognize the indelible imprints that discontinuous perturbations invariably leave behind.
                                   —Klauder, 1978

I am sure that you, like me, live your daily life relying on a set of deterministic operating assumptions of lawfulness, regularity, consistency, and continuity. It is curious that we do so despite functioning in a world filled with randomness, coincidence, chaos, and discontinuity. The human mind seems to have evolved to discover causes among correlated events, correlations among coincidentally arranged events, patterns amid flux, and structure where ambiguity resides (Chapman & Chapman, 1967, 1969; Hamilton, Dugan, & Trolier, 1985). Noticing an effect, we infer its cause or we construct an attributional analysis that gives it causal significance (Jones & Davis, 1965; Hastie, 1985; Heider, 1958; Kelley, 1967, 1971; Nisbett & Ross, 1980; Proudfoot & Shaver, 1975). Imposing such cognitive organization on

our experiences makes the new familiar, the confusing understandable, and structures the transient or scattered into neat mental categories. This process gives rise to a comforting sense of predictability and welcome to its companion, the illusion of control (Geer, Davison, & Gatchel, 1970; Langer, 1975).

Yet the brain is also designed to attend to change, to detect novelty, to orient with surprise to sudden perturbations in our environment, in short, to dishabituate in a moment's notice to anything that is new to us. Even before we are consciously aware of an anomalous stimulus event, the brain registers its presence by the P300 electroencephalogram (EEG) "surprise" wave pattern (Donchin, 1981; Donchin & Coles, 1988). All novel stimuli, change, discontinuities, and perturbations get fast-tracked to our attention center because they carry the potential for danger or opportunity, until proven otherwise, and then we can put them out of mind by silently engaging automatic habituation processes. There is obvious evolutionary significance to developing "discontinuity detectors" and to acting rapidly and wisely on the information they offer for aiding survival to environmental threats, adjusting to homoeostatic imbalances, and discovering unexpected pleasures. However, although this mind machine works wonderfully most of the time for most of its users, sometimes the wrong modules are engaged when dealing with input from its discontinuity detectors (Fodor, 1983; Ornstein, 1986). Then the mind generates premature conclusions based on minimal, readily available information, mistakes correlations for causation, or uses familiar, but inappropriate, heuristics for dealing with new experiences (Massad, Hubbard, & Newtson, 1979; Tversky & Kahneman, 1973).

Discontinuity Theory is in part a formalized attempt to recognize and investigate some consequences of such curious aspects of the human experience and the fallibilities of our usually reliable and trustworthy minds (Ross, 1977, 1978). Starting with a few basic assumptions, the theory elaborates the processes by which perception of an anomalous experience triggers a motivational state that drives a host of reactions at various levels of functioning. After outlining the main features of this approach, I expand on the nature and operation of discontinuities, examine in detail the primary reactions triggered by some kinds of discontinuities, and conclude this section by considering how "madness" may become an unintended consequence, or by-product, of the very attempt by some people to appear rational and normal to themselves and others.

A. BASIC ASSUMPTIONS AND PRINCIPLES

The theory starts with some basic assumptions about the three fundamental human needs involved and their motivating effects. It also depicts the

nature and varieties of discontinuities that can impact on human behavior, and spells out the relationships between cognitive and social needs and processes of rationality and normality. After describing special features of reason-based choices for the explanations and misattributions generated to account for discontinuities, this section concludes by showing how "madness," or initial forms of psychopathological symptoms, may emerge from distortions of the operation of the principles underlying rationality and sociability.

1. The Needs to Belong, to Know, and to Gain Esteem

Two of the most basic needs of our species, beyond those of biological and safety concerns, are the cognitive need to know and the social need to belong. In Maslow's (1970) hierarchy of needs they are sandwiched around esteem needs. Discontinuity theory assumes that some kinds of experienced discontinuities directly challenge personal esteem, and when they do, the needs to know and to belong are activated. The *need for esteem* is the individual's generalized need for confidence, sense of personal worth and competence, self-esteem, and respect of others (Brown, 1998; Markus, 1977; Steele, 1988).

The *need to know, or to understand*, is the desire to make sense of all human experience, to understand how the world functions, how stimuli are associated, how consequences emerge from prior events, and how the future can be predicted by knowing past and present circumstances. This cognitive need is the driving force in our constant, often automatic, processing of information bombarding us from within and without (Bargh, 1982; Cacioppo & Petty, 1982; Wegner, 1989). It is our dynamic travel guide that finds patterns in apparent randomness, extracts meaning from ambiguity, gives coherence to chaos, and discovers causal mechanisms that locate anomalous events and relationships within explanatory networks (Frankl, 1970).

The *need to belong* is the basic human desire for attachment, connection, and affiliation to others who will recognize, accept, and love us (Baumeister & Leary, 1995). This bonding demands that people seek contact with others by going beyond the confines of self-focus to make and strengthen the human connection. It leads to behaving in ways that are socially approved by significant others in one's life space, and for those actions to be evaluated as situationally appropriate. Much research has established that social isolation is a major risk factor in a range of pathologies, while having a sense of being enmeshed in a supportive social network contributes to one's mental and physical well-being (Cohen & McKay, 1983; Gottlieb, 1981;

House, Landis, & Umberson, 1988; Kulik & Mahler, 1989; Pilusuk & Parks, 1986; Taylor, 1986).

In my model, the role of social isolation figures prominently in the development of delusions and other psychopathological symptoms. First, the isolated person may be unaware of the kinds of prevailing explanations that would be socially acceptable in many reference groups, and thus she or he could utilize them without prejudice. Second, once explanations are initially composed, there are not available social correctives on their reasonableness or logicality. Third, without a particular audience in mind when forming or refining explanations, they may become loosed from the moorings of social constraints and travel far from known shores of reality. Fourth, the absence of ready affiliations eliminates the option of seeking normalizing functions to cope with the threats posed by discontinuities when the rationalizing function is not working effectively.

In addition to providing a sense of social security and enhancing self-worth, the need to belong provides the basis for social comparison (Festinger, 1954; Miller & Zimbardo, 1966; Schachter, 1959; Zimbardo & Formica, 1963). It is by means of social comparison processes that we assess our abilities, opinions, values, and emotions when objective standards are unavailable or vague. Less commonly recognized is the value of engaging social comparison processes as a prophylaxis against autistic thinking in which one's personal conception of reality (including beliefs, wishes, and fantasies) can become the criterion for assessing the validity of external reality (Johnson & Raye, 1981). This is a reversal of the usual basis of reality testing in which validity checks and constraints on the appropriateness of one's thoughts, feelings, and actions come from evidence in the external physical world and consensual validation from one's social world. When that idiosyncratic thinking occurs chronically, it becomes the basis of the "psychotic pursuit of reality," using internal reality as the foundation for assessing external reality (Meyer & Ekstein, 1970). Less extreme forms of this distorting, denying, or disregarding physical-social reality can be found under conditions of high ego involvement, sensory deprivation, daydreaming, taking poetic license for creativity, and other mental states that overtax or disengage ordinary consciousness (Kihlstrom, 1984).

2. The Motivating Effects of Discontinuities

> The grand thing about the human mind is that it can turn its own tables and see meaninglessness as its ultimate meaning.
>
> —John Cage, *Silence*

At the core of this model is the central role played by the perception of a discontinuity as a motivating trigger for informational, social, or behavioral

search processes. A *discontinuity* is here defined as a perceived change in the level or quality of one's functioning in a domain that is important for one's sense of self-worth or self-image. Such discontinuity involves an awareness of a noticeable deviation from an expected normative standard of how one usually feels, thinks, perceives, or acts —in those areas that figure into the calculation of one's global sense of self. As that self-involvement increases, a threshold is reached when the discrepancy qualifies as a "significant" violation of an expectation. We know that expectancies represent beliefs about some future states of affairs, and "expectancies constitute the fundamental building blocks on which behavioral choices are built" (Olson, Roese, & Zanna, 1996, p. 211). The four dimensions on which expectancies vary, and thus their violations correspondingly vary in personal significance, are certainty, accessibility, explicitness, and importance (Olson et al., 1996). In the current theory, discontinuities assume special personal relevance when the expectancies they rest on are held with certainty and confidence, are accessible or readily activated, become explicitly generated, and have motivational importance through relevance to one's needs and values as well as to their scope of connectivity to other expectations.

A violation of expectation with those attributes is obviously a discontinuity that holds special significance for the integrity of the self-construct. Motivations arise to reduce the confusion, threat, and distress that such discontinuities engender. It is assumed that negative affect is aroused as a correlated consequence of the cognitive disruption produced by discontinuities. Attempts are made to reestablish harmony, intrapsychic and interpersonal, as well as to restore any balance between self and nature or self and spiritual forces, which existed prior to the anomalous experience. Research has found that "expectancies can play an important role in triggering individuals to undertake causal analyses" (Pyszczynski & Greenberg, 1981, p. 36). In addition, more thorough attributional search processes are activated for unexpected than expected events. Expectancy violations can generate a range of reactions from humor to horror, depending on context, medium of exposure, ease of clarification, and other situational and dispositional variables (Deckers & Devine, 1981; Lefcourt & Martin, 1986; Rothbart, 1976; Suls, 1972, 1983). Expectancies also color our interpretations of social issues, our framing of social problems, and interpersonal relationships (Burgoon, 1993; Jussim, 1990a,b).

Violations of expectations come in many forms, each of which typically elicits characteristic affective reactions. Consider the following array of some V.O.E. types.

1. *Misfortune:* Distress at unexpectedly negative outcome, bad luck.
2. *Good fortune:* Joy at unexpectedly positive outcome, good luck.

3. *Magic:* Amazement at magician's "trick" that defies beliefs about physical reality or human limitations.

4. *Miracle:* Awe (fear, reverence) at unexpected positive outcome that has no known material, physical, natural causal explanation, thus assumed to involve spiritual intervention.

5. *Humor:* Laughter at, enjoyment of, joke's punch line or visual comedy routine that does not follow from initial premises; when its puzzle is resolved, we laugh, when not resolved, we are confused, "don't get the joke."

6. *Horror:* Fear revulsion, terror at sudden negative, violent, destructive outcome, which violates context expectations created in plot, or in one's experiences, or from traditional "standards of decency."

7. *Natural disasters, cosmic perturbations:* Fear, awe, confusion by experiencing earthquakes, eclipses, volcanic eruptions, and other such calamitous events when they are unpredicted.

8. *Social Deviance:* Rejection of, anger at, a person or group for violating social norms of situationally appropriate, relevant behavior.

9. *Aesthetic Value Violation:* Shock, anger, resentment, disbelief, when art challenges established way of representing, viewing, reality (such as the early labeling of Impressionist painters as crazy "Fauvists").

Informational search activities may then be initiated to understand what is happening, what is being experienced, how to explain and label the discontinuity, and to decide what personally relevant meaning it may convey. Information-gathering strategies and hypothesis-testing processes are cognitively and socially complicated since they may seek confirmation or disconformation, be influenced by action agendas, limited by cognitive skills and access to evidence (see Klayman & Ha, 1987; Skov & Sherman, 1986; Snyder, Campbell & Preston, 1982; Trope & Bassok, 1982, 1983).

A memory search seeks historical comparisons, analogies, correlated similar occurrences of negative reactions and prior unusual causes, along with other reasoned analyses. There is an emotional asymmetry between positive and negative affect (Taylor, 1991). Negative outcomes elicit more extensive analytic reasoning than do positive ones (Schwarz, 1990), and are more likely to promote attributional searches (Weiner, 1985). Because negative emotions often arise under circumstances that threaten well-being and thus require immediate coping (Ellsworth & Smith, 1988; Taylor, 1991), they demand more precise identification of the cause of the current affective state. Faced with the negativity of a discontinuity, the person should engage a causal search focused on single, isolated causes for which a coherent remedial action can be taken, rather than the more diffuse, generalized search typical in identifying causes of positive emotions (Liu, Karasawa, & Weiner, 1992). We also know that having a negative affective expectation

will help to create correspondingly negative affective experiences (Wilson, Lisle, Kraft, & Wetzel, 1989). This cognitive search may be complemented by a concurrent situational analysis that checks out the social and physical environment, along with an assessment of the condition of one's body/health/general status for causal clues.

However, when the discontinuity is perceived as having positive, favorable effects (such as an unexpected promotion or prize), there is not the same urgent need for understanding or action taking. Indeed, for many people thinking analytically about one's good fortune seems to dilute its pleasure. So, as Pirandello (1923) reminded us in the opening quote, we accept such delightful anomalies as due us, to be accepted at face value without question. That view of the passive processing of positive discontinuities is supported also by John Stuart Mill (1873) who says: "Ask yourself whether you are happy, and you cease to be so."

Can discontinuities that bring sudden considerable benefits, such as winning millions of dollars by chance, or unexpected fame from one's actions, ever have negative consequences and symptomatic outcomes? Although they are less likely to do so than those that threaten loss of control over important spheres of functioning, "positive discontinuities" may have similar negative consequences depending on how the discontinuity is interpreted. I am aware of one such case of a young journalist who happened to be in his home neighborhood in Watts, California, when a dramatic racial uprising erupted in 1965. Since he was African American, he was able to cover the story at a time when white reporters were banned from the area by the residents. Bob Richardson, though not actually a reporter, was given permission to send in daily reports to his boss at *The Los Angeles Times.* The stories won the prestigious Pulitzer prize for investigative reporting shared by *The Times* and Richardson, and he was awarded reporter status—the first Black reporter on a major urban newspaper. From there it all went precipitously downhill for the neophyte reporter. He did not feel he deserved the acclaim, was lucky to happen to be on the scene at the right time, and was unable to follow up that prize-winning journalism with other important stories. He did not even attend the Pulitzer Prize ceremony, began drinking, taking drugs, missing work, not meeting deadlines, got fired, lived as a homeless person on the streets for years, hungry and penniless. His story became known only after a young screenwriter, Michael Lazarou, writing a script for a movie about the Watts riots, tracked Richardson down to invite him to be his consultant. Being able to relive his experiences at a temporal distance from them, and to share his sense of not deserving what he had earned, helped Richardson to get back on track and come up from the gutter to a more productive, if low-key, lifestyle. This moving story about the downside of a fame-based discontinuity was

presented in a special television show on ABC-TV's *20/20* program (August 3, 1990).

The perception of a discontinuity is usually at a level of conscious awareness, although it can also occur at preconscious or unconscious levels of awareness (Kihlstrom, 1985; Marcel, 1983). We know that actors may behave in predictable ways, yet not have access to their underlying mental processes, for any number of reasons (Nisbett & Wilson, 1977). Some people may respond with strong, immediate emotional reactions before they know why they are "acting without thinking." LeDoux (1989, 1995) speculates that they may be overly emotional because the direct response of their amygdala is stronger than the cortex's slower ability to constrain it with rational interpretations. He argues that this same process may trigger "mindless acts of aggression." The amygdala has recently been shown (on PET scans) to respond more strongly to externally stimulated emotional stimuli than to memory-generated emotions (Reiman et al., 1997). Thus, we may become aroused without knowing why for many reasons. Some of that unexplained arousal may become discontinuities of note.

Freud's (1946) repression model is consistent with aspects of Discontinuity Theory. It contains two sources of discontinuity and a uniquely psychodynamic way of coping with each of them. The initial discontinuity resides in the conflict between feeling strong biologically driven (libidinal) impulses and recognizing socially learned constraints on their expression (superego). One's positive self-regard is threatened by experiencing these sexual and aggressive impulses, and that is the primary discontinuity. Repressing that conflict removes it from consciousness and obviates attempts to deal with it directly. The second source of discontinuity occurs later on when the person confronts a seeming innocuous situational stimulus that directly or symbolically is associated with the potential satisfaction or expression of that libidinal impulse. A state of anxiety is activated, as a signal system warning that a repressed conflict is about to emerge into consciousness. The strong autonomic response with diffuse bodily effects that occurs is clearly a negative affective state. The dominant response to that unexplained arousal, that we label as anxiety, is to socially isolate one's self from others since the reaction seems situationally inappropriate (see Bromberg, 1968; Sarnoff, 1971). By contrast, the arousal of high levels of fear in response to an objective, external source of anticipated bodily threat activates needs for affiliation (Sarnoff & Zimbardo, 1961).

In the Freudian model, this anxiety is coped with by activating any of a host of defense mechanisms that diffuse, dampen, or misdirect its impact. This second source of discontinuity is really between cognitive and affective systems that, up to this point, have been isolated by repression mechanisms. The anxious person is experiencing sudden, strong, negative affect without

cognitions about sources justifying such heightened arousal. Pathology results in this psychodynamic model only when anxiety becomes so chronic that defense mechanisms are overused or improperly developed to start with, and the individual's coping system is overextended.

a. Functions of Discontinuity Explanations. Why is it important to seek to explain discontinuities rather than to conceal them by repressing or suppressing them? This is where the discontinuity model differs from the Freudian account in emphasizing the reason-based nature of a search for explanation rather than a reason-repressing process. Consider the following set of functions served by discontinuity explanations; it is these functions that drive the search mechanism:

1. To establish the origin of a discontinuity as either internal, in one's mind or body, or external, "out there"
2. To establish one's relationship to the event as either accidental, coincidental, or causally implicated
3. To reduce the mystery created by a discontinuity, by locating it in a familiar scenario with a known label
4. To minimize the potential threat discontinuity poses by understanding its origins and consequences
5. To determine whether discontinuity is transient or likely to recur
6. To distinguish between consensually validated experiences, shared by others, and idiosyncratic ones, unique to one's self, as in the difference between illusions and hallucinations
7. To discover how to prevent, avoid, escape, minimize, or overcome the discontinuity's impact
8. To activate self-directed interventions to cope with the anxiety the discontinuity generates
9. To respond to the problem-solving challenge that all discontinuities pose

These activities overlap with the basic goals of the scientist and the clinical practitioner: to describe, explain, predict, and control behavior, as well as to take therapeutic actions to improve functioning. The key difference lies in the greater efforts scientists invest in maintaining an objective detachment, in using the scientific method as protection against uncontrolled observations, biased search for relevant data, and also premature and inflexible conclusion drawing.

The ordinary person in the throes of dealing with a subjectively significant discontinuity does not have the training, the luxury of reflection time, nor the detached perspective of the scientist. Instead, she or he begins as a biased observer, selectively attending to available and especially salient evidence, making sampling errors, integrating various data sources without

adequately weighting the multiple factors involved (Nisbett & Ross, 1980; Ross, 1977; Ross & Sicoly, 1979). The search for explanation then comes to rely on stored schema, readily available heuristics, analogies, folk wisdom, and currently prominent "pop" psychology views, all mixed with limited and faulty reasoning strategies to generate one's personal theory of this discontinuity (see Malle, in press). Under such circumstances, a biased theorist is born, eager to validate that theory by searching only for confirmatory data—likely of course, to be found, theory affirmed, search terminated, and true cause uncovered (sometimes) or not (perhaps more often). Regardless of the actual truth value in the outcome of this discovery process, the beliefs it generates will persevere in the mind of the theorist (Anderson, 1983; Anderson, Lepper, & Ross, 1980; Fleming & Arrowood, 1978; Jennings, Lepper, & Ross, 1981; Lord, Ross & Lepper, 1979; Ross & Lepper, 1980). When that perseverance becomes inflexible and rigidly defended despite contrary evidence, prejudice and paranoia may emerge as but two of the forms of resulting pathological thinking.

Unlike Schachter and Singer's (1962) assumption that the search to understand discontinuities in the form of "unexplained arousal" begins as a general, neutral scanning process, Discontinuity Theory assumes that for adults the experience of sudden arousal with an insufficient immediately available explanation triggers a biased search process. This assumption is predicated on the notion that such arousal signals a loss of personal control, which is a negative state of self-awareness (see Marshall & Zimbardo, 1979; Maslach, 1979). Events perceived as unpredictable and uncontrollable are threatening and anxiety arousing, and demand explanation when they are schema-incongruent (Hastie, 1985; Mineka & Kihlstrom, 1978). A later section will offer experimental data that support this assumption.

b. Locating the Discontinuity without or within. An early phase in the search for a discontinuity explanation involves locating its potential cause either in (a) some aspect of external reality—and thus perceivable, or perhaps experienced, by others in that situation; or (b) in the internal reality of one's mental or bodily condition—and thus a private, idiosyncratic cause. Social comparison search and/or interpersonal disclosure helps to determine whether others (especially appropriate companion targets) in that situation are responding similarly to one's self, and also differently from their usual prior state. If they are, the likely cause is having a general effect and a common search for situationally based causes can be instituted, perhaps with help from those others. However, if they are not, then the likely cause is not socially shared, and the effect may be limited, specific, and unique to one's dispositions or state. That realization poses new concerns for our Actor since it marks the self as currently "different," or deviant from comparable others. The discontinuity may then be interpreted as carrying

diagnostic information about something going wrong, or the start of worse things to follow. Under such circumstances, the person experiencing this profound discontinuity may choose social isolation at least temporarily, to figure out what is going on, without the intrusion and concern for others noticing his or her arousal or differentness. Disclosure, which ordinarily might help in the mutual discovery of an external cause, or get one a sympathetic hearing about an internal cause, will be avoided because to now disclose aberrant personal feelings will only heighten the interpersonal contrasts. Several experiments on disclosure of unexplained arousal will be presented that sought to examine disclosure processes among those who were in the midst of experiencing a powerful discontinuity.

Discontinuities are most likely to be noticed if they are sudden, intense, disruptive of ongoing behavior, situationally inappropriate, or especially unusual for the person in a particular domain. These observations lead the Actor to make an inductive leap to a dispositional inference, one that goes beyond the observed evidence to add the baggage of surplus meaning. The behavioral state characterization, "I am *acting* irrationally, or anxiously, or nervously," becomes a state description, "I am irrational, anxious, or nervous." This progression may end up as a trait diagnosis, "I am an anxious person," "I am a boring speaker," "I am an incompetent student." This attributional sequence moves the analysis of the discontinuity away from any original instigating (perhaps external) conditions toward focusing on the self as causal agent. When that happens, the likelihood of coming up with the true cause of the original discontinuity is seriously constrained. That happens because the Actor's thinking suffers a loss of specificity in denoting any situational correlates involved, the time parameters of onset or variation of response, the response channels involved, recall of prior comparable reactions, or assessment of whether others are reacting similarly. It becomes quite reasonable for our Actor then to conclude that the problem is: "something is wrong with *Me.*"

In addition to the original, or prime, discontinuity, there are also correlated, secondary discontinuities in physiological reactions, cognitive, emotional, behavioral, and social responding. The Actor may react with changes in one or more physiological channels, such as heart rate increase, respiration changes, tremor, muscle tension, or EEG signs of unusual brain wave activity. Or there may be evidence of distractability, distress, or nervousness which is apparent to others who want to know what is wrong. Usual social relationships may become strained as the person focuses inward, avoids self-exposure, and becomes overly sensitive to any social source of further arousal, such as criticism, "prying," or even expectations that life should go on as if nothing had happened. The matter also gets complicated once others are involved since they will also generate explanations for the discon-

tinuity in behavior they are witnessing. In addition, where that behavior is extreme and atypical for the person, such as dramatic mood shifts, memory loss, or overt anger, these others will be motivated to keep up appearances by concealing it from outsiders. This was sadly true among family members of men who were unknowingly suffering from neurotoxic damage from workplace chemicals, as will be described in one of our case studies.

A Machiavellian strategy might also be utilized by those without an adequate causal explanation for their experienced discontinuity. Whether enacted consciously or not, they could attempt to arouse strong, unusual reactions in others so that they are rendered more emotionally comparable. Tactically this could be accomplished in many ways: by spreading warnings about the dangers of violent crime in our midst, environmental pollution, the thinning ozone layer, conspiracies of all kinds, not to mention the imminent abduction by beings from UFOs, and the end of the world as the Millennium approaches (see Jacobs, 1993; Lattin, 1988; Mack, 1995).

A word about the prevalence of conspiracy beliefs in the general population. In a field study of reactions to Oliver Stone's provocative film, *JFK*, we interviewed 53 people on their way into the movie and 54 on their way out, from a middle-class, educated audience (Butler, Koopman, & Zimbardo, 1995). One of our questions asked about the likely conspiracies in the film that might have led to Kennedy's assassination, whereas others asked about likely conspiracies in the lives of the respondents. Remarkably, 64% reported a history of one of more conspiracies in their personal lives, with the most, 42%, reporting conspiracies against them at work (50% before viewing, 35% after viewing the film). Such results add to my belief that there is much "soft-side" madness among otherwise normal people, whose beliefs and symptoms are not extreme enough nor dysfunctional enough to be pathological, but nevertheless, they are on the negative side of the normal pathological continuum.

There is less harm to be suffered in being mad among madmen than in being sane all by oneself.

—Denis Diderot, *Supplement to Bougainville's Voyage*

The cognitive and social searches may blend when the individual comes up with an explanation that seems reasonable, but is not convincing to others among her or his usual reference groups. In this case, those skeptics will be abandoned and replaced by new alliances who are more willing to accept one's discontinuity explanation. One form of the social search seeks those who are more easily persuaded to accept, or at least tolerate, the "working discontinuity explanation" than can be expected from one's family, friends, or co-workers. This search for approving others who will believe

the unusual discontinuity explanation may be supplemented with a second type of social search for normality by submerging one's self in a subculture that is judged as "deviant" on some societal dimension. And to go a big step further, with sufficient social skill, personal power, or charisma, that person can create a group that endorses the discontinuity explanation as an article of faith, while also willingly acting in ways that this new group leader presents as appropriate and central to the group's identity. This has happened in cases of cult leaders imposing their bizarre beliefs and action rituals on followers under the guise of ordinary operating procedures for that group. One of our case studies will document a recent instance of a cult leader directing his male members to castrate themselves, at a time when he was grappling with problems of strong, unacceptable homosexual feelings—his discontinuity, in my sense of the term (Miller, 1997).

c. Culturally Constructed Discontinuities. Our focus thus far has been how an individual Actor attempts to cope with the challenges posed by perceiving a personally significant discontinuity. That level of analysis is appropriate in individualistic cultures, such as in the United States. However, it is possible to take the person off the hook of the "self-is-solely-responsible" for generating acceptable discontinuity explanations. In some collectivist cultures (Marsella, 1979; Triandis, 1994), discontinuities are acknowledged as a source of potential danger to the harmonious functioning of the entire society and not just a personal problem for the individual to cope with in the solitary fashion I have outlined above. Such cultures may develop, and hand down across generations, discontinuity scenarios likely to be experienced along with societal remedies and even preventive strategies. As soon as the first signs of an individual's discontinuity are manifested publically, societal agents take over and intervene with socially sanctioned procedures to restore the harmony disrupted by that discontinuity. Communal treatment rituals always involve the Actor along with all significant others among family and tribal members.

Two examples of this social construction of discontinuity and its treatment come from the Navajo in the United States, and the Nyakusa of Tanzania, Africa. For the Navajo, well-being comes from social harmony as well as harmony between people and nature. When this balanced, ideal state of "hozho" is disrupted, illness is seen as an outcome of the resulting disharmony. The disharmony is a form of evil introduced through taboo violations, witchcraft, overindulgence, or bad dreams. The individual who experiences or reports a disharmony (a discontinuity in our terms) is neither personally responsible, nor at fault for it. Rather, the illness, or evil, is taken as a sign of broader disharmony that must be dealt with at the tribal level with communal healing ceremonies that repair that disharmony, with the ever-present goal of restoring hozho.

Similarly, among the Nyakusa, at the first sign of deviation from the expected norms of harmonious living, communal interventions are swiftly enacted to set the situation right. In this culture, everyone is aware of signs of discontinuities that are violations of natural laws, such as multiple births (since they are common to animals, but rare in humans), sudden death of young people, expressions of strong anger, or any form of illness. The rituals begin with social acceptance of the afflicted person(s) and a search to discover the source of the discontinuity, as it holds the potential for afflicting others and so must be counteracted immediately. Appropriate medicine is administered not only to effect biological change, but to modify the habits, dispositions, and desires of people (namely psychological cures). There is special medicine for anger in husbands, employers, and police, and other remedies to cure thieves of criminal habits. Still other tribal medicines make lonely men and women more attractive, and make those who would be leaders more persuasive. Remarkably, and perhaps as a consequence of these societal explanations and interventions, there was no evidence in this tribe of any behavior that could be classified as "pathological" over the dozen years that anthropologist Monica Wilson (1951, 1962, 1970), studied them extensively (personal communication, September 16, 1971). These examples frame in stark contrast the prevailing situation in most individualist cultures where discontinuities are experienced as personal events that must be coped with and treated at an individual level.

Another current instance of utilizing a prevailing belief system to account for a widespread, shared societal discontinuity is the rise of anti-Semitism in Russia (Reynolds, 1998). Loudly and crudely blaming the country's woes on Jews follows a "time-dishonored" tradition. "Anti-Semitism is as perennial in Russia as the snow. It tends to arrive in force during seasons of economic discontent, and it lurks beneath the surface the rest of the time as stubbornly as permafrost," according to investigative reporter Maura Reynolds (p. A20). Since the Soviet collapse as a world power, the people have been suddenly thrust back into conditions more common in underdeveloped nations, of severe deprivation, crime, lawlessness, and chaos. "As a result, Russian nationalism and its anti-Semitic corollary have become a kind of default ideology" (p. A20).

3. On the Nature and Varieties of Discontinuities

Discontinuities come in many shapes and forms. They may be transient events, dramatic first time events, cyclical, or cumulative over some time period. I'll examine how these various forms of violation of expectation influence human behavior patterns.

a. Expectation Violations in Daily Functioning. The most commonly experienced discontinuities are those that violate one's expectations about domains related to one's daily functioning. These expectations are based on activities and observations that are routinely made about aspects of the self in relationship to others, to specific tasks, to desired goals, and to a sense of well-being and self-worth. You discover your parent does not love you, you are rejected by those you like and thought liked you, you are shown no respect when you deserve it, you fail when you should have passed or excelled. In other words, you do not perform intellectually, physically, socially, sexually, or athletically as you have come to believe (and take for granted) that you should. If the domain in which this violation of expectation occurs is one that is significant for the individual's sense of self-worth, then it demands attention and some remedial action to cope with the challenge it poses to self-image maintenance. This type of discontinuity is the most basic foundation on which this conceptual model is constructed.

b. Dramatic First-Time Experiences. Another form that discontinuities take are first-time events in one's life that are dramatic in their sensory, physical, or psychological impact. Consider someone's first headache or nightmare, the death of a loved one, the sudden divorce of parents, a young girl's first menstrual period or a boy's first nocturnal emission, and a child's first abuse by a parent. Assume further that neither family, friends, nor society provided preparatory information that could mitigate the confusing impact that such powerful events may have on the individual. How then would one understand the nature of these vivid discontinuities? What inferences might be made about the structure of one's social, biological, and physical worlds? It is not unreasonable to suppose that under such dramatic and confusion-eliciting conditions, individuals might generate explanations that are mystical or spiritual, or not bound by conventional rules of reasoning. In addition, we might expect that people would also make "arrangements" with culturally dictated higher forces. They ask to be protected, to prevent recurrences, or to help conceal the fearful experiences from others. Their part of the bargain may involve promises to be good, asexual, penitent, to enact other forms of submission, or even to leave the payback open to the later demands of that higher authority. That deal will always succeed— if the event is transient and the discontinuity does not appear again with any regularity. Then even after gaining intellectual understanding about the nature of the discontinuity later on, the individual may feel secretly or nonconsciously bound for life to pay back on that higher-order contract. That arrangement could lead to a variety of dysfunctional beliefs and ritual actions.

c. Cumulative Build-up of Discontinuities over Time. Other discontinuities are not noticed until their impact gradually accumulates over time to

create profound functional deficit or excess. This occurs, for example, with exposure over time to work situations where low levels of neurotoxins are gradually but steadily released from work materials, such as lead paints or plastics. In some instances, OSHA standards are not based on tests of long-term exposure to such chemical pollutants, thus workers, company, and union officials are unaware of this toxic consequence of their work setting. We shall see in one of our case studies how this kind of discontinuity may generate tragic outcomes, such as memory loss, dysphoric mood swings, and violent behavior—which are misattributed to psychological disorders and mistreated as such.

Incipient deafness may also result in discontinuous experiences. Some forms of deafness (conductive deafness) are gradual and continuous in their progression. Consequently, they are often not noticed for a long time, if ever. The person may not realize that deafness is the problem because the auditory mechanisms have deteriorated gradually, and because he or she may have unknowingly started to use lip reading and bodily gestures to fill in what was not heard. In addition, the stigma of deafness may lead to denial among some people even after the first signs of hearing loss seem apparent. This denial may motivate misattributions to psychological causes instead of acknowledgment of their organic origin.

This happened in the case of a college dean who hated to go to cocktail parties even though they were an essential part of the public relations function of his job. The background noise at such parties made it difficult to detect speech patterns, and when someone asked a question about a recent book, review, or article, he was forced to ask them to repeat the question. Believing they thought he was unsure of that information, which any scholar of his stature should know, he found such events increasingly aversive. He was about to quit his post until his wife forced him to acknowledge that his primary problem was his organic deafness (that he was denying because it symbolized old age). His was a condition that required a hearing aid, not a new job.

d. Transient, Rare Phenomena That Are Shared Collectively. The most apparent discontinuities come from natural physical phenomena that are rare, irregular, and dramatic in their impact on individuals and collectives, such as comets, eclipses, hurricanes, tornadoes, earthquakes, volcanic eruptions, lightning, famine, and plague. While science now informs most societies about the dynamic properties of the physical nature and natural causes of such discontinuities, in some less scientifically informed cultures, these cosmic discontinuities assume personal relevance, demanding immediate explanation and remedial action.

Some years ago it was reported (Reuters, in *S.F. Chronicle*, 11/23/73) that the Brazilian government was trying to give advance warning to its

Indian tribes of the impending arrival of the comet Kohoutek in order to prevent "a revival of old myths and cults" and to quell their distress. Their concerns were based on the Indians' reactions to an earlier eclipse of the sun. In one tribe the chief demanded his members engage in self-imposed reproductive restrictions, as a pledge made in return for the normalization of the elements. Another tribe, surprised by the eclipse of the sun during their lunchtime, believed they were being punished by the gods for eating too much. They induced vomiting and the tribe began a regularly scheduled fasting ritual. The stuff of myths also comes from this same report, since the warriors in one tribe gathered in the center of the village and sent salvos of flaming arrows toward the darkened sun to light it up again. When the sun reappeared, "the warriors were hailed as heroes for having lit the sun with their arrows." We may assume that future generations will celebrate their wisdom and bravery with a special festive ritual.

There are parallels between this example and the phenomenon of "Cargo Cults." This fascinating social movement fits the development of superstitious behavior practiced by an entire society as a collective behavioral ritual to correct a socially shared discontinuity (see Lawrence, 1964; Strelan, 1977; Worsley, 1968). Across vast distances in the Pacific islands of Micronesia, different groups practice similar rituals designed to bring back ships that once appeared filled with bounty and then suddenly vanished—a dramatic discontinuity to be explained and corrected. In earlier times, these ships were sailing vessels exploring the area for treasures; later they were Japanese and then American war ships that occupied and then abandoned these islands during World War II. A common assumption in all these groups is that the ships were originally sent by their ancestors who filled them with goods for their tribe. But evil men stole the ships and the bounty that really belonged to them. To appease the gods and ancestors, a leader will assert that the cargo will return only if certain tribal actions are taken collectively. These may include destroying crops, burning down the village, migrating to another area, or making any dramatic change of lifestyle that can be taken as a sign of their devotion and sacrifice. Of course, when that action fails to make the cargoes materialize, the leader is deposed or killed, and a new leader with a new solution takes over. What is amazing about this superstitious collective action is that it is so widely practiced and has been going on for decades.

The relevance for our theory is that the discontinuity is socially shared, an ideology constructed as an integrated set of explanations to account for an anomaly, an action sequence put into practice, and when it fails to correct the situation, the entire process is recycled. As with the celebrated case of a failed prophecy of a doomsday cult studied by Festinger, Riecken, and Schachter (1956), the greater the members' commitment to the group's

beliefs, the more postdecisional dissonance will arise when the leader or the group's prophesy fails. The dissonance will then energize new actions to right the wrong. However, in this instance, it is remarkable that after so many replications of failed predictions, the Cargo Cults continue to operate at full strength fueled by the perception of a single discontinuity so long ago.

With education, we tend not to believe that natural disasters are causally related to the self. However, such "primitive" thinking is typical of all of us during the early childhood preoperational period. Piaget (1954, 1977) describes this stage in cognitive development as one in which children engage in egocentric thought that positions them at the center of all phenomena. However, under conditions of stress, or when personally experiencing repeated occasions of natural disasters, adults may revert to such "childish" thought patterns. Just as Job asked his god, "Why me?," we may do likewise when faced with personal tragedy or trauma—of rape, death of our child, ruined crops, or failed ambition, to mention but a few instances. When that question is posed in a subjective form, the answer must be based on some personal qualities of the Actor, or on the operation of mystical forces conceived of as being directed against the individual—and not based on laws of nature or other external considerations.

e. Categories of Discontinuities. Discontinuities can be categorized along the following dimensions:

1. Relevance to sense of survival, of self-worth: very significant to relatively insignificant
2. Duration: transient and brief to chronic and permanent
3. Scope: discrete and specific to general and pervasive
4. Onset: sudden to gradual development
5. Source: external (climactic, celestial, environmental, social-situational) to internal (biological, physiological, emotional, mental, behavioral)
6. Occurrence: rare, random, irregular; to cyclical; to recurring and common
7. Perceived hedonic valence: positive to negative
8. Degree of expectation: anticipated to some degree as a feature of a transitional period (into adolescence, for example) to totally unexpected or anomalous occurrence
9. Experiential basis: personally experienced to vicariously experienced
10. Societal preparation: none to much
11. Origins: symbolic or unconscious origins to concrete or consciously acknowledged origins

f. Relating Memory Processes to Discontinuity Processes. It is also possible to relate the construct of discontinuity to three basic types of memory processes: semantic, episodic, and procedural (Tulving, 1972, 1983). *Seman-*

tic discontinuity involves an experience in which one's general knowledge about the world is violated when physical or social "facts" do not occur as expected from previously learned contexts. This schematic violation disrupts routine information processing, thus forcing a heightened awareness of the discrepancy. "What is wrong here?" "What doesn't fit as it should?" are the questions that come readily to mind—to the scientist, the inventor, or the simply curious. *Episodic discontinuity* occurs when a semantic discontinuity becomes self-referential, seen as personally relevant, or containing information that might have predictive value for the individual's well-being. The abstract nature of the observed informational discrepancy assumes personal significance when the individual poses the questions, Why is this happening to ME? or "What does this mean for MY survival, well-being, self-image? Finally, *procedural discontinuity* is the awareness that one does not know or recall the rules of logic or of inferential thinking which are essential for discovering the basis of these semantic or episodic discontinuities. The person believes he or she ought to be able to explain the discontinuity, but can't figure out how to do it effectively. Efforts fail to clarify the situation or correct the disruption in functioning. This may occur because of extreme stress, fatigue, sensory or discontinuity overload, or pressing situational or time demands to generate an immediate and satisfactory explanation to self or others. Of course, another reason that some people are not able to figure out the nature of a given discontinuity is a basic lack of cognitive capacity to engage in such conceptual analyses.

B. KNOWING IS TO RATIONALITY AS BELONGING IS TO NORMALITY

The mind is a strange machine which can combine the materials offered to it in the most astonishing ways.
                                        —Bertrand Russell, *The Conquest of Happiness*

In this section we will outline three search processes that individuals employ when coping with significant personal discontinuities, the cognitive and social searches and then the behavioral search.

1. The Cognitive Search Process

The desire to *know*—to understand the world around us and the inner workings of our minds—is a fundamental need of homo sapiens. Some would argue that the search for meaning is a powerful human drive (Frankl, 1970). Typically, it is realized through thought processes grounded in ratio-

nality. Under most conditions, intelligent and educated people make use of logical reasoning, rules of inference, heuristics. analogies, accepted canons of evidence, and tentative conclusion drawing based on observations that are open to correction by better data. We learn to see and represent the world conceptually according to the way "it really is" by not always accepting the phenomenal reality of perceptual experience. This change from perceptually driven views of the world to conceptually driven ones is a developmental landmark that gets elaborated as children develop "foundational theories"—frameworks for initial understanding—to explain their experiences of the world (Carey, 1985; Wellman & Gelman, 1992). Rationality differentiates analytical thinking, "I think, therefore I am," from solipsistic thinking, "I think of it, therefore *it is.*" Formal education transforms magical, animistic, solipsistic thinking into reasoned analysis (cf. Bruner & Goodman, 1947). We use evidence to substantiate our beliefs, and other people to consensually validate and approve our conclusions. Moreover, we are motivated to seek reasonable causes to account for experienced effects, and to generate causal explanations that are both analytically "correct," and socially "right" rationalizations (Aronson, 1968).

Because of the centrality of this need to know and understand, it becomes vital to our sense of self-competence that we appear to be rational to ourselves and to significant others. We put ourselves at risk for being perceived as not rational, as "ir-rational," when we are unable to generate adequate explanations for discontinuities, or we fail to discover causes that account for powerful effects currently being experienced. As one moves closer to recognizing or experiencing that aversive state of irrationality, even greater mental energy is directed toward the internal search mission for rationality.

Paradoxically, there comes a point when cognitive-emotional resources become overtaxed and the search becomes truncated, ending with an irrational conclusion that is rigidly defended. Resources become limited when the individual is dealing simultaneously with the motivations aroused by the initial discontinuity, the looming failure of the need to understand the whys of this experience, and perhaps exhaustion of one's usual modes of rational analysis. At the same time, there may be increasing concerns about what others will think of this peculiar state of affairs.

Consider, for example, the case of an assistant professor whose whole life was entirely centered around teaching and research, but who was then told by colleagues that his chances for tenure were not good. It was suggested to him that a face-saving option to the potential failure of his tenure evaluation, and its associated stress, would be simply to decline to come up for that problematic evaluation. But by taking that option, the candidate rejected himself. Doing so denied him the possibility of expressing his rage

outward toward an unjust system or unsupportive colleagues. Who could he then blame for this discontinuity? At some level, only himself. This self-blame redirects the negative affect inward, and adds a secondary emotional load to attempts to make sense of the situation and take constructive action. (In this real-life example, such a scenario contributed to the sudden onset of this young man's serious mental disorder.)

There comes a point in the cognitive search process when a systematic, rational search is transformed into accepting any explanation which seems minimally plausible, justified by any spurious, perceptually salient, or cognitively primed data. Once such an explanation is put in place, then defenses are erected against considering alternative hypotheses. Now the Actor has switched from being a tentative hypothesis tester to a dedicated advocate for this new "theory."

> Self-knowledge is a dangerous thing, tending to make man shallow or insane.
> — Karl Shapiro, *The Bourgeois Poet*

Under most circumstances the explanation advanced is accepted, or at least tolerated, by others if it fits their general understanding of the person and the situation. But sometimes it doesn't, and instead of modifying it to make it more socially acceptable, the person may insist on telling the story without making functional adjustments. When significant others disagree with the conclusions of this "totalitarian ego" (Greenwald, 1980), and sense its rigidly defended fortress, they judge the person to be irrational. They may then begin to avoid or exclude the person, or classify her or his unacceptable thinking as "psychopathological" in clinical terms, or "crazy," "weird," in lay terms (Lemert, 1962). That negative social response adds to the person's feeling of deviance and social isolation. Another aspect of the social dimension of Discontinuity Theory comes from considering the second need postulated as basic to human functioning, the need to belong and to affiliate with others.

2. The Social Search Process

Through the process of *belonging* we are in a better position to establish the normality of our actions, feelings, and thoughts through reference to community standards of acceptability, appropriateness, and desirability. The normative basis of our behavior is usually established via social comparison processes of observing comparable others in similar behavioral settings (Festinger, 1954; Wood, 1989). In contrast to the Why? questions of the rationality-seeking internal search, the normality-seeking external search mission seeks answers to questions, such as: "Who or what is doing this to

me?", "How should I act and what should I feel in this setting?", "Who else is reacting as I am?", and "What are they thinking about me?"

This search may go beyond the rather passive process of merely observing, judging, and deciding on the normativeness of one's reaction and its situational inputs. Instead, it can be transformed into a proactive process, as when detecting discrepancy between self and others, the individual actively tries to modify others' beliefs or actions to be more consonant with his or her own. This normative discrepancy can also be handled in other ways, by changing reference groups, by giving up on usual or traditional ones perceived as difficult to influence or as exerting too much pressure toward unanimity of behavior. At this point, the person may seek out new groups that seem more open to such "deviant" ideas or actions. With sufficient social influence skills, one can reassert the "normality" of one's unusual reactions by proselytizing for a new social movement, starting a cult-like group, initiating an anonymous Internet chat group around controversial issues or conspiracies and multiple chemical sensitivities, or spreading rumors that create arousal states in others which are similar to one's own.

During World War II, research on rumor transmission revealed that there was a marked increase in the spread of fear-arousing rumors among soldiers on their way to combat zones, rather than (as might be expected) rumors that reduced the level of already high arousal. But this greater spread of fear-arousing rumors occurred only under conditions of high ego-involvement and high ambiguity (Allport & Postman, 1947; Rosnow & Fine, 1976). By creating and transmitting such highly arousing communications among similarly situated peers, any soldier's extreme fears were normalized by spreading a net of arousal over the entire comparison group.

There are a number of measurable behavioral concomitants of each of these cognitive and social search processes. For Actors focused exclusively on the *internal cognitive search* for explanations of discontinuity, Discontinuity Theory predicts that they will

1. prefer a period of initial temporary social isolation rather than be in the company of others, until a suitable explanation is available to test out;
2. prefer information gathering from experts to social support from family and friends;
3. misattribute unusual psychological reactions to more ordinary biological causes (for example, anxiety may become hunger);
4. misattribute chronic, negative potential causes to reversible, modifiable ones;
5. misattribute unrecognized organic causes of discontinuity to psychological constructs that are familiar or currently fashionable;

6. use intrapsychic defense mechanisms, such as denial, compartmentalization, or intellectualization, rather than those based on interpersonal strategies, such as projection.

By contrast, the Actor enmeshed in the *external situationally-centered social search* for normality will:

1. be more conforming, compliant, and imitative;
2. seek out others who are reassuring and supportive, but not necessarily experts with relevant information;
3. affiliate more with others who are acting "unusual" or in ways comparable to one's state of tension/arousal;
4. mislabel subjectively experienced states, such as anxiety, to objectively specified external dangers, such as fear, which are situationally shared;
5. use defense mechanisms that are primarily interpersonal, such as projection.

When conditions make it difficult for one of these needs to be satisfied, then pressures increase for the other need to take prominence. When an adequate explanation for a discontinuity is not forthcoming, then greater effort will be expended toward normalizing activities. Similarly, if the normalizing function cannot be satisfactorily exercised in a given situation, then we should expect more sustained efforts toward generating rational or rationalizing accounts of the discontinuity. However, when it begins to appear that neither the search for rationality nor normality is functioning effectively, then arousal levels are increased because of new concerns for being perceived as both "ir-rational" and "ab-normal," and thus not comparable to others in one's thinking, feeling, acting. That new high level of arousal can interfere with both reasoned analyses and systematic social search processes. This dual impediment fuels a downward spiral toward more primitive and regressive ways of thinking, rigidified functional fixedness, social isolation, or even socially deviant acts.

It is not clear whether these two search processes occur sequentially, simultaneously, or in an alternating pattern. It is also not clear which process takes initial precedence. That probably depends on the specific type of discontinuity encountered (to be elaborated in the next section); the person's relative hierarchy of needs to know versus needs to belong; features of the situation in which the discontinuity emerges (alone or with others present); priming factors; and any learned tendencies or dispositions toward focusing on analytic or social modes of thinking.

Discontinuity Theory posits that some social affiliations are sought by those experiencing significant discontinuities of various kinds. By doing so, the Actor "normalizes" unusual personal reactions being experienced

privately or enacted publically, to the extent that the group is accepting or supportive of those deviant, exaggerated, or atypical reactions. This change in reference group reduces the Actor's risk of not being able to adequately explain the discontinuity to former peers and enhances general self-esteem through the initial acceptance and positive social comparisons with the new group members.

A recent study offers some interesting support for this prediction by revealing a paradoxical relationship between self-esteem, delinquent behavior, and delinquent peer associations. Jang and Thornberry (1998) found that contrary to traditional analysis, low self-esteem does *not* lead either to increased association with delinquent peers or to engaging in delinquent behavior, as shown in their multiwave panel study repeated over several years. However, among their large sample of "at-risk" urban adolescents, engaging in delinquent behavior lowers self-esteem ($r = -.22$), whereas making delinquent associations enhances self-esteem ($r = .30$). This general effect holds across gender and racial or ethnic groups, and is even stronger for females and African Americans than for Caucasian male adolescents. The elevated self-esteem that follows associating with delinquents, but not engaging in delinquent behavior, is strongly related to self-acceptance ($r = .76$) and negatively related to measures of self-rejection ($r = -.72$). Thus, global self-worth of individual "at-risk" adolescents is enriched via this social affiliation, which I would argue entails the search for normality. The authors conclude that normative support from associating with delinquent peers promotes self-esteem possibly through the intervening processes of reflected appraisals and social comparison rather than those of self attribution.

3. The Behavioral Search Process

But I will complicate the situation a bit more, by proposing that a third alternative search, the behavioral, may be instituted in place of either the cognitive or social, or at any time when those searches are not satisfactory. Although conceptually less interesting than our dynamic duo, it is likely to be more widely practiced among the less educated general population (especially by those who are not typically given to engaging intrapsychic analyses and complex reasoning) or among the introverted and already socially isolated. The behavioral search, when energized by a significant discontinuity, is concerned not with the "Why?" or the "Who?" questions of the cognitive and social searches, but instead with the "How?" question: "How can my distressing feelings be reduced?" And the answer is relatively easy. The Actor can directly or indirectly deal with the arousal or anxiety

component of the discontinuity by dulling cognitive processing through taking alcohol or drugs, by engaging in a variety of high-intensity physical or emotional activities that justify one's strong feelings, or by immersion in distracting activities that redirect attentional focus away from even thinking about the discontinuity and its precipitates. These mental and emotional activities may create a dissociated state. But in another sense, such a person moves into a state of deindividuation where cognitive controls that usually govern behavior are dumped out of consciousness (Zimbardo, 1970).

Discontinuity Theory thus combines elements of both cognitive dissonance (Festinger, 1957) and social comparison processes (Festinger, 1954) with self-perception theory (Bem, 1972) and also attributional processes (Heider, 1958; Kelley, 1967). The seeds of this approach were evident in a conclusion I advanced in my book on motivational aspects of dissonance theory (Zimbardo, 1969):

> A systematic integration of social-comparison theory (Festinger, 1954), Bem's (1967) provocative self-perception model, and dissonance theory is needed to develop the social implications of this aspect of dissonance generated by inconsistency between a discrepant commitment and concern for evaluation of the self by others. (p. 280)

Counter-normative commitments elicit dissonance under high choice–low justification conditions because they are not rational actions given the subjects' lack of awareness of the situational forces impinging on them. However, the usual "rationalizing" dissonance-reduction tactics repeatedly found in such experiments should be undercut when subjects are provided with other information that "normalizes" their discrepant decision. Craig Haney's (1978) dissertation research supported that prediction by showing that the classic dissonance-reducing changes in attitudes (from writing essays contrary to one's initial position) were minimized by social information that several others had also made that same commitment, but were maximized when subjects believed that others had refused to make that commitment. When they could make relevant social comparisons, the subjects' needs to justify a discrepant attitude position, and seem more rational, were either significantly reduced, or exaggerated.

C. BIASED RATIONALITY

Why is it that people do not always generate the correct causal explanation for the observed effect when they are trying to account for a significant discontinuity? Of course, many times, or even most times, we do advance

the correct explanation, and the search ends there. Lost a good job? Answer: company is downsizing. Failed a test? Answer: I haven't prepared for it. But there are many answers to why that doesn't always happen, and why we come up with false, faulty, or misleading explanations and causal misattributions.

First, since the information search is personally motivated, and not a dispassionate search for truth, it is more vulnerable to distortion by the operation of various cognitive biases operating at both stages of discovery (predecision) and justification (postdecision). Prior experience, or recent priming, may make the Actor attend selectively to some probable causes more than to others. When the discontinuity involves any negative state of arousal or physical distress, the search is directed toward finding only previously established classes of negative causes, and not all possible causes.

If the discontinuity occurs in an interpersonal setting where an explanation must be generated quickly to satisfy others in addition to one's self (such as in the midst of failing to perform sexually), that additional time pressure imposes constraints on the search to overvalue situationally salient stimuli or readily available personal schema (Kihlstrom & Cantor, 1984; Natale & Hantas, 1982). More obvious figural stimuli get noticed and other background ones (that may be the causal agents) get ignored. It may also lead to reliance on the heuristic with top-of-the-memory answers seeming most relevant and true (Taylor, Kahneman, Slovic, & Tversky, 1982; Tversky & Kahneman, 1973). When others are involved, this search for reasons is also constrained from the start by awareness of what kinds of explanations they are likely to accept as reasonable (Darley & Fazio, 1984; Schlenker, 1980; Shotter, 1984; Tetlock & Manstead, 1985). Other biases may operate to influence how available data are processed, integrated, stored in memory, retrieved, and acted upon (Bower, 1981; Bem, 1972; Dodge & Frame, 1982; Goldfried & Robins, 1983; Hodgins & Zuckerman, 1993; Quattrone & Tversky, 1984).

There are two other general ways in which the search for meaning can become misdirected. Accurate identification of the true source of any discontinuity may be limited by the operation of either learned or situationally induced cognitive biases (Nisbett & Ross, 1980; Wong & Weiner, 1981). While some of these biases direct attentional focus *away* from the true source, others misfocus search strategies *toward* specific types of explanation and attributions that are more appealing, though wrong. Although some misattributions may intensify emotional reactions, others may reduce them by transferring the locus of arousal from internal states (fear or anxiety) to neutral, objective external conditions, such as noise, or crowds, for example (see Brodt & Zimbardo, 1981; Davison & Valins, 1969; Nis-

bett & Schachter, 1966; Ross, Rodin & Zimbardo, 1969; Schachter & Wheeler, 1962). Let's outline how each of these opposite forces work to produce inaccurate causal explanations—despite a lot of reasoning.

1. Misattributions away from the Primary Discontinuity Source

Why does reasoning move *away* from the correct causal explanation of a discontinuity? Some of the relevant conditions are as follows:

1. Refusal to acknowledge causes that seem chronic, irreversible, negative and trait-like (you are ugly, stupid, incompetent, unloved, undesirable, old, etc.).

2. Refusal to accept the accountability of the true casual agent because of his/her power, credibility, authority, or dependent relationship, and social support for doing so (your father abused you, your mate is cheating on you, your leader betrayed you, etc.).

3. The cause is not salient because it is embedded in a complex stimulus context.

4. The onset of the cause is gradual, delayed, or requires an additional catalyst, or interacting second variable to become active.

5. The cause is the absence of something critical, which is harder to detect than its presence (as in the slow development of hearing loss).

6. The causal agent is not visible and needs special detection methods (as in hormonal imbalances or selective cerebral damage).

7. The causal agent is not yet known to medical science, or is not yet part of the current knowledge base.

8. The active causal agent is seemingly neutral because it is a conditioned, or symbolic, representation of the original powerful unconditioned stimulus.

9. The true cause is not accessible for conscious processing (as with emotion-arousing information "heard" under surgical anesthesia, or amnesia for childhood abuse).

10. Others purposely conceal the true cause from the Actor "for the person's own good" (as happens when parents do not prepare a child for their imminent divorce, or the expected demise of a loved one, despite the obvious conflict or stress in the environment, or when a child is given a falsely elevated sense of her or his ability or competence).

11. The cognitive state of the Actor at the time of the search may be suboptimal for careful, reasoned analyses (fatigued, stressed, depressed, excited, confused, drunk, etc.).

12. Correlated patterns are mistaken for causally related events.

13. Chance or coincidental events are assumed to be causal agents.

14. The true situational determinants are cleverly concealed by experimental social psychologists in deception research paradigms.

2. Misattributions Toward Alternative but False Sources

In addition to these reasons for not noticing or acknowledging the true cause, the Actor may be drawn *towards* certain classes of explanation that are wrong, doing so because of the operating force of other competing biases, such as the following:

1. The presence of a salient, dramatic event that dominates possible causes.
2. The desire to find and endorse explanations that enable behavior or bodily conditions to seem modifiable or improvable, or to pursue goals achievable by effort, time, and expert intervention (for example, your problem is motivational rather than an ability deficit, the condition is psychological rather than physical and organic, etc.).
3. The ready availability of culturally sanctioned explanations (stress, PMS, in the genes, conspiracies, the Evil Eye, celestial or spiritual activities, etc.).
4. Priming by recent exposure to a particular stimulus class.
5. The wish to have the explanation absolve the Actor of personal responsibility for the discontinuity.
6. Choice of causal explanations that elicit attention, sympathy, support from others.
7. Selection of a cause that maintains consistency with the Actor's relevant beliefs, values, or ideology, even if false.
8. The reliance on learned, reinforced explanatory categories to guide the Actor's search for meaning.

The operations in both categories of (4) and (5) are combined in those for whom the discontinuity is a dysfunctional lifestyle that is misattributed to their being abused as children. The significance of the final category of learned search frame biases is elaborated next because it is one of the unique aspects of this theoretical approach.

3. Explanatory Search Frames Biasing Discontinuity Explanations

Many of us get reinforced for using particular classes of explanation when faced with a discontinuity to be explained. I term this construct *explanatory search frames*. We may imitate explanatory modes that are preferentially used by family models, or learn them from our exposure to other models in religion (Proudfoot & Shaver, 1975), education, the media,

friends, or others. These classes of explanation can be conceptualized as being arranged in a personal hierarchy of availability or accessibility (in the Tversky & Kahneman, 1973, sense), readily activated by the perception of a discontinuity. They determine how the search for meaning is framed initially, by focusing on either physical or social sources of discontinuity, and what questions are likely to generate answers relevant to that realm—What? for the physical versus Who? for the social potential cause. They may direct searches either internally to aspects of body or self, or externally to the environment, to other people, or agencies. It is instructive to realize that anomalies of experience may occur in many domains of cognitive functioning, such as attention, imagery and perception, recall, recognition, judgment and belief, and anomalies in experiences of the self (Reed, 1974).

To get a sense of how people explain a wide range of possible discontinuities, I asked several hundred of my students to respond to thirty hypothetical scenarios involving a variety of unexpected events that each had a positive or negative outcome. Their open-ended responses were coded and then given to another large class of students who reacted to the discontinuity scenarios by choosing one of the fixed-response alternatives that best explained the anomalous experience. Specifically, they were invited to imagine each scenario as having just happened to them, and then to ask: "How could this have happened, or why?" They were instructed then to "provide whatever possible explanation(s) you can come up with." The gist of these scenarios can be gleaned from the following examples:

1. "You get together with a group of people to work on a joint project. Everyone else seems to be whispering. When you ask them why they are talking so quietly, they deny that they are doing so—but keep it up." Explanations:(a) The others are talking about me and/or trying to exclude me from their group. (b) There must be something wrong with my hearing that I was unaware of. (c) the background noise and room acoustics are creating conditions that make communication difficult.

2. "You've been doing an excellent job at your place of employment. Promotions are being passed around, but your boss ignores you and your good work is not acknowledged." Explanations: (a) The company criteria for promotion place more emphasis on being socially attractive than on being accurate and reliable. (b) My boss doesn't like me and is out to undermine my confidence. (c) It's divine intervention because the promotion would not be in my best long-run interests.

From this exploratory study, it was apparent that across this set of quite varied types of discontinuities, eight categories of explanation exhausted most of the variance, as shown in Table I.

TABLE 1

EXPLANATORY SEARCH FRAMES UTILIZED TO ACCOUNT FOR A VARIETY OF DISCONTINUITIES

Internal focus

1. My body and health status
2. My self-attributes, dispositional tendencies, personality traits (such as being "unlucky," or a "shlemiel")
3. Something from my past

External focus

4. The currently experienced physical environment
5. My social environment, another person, or group
6. Mystical or spiritual forces (such as gods, angels, devils, witches, extraterrestrials)
7. Structural or ideological systems (such as racism, sexism, Communism, liberalism)

Dispersed focus

8. Chance, coincidence, "dumb luck," or merely correlated events

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The last category of chance or coincidence was the least frequently proposed as a cause for these varied and often extreme instances of discontinuity. Instead of "dumb luck" operating in a discontinuous experience, people are more likely to interpret it dispositionally ("I am a lucky/unlucky person") as the causal mechanism. Incidentally, this exercise helped me to understand a pedagogical puzzle, why so many bright students in my classes do not learn the maxim that "correlation does not imply causation." I now believe that the mind is designed to transform perceived correlations into causal experiences, so it becomes difficult to accept the fact that they are really different processes.

In the final part of this section, I will advance another special feature of Discontinuity Theory, namely the prediction of specific types of pathology based on which of these characteristic explanatory search frames are habitually used when dealing with personally significant discontinuities. But before doing so, I will discuss the more general role of reasons, attributions, and narrative stories in formulating decisions.

4. Reason-Based Decisions about the Best Discontinuity Analysis

Our prototypical Actor perceives a discontinuity that qualifies as "significant" according to the criteria noted previously, reflects upon alternative causes, and makes the decision that one of them is most probable. Having chosen that option, the Actor then seeks evidence to bolster that decision (Lord, Ross, & Lepper, 1979). Although some Actors exert considerable mental effort in searching for a compelling rationale for choosing one alternative rather than any alternatives, other Actors' choices may be imme-

diately and nonconsciously influenced by affective judgments (Kihlstrom, 1984, 1985; Marcel, 1983; Rachman, 1981; Rosenberg, 1960; Zajonc, 1980). Research on reason-based choice (Shafir, Simonson, & Tversky, 1993) shows that the reasons considered in making a choice may be influenced by the effects of context, salience, compatibility, framing, and elicitation procedures, which are all manipulable. These variables "highlight different aspects of the options and bring forth different reasons and considerations that influence decision" (1993, p. 34). In the situations we have been considering so far, classical decision theory does not hold because people do not have stable values or preferences; rather these are constructed "on-line" during the process of dealing with a given discontinuity scenario. These cognitive scientists (Shafir et al., 1993) conclude their experimental investigation of how reasons guide choice with a statement quite compatible to those advanced earlier in this chapter:

> We often search for a convincing rationale for the decisions we make, whether for inter-personal purposes, so that we can explain to others the reasons for our decisions, or for intra-personal motives, so that we may feel confident of having made the 'right' choice. (p. 33)

This cognitive approach to the role of reasons that precede and guide choice contrasts with the postdecisional processes of generating rationalizations and justifications that has characterized much social psychological theorizing and research (e.g., Aronson 1968; Bem, 1972; Cooper & Fazio, 1984; Festinger, 1957; Wicklund & Brehm, 1976; Zimbardo, 1969). Discontinuity Theory, as outlined here, proposes that the role of reason operates at both pre- and postchoice stages of generating alternatives, choosing among them, and then constructing adequate rationales for why that choice was best. I prefer to think about these two temporally distinct phases as the context of discovery and the context of justification, respectively. Precisely because Actors must often consider the necessity of convincing others of the reasonableness of the causal argument selected, they need to create accounts, narratives, or mini-theories that enrich the central reason(s) guiding and justifying their position. A similar view has been argued by Billig (1987), who advances a rhetorical approach to understanding such issues, noting that, "our inner deliberations are silent arguments conducted within the single self" (p. 5). Surely that notion captures the process going on inside the mind of the Actor coping with the tension created by a significant personal discontinuity. We will see evidence for such a claim in both the case studies that follow this general section, and also in some of the personal accounts collected during the experimental testing of various aspects of our theory.

D. MADNESS AS *IR*-RATIONALITY PLUS *AB*-NORMALITY: ENACTING ONE'S THEORY IN SEARCH OF DATA

— The mind is its own place, and in itself/Can make a heaven of hell, a hell of heaven.
—Milton, *Paradise Lost*

When the Actor does generate reasons, or a story, in the form of a personal theory that seems to account for the discontinuity, then that theory takes on a centrifugal force that sucks up all evidence into its vortex of justification. Only confirming evidence is noticed, catalogued, and packed into the emerging pattern of self-evident truth, while critical disconfirming data are set aside as irrelevant. This person gets into trouble in two ways. First is the failure to be an objective, diligent, bottom-up monitor of available data, and the second is the failure to generate a top-down set of the most reasonable hypotheses with alternatives that must be disconfirmed and discarded before accepting the most probable one. As a biased theorist enamored of one's little theory, one's conjectures and misattributions soon become "facts" on which other decisions are based. Under some circumstances, these mental transformations cause the initial perturbations from a discontinuity to escalate into pathological reactions.

If a discontinuity is personally significant and ongoing, rather than transient, and the Actor's searches for rationality and normality do not adequately achieve a sufficient degree of anxiety reduction, then the possibility exists that more drastic psychological processes will be called into action. There are several forms this action can take. Failing to discover order, logic, and a satisfactory reasoned analysis of the original discontinuity, the person may impose a spurious kind of order and organization on the rest of one's life through reliance on compulsive thinking and obsessive behavior. She or he may develop a ruminative thinking style that replays aspects of the old discontinuity scenario, exaggerates self-blame for negative outcomes, and thereby encourages a depressive disorder (Nolen-Hoeksema, Parker, & Larsen, 1994).

If there is the danger that others will reject the Actor's explanation and not be socially supportive, then social withdrawal and isolation handles that challenge to one's self-esteem. If the discontinuity-generated anxiety cannot be reduced by the cognitive, social, or behavioral searches, then it can be eliminated by suppressing all forms of arousal and becoming motive-less, or affect-less. If there is not consensual validation for the Actor's explanation, nor acceptable external validity checks, he or she can reverse the process by making internal reality the standard against which to validate the external. Finally, if standard forms of reasoning have proven ineffective, then reliance on nonstandard forms of logic, reasoning, and language can

prevent refutation of the Actor's proofs. Such tactics, operating at various levels of conscious and unconscious processing, obviously describe the cognitive, affective, motivational, and behavioral characteristics of serious mental disorders. In some cases, we can observe the development of a rigid character structure that comes to dominate the person's lifestyle. Shapiro (1981) notes that "such a continuously deliberate, purposive, and tense self-direction involves a special kind of self-awareness or self-consciousness. Rigid people direct themselves with a greater and more extensive awareness than others have of what they are doing, and how they are doing it" (p. 70). In the final experiment to be presented in this chapter clinicians judged many of our ordinary, "normal" research participants as suffering from "pathological" disorders. I believe their judgments were swayed by the extreme rigidity with which these students maintained untenable explanations to account for the discontinuity of their unexplained arousal.

Sociologist Edwin Lemert (1962) concludes his analysis of the conditions that lead to paranoid reactions among usually normal individuals with this summary of social and personal discontinuities:

A number of studies have ended with the conclusions that external circumstances— changes in norms and values, displacement, strange environments, isolation, and linguistic separation—may create a paranoid disposition in the absence of any special character structure. (p. 70)

We can now advance the strong form of our argument: All forms of madness that do not have their origins in organic, brain, or hormonal defects, are the perversion of the most natural and basic human functions, the needs to know, to belong, and to gain esteem. In the process of engaging in the fundamental aspects of being a thinking, relating human being who desires to understand the unknown, to order chaos, and to enrich the human connection, some of us get led astray. We start down the wrong path to getting the answers we seek by using biased thinking strategies when trying to find causal explanations for experienced discontinuities. These explanations become the *symptoms* of faulty thinking, of pathological reasoning, of delusional beliefs of inappropriate affect. The symptoms of madness emerge from, and are sometimes isomorphic with, the explanations generated to provide a narrative account of certain discontinuities. Explanations need not be verbally stated propositions, but can be nonverbal messages that convey various meanings to the Actor and observers. For example, a headache can be an explanation for academic or sexual performance failures, or a muscle spasm may become the reason for sports failures—both are forms of nonconscious self-handicapping reactions.

Discontinuities that are unexplainable and not open to normalizing through social affiliations may trigger a transformation of the disturbed

psychic energy they create directly into somatic symptoms, such as asthma (Eastwood, 1975). We may "choose" physical symptoms that convert ineffable psychological distress into bodily problems that can be treated, discussed, and that often get sympathy (Pennebaker & Epstein, 1983). That happened to me during my junior year in high school. I had always been very popular in my Bronx neighborhood and in the various schools I attended, but was totally rejected for almost an entire school year when I went to North Hollywood High School. This social status discontinuity was alien to me, and did not make sense since I had not changed in any way, but it was evident that I was being shunned. After a month or so, I developed nighttime asthma, that made it difficult to sleep, caused me to miss classes or come late, and elicited much concern from my family. So much so, that they moved back to the Bronx at the end of the school term. I learned late in this unfortunate experience that a rumor had been circulated that I was a New York Italian connected to the Mafia, and the other students were afraid of me! Back in the Bronx, I was elected the most popular boy at James Monroe High School the very next term. That transformation based on situational context and not dispositional variability was a source of interesting dialogues with my classmate, Stanley Milgram.

The secondary anxiety about appearing to be irrational, without a satisfactorily reasoned analysis for important discontinuities in one's life, may also lead to some forms of social pathology as the Actor eschews usual reference groups for more exotic, bizarre, deviant ones that normalize idiosyncratic behavior in the unusual behavioral context they provide. We have also described how more extreme reactions can surface when the Actor becomes aware of seeming to be both irrational and abnormal—such reactions as social isolation, affect suppression, and reversed reality checks. Another form of personal pathology that can result from the processes described is the emergence of addictive and compulsive behaviors that get reinforced while trying to suppress the anxiety component of discontinuities by resorting to direct behavioral strategies.

J. Why Call it "Madness?"

What is madness/To those who only observe, is often wisdom/To those to whom it happens.
— Christopher Fry, *A Phoenix Too Frequent*

Using the term "madness" permits inclusion of a wide spectrum of reactions across a diverse body of available literature in anthropology, sociology, law, drama, history, as well as psychiatry and clinical psychology (see Claridge, 1985/1995; Foucault, 1967; Franzini & Grossberg, 1994; Henry,

1971; Orford, 1976; Scheff, 1975; Shapiro, 1965; Szasz, 1973; Wing, 1978). Madness, in such a view, is not an objectively verifiable fact, as is cancer or stroke. Madness is always an attribution about a deviation from expected normative behavior. It is an attribution made by human observers and is particularly significant when they have expert or legal power. Morton Schatzman (1973) asserts such a view in his book, *Soul Murder:* "Many people feel persecuted, but no one ever feels paranoid. Paranoia is not an experience; it is an attribution one person makes about another" (p. 147).

Such attributions, explanations, and accounts of unusual behavior must be understood in terms of the social transactions among people (see Antaki, 1981). To be labeled "mad" is dependent on cultural and contextual factors, on interpersonal power relationships, on the current value to the society of the Actor in question, as well as on the degree of social support or isolation of that person (Medvedev & Medvedev, 1971; Mezzich & Berganza, 1984). Standards of rationality and normality are culturally determined, varying as well over historical epochs as knowledge changes and as culturally sanctioned explanations for discontinuities and madness also change (Bell, 1980; Eaton, 1980; Levi-Strauss, 1966; Porter, 1989; Rosen, 1968; Rosenbaum, 1970; Van Gennep, 1960).

Madness also varies across a broad continuum from mildly deviant, aberrant, eccentric in thoughts, feelings, and actions to "being out of one's mind," running amok, going berserk, certifiably crazy, and *Diagnostic and Statistical Manual (DSM)* pathological (APA, 1980; Fabing, 1956; Luborsky, 1970). My predictions about the madness-engendering consequences of some discontinuities and their associated biased search frames do not extend to any pathologies that are organic in origin, or genetic, or developmental, but to learned adaptations or maladaptations. The normal side of madness involves "functional perturbations" in normal people in their obsessions (Köhler, 1958; Rachman & Hodgson, 1980); motivated irrationality (Frankel, 1973; Pears, 1982); benign paralogical thinking (Glasner, 1966); self-deceptions (Goleman, 1985; Gur & Sackheim, 1979; Sarbin, 1981); mental epidemics (Young, 1927); "love melancholy" (Burton 1621/1977); "creative malady (Pickeri, 1974); everyday paranoid thinking (Artiss & Bullard, 1966); eccentric and bizarre behaviors (Franzini & Grossberg, 1994); suspicions that merge into delusions; occult beliefs (Singer & Benassi, 1981); and other forms of abnormal behavior in normal people, such as prejudice, vandalism, violence, self-derogation, and addictions (see Gruder, Gurwitz, & Reiss, 1977). We also need to recognize the extent to which apparently functioning members of society may still be carrying around a high degree of pathological symptoms. In a recent study of more than 600 students at three private and public colleges, 18% had average scores on a general symptom inventory that exceeded outpatient norms, and for 17%

the number of symptoms they reported exceeded even inpatient norms (Holman & Zimbardo, 1999).

It can be argued further that madness decreases in a society to the extent that (a) the society provides a ready storehouse of sanctioned hypotheses, theories, or rationales for the appearance of discontinuities in thinking, feeling, and acting; and (b) the society intervenes to restore harmony by accepting some responsibility for its role in the discontinuity, as we saw earlier in the example of the rituals practiced by the Nyakusa (Wilson, 1962). For some kinds of discontinuities, readily available societal explanations abound in the form of truisms, homilies, folklore, wisdom of the elders, and white or black magic. When the culture has the answer, the individual's search for a discontinuity-based reason is short-circuited. By accepting the dominant, prevalent explanation, and being open to whatever prescribed ritual practices accompany it, the Actor does not risk social rejection. Simply following the standard operating procedures ensures the Actor will be perceived as doing the "right thing." Normality is thus assured, even if the treatment does not change the state created by the discontinuity. Conversely, madness becomes more prevalent to the extent that individuals are forced to generate their own explanations for experienced discontinuities, and also to provide necessary data sets that verify those attributions—to the approved standards of critical societal judges. This reasoning leads to the obvious conclusion that the frequency of psychopathology should be greater in more individualistic than collective societies.

My perspective suggests that madness is not an "alien" aspect of humanity, but merely a perversion of human perfectibility. In understanding madness, we understand some of the most fundamental dynamics about the human mind: how we know reality, distinguish internal from external, represent sensory and social experiences in memory and reasoning, make causal attributions, and find evidential bases for our theories.

Instead of focusing on inner "disease states" that need to be "cured," or on "premorbid" personalities with a ready vulnerability to mental illness, the present model postulates that madness is to be treated by first ruling out organic impairments and dysfunctions, and then by examining (a) the nature of the explanations for discontinuities that ordinary people generate; (b) how and why these explanations have become biased; (c) why people persist in maintaining them despite contrary evidence; and (d) what can be done to correct these biased explanatory searches, misattributions, and faulty conclusions.

2. Explanatory versus Confirmatory Processes in Symptom Development

What is madness? To have erroneous perceptions and to reason correctly from them.
—Voltaire, *Madness, In Philosophical Dictionary*

Mad is a term we use to describe someone who is obsessed with one idea and nothing else.
— Ugo Betti, *Struggle Till Dawn*

So far, I have argued for the central role of discontinuity as a catalyst of various search processes, some of which swerve off the path of rationality and normality to create disorders in cognition and affect that may result in the formation of pathological symptoms. Further, I have maintained that biases in the explanatory search frames used to make sense of discontinuities mediate the development of unusual explanations that serve as symptoms, some functioning as self-handicaps (Kolditz & Arkin, 1982).

However, I have combined two different processes that should be considered separately. While the *explanatory search*, triggered initially by the need to explain a discontinuity, leads to the development of theory building, the *confirmatory search* integrates the Actor's current experience and situational information as support for the established personal theory about the nature of that discontinuity. This distinction was first made in a brilliant thesis by Lisa Butler (1993), working in my laboratory, as a way to understand how paranoid symptoms could reflect a disorder of affect (specifically, anger) and not a disorder of cognition, as traditionally believed.

Although Butler's distinction limits the two searches to her primary interest in paranoid processes, I believe it is more widely applicable to other pathological processes as well. Her analysis also distinguishes between bottom-up and top-down information processing as they operate in each of these two cognitive processes. Butler argues that the development of paranoid symptoms, such as suspicions and delusions, precipitated by discontinuities in explanatory or reactive paranoia, depends on a data-driven or 'bottom-up' process of explanation or theory building. She contrasts that process with confirmatory or proactive paranoia, in which "the expectations of a paranoid personality or the delusional beliefs of a paranoiac drive an inspection and 'top-down' interpretation of features of the social and physical environment with its goal being to reconcile experience and information with the prevailing predispositional theory" (p. iv).

Paranoia is a mental disorder that ought to be of considerable interest to social psychologists because of the critical role played by people schema and misattributions about actual or imagined others (Maher, 1974a,b; Maher & Ross, 1984). It also shares features with prejudice in its creation of adversaries, resistance to change of belief structures, the central position of the self in paranoia, and of one's identity group in prejudice (Fenigstein & Vanable, 1992).

John Kihlstrom effectively develops the view that paranoid delusions are explanations of anomalous experiences that are best understood within

the framework of attribution theory and social cognition (Kihlstrom, 1979; Kihlstrom & Hoyt, 1988). He elaborates upon Brendan Maher's (1974a,b) analysis that delusions are the product of normal reasoning processes initiated by an unexplained perceptual anomaly, one that arouses anxiety and demands explanation. In this formulation *unexplained* anomalistic experiences are primary while delusions are secondary. Similar views have been advanced by Jaspers (1962) and Reed (1974), who argued that primary delusion was a contentless, diffuse, ineffable perceptual experience. Delusions are then developed as belief systems—false beliefs—that provide the content, structure, and meaning for the anomaly. They are self-referential ideas about oneself, whose "content is crucially related to the individual's fears, needs, or security" (Reed, 1974, p. 83). Such delusional beliefs "reflect the patient's attempts to describe, from attributions about, and explain primary delusional experiences. These explanations draw on the person's fund of world knowledge and repertoire of inferential processes" (Kihlstrom & Hoyt, 1988, p. 83). In a sense, these delusions are reminiscent of the explanations given by Gazzaniga's (1998) split-brain patients whose verbal, left hemisphere generates explanations, sometimes bizarre, to account for the perceptual or sensory experiences of the right hemisphere. Just as it is difficult to convince such patients that "believing is not seeing," so too, it is difficult for normal individuals and schizophrenics alike to self-correct their delusions and irrational explanations as long as the anomalies persist that they purport to explain. This is so for all the reasons that they do not behave like professional scientists in using optimal hypothesis-testing strategies, searching for diagnostic information, seeking disconformation, and minimizing subjective biases.

Mark Leary and Rowland Miller (1986) effectively articulate the general utility of social psychology for understanding the origins, diagnoses, and treatment of dysfunctional behaviors, usually the sole province of clinical psychology and psychiatry. They elaborate on a number of the processes and constructs outlined in this chapter that link basic aspects of social psychology to those of "abnormal" psychology (long ago linked before *JASP* became *JPSP*).

A new, social-information-processing model of paranoid social cognition, elegantly developed by Rod Kramer (1998), highlights the importance of the informational and social context in which an individual's perceptions and cognitions are embedded. This analysis of the formation of suspicion and distrust at all levels of social organization proposes three input variables: feeling uncertain about one's social standing, or "tenure status," perceiving one's self to be distinctive, to stand out, in a group setting; and perceiving one's behavior under evaluative scrutiny. They combine to promote a dysphoric, negative self-consciousness, which in turn, leads to

hypervigilance and rumination. When filtered through a series of judgmental biases, these selective, obsessive thoughts emerge as paranoid delusional beliefs. Here is another instance of a social psychological approach to understanding paranoia that deserves experimental testing, as well as application to clinical populations.

The social psychology of paranoia is interestingly revealed in one of our experiments (to be presented later on) that induced paranoid symptoms in normal college students through several alternative discontinuity manipulations (Zimbardo, Andersen, & Kabat, 1981). In a matter of minutes, these participants, chosen for their mental and physical health, were behaving in ways that peers and clinical test results agreed was deserving of a diagnosis of a paranoid disorder.

3. Predictions Relating Biased Explanatory Search Frames to Forms of Pathology

A man's worst enemy can't wish him what he thinks up for himself.

(Yiddish proverb)

Finally, let's move from abstract generalizations to more specific predictions about how particular types of pathology are linked to each of our eight categories of biased explanatory search frames. Table II outlines the

TABLE II

PREDICTED PATHOLOGICAL REACTIONS AT INDIVIDUAL AND SOCIAL LEVELS BASED ON BIASED USE OF SPECIFIC EXPLANATORY SEARCH FRAMES TO ACCOUNT FOR PERCEIVED DISCONTINUITIES

Biased focus	Individual pathology	Social pathology
Internal orientation		
Body/health status	Hypochondriasis, Somatoform disorder	Mass hysteria
Self-attributes (Negative)	Depression	Prevalence of shyness
Personal past (Aversive, Negative)	Depression	Prevalence of "false memory syndrome"
External orientation		
Physical environment	Phobias	Vandalism
People	Paranoid disorders	Prejudice, discrimination
Mystical/spiritual forces	Paranoid disorders, spirit possession	Witchcraft, satanic cults
Structural/ideological agencies	Fanaticism, suicidal martydom	Terrorism, war
Chance, luck, fate (Present fatalism)	Learned helplessness, addictions, depression	Maintenance of low socioeconomic status

expected relationships between each type of biased explanatory focus and the forms of individual pathology to which it gives rise. This perspective is extended further by also relating biased search frames to forms of social pathology that are a product of collectives of people employing similar search frames when some of them are experiencing discontinuities. The experimental research section of this chapter presents evidence for the validity of some of these linkages, based on studies that manipulated various biased search frames and measured resulting pathological outcomes.

For each type of biased focus, or explanatory search frame, there is a corresponding extreme reaction when it is overused as the only source to account for a significant discontinuity, and is rigidly maintained despite evidence to the contrary. The correspondence rule specifies that when thoughts, feelings, motivations, and behavior are organized around a particular biased focus, then the fundamental feature of that bias acts as an organizing schemata which leads to specific pathological disorders that share the properties of those central schema. The determination or diagnosis of pathology is typically made by those with expert status in the realm of mental health, psychiatrists and clinical psychologists. But such evaluations are routinely made also by those familiar with the Actor, and at times by the Actor as well. Here pathology refers both to the professional judgments of mental disorder and the lay evaluations as well.

It is also possible to extend these ideas to social situations where many people share the same discontinuity bias, despite differences in the origins of their discontinuities. Social pathology refers to actions by a collective of people, acting individually or in concert, to engage in behaviors that are nonnormative, socially undesirable, or that violate some higher-order ethical standards.

The predictions I feel most confident about are those positing the following correspondences:

1. Those judged to have hypochondriacal, or somatoform, disorders, will most likely be those whose internal biased search frame centers around their Body/Health Status.
2. Those with phobic disorders will be overrepresented among those whose biased external search frame centers on aspects of the Physical Environment.
3. Paranoid disorders will be traced back most directly to those whose external biased focus is on People. In addition, the biased focus on Mystical/Spiritual forces can also contribute to paranoia if the Actor either personalizes those gods and demons, or assumes that others are influencing evil spirits to act against him or her.

These three predictions were directly tested in experimental research to be presented later in this chapter. Manipulated search frames focusing

on environment, body or health, and people among those coping with unexplained arousal resulted in mental and behavioral reactions that were classified as pathological for some research participants. We found correspondences between environment framing and phobia, health framing and hypochondriasis, and also people framing and paranoia. Returning to the remaining predictions, from Table II, I cite the following:

4. Depression is most likely to be linked to both an internal biased focus on Self Attributes, if that focus centers on personal inadequacies, deficits, or failures to achieve goals. It can also be linked to an explanatory search bias that focuses on one's past, if that construal of the past is primarily negative or aversive. A Past-Negative focus centers around ruminations of trauma, abuse, neglect, mistreatment, and failures, which combine to lower self-esteem and raise depression.
5. The external biased focus on Structural/Ideological Agencies, as a causal agent in discontinuities, is most likely when the Actor has a salient identity as a member of a particular group in opposition to competing or more dominant groups in the society. Then the "isms" come to play a significant role in attributions of one's personal failures and troubles, and for the inequities experienced by one's group. At an individual level of pathology, the extreme involvement in this form of thinking leads to fanaticism, authoritarianism, and suicidal martyrdom.
6. Those who attribute discontinuities to the operation of chance, luck, or fate feel that their lives are controlled by random forces or are predestined by religious or mystical agencies, rather than by their personal agency. That orientation leads to the pathologies of learned helplessness (Seligman, 1975), pessimism, depression, and addictions to immediate pleasures regardless of long-term costs.

Before turning to examine the predictions relating these explanatory search frames to corresponding forms of social pathology, I want to mention another line of research that identifies individual time perspective profiles, using a new metric, the Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999). In one of our validation studies, those whose time perspective scores mark them as high on the Past-Negative factor (focus their thinking on aversive aspects of their past life) were lowest in self-esteem and highest on depressive symptoms, and also on trait anxiety, of any group, with robustly significant correlations for each of these negative outcomes.

The Social Pathology side of the agenda extends the conceptualization that went into formulating the individual pathologies to societal forms of dysfunctional behavior. These predictions are made more tentatively than those for the Individual Pathologies, but are perhaps more interesting.

1. Instances of mass hysteria represent a form of emotional contagion that occurs only among those whose primary search frame is Body/Health. When people are in proximity to others in a collective setting, any of whom experience and display reactions to a current discontinuity that is symbolically related to a prior discontinuity, such as a personal loss, a social psychogenic process will be triggered.

2. The focus by individuals on Negative Personal Attributes could, when aggregated, contribute to the high levels of shyness being reported in our society and in others (Carducci & Zimbardo, 1995). Shyness, like paranoia, is as much a social process as it is an individual one.

3. Overemphasis on the negative aspects of one's Past, as a biased cognitive focus, when combined with a currently dysfunctional lifestyle, and mass media exposure to cases of traumatic abuse, could contribute to the recent phenomenon of False Memory Syndrome versus recovered memories of abuse (see Freyd, 1996, Hechler, 1994; Loftus & Ketcham, 1994; Ofshe & Watters, 1994; Pope & Brown, 1996; Schooler, Bendiksen, & Ambadar, 1998; Winegrat, 1985; and entire issues of *Current Directions in Psychological Science*, Lynn & Payne, 1997, and *Child Mistreatment, Vol. 2*, May, 1997).

4. Destruction of aspects of the environment through acts of vandalism is the social pathology of those with an extreme Environment bias (Zimbardo, 1976).

5. Prejudice is the social pathology aspect of individual paranoia. Instead of simply fearing others are out to harm them, the collective of such individuals focuses on others whom they can harm or exploit because these others are inferior relative to their own dominant status as the discriminators (J. Jones, 1997).

6. Practicing witchcraft, and other Satanic cult-like activities, assumed to harness the power of mystical forces for personal or collective gain, is an instance of the social pathology dimension of a biased focus on Mystical/Spiritual Agencies (see Baroja, 1973; Middleton, 1967; Sebald, 1978).

7. While the positive dimension of this orientation toward explaining discontinuities in terms of Structural/Ideological Agencies is a constructive activism that seeks to change systems of assumed oppression or dominance hierarchies (Pratto, 1999), the negative dimension is anchored by those who form collectives that endorse terrorism and war, the ultimate social pathologies.

8. Finally, an insidious form of social pathology is the maintenance of low socioeconomic status (SES) for entire groups of poor people as a consequence of their adopting a fatalistic, present-orientation that leaves vital decisions to the operation of chance and luck, rather than a developed sense of self-efficacy (Bandura, 1997).

These ideas and predictions about social pathology are based neither on compelling evidence, nor rigorously derived from Discontinuity Theory.

Rather, they are presented for their heuristic value in provoking consideration of a range of dynamic relationships between the cognitive and social psychological constructs outlined in this theory, clinical perspectives on psychopathology, and sociological views of collective forms of pathology.

Each biased search focus, hypothesized to lead to particular pathologies when misused in the process of accounting for anomalies in one's experience, also has an "idealized" version. Such a focus may function productively and constructively to promote value orientations, guide decisions, and initiate individual and collective actions in socially approved directions. When they are practiced by many people within a society, these biased frameworks help form the foundations of many "approved disciplines" and institutions. Consider one set of parallels between such socially shared biased search frames and the approved societal disciplines they engender.

1. Body/health focus supports medicine
2. People focus supports social sciences
3. Environmental focus supports physics, ecology
4. Self attribute focus supports drama, personality/character analysis
5. Temporal focus supports history
6. Temporal focus plus people focus supports psychoanalysis
7. Structural/ideological focus supports politics, military
8. Mystical/spiritual focus supports religion, shamanism
9. Ideological focus plus spiritual focus supports right-wing religious politics

We next consider a set of illustrative case examples of various aspects of Discontinuity Theory before turning to our experimental evidence.

III. Case Studies Illustrating Aspects of the Theory

I wish now to introduce a more clinical perspective to this presentation by describing case study examples that enrich the conceptual side of the theory by illustrating its applicability across a spectrum of real-life experiences. Some come from people I have worked with directly, or known personally, others derive from the literature and media sources. They are grouped under headings that relate to different aspects of Discontinuity Theory.

A. FAILURE TO RECOGNIZE OR ADMIT THE TRUE SOURCE OF ONE'S DISCONTINUITY

The first of these two cases is perhaps the single best instance of the power of this new approach to understand and deal with psychological

disorders that stem from the failure to recognize or admit the true source of a discontinuity. The second is a reinterpretation of a classic case study in clinical literature, that of Dr. Schreiber. The memoirs of his psychotic experiences formed the basis of Freud's theory of homosexual projection in paranoid disorders (Freud, 1911).

1. Gary, the Almost Perfect Student

Gary, a freshman in my Introductory Psychology course, came to an office hour to request a referral to a Student Health Clinic therapist. He reported having three problems that started recently and were interfering with his concentration and study, and thus were negatively affecting his grades. Before making that referral, I asked if he first wanted to discuss his problems with me so that my referral would be more informed. In response, he reported the following: (a) that eating difficulties were making him nauseated and unable to eat much food, causing weight loss and a general weakness that made studying difficult; (b) that sexual impotence made it impossible to get or maintain an erection, causing much concern over his sexual identity and masculinity; and (c) that he was experiencing uncontrollable hostile impulses and violent ideation at the slightest sign of disagreement with anyone, and these were very bothersome since he had always been a mild-mannered person. This combination of acknowledged physical and mental problems was responsible for his recent low grades in many courses since they impaired his concentration both in class and studying in the dorm, according to Gary's reasonable self-analysis.

Indeed, this set of "presenting symptoms" deserved expert clinical treatment, which I arranged for him to receive from a colleague, who happened to be psychoanalytically trained. But before leaving, I asked Gary two more questions about the specific timing of the onset of these events, his teachers, and grades. Because these experiences were recent and fresh in his mind, Gary was able to state with certainty the week or so when each of them first were noticed during the current school term. "I am a perfect student" was his answer to the grades question. He had always gotten straight-A grades, graduating at top of his class (in a small rural high school), which made his parents so proud they typically referred to their son as "Perfect Gary."

My colleague in Student Health confided to me that Gary's was a very serious case, requiring long-term treatment, more than could be handled through their services. His diagnosis integrated all three seemingly disparate problems around the theme of repressed homosexuality impulses beginning to emerge into consciousness (briefly, the impotence was around contact

with females, eating food was symbolic fellatio, and the hostile imagery was projection of his fears of being discovered).

Meanwhile, I had checked with each of Gary's teachers who told me the dates on which he received his low test or paper grades in their courses. When Gary returned the next week, I invited him to verify the timeline of the origin of each of his three personal problems that were causing his academic problems. He was surprised to discover that in every instance, his poor grades *preceded* the onset of any of the troubling symptoms of distress. The causal sequence was totally reversed!

I explained that the path of my reasoning started with the violation of a vitally important aspect of his self-image—being the perfect student—when he first started performing subpar in his courses. Such difficulties are common among many new students at top academic institutions where most other students were also selected because they had been outstanding. Lower grades are a fact of life where grading is "on the curve," evaluating students' performance relative to each other, rather than to absolute norms. The true source of his problems might be traced to the discontinuity occasioned by his sudden fall from academic grace and perfection, which had more to do with the new elevated comparison group of "academic sharks" among whom he was now swimming than a loss of brain power.

After further discussion of the impossible burdens imposed on him by having to sustain that image of perfection, and learning that the college no longer sent student grades home to their parents, Gary left feeling much less anxious. I checked with him several weeks later and he reported that all those terrible problems had stopped, and his grades were beginning to pick up. He never went back to the therapist, and graduated four years later with satisfactory, average grades from a quite respectable college.

Among the conceptual morals of this story relevant to Discontinuity Theory are the following:

1. When the true source of a discontinuity is perceived as negative, chronic, and unchangeable (I am not smart), alternative misattributions are generated to create sources that are perceived as modifiable by expert treatment (I have a psychological problem, rather than an intellectual deficit).

2. Self-handicapping substitutes a motivational basis for failure or anticipated evaluation in place of an ability-based explanation (Arkin & Baumgardner, 1985).

3. Physical symptoms can be the nonconscious, nonverbal explanations for discontinuities (Pennebaker & Epstein 1985)

4. There may be anticipated "secondary gains" in the preconscious choice of symptoms (e.g., Gary got attention, sympathy, and acceptance of the "reasons" for his academic problems)

5. The longer the time gap between experiencing the original discontinuity and seeking expert or lay help for it, the harder it is to discover the true causal timing sequence of discontinuity triggers and consequences, since memory distortion and other intervening discontinuities add to the causal attributional confusion.

6. While many students have similar problems, few develop such extreme solutions as Gary's, because academic performance had become the most important, or only, yardstick for measuring his self-worth.

7. Biases of observer-listeners to the accounts of someone experiencing a discontinuity will influence their interpretation of its likely causal factors and sequences, and in turn, will get communicated to the Actor as a "working script" for understanding why it is happening.

I will elaborate briefly on two of these points. Most people who seek professional help for mental problems often wait months or years from the onset of the problem to their first visit, a time span that makes it difficult to do what I was able to do to create Gary's "miracle cure" by uncovering a precise causal-sequence timing. Had he come to see me the next year, he would likely recall only vaguely when his problems began, and his alternative causal sequence would have been difficult to challenge and disprove, especially since it was so reasonable.

Secondly, notice that not only did the psychoanalytic training of the therapist direct him to frame Gary's symptom triad solely within that Freudian theoretical perspective, but he failed even to recognize what my academic bias focused on immediately—the significance of grades in Gary's narrative (for a report of attributional biases among clinicians, see Plous & Zimbardo, 1986). (In a subsequent section, I will report a more detailed example of the way that such a theoretical bias distorted the understanding by a clinical expert of why my research participants were experiencing intense distress.)

2. Dr. Schreber Is Mad Because He Can't Tell the World that Dr. Schreber Abused Him

A second instance of misattributing the cause of a discontinuity to a nonveridical source has a less happy ending than our first case. Daniel Paul Schreber (1842-1911) was an eminent German judge who became a paranoid schizophrenic mental patient at age 42, spent 13 of the next 27 years in asylums, and died there. During this time period he collected the notes about his thoughts and experiences into a published book, Memoirs of My Nervous Illness (Schreber, 1903/1955). Schreber's memoirs provided Freud with extraordinarily clear descriptions of the patient's thinking pro-

cesses and fantasies, according to analysts Kanzer and Glenn (1980, p. 329). So much so, that they became the basis of one of Freud's most famous cases, his first literary-historical writing of "pathography," and the basis for his theory of the origin of paranoia as a defense against homosexual love (Freud, 1911).

There are a number of curious facts and inferences about this case that fit aspects of Discontinuity Theory. First, all portions of the "Memoirs" related to Schreber's childhood were deleted by Schreber's editors prior to publication. The second related curiosity is that Freud exercised remarkable "analytic restraint" in not using a major source of available information about Schreber's childhood, namely the voluminous writings of his father, Dr. Daniel Gottlieb Schreber. His father was the preeminent pedagogue of his era. He authored 18 books that were widely read and reprinted, covered a wide range of topics, but primarily focused around hygiene, physical culture, and rigorous educational systems for parents and teachers to raise strong, disciplined, obedient, and moral children. He was the medical director of an orthopedic institute in Leipzig, and the founder of "therapeutic gymnastics" throughout Germany, and of Schreber Associations, which Freud clearly lauded in his writing (1911). So great was his influence, that one biographer said of Dr. Schreber, the father: "Every age produces a man who expresses its spirit as if with the power of Providence . . . the generation of our century demanded and created a man like Schreber" (Politzer, 1862, p. 2).

Schreber, the mad son, suffered from painful bodily experiences which he wrote were "miracles" performed on him by "God," who sent "rays" upon his body. However, these were malevolent miracles, "of such a threatening nature that I thought I had to fear almost incessantly for my life, my health, or my reason" (Schreber, 1955, p. 131). He had sufficient insight to suspect that others reading about these miracles would doubt his sanity because they "will naturally sound extremely strange to all other human beings, and one may be inclined to see in it only the product of a pathologically vivid imagination" (p. 132). However, his insight was blindsided when it came to identifying the true source of his lifelong suffering—most obviously Dr. Daniel Schreber, his father.

Extensive research by William Neiderland (collected in Kanzer & Glenn, 1980), and elaborated by Morton Schatzman (1973), compares the published child-rearing doctrines of Schreber, the father, with the persecutory delusions of Schreber, the son. For each of his "supernatural miracles" of head or chest compression, of heat or cold, of being tied to earth, or fastened to rays, there is a direct correspondence with a physical device or special treatment recommendation in his father's writings about how to educate children to be physically and morally straight. Drawings of these devices

resemble tools of the medieval torture chamber more than of the classroom. Nevertheless, the father proudly reported testing each of them on *his own children*, some beginning as early as when they were three months old.

Of the many interesting aspects of this case, four deserve special mention here. First, Dr. Schreber's goal of training a child to be "unconditionally obedient" to authority was carried to fruition later on as a primary feature in Hitler's Nazi ideology. It also presaged George Orwell's "doublespeak" in *1984*. The elder Dr. Schreber, wrote that "unconditional obedience was nobly independent," "submission is freedom," and "self-control is control by parents" (see my analysis of the psychological dimensions of *1984*, Zimbardo, 1984a,b).

The second point of direct relevance to Discontinuity Theory is the son's inability to indict his father as his abuser and tormentor, selecting instead a narrative that makes God's malicious miracles the agent or agency of evil, and the cause of his madness. The mad son comes tantalizingly close to acknowledging the sadistic abuse by his father, time and again in the *Memoirs*, but then deduces a safer source instead. Interestingly (given the use of hypnosis as the experimental paradigm in my research described in the next section), son Schreber compares his nervous state of what he calls "soul murder" to that of an hypnotic subject whose own will power is imprisoned by the hypnotist who takes possession of his soul. He concludes, "At a time when my nervous illness seemed almost incurable, I gained the conviction that soul murder had been attempted on me by somebody" (p. 55). Not by some God, but by *some body*, namely, the person who was treated by his contemporaries as the god of pedagogy.

The third point is the relevance of this case to understanding one of the dynamics in current cases of recovered memories of early childhood abuse. It speaks to the powerlessness of children to speak up against powerful adults who abuse them, and their lack of societal support when society does not want to believe such horror stories about respectable parents.

Finally, what should we make of Freud's failure to recognize the obvious links between this Father's tyrannical training methods that he applied to his children, and the Son's corresponding symptoms of mental disorder? I believe it reflects Freud's theoretical bias that motivated him to overextend the notion of repressed infantile psychosexual fantasies—over the realities of parental abuse, and actual seduction of children to apply it to his analytic patients, in explaining hysteria and obsessional neuroses. (For a fuller account of this provocative dimension of Freud's deceptive accounts of his psychoanalytic reconstructions, see Esterson, 1998.) We are also forced to note Freud's unquestioning acceptance of the public esteem of Dr. D. G. Schreber (perhaps the same reason editors deleted those un-

flattering memoirs dealing with Daniel Schreber's childhood). Such esteem is frankly surprising, when that widespread acceptance in Germany of Dr. Schreber's child-rearing strategies and tactics, and his lofty reputation as an esteemed educator, are weighed against these stark facts: one of his sons had to be institutionalized for his madness, and his other son (curiously also named Daniel Schreber) committed suicide at an early age.

B. MISATTRIBUTIONS OF ORGANIC, PHYSICAL SOURCES TO PSYCHOLOGICAL SOURCES OF DISCONTINUITY

Many physical illnesses with an organic basis also have symptoms that show up as behavioral, cognitive, or affective disturbances (such as hypothyroidism, pernicious anemia, or brain tumors), while others worsen an existing mental disorder. Without adequate medical examinations, patients may be misidentified as having a psychiatric illness when the cause of their problem is a disease or organic impairment. They may be treated by psychiatrists, clinical psychologists, and even sent for treatment to mental hospitals when their primary problem is an undetected physical one, requiring medical care.

Strong evidence for this point comes from a study that administered thorough medical evaluations to more than 500 patients from a variety of California mental hospitals. The researchers found that many of these mental patients had active, important physical diseases, a large percentage of which were not detected. "The mental health system had recognized only 47% of study patients' physical diseases, including 32 of 38 causing a mental disorder, and 23 of 51 diseases exacerbating a mental disorder" (Koran et. al., 1989, p. 733). If health-care professionals so often fail to identify the origin of an unusual psychological reaction as due to physical causes, we can assume that many lay individuals make the same mistake. Let me illustrate some of the consequences of this failure to identify the physical, organic origin of a discontinuity that instead is experienced as psychologically induced, in four case examples.

1. The Case of Anna O: Hysteria or Tuberculosis?

Freud and Breuer used the case of Anna O. as the basis for their earliest diagnosis of psychogenic illness as an hysterical conversion reaction (Breuer & Freud 1895/1955). Among her various sensory and motor problems was a severe cough, which began when she was taking care of her sick father. Diagnosed as a "nervous" cough, its dynamic origins were explored under hypnosis with Anna O. as the first patient to ever experience

the new "talking cure." However, this extraordinary women, Bertha Pappenheim, who became a leader in women's rights and a pioneering social worker, terminated her unsuccessful analytic treatment with Breuer and entered a sanitarium. She was later released largely free of her initial symptoms—of tuberculosis. It is most likely that she had been suffering from an organic illness contracted from her close contact with her father and not primarily a psychological one at all, although she may have suppressed her frustration about having to care for her father so long and about the lack of opportunities for woman. It is ironic that the vital concept of psychogenic illness was developed from a case of organic origin that was misconstrued as psychological (see Rosenbaum & Muroff, 1984; Thornton, 1984).

Montaigne (*Essays* 1580/88) told us long before the psychodynamicists, that, "The mind has great influence over the body, and maladies often have their origin there." But we might add, which There?

2. My Colleague Confuses Lack of Sleep with Lost of Interest in Psychology

A colleague known for his dedication to, and love of, psychology, recently began to question whether he should stop doing research or maybe even change his field. That conclusion was based on his apparent loss of interest in research his students were presenting during lab meetings or colleagues during colloquia. The evidence he used in making this inference was his yawning, and overwhelming feelings of sleepiness, taken as symptoms of being bored. It was not until his wife detected he had a sleep disorder, which was verified by the local sleep disorder clinic as sleep apnea, that he received the right treatment for it. With that change in attribution, he resumed his overproductive research career.

3. Old Joe Goes Ballistic on the Pharmacy Line

In another personal case, an elderly man in front of me on the waiting line for hospital prescriptions told the nurse he was late for work and needed his medication as soon as possible. She turned from him to ask the pharmacist how soon he could get his prescription filled, and before turning back to help me as next in line, she said they would rush his order. As she walked back to the waiting line and began talking with me, Old Joe began to scream at her, shouting obscenities and racial epithets about his repeated lack of respect by her kind of people. Naturally she got furious, and started to yell back at him. I grabbed his shoulder and said in a loud voice as he

stared at me. "She is doing you a favor, and will get your medicine right away, just sit down and wait a few minutes." Old Joe calmed down, apologized, and the tension was broken, and the line moved on. I realized that Joe had not heard the nurse talking with the pharmacist when her back was turned to him, so he must have a hearing disorder. My remedy was simple action to make it loud and clear to him that he was getting what he asked for. But it was evident to me that from his perspective of not having heard her solicitous exchange, he was being disrespected. It must happen enough for Joe to have formed a categorical conclusion about Black nurses who act in a hostile way toward him. His ultimate remedy is, of course, wearing a hearing aid, but there are many reasons why people do not use them even when they realize they are hearing impaired. This is the stuff of paranoia, reasoning correctly from an initial misperception, and the basis of one of our early experiments (Zimbardo, Andersen, & Kabat, 1981), elaborated on in the next section of this chapter.

4. Terry Paints a Mad Portrait of Himself at Bud Plastics

While the last two examples ended with positive outcomes, a tragic conclusion emerges from another instance of mistaking an organic problem as a psychological one. The Bud Plastics Company in Ohio makes the bodies for Corvettes using the help of many different union workers to handle various aspects of its manufacture. A few years ago, individual workers began to experience a variety of severe symptoms, memory loss, emotional volatility, blind rages, and exhaustion that made them sleepy all the time. Many of the men were quite young, in their twenties, and had been perfectly "normal" when these bizarre discontinuities started to surface. Neither they nor their spouses could understand what was happening, but it was sufficiently weird and extreme that they tried to conceal their symptoms from others. As their conditions worsened, they got medical exams, which were negative, so were referred for psychiatric evaluation. Some ultimately went into therapy, and others were sent to a mental hospital. But nothing helped improve their condition. It was not until a relatively large number of these workers reported sick that a union supervisor took notice of a potential workplace issue. The resulting investigation uncovered a tragedy in the making. These men were suffering from incurable neurotoxic brain poisoning caused by their chronic exposure over many years to low levels of neurotoxic substances in the paints and plastics they were using. OSHA safety tests and evaluations of these substances had not included long-term exposure to substances that had been proven benign

in briefer exposures (reported on *National Public Radio*, "Chemicals in the workplace," 10/21/1985).

This case raises several issues relevant to Discontinuity Theory. First, it is possible to misread a physical cause as a psychological one and to be mistreated for it if the attendant symptoms are behavioral or psychological. Second, discontinuities in behavioral reactions demand explanations not only by the Actor, but also by all those personally connected to him or her, especially when they are obvious, atypical, and cause social shame. Third, when many individuals are experiencing the same symptoms but do not disclose them to others, they create a state of pluralistic ignorance that fosters dispositional attributions, "what is wrong with me?" (Prentice & Miller, 1996; Wetzel & Walton, 1985). That orientation leads them to seek individualized medical treatments, rather than advancing situational attributions of "what is wrong with the job?" that is affecting many workers. Doing the latter, calls into action a public health approach rather than a medical one. This case led me to conduct a study on disclosure of a discontinuity among students in a dyad, each experiencing similar symptoms of unexplained arousal, to be presented subsequently.

A final instance of the interaction of organic, medical conditions and psychiatric complications comes from an old study that first chronicled the development of psychopathology in previously mentally normal patients following their open-heart surgery (Freyhan, Giannelli, O'Connell, & Mayo, 1971). Every one of 150 patients needing cardiac surgery, over a three-year period, was referred to preoperative psychiatric and EEG evaluation, and was then followed up during postoperative recovery using interviews and a wide spectrum symptom profile. Open-heart surgery is obviously stressful, and the associated experiences of mortality represent a unique kind of discontinuity for the patient. Nevertheless, the data from this carefully controlled study are astonishing. Over 50% of the patients manifested psychiatric complications postoperatively, which the authors say is "probably a conservative estimate" for a number of reasons. The "symptoms resemble a kaleidoscopic view of mental illness" (p. 187), with 42% of the patients being symptomatic for more than 3 weeks, 75% rated as moderate or severe in severity of the psychiatric symptoms, and 59% having multiple syndromes—delirious syndrome, paranoid-hallucinatory syndrome, and/or mood-disorder syndrome. Of relevance to one of my experiments (to be reported on the generation of paranoia in normal subjects experiencing unexplained deafness) is the observation made by these psychiatrists and physicians:

"Patients developed typical ideas of references, suspecting that nursing and medical staff were secret agents observing and recording their activities. The monotonous

noises of electronic monitoring equipment lends itself to such notions particularly in individuals whose cognitive functions are already impaired." (p. 189)

C. IGNORANCE OF TRUE SOURCE OF DISCONTINUITY REPLACED BY PREVAILING EXPLANATIONS

Sometimes the inability to generate the correct causal attribution is the result of current lack of public knowledge about the nature of the true causal factors involved. When the discontinuity is severe, and shared by many people, alternative hypotheses will center around whatever prevailing theories are accepted in a given community. Many of history's most bizarre and inexplicable societal episodes may fall within this category.

1. Was Salem Witchcraft Caused by Eating LSD-Laced Rye Bread?

Although witchcraft persecution trials were a widespread effect of the European Inquisition, they occurred in North America in only one town (Salem), in only one year (1692). The set of intense symptoms that flared up in a group of farm girls (fits, spasms, tremors, feeling pinched or bitten, hallucinations—the discontinuity to be explained) was explained by the prevalent religious/demonic interpretation (Hansen, 1969). A likely alternative explanation appears to be food poisoning, ergotism, a fungus that grows on rye grain and produces a natural form of the hallucinogen, LSD. This interpretation was first proposed by psychologist Linnda Caporael (1976), and supported with additional archival data by historian Mary Matossian (1989).

Most of the reported symptoms of bewitchment are identical with those of ergotism, and also were found among Salem's farm animals. Available evidence indicates that the cold, wet climate that year favored growth of this fungus that was ingested by poor farm families in their heavily rye diet. Matossian argues persuasively that serious outbreaks of such microbiological contamination of the food supply have played a significant role in shaping social behavior, and thus explains many social discontinuities recorded throughout Europe for hundreds of years. Wherever peasants relied on a rye-based diet, and the climactic conditions generated fungus poisoning, mass reactions to the shared discontinuity of their bizarre symptoms led to revolutionary riots in 1789 by French peasants gripped by "the grand fear," religious revivals in the 18th century, and many other social epidemics. This example illustrates another way in which a discontinuity experienced at an individual level can have social psychological implications when aggregated across a population.

Incidentally, the Inquisition was given its impetus by the publication in 1486 of a theological treatise on *The Witches' Hammer* or *The Malleus Maleficarum* (Kramer & Sprenger, 1486/1971). It is said to have been on the bench of every judge and the desk of every magistrate in both Catholic and Protestant countries of Europe that were driven to combat the "Society of Witches." Curiously, its distorted reasoning begins with reflection on a cosmic discontinuity, namely the existence of evil in a world created and controlled by an omniscient, omnipotent, God. By turns it focuses on human agents of the Devil, witches, who facilitate evil by undermining human virtue and resolve, thus must be found and destroyed.

D. DISCONTINUITY-MOTIVATED SEARCH FINDS CAUSALITY IN CHANCE, CONSPIRACY IN COINCIDENCE

As nature abhors a vacuum, the human mind abhors chance in human affairs. It finds patterns in randomness (Chapman & Chapman, 1967, 1969), order in chaos, meaning in nonsense, causes for correlations, and planned conspiracies behind coincidental events. Thus, we should not be surprised that when a person has experienced some significant discontinuity, she or he will be readily able to generate a "reasonable" causal explanation, and sustain it despite all evidence to the contrary. When that erroneous explanation leads to social action, it could become dangerous.

1. Mrs. Lincoln Fears That I Am Controlling Her Mind

Mrs. Lincoln was a middle-aged, African-American housewife, whose apparent discontinuity experience was hearing voices of several people talking to her. At first, she reacted to them with benign interest, curiosity, and some amusement. But when she started acting out their suggestions, she got in trouble at work, first losing her job at the post office (when the voices told her to take frequent breaks), and later as a bus driver, when the voices suggested new routes for Mrs. L. to follow.

She was very concerned about getting her job back because she had a family to feed, and so came to see me at Stanford University to implore me to intervene—since she believed I had been responsible for starting up her voices! Prior to our initial conversation, she had sent me a New Year's greeting card, had learned much about my background and family, and sat patiently outside my office all day for many days (during winter recess) until my secretary noticed her there and made a formal appointment with me.

Our conversation began with her asking whether I taught a course on mind control, which I did, and then whether research was being done at

Stanford University on mind control, which I said was not likely, given the recent ethical guidelines against any such research. Nevertheless, Mrs. L. insisted that I was somehow controlling her mind, was responsible for the voices she was hearing, and wanted me to silence them so that she could get her job back at the post office. Despite my reasoned arguments, she insisted there was a definite link between her voices and being a subject in mind control research at Stanford.

The meandering link was created from the following circumstances. She had come to the university earlier for diagnostic screening of her eligibility for inclusion in shyness treatment groups that we were starting at our Shyness Clinic. After taking a battery of psychological tests and a brief interview, she was told by the therapist that she was not really shy enough to warrant therapy.

Five months later, her voices began to speak up, and Mrs. L. associated this unusual experience with the only other recent unusual event in her life, visiting Stanford University and being studied by psychologists under my supervision. This "ego-correlation," pairing personally experienced unusual events, became ever more viable the more she thought about it. This belief had persisted for a full seven years, up to the time of our first appointment, when she wanted to know my intention in implanting those voices in her mind (see Malle, in press). She returned repeatedly, sitting outside my office for hours on end, always with a smile, but refusing to leave until she spoke with me again.

I arranged with a female Afro-American clinical psychologist to talk with her, who encouraged her to see her therapist and take her medications, and provided rewards for doing so, like taking her to lunch. Nevertheless, Mrs. L. insisted on my writing a letter of recommendation to the post office, which I finally wrote, sending her a carbon copy. However, because her copy was unsigned by me, she got angry believing the original was also not signed or even sent. Mrs. L. then refused to leave my office until I wrote a better letter, signed and mailed in her presence, that got her job back. At that point we all became concerned about the potential for violence and informed her therapist that he had to talk her into leaving or university security would intervene. I never heard from her again, but have not forgotten Mrs. L. and what her voices might tell her to do next.

At about the same time as Mrs. L. appeared and disappeared, a colleague in the Math Department, Karel deLeeuw, was brutally murdered by a graduate student as he sat working in his office. His killer, Theodore Strewleski, was "unnaturally sensitive to what he called 'put downs,' and once he felt someone had insulted him, he brooded on it for years" (Ciotti, 1980, p. 42). Strewleski's discontinuity may have been the failure to complete his dissertation 18 years after starting out as a promising graduate student

in an outstanding program. Professor deLeeuw was but one of many faculty on Strewleski's list to be murdered for their arrogance and show of disrespect to students. Thus, sometimes discontinuities can lead from thoughts to feelings to actions, in some cases, destructive ones.

A sad, remarkable parallel to the Strewleski case occurred recently when another graduate student confessed to fatally shooting his engineering professor as he was in the process of collecting final examinations at Wayne State University (Reuters News Service, 1998). A colleague hinted at a possible motive, saying, "The math is extremely difficult. (The suspect) was just unable to do it. He did not know how to evaluate himself correctly. He wasn't at all able to get the degree." (p. A2). This 48 year-old student, turned premediated murderer, was also like Strewleski in having been around his university for many years, unsuccessfully trying to graduate with a doctoral degree. Another illustration of a chronic discontinuity with lethal consequences.

E. SOCIAL SEARCHES FOR NORMALITY MAY END IN BIZARRE PLACES WITH STRANGE BEDFELLOWS

People experiencing discontinuities that have a noticeable effect on their behavior may become more concerned over their apparent abnormal appearance than in generating an adequate rational explanation for it. Regardless of the origin of the discontinuity, if people feel that it is affecting their behavior and demeanor sufficiently to mark them as "different" by their usual reference groups, they may seek out new bases of social comparison with similarly deviant others. The first case illustrating this social aspect of Discontinuity Theory has a medical basis for her suddenly aberrant behavior that drove a conservative college student to become a punk rocker. The second reveals what can happen in a similar situation when the person experiencing a discontinuity has sufficient personal power to persuade others to act in ways that normalize his discontinuity.

1. Mary Jane, The Punk Rocker Graduate Student, Needs Sugar

As an undergraduate. Mary Jane began experiencing sudden, dramatic mood swings from anger to rage to depression to elation within a few hours. She was easily irritable, temperamental, and hyperkinetic at times alternating with listless apathy in the mornings. Her dorm roommates found her hard to deal with since she became hostile and argumentative as well, but as suddenly could function normally and be sweet and happy.

She first attributed these atypical reactions to her sister's death from a drug overdose since they began shortly after that salient event. It is significant to note that she also had started a vegetarian diet at that time to cope with her feelings of listlessness, and would faint during religious services if she fasted. Mary Jane began to worry about "what's wrong with me?" as her anomalous reactions persisted for a year after a reasonable mourning period. Her mother interpreted her negativity as an "attitude problem" and referred her to a therapist, a family friend, who also focused his causal analysis on her mixed feelings regarding her sister's death. She "bailed out" of therapy when her symptoms continued to worsen. Her family felt that she was "creating problems for herself," and that her problems were obviously mental, even though her father was a physician.

Her roommates got increasing irritated by her staying up all night reading and studying then sleeping in all morning, not to mention her abusive behavior that got her labeled as "weird." She also started smoking, along with drinking lots of coffee and alcohol, and began to get interested in hard-core punk rock music and rockers. She attended concerts regularly (X, Sex Pistols, Chaos), would slam dance, get battered, punch others, scream obscenities, and be physically exhausted, but then would sleep deeply and wake up feeling better. She also donned punk attire totally—spiked Mohawk, leather, chains, studs, piercing, and other regalia. Mary Jane then gave up entirely on her former friends, and associated exclusively with punk rockers who, like her, were angry and existentially depressed. They needed no explanations nor gave any, and she fit in perfectly like her cut-down glove. At that point in time, she made a character attribution. "I am just an angry person."

At the end of senior year she outgrew the punkers, realizing that she hated that kind of music and joined a new social set which embraced total apathy, negativity, and depression. She reported later basking in their depression and being "bummed out," feeling no affect at all, and not needing to explain why to anyone. They listened only to "gloom and doom" music (like "Care" and "Joy Division"), dressed totally in black, and were united in their anti-establishment social activism. She felt that finally she was able to "get away from Me; I was a Group now!"

Despite this lifestyle, Mary Jane continued to focus on her studies, got energized by studying, enjoying snacking a lot as she did, and got good enough grades to be admitted to Stanford University that fall. When I met her, Mary Jane was still in a socially alienated mode, and clearly "different" from our traditional, rather conservative graduate students, but obviously smart and surely "interesting." She had just discovered that her vague associations of her mood swings and diet "sugar rushes," "starch highs," were the result of her chronic, severe hypoglycemia. Her abnormally low

blood sugar levels were worsened by a vegetarian diet, by fasting, coffee, alcohol, and a long night's sleep. They were elevated by snacking junk food. Although her father was a physician and her mother also had been hypoglycemic, they did not interpret her obvious medical symptoms accordingly because of the vividness of the alternative explanation of grieving over her sister's death.

With a new diet and new interpretation, Mary Jane began to change her dress and demeanor to resemble that of a more typical graduate student. Over time she performed well enough to earn her a fine job as an assistant professor in a traditional liberal arts college.

In retrospect, as we discussed her earlier behavior, she interprets joining the punkers and the nihilists as "social facilitators" that immediately established her unusual reactions as usual, made explanations unnecessary and provided needed social affiliation to offset rejection by former friends. The association with these particular groups also served to exchange an external focus for her prior egocentric preoccupation and failed internal search mission for an adequate explanation of the discontinuities she was experiencing.

I would argue that a comparable social psychological process may be at work among many ordinary individuals who join various social/religious/political cults (Zimbardo, 1997). Steven Hassan, a former member of the Unification Church ("the Moonies") and author of *Combatting Cult Mind Control* (1988) informed me that the majority (as high as 75%) of those recruited into cults are experiencing some form of "discontinuity" in their lives, often of a spiritual or mystical nature, but it may also come from a personal loss (personal communication, January 9, 1995). At times the attraction of cults may derive in part from the group's unusual demands for extreme behaviors that are alien to the usual lifestyle of the recruits, thereby allowing them to submerge their feelings of differentness or inadequacy within the cult's new normative structure.

2. Prophet Applewhite Castrates His Followers on Their Way Through Heaven's Gate

It was strange enough for the world to learn that 39 members of a cult had committed mass suicide in a posh mansion in San Diego, California, March 26, 1997, but the story got ever stranger as more information was uncovered about the Heaven's Gate cult (Chua-Eoan, 1997; *Newsweek*, 1997). This group, composed of highly educated, technologically sophisticated members (with a group web site), varying widely in age, were totally obedient to their leader/prophet, Gordon Applewhite. He imposed a rigid lifestyle, with detailed rules and routines that controlled their every action,

so as to "prepare their seed for harvesting" when they were transported beyond earth to Heaven's Gate by a UFO. As they waited patiently for a celestial sign, they first assumed their signal for imminent ascendance was the movie *Cocoon*, with its UFO transport ending. But when that failed to materialize, they later found a better signal in the advent of the well-publicized comet, Hale-Bopp. Applewhite, a.k.a. "Leader Do," told his followers that a hidden UFO was trailing behind the comet and would be their designated heavenly transport. To be carried out of this world, they first had to give up their corporal bodies in their well-choreographed group suicide (Gleick, 1997).

My special interest in this case stems from the leader's social power to rectify a discontinuity that he was experiencing by imposing a severe demand on his followers that normalized his unacceptable impulses. Applewhite is reported to have struggled for years against the emergence of his homosexual impulses that were unacceptable to him. A central goal of leader Applewhite was to eliminate the negative "vibrations from the vehicle" (body), primarily by controlling sensuality in all of its forms. He advocated first abandoning gender distinctions, then all sexual behavior, even masturbation (Taylor, 1997). Later, when apparently that was not sufficient for him, he urged his male followers to "remove the battle" they were fighting within by castrating themselves, as he did. Many of his blindly obedient followers also had themselves castrated (*CNN Special Report*, 3/30/97; Miller, 1997; Roberts, Hollifield, & McCarty, 1998).

F. CHRONIC, SHARED DISCONTINUITIES CAN LEAD TO MASS SOCIAL REACTIONS

The phenomenon of Cargo Cults was presented earlier as an instance of a widespread societal reaction to the perceived discontinuity caused by the sudden disappearance of the abundance that had been created by the sudden appearance of foreign ships. Part of that analysis includes a socially shared perception of the discontinuity, and a common way of responding to it that is socially acceptable in that setting, even when it entails bizarre reactions. Our final case study involves a socially shared pathological reaction among children who earlier had all experienced a similar kind of personal discontinuity.

1. Mass Hysteria among Schoolchildren Experiencing Chronic Loss and Family Disruptions

An outbreak of illness spread swiftly among a large group of schoolchildren attending an assembly at an elementary school in a Boston suburb

(Small & Nicholi, 1982). Thirty four of the 224 children at that school function had to be hospitalized with severe dizziness, hyperventilation, headache, nausea, abdominal pain and general weakness. However, extensive epidemiological investigation failed to detect an organic cause, and since the symptoms went into remission as quickly as they surfaced, and were more common among girls than boys, the investigators concluded it was a case of "mass hysteria."

When a sixth grade boy, a class leader, fell from the stage during the play being performed for the assembly, immediately several other students became ill and in minutes clusters of children throughout the auditorium were similarly stricken down. Two aspects of this case are particularly relevant to our theory. First the initiating setting was the last gathering of the student body for the year, with the sixth graders moving on to new schools, leaving some of their old friends behind. This may have been perceived as a significant loss to them that could not be individually expressed since graduating was supposed to be a joyous event. Second, evidence was found that the majority of children hospitalized had suffered a previous loss that may have made them vulnerable to the current loss and predisposed those children to mass hysteria. Comparisons of the hospitalized children with their nonhospitalized peers revealed that they had a much higher incidence of family disruption, assessed as significantly higher rates of parental divorce and death within the family. These sources of discontinuity loom large in a child's life. They may be stored as chronic perturbations in consciousness that can influence behavior in settings that share in symbolic significance, in this case, an anticipated new source of loss.

Having outlined and elaborated on features of Discontinuity Theory and illustrated some aspects of it with a variety of case study examples, we are ready to turn to a series of experiments conducted over many years to examine its empirical support. Several of the studies have been published, but some additional data will be presented here, while several more are unpublished and will be presented for the first time.

IV. Experimentally Creating Discontinuities, Search Frame Biases, and Their Consequences

This section begins with a summary of the basic paradigm that guided each of the series of experiments that will be elaborated subsequently. I then describe in more detail the ways in which hypnosis was utilized as our methodological tool for inducing the experience of discontinuity. As part of this overview, it is helpful to lay out other common features of our

research, such as the assessment of the psychological and physical status of our participants, the procedural sequence and standardized controls used, the types of outcome and process measures recorded, how the extensive debriefing phase was developed, and the follow-ups conducted.

A. BASIC EXPERIMENTAL PARADIGM

Earlier research from our laboratory that attempted to replicate and extend the conclusions of the Schachter and Singer (1962) two-factor model of emotion revealed that the discontinuity created by hypnotically induced unexplained arousal (Maslach, 1979) had many advantages over the discontinuity induced by misattributions of arousing drugs, such as epinephrine (Marshall & Zimbardo, 1979; Maslach, Zimbardo, & Marshall, 1979). These advantages are listed in Table III.

I am aware of the potential limitations and controversy of using posthypnotically induced discontinuity experiences and search frame biases. Hypnosis is still not well accepted among mainstream researchers, nor are the mechanisms by which it works well understood. Nevertheless, I decided to adopt that procedure for my basic paradigm because I felt confident in its research utility for testing the predictions from my conceptual model based on my personal familiarity with hypnosis along with successfully using it over many years professionally (see Marshall & Zimbardo, 1979; Maslach, 1971; Maslach, Marshall & Zimbardo, 1972; Monteiro & Zimbardo, 1987; Piccione, Hilgard, & Zimbardo, 1989; Zimbardo, 1969; Zimbardo, Marshall, White & Maslach, 1973; Zimbardo, Maslach & Marshall 1971, 1972). I have also relied on the successful use of hypnotic programming of research subjects by Blum (1979), amnesia studies by Evans (1979) and by Kihlstrom,

TABLE III

RESEARCH BENEFITS ASSOCIATED WITH HYPNOTICALLY INDUCED AROUSAL COMPARED TO AROUSAL BY EPINEPHRINE INJECTIONS

Arousal effects are equally strong

Onset and offset are immediate and stimulus cued

Less variability across participants within the same condition

Can be limited to specific and minimal arousal symptoms

Effects do not carry over beyond the research setting

Less suspicion and disbelief among participants

Does not require elaborate and costly medical cautionary procedures (demanded by Medical School Panels for Human Research)

Evans, Orne, & Orne (1980); and the knowledge gained from my long association with Jack Hilgard's hypnosis laboratory at Stanford. The major relevant criticism to contend with is the subject-selection factor, since only about a fourth of the population is highly hypnotizable. I've tried to deal with that constraint by randomly assigning these subjects to the various conditions in each experiment, using within-subject controls in one experiment, hypnotic simulators in some studies, and by comparing high and low hypnotizable subjects in another study.

In this program of research, *discontinuities* were operationally defined as experiences of "unexplained arousal" induced in highly hypnotizable subjects by means of posthypnotic suggestions to feel changes in their physical functioning, (e.g., increases in heart rate and respiration) at the sight or sound of a pre-determined cue. Suggestions for *source amnesia* in the experimental treatment added the "unexplained" component to the standard arousal manipulation for these participants, while controls remained aware that their arousal was hypnotically induced.

A second posthypnotic suggestion was used in some studies to provide participants with explanatory frameworks to guide their attributional search for the meaning of their aroused state. These "biased" search frames included other people (social), the physical environment (external), or their body/health (personal, internal).

Following the standardized hypnotic induction and suggestions, participants continued to engage in various prearousal tasks, then received the arousal cue, and then continued to work on their task alone, or sometimes with another peer or confederate. Participants completed personality scales and other measures during, and sometimes after, this discontinuity experience. In some studies, they were also wired for psychophysiological recordings. While still in a state of arousal, each participant was interviewed by the experimenter or a clinical psychologist (blind to their experimental condition) to assess her or his judgments, attributions, emotions, and memory. Subject reactions were sometimes videotaped for later analysis, rated by judges, also by clinical psychologists, and made available to our Human Subjects Institutional Review Board on request. Extensive debriefing ended the experimental session, which typically lasted about 90 minutes.

1. Participant Characteristics

Our research participants were Stanford University undergraduates (assumed to be both intelligent and well educated), who were recruited from Introductory Psychology courses and given experimental course credit and modest payment for their services. Prior to their research involvement, we determined that they were normal and healthy, both physically and

psychologically. We did so by means of interviews and self-report questionnaires that revealed they all were not in therapy, or on psychiatric medication, had no current medical or psychological problem, were not anxious (all were within one SD of the nonclinical norm on the Manifest Anxiety Scale), and showed no evidence of paranoia, phobia, or hypochondriasis on relevant Minnesota Multiphasic Personality Scale (MMPI) subscales (within the normal range). Finally, all had to report feeling "good, well, or great" at the start of any experiment to be included during that session.

2. Hypnotizability and Hypnosis Enhancement Traning

Participants were selected on the basis of their scores on measures of hypnotizability (using a slightly modified, shorter version of the Harvard Group Hypnotizability Scale, Form A, Shor & Orne, 1962, and in some studies, also individual assessment via the Stanford Hypnotic Susceptibility Scale, Form C, Weitzenhofer & Hilgard, 1962). Two groups were used: highs scoring 8–10, and lows scoring 0–2. In addition, it was necessary for those who were highly hypnotizable to also demonstrate their ability to experience posthypnotic amnesia, as shown by high scores on the amnesia section of the above scales, and validated in specific tests during hypnosis training sessions.

Hypnotizability is a reliable individual difference measure of responsiveness to hypnotic suggestions to experience a range of phenomena not typical in ordinary consciousness (Hilgard, 1965). It is this ability that creates the hypnotic experience and not some special talent of the hypnotist, who is merely the coach or guide. Neither gender differences nor any valid dispositional correlates have been found for hypnotizability (Hilgard, 1982), although it does decrease with age and education. Hypnotizability is a highly reliable trait, as shown by our 25-year test–retest correlation coefficient of .71 (Piccione, Hilgard, & Zimbardo, 1989).

A special feature of this research program was the use of a training procedure designed to enhance hypnotizability by enabling participants to enter a deep hypnotic state quickly, by means of instructions administered by me in person or via tape-recording, or later on by self-administration. During the training, participants attended one or two small group sessions (3 hours of training in total). Among the features of this training was practice by participants in rapid induction, deepening of hypnosis, and the experience of a wide range of hypnotic phenomena, such as sensory imagery, positive and negative mood arousal, amnesia, carrying out posthypnotic instructions, age regression, pain control, self-esteem boosting, and concentration for studying (only some were relevant for our research; the last four were for the personal benefit of the students). This training also included

repeated self-ratings of subjective arousal on a 10-point SUA scale (Subjective Units of Arousal, where 0 = totally relaxed and 10 – extremely tense), a measure used later in all our studies. Participants also received training in how to write about and discuss their reactions during each phase of the hypnotic training. It was important that participants realized that they were able to communicate their feelings and thoughts while deeply hypnotized or during a posthypnotic phase, so that this knowledge could be transferred to the experiment proper, when they were actively engaged in various tasks, or in debriefing. To control for this pre-experimental exposure time and contact with the researchers, comparable training was used for low hypnotizable participants in the one study where they were included. For hypnotic simulators (used in another study), the preliminary small group sessions, also held in the same laboratory, included watching a video on hypnosis, discussion about hypnosis phenomena and research, and experience with induced relaxation and role-playing being hypnotized.

3. Common Procedural Features

To save space in describing the methodology for the individual studies that follow this section, those procedural features common to all studies will be outlined here, so that only special aspects particular to those studies need be mentioned later.

All participants were randomly assigned to experimental and control treatments. The treatments included posthypnotic suggestions for somatic arousal (cued to a specific stimulus) with or without explicit amnesia, or awareness, of this suggested arousal source. The arousal cue was varied between studies to minimize any specific associations of a particular stimulus, and thus to increase its generic value. The cues included a bell sounding, a timer being started or stopped, or a specific word projected on a slide or on a memory drum. Hypnotic inductions and experimental treatments were standardized and presented via tape recordings, written instructions, or both.

Instructions for somatic arousal were limited to the two basic symptoms of most arousal states, increased heart rate and respiration. Pretesting with other, additional symptoms, such as tense muscles or moist palms, revealed no greater effect than did these two basic symptoms on any of our assessments. Interestingly, many subjects spontaneously reported feeling those, and other symptoms when they were "generically aroused." Either the entire procedure, or final interview, was video-recorded, both for data analysis and so that the Human Subjects Research Committee could monitor the research protocol.

The *Amnesia Suggestion* stated, "You will NOT remember the reason you are feeling aroused, and will have no desire even to try to remember

the suggestion made to you. You will feel aroused and not associate it with the suggestion you got." The *Awareness Suggestion* stated: "Of course, you will remember fully that the reason you are feeling aroused is because of this suggestion I made to you to alter your heart rate and respiration. You will feel aroused and associate it with the suggestion as you try to understand the reason for your feelings of arousal."

The engagement of an explanatory search process was encouraged by further instructions in the Amnesia condition, to the effect: "However, it will be important for you to try to figure out why you are feeling as you are, and to try to understand the reason why you are feeling aroused." Experimentally induced search frames were added to the above instructions in some studies, by inviting the individual to consider the possibility that what she or he was experiencing "might have something to do with other people/the physical environment/your body or health." Obviously any subject was given only one of these search frames to consider using during the attributional search process. In pretesting, we also explored the effects of the induced biased search frame of "with mystical or spiritual forces."

A wide variety of assessment measures were used in various studies, including self- and peer-ratings (especially subjective units of arousal [SUA] ratings); videotaped behavior ratings; Thematic Apperception Test (TAT), Rorschach, MMPI, emotion circle, interpersonal circle ratings; psychophysiological measures of heart rate, respiration, galvanic skin response (GSR), electromyography (EMG), and EEG. Each study concluded with a long three-phase debriefing of participants both in and out of hypnosis. Subjects had to make written and oral statements of their understanding of the nature of the experiment and the manipulations; they were dismissed only when they gave evidence of full understanding; and they had to have returned to near their initial base rate levels on the final SUA rating (the debriefing process will be more fully described in the Ethics section of this chapter). All participants who showed particularly strong reactions during treatments were called by me or the clinical psychologist that evening or the following day, in order to assess and help resolve any negative sequelae (there were none). A written mail survey was conducted several weeks later in one study, and a year after another study to determine negative or positive enduring effects, and the value of participating in this research. (Some of that data will be presented in the next section on Ethical issues.)

B. PILOT-TESTING FEATURES AND OBSERVATIONS

Extensive pilot-testing was conducted with several dozen participants to determine the ideal procedure for creating discontinuities using posthypnotic suggestions, the minimal number and type of symptoms needed to

create a general state of arousal, and the effects of various induced search frame biases. In addition, piloting helped us to evaluate the reality and validity of the amnesia induction, as well as to determine and deal with any negative sequella of this unique research experience.

The posthypnotic suggestions used in early pilot studies instructed participants that at some time during the day's session, when they saw a brown circle on the cover of a book, they would begin to experience feelings of anxiety. The book was about hypnosis (Fromm & Shor, 1979), which later I asked them if they had read. This procedure was abandoned when I learned that some students were getting aroused outside the experimental setting by seeing brown circles on various objects. Thus, we learned that the arousal cue had to be specifically limited to the experimental setting.

We also found that directly suggesting "anxiety" as the arousal state created too wide a range of negative consequences since it tapped into multiple interpretations, including anticipations of upcoming future events over which one might feel anxious, as well as the recall of past events that had been anxiety-provoking. Consequently, we settled upon limiting the suggestion to specific physical symptoms associated with generalized arousal. It also becomes more conceptually interesting (from the perspective of the current model) if such a generic arousal state leads to misattributions that are in some way judged to be pathological.

We had to discontinue using the biased search frame of "spiritual or mystical forces" as a possible explanation for the arousal, even though it generated fascinating accounts of religious influences, UFOs, intelligent extraterrestrials, and remote mind control by unseen technologies, among other accounts. (Recall my case study of Mrs. L. who resolutely believed I was controlling her mind at a distance.) This interesting search frame was not utilized in our formal studies because the after-effects it created in some students were disturbing. Some science and engineering students remained upset after being debriefed when they discovered that they could even entertain such preposterous beliefs that were alien to their scientific orientation and value system.

It was evident that our various arousal manipulations had a powerful, observable impact on most pilot students, as shown in their strong emotional reactions, unusual thinking and overt behavior. However, the nature or power of the amnesia induction was less clear. Although almost all participants reported not recalling the experimental instructions, it was impossible to determine whether that was evidence for a true deficit in memory retrieval (i.e., a dissociative experience in highly hypnotizable individuals), or merely an active suppression of memory, or a socially motivated act in which they appeared as though they had forgot. Although "genuine" amnesia has been found among high hypnotizable subjects in other studies who

met the criterion of amnesia that we also used (Evans, Orne & Orne, 1980), it was important to demonstrate the reality of our amnesia conditions in our laboratory setting. Initially, we tried to do so by seeing if an experienced clinician, totally blind to the experimental treatments, could breach the induced amnesia during a diagnostic interview, and thus discover the nature of the manipulations.

A practicing therapist was invited to assist me by dealing with a problem I told her I was having in a new research project, namely, some subjects were becoming upset during the experiment. She was paid to interview each of seven high hypnotizable students who shortly before had been given the arousal induction in a sound chamber (while selected psychophysiological measures were being taken). When next in an adjacent room with another student, they were exposed to the arousal cue word that appeared on a memory drum as part of a memory task. The clinician's goals were: to find out what the student-subjects were feeling, and why they were feeling that, and to try to make them feel better—all while the subjects were still in the midst of their induced amnesic arousal. Analysis of the tape-recorded interviews revealed some encouraging outcomes, as well as some discouraging findings.

Amnesia was never breached; the therapist was totally unable to discover the true explanation of the arousal symptoms as suggested by our experimental instructions. This result encouraged us to continue using our arousal–amnesia induction procedure.

The therapist did find out that the students were aroused, upset, anxious, nervous, distressed, and were experiencing a variety of physical symptoms. She also discovered that hypnosis was somehow involved in the research. But curiously hypnosis was not entertained as the causal candidate for the negative reactions being experienced because the students insisted it could not be the responsible agent since hypnosis in the past had always made them feel good, relaxed, focused, and positive. That is the good news we had hoped to find. We were surprised, however, to hear that in every case, a suitable alternative explanation was generated based on "leading questions" derived from the therapist's psychodynamic orientation. For example, when told that the first experience of distress came while the student was in the sound chamber, she asked if he were alone there, and/or felt abandoned by Dr. Zimbardo, and then she explored his prior feelings of rejection. To another student who said she got aroused when taking the memory test in the large lab room along with another student, the therapist explored issues of performance anxiety and excessive competitive needs. Desires to please his demanding parents as a source of high levels of "test anxiety" seemed appropriate as her causal attribution proposed for yet another subject's discontinuity.

Although the therapist was unable to make most of the student participants feel better in the relatively brief diagnosis session (30–45 minutes), she was effective with several of the last students for whom she was more assertive in proposing the dynamic reason for their distress— which they accepted as "reasonable." There are several messages here to note. The experience of a significant personal discontinuity may motivate not only the actor to engage in cognitive detective work to come up with an appropriate explanation, but family, friends, co-workers, and professional caregivers may also offer their interpretations. Those views may reflect prevailing societal perspectives, or individual search-frame biases based on personal experience, or they may be a natural consequence of the formal theoretical training of professionals in health-care occupations (see Plous & Zimbardo, 1986). These alternative explanations may add to the Actor's confusion when they are wrong or misleading, yet may be accepted if they have the authority power of a persuasive, credible communicator. For example, it seems that some of the client–patient testimony in "false memory syndrome" cases may be understood as a matter of attributing a variety of personal discontinuities to the alleged recovery of repressed memories of childhood abuse, as suggested by influential therapists, social workers, or the popular media.

We have continued to develop more sophisticated assessment of hypnotic amnesia using EEG event-related potentials (ERP) of memory, as well as other validity tests during hypnosis training. In one of our recent studies, with a reasonably large sample of 44 subjects, (LaBerge & Zimbardo, 1999) of ERP correlates of suggested hypnotic amnesia for recently learned words, high-hypnotizable subjects reporting amnesia show significantly increased P300 in response to words covered by the amnesia suggestion compared to control words. In contrast, subjects not experiencing amnesia, whether high or low hypnotizables, or whether simulating amnesia or not, show no such difference. The increased P300 waveform may well index the surprise of unconscious recognition or unexplained arousal in subjects experiencing amnesia. Although it is possible to breach hypnotic amnesia with expectancy manipulations (Silva & Kirsch, 1987), the expectation of amnesia following deep hypnotic relaxation (as in all of our research) has been shown to produce dramatic reductions in recall for a set of stimulus words.

C. OVERVIEW OF EXPERIMENTAL FINDINGS

The individual experiments that follow will show the following general outcomes:

1. High hypnotizable participants respond differently than those who are low hypnotizable to amnesia versus awareness suggestions of the source of induced arousal.
2. Hypnotic simulators respond less intensely than hypnotic participants to unexplained arousal inductions.
3. There are significant autonomic, psychological, and behavioral consequences of these induced discontinuities.
4. Concomitant mood states are typically negative in affective quality.
5. Plausible alternative explanations are generated by subjects to account for their experienced discontinuity.
6. Paranoid-like thinking is generated by biased attempts to explain discontinuities based either on unexplained deafness or unexplained arousal with a social search frame bias.
7. Research participants construct explanations for their induced discontinuities that are predictable from their induced search frame categories
8. Predictable types of psychopathological reactions (phobias, hypochondriasis or somatoform disorders, and paranoia) emerge in a significant number of these normal individuals, as assessed by self-reports, peer ratings, objective clinical tests, and expert judgments by clinicians.
9. Subjects typically fail to disclose the strong negative feelings and thoughts they have about their unexplained arousal to another person (peer or confederate) in the arousal context, although when they do, disclosure has beneficial effects.

This interpersonal disclosure setting is one social dimension of Discontinuity Theory that raises the issue of the attribution of one's discontinuity either internally to idiosyncratic dispositions or externally to shared properties of the immediate stimulus situation being experienced by coacting others.

D. MULTIPLE CONSEQUENCES OF UNEXPLAINED AROUSAL

This study (Zimbardo, LaBerge, & Butler, 1993) compared the emotional, cognitive, and autonomic nervous system reactions of subjects experiencing physiological arousal with and without awareness of its source. High hypnotizable subjects (and an equal number of low hypnotizable subjects as controls) were used in a unique within-subject design in which hypnotically induced arousal (heart rate and respiration increases) was experienced by each subject both with awareness and again a second time with amnesia for its source (in randomized sequence). This two-phase

procedure enabled each subject to have arousal experienced as explained and also as unexplained. Unexplained arousal was operationalized in this study as the induction of generalized physical arousal symptoms with source amnesia. We assumed that such unexplained arousal would be experienced only by those subjects who were highly hypnotizable and thus could internalize experimental suggestions for hypnosis and for arousal with amnesia for its true source.

We predicted that the experience of discontinuity, in the form of unexplained arousal, would have the following demonstrable effects: (a) both autonomic and psychological measures of arousal would be comparable in their patterns of change over the time course of experiencing relaxation, arousal, and debriefing; (b) the level of autonomic and psychological arousal would be significantly greater than in other conditions (either for explained arousal among those high in hypnotizability, or in either the amnesia or awareness condition for those low in hypnotizability) because of the added effects of uncertainty-caused anxiety superimposed on the initial general arousal; (c) subjects would report concomitant mood state changes in the negative direction; and (d) subjects amnesic for the source of their condition would be more likely to generate plausible alternate explanations, that is, causal misattributions.

As predicted, for the hypnotizable subjects, unexplained arousal produced significant and dramatic effects when compared with explained arousal (for high or low hypnotizable subjects). We found elevations in self-reported and physiological measures of arousal, negative mood states, and also causal misattributions that characterized those experiencing this discontinuity.

Eighteen subjects completed the experimental procedures, nine in each hypnotizability condition. Among our highly hypnotizable subjects, five were male and four were female; of our low hypnotizable subjects, three were male and six were female. Another eight students were utilized in pretesting phases to train research assistants, test aspects of the procedure, and assess outcome measures. Of the 280 students taking the group hypnotizability test procedure, 55 (20%) scored as highly hypnotizable, 29 (53%) of whom passed the amnesia item, while 32 (11%) scored as low hypnotizable.

Our basic design involved repeated assessment of several physiological and psychological variables at selected times during a 30-minute sequence of events in each of two similar but separate experimental periods. Under the guise of a study of hypnosis and signal detection, all subjects received identical, standardized taped instructions that included responding to a variety of faint audio signals, hypnotic suggestions for relaxation, and then induced arousal with or without amnesia for the posthypnotic suggestion, followed by various dependent measures. Subjects were randomly assigned

to the arousal-amnesia or arousal-aware treatment for the first experimental period. Using a within-subject design, each of the low and high hypnotizable subjects then experienced the reversed aware/amnesia treatment in the second period. This within-subject manipulation was introduced to reduce error variance in the physiological measures and to provide a more effective test of the effects of unexplained arousal uncontaminated by individual differences between subjects.

Three kinds of physiological measures were used: heart rate, respiration rate, and EEG recordings (technical details are available in Zimbardo, LaBerge, & Butler, 1993). Three different psychological measures were utilized to tap perceived arousal, mood, and subjects' attributions for their arousal. A primary dependent measure was the subjective assessment of experienced arousal reported as SUA. These repeated SUA ratings were made five times during the first period of the procedure: (a) initially after the protocol was explained and subjects had completed consent forms; (b) after being fitted with sensors that would record their heart rate, respiration, and EEG reactions, and the recording equipment had been calibrated; (c) following hypnotic relaxation suggestion; (d) following posthypnotic cued arousal; and (e) as the final baseline measure at the end of debriefing in the first phase. During the second phase of the study, SUA ratings were taken three more times corresponding to the repetition of events 3, 4, and 5 in the first period (data presented in Figure 4).

Additional psychological measures were taken during the critical period when subjects were experiencing the effects of arousal following the amnesia or awareness manipulation. These included a selection of items from the Profile of Mood States (POMS) (McNair, Lorr, & Doppleman, 1971), and a sentence-completion task designed to check on memory for the hypnotic suggestion and causal attributions for the arousal. Both were administered verbally via an intercom between the experimenter in the control room and the subject who was isolated in a dimly lit, sound-attenuation chamber within an adjacent laboratory. As the experimenter read each of the 34 mood descriptor terms (e.g., "forgetful," "alert," "annoyed"), the subject replied aloud with a number from a 5-point scale that indicated the extent that mood was currently being experienced (where 0 − not at all; 2 = moderately; and 4 = extremely). Next, the experimenter read aloud each of ten sentence stems (e.g., "Right now I feel . . . ," "The answer to my confusion is . . ." "I feel the way I do right now because . . .") and the subject's spontaneous stem completions were recorded.

Subjects were led to believe the study concerned differences in signal-detection ability between those who differed in hypnotic susceptibility and degree of hypnotic relaxation. This cover story was used so that subjects' attention would be focused on randomly presented, external acoustic signals

in order to create a uniform mental set across subjects. It also would enhance their responsiveness to the acoustic arousal-cue signal. Baseline physiological measures were taken to calibrate our recording systems and to provide a pre-experimental index for subsequent change. Subjects were instructed to try to increase their heart and (HR respiratory rates (II) as much as possible (without moving around in their seat) for one minute. This Arousal-Demand period allowed the subjects to experience intentionally directed arousal in a nonthreatening way in this novel experimental situation, prior to their hypnotically induced arousal experience.

Following their baseline assessment, subjects heard a 2-min tape-recording to induce a state of hypnotic relaxation, followed by the third SUA rating and then taped arousal instructions: "In a short while you will have an unusual experience. When you hear a bell ring, like this (BELL RINGS), you will act as if you are aroused, so that your heart rate will increase and your respiration will increase. You will continue to respond this way while performing various tasks. You will maintain that arousal until you hear, 'Now you can relax.' Then you will no longer feel the symptoms of arousal; as the signs of your arousal go down to their usual level, your heart rate and respiration return to their typical normal levels." This posthypnotic arousal suggestion was combined with a second suggestion designed to establish either Awareness (AWR) or Amnesia (AMN) for the source of the cued arousal experience—as I described in the earlier Overview section.

The arousal cue followed a 60-sec baseline period of no activity by the subject, then came the fourth SUA rating, with physiological data collected for 120 sec after the arousal cue. The mood measure and sentence completion measure were then administered, followed by removal of the posthypnotic suggestions for arousal and amnesia, and a fifth SUA rating. After a brief rest period of about 5 min, this procedure was repeated with the awareness or amnesia suggestion reversed for each subject in the two hypnotizable conditions, with the order counterbalanced within condition. At the end of this two-phase procedure, each subject was given an extended, personalized process debriefing (see later Ethics section for details).

I. Results and Discussion

The major results are described first for the psychophysiological measures, then the SUA ratings, the mood ratings, and finally, the sentence completions (see Zimbardo et al., 1993, for the detailed statistics of these findings).

Mean values of HR and RR were analyzed by a mixed ANOVA (Hypnotic Level × Treatment × Pre–Post Arousal Cue) and significant main effects were found for both HR ($F(1, 16) = 15.9, p < .001$, and RR ($F(1,

$16) = 9.1, p < .01$). A significant Hypnotic Level by Pre–Post interaction indicated that high hypnotizable (HI-HYP) subjects increased their HR more than did the low hypnotizable (LO-HYP) subjects from before to after arousal ($F(1, 16) = 5.9, p < .03$). Arousal change scores associated with the arousal cue were computed and HR was found to be five times greater for the HI-HYP group than for the LO-HYP group under the Amnesia condition ($t(16) = 3.1, p < .01$). Moreover, the comparison between Amnesia and Aware conditions showed, as predicted, significantly greater respiration rate increases for the HI-HYP group relative to the LO-HYP group ($t(16) = 2.6, p < .02$). There were no group differences in either measure for the Aware condition (nor any gender or order effects). After the data were Windsorized to deal with outliers, t-tests showed that again, as predicted, the HI-HYP group compared to the LO-HYP group showed more arousal in the Amnesia than Aware conditions for both heart rate ($t(12) = -4.2, p < .001$) and respiration change scores ($t(12) = 2.8, p < .02$). Figure 1 shows this effect as box plots for both HR and RR differences. It is apparent that the big action is in the HR arousal effects for the highly hypnotizable subjects experiencing amnesia (our Discontinuity condition).

The immediacy and power of the arousal induction on the HI-HYP subjects compared to the minimal impact on those in the LO-HYP condition is apparent from the HR data plotted across the experimental time line, as shown in Figure 2. The second obvious effect, in support of one of our hypotheses, is the sustained higher arousal of those hypnotizable subjects when they were in the Amnesia condition than when they were Aware of the source of their arousal. By contrast, the lowest arousal is seen for the Amnesia-LO HYP group.

Although not presented in our earlier publication, there was also a provocative EEG finding, which I think is worth mentioning here for its possible value in speculating about brain mechanisms involved in these amnesia effects. As can be seen in Figure 3, there was relatively greater activation in the right parietal lobe (P4) than the left (P3) for EEG Alpha waves in only one condition: HI-HYP experiencing Amnesia. Although the effect is small and needs replication under conditions where subjects are not carrying out as many tasks as in this study, it could be interpreted to mean that the right cerebral hemisphere was being activated during the time these hypnotizable subjects were experiencing amnesia. Recall it is the right hemisphere that is the "silent partner" to worldly experiences which are interpreted by the left cortex (Gazzaniga, 1998). Thus I would expect this effect to be reversed during the time when those experiencing such discontinuities are trying to generate causal attributions to make sense of them,
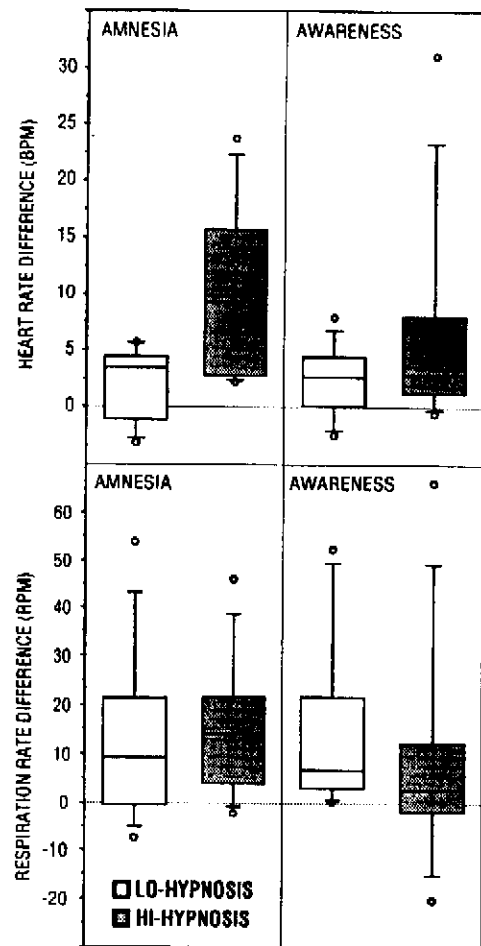
Fig. 1. Box plots for heart rate and respiration rate differences by condition. The box plots (Cleveland, 1985) are read as follows: The line through the middle of the boxes marks the median values; the tops and bottoms of the boxes mark the 75th and 25th percentiles; the lines extending above and below the boxes mark the 90th and 10th percentiles; the circles mark data points above and below the 90th and 10th percentiles. (From Zimbardo et al., 1993. Copyright © 1993 by the American Psychological Association. Reprinted with permission.)

with greater left hemispheric activation. That evidence will have to wait for our next program of research.

The SUA data were analyzed with a 2 × 2 × 2 (Hypnotic Level × Treatment × Pre–Post Arousal Cue) mixed analysis of covariance
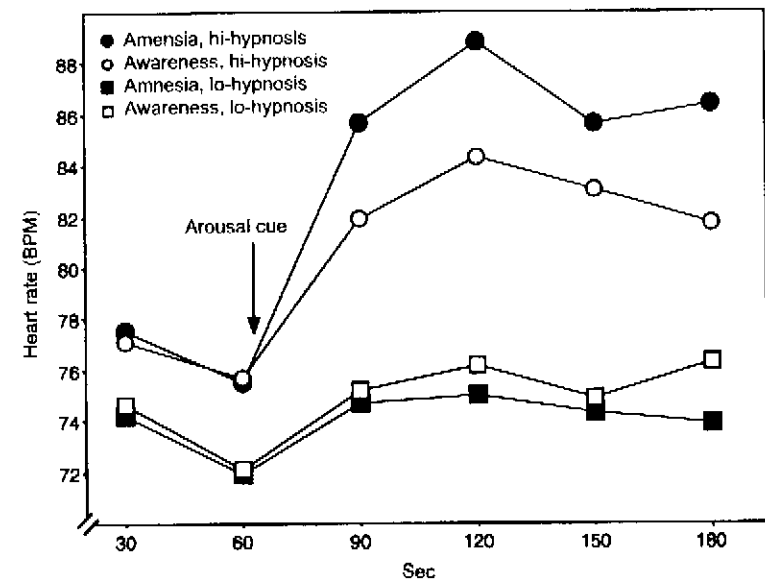
Fig. 2. Mean heart rate under amnesia and aware conditions by hypnosis group. (From Zimbardo et al., 1993. Copyright © 1993 by the American Psychological Association. Reprinted with permission.)
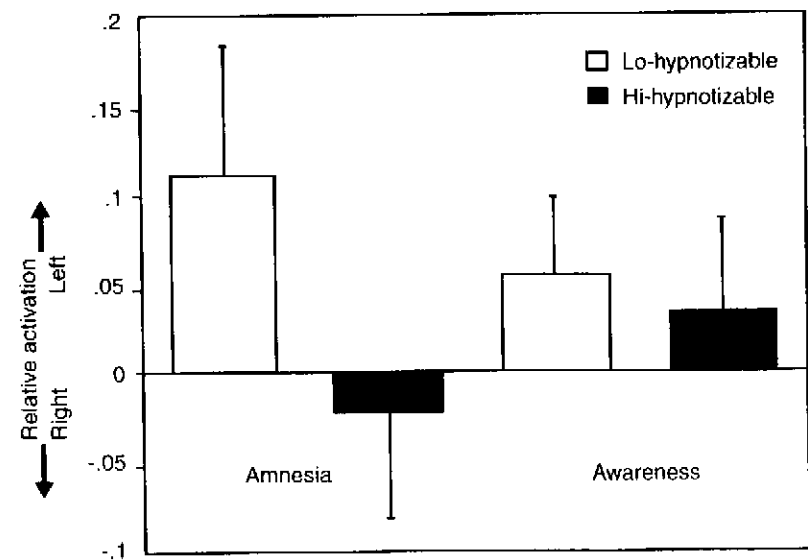
Fig. 3. Mean relative electroencephologram alpha activation in right and left parietal lobes.

(ANCOVA), with Post-Hook-up SUA levels as the covariate and with Treatment and Pre–Post cue scores as the repeated measures. Figure 4 portrays this elegant set of data arrayed by the two hypnosis groups each separately for their Amnesia and Aware conditions. We see that their initial baselines are nearly identical, as are their Pre-Cue low levels of arousal. The arousal cue has a clear effect across the board—everyone showed some degree of arousal ($F(1, 16) = 49.3, p < .0001$). However, the arousal for the HI-HYP subjects was greater ("very aroused") than for the LO-HYP group ("moderately aroused"), ($F(1, 16) = 8.2, p < .01$). Arousal ratings were highest when HI-HYP subjects experienced the Amnesia condition compared to their reactions when in the Aware condition ($t(8) = 2.7, p < .03$). A near significant triple interaction with $p < .07$ (Hypnotic Level × Treatment × Pre-Post Arousal Cue) confirms what can be seen in Figure 4, arousal was greatest when hypnotizable subjects were experiencing Amnesia. It is also important to point out that these differences between the Amnesia and Aware conditions in self-reported arousal were highly correlated with similar differences in both HR change scores ($r(18) = .54, p < .02$), and also with RR change scores ($r(14) = .71, p < .005$). Thus, as expected, both systems were responding comparably to our manipulation.

Two final comments about the SUA ratings deserve passing mention. One index of the effectiveness of our debriefing procedure is shown by the substantial decline in arousal in all conditions back down to, or even below, the initial, normal level of arousal that students brought into this experi-
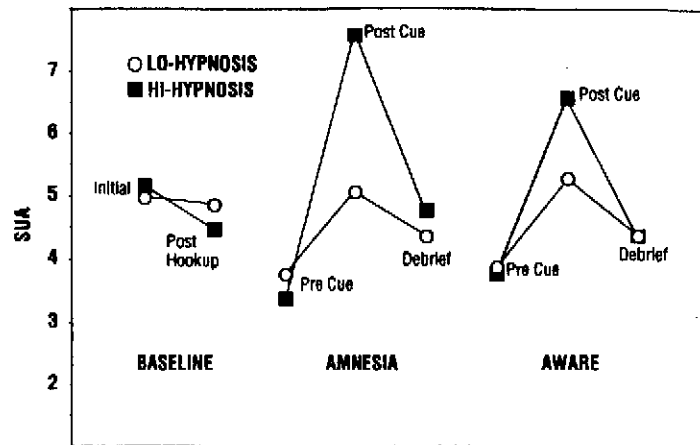
Fig. 4. Mean subjective arousal (SUA) ratings by experimental condition over the course of the experiment. (From Zimbardo et al., 1993. Copyright © 1993 by the American Psychological Association. Reprinted with permission.)

ment. The power of the hypnotic arousal induction can also be gauged by the HR increases in some subjects by as much as 20 beats per minute in a short interval, with SUA ratings reaching as high as the scale maximum.

From these arousal measures we do not get a sense of the hedonic quality of the experience; for that report we must turn to our mood measures. They show us that induced unexplained arousal not only has clear psychophysiological effects, but it has a predictable impact on mood states, as shown in Table IV. This effect is not experienced as an hedonically neutral, generalized activation, but rather is manifested as a syndrome of negatively valenced affects. Those subjects in the Discontinuity condition (HI-HYP + Amnesia), showed significant elevations in their degree of Negative Arousal ($t(8) = 2.79, p < .02$); Confusion ($t(8) = 2.90, p < .02$); Anger ($t(8) = 2.45, p < .04$); and a trend in the predicted direction for Depression ($t(8) = 2.00, p < .08$). Paired t-tests revealed no significant differences in the mood states of LO-HYP Subjects in the Amnesia compared to the Aware conditions. Main effects of hypnotizability were obtained for Negative Arousal ($F(1, 16) = 4.4, p < .05$), and for Anger ($F(1, 16) = 4.5, p < .05$). There was also a main effect of condition on several of the scales, with the mood ratings in the Amnesia condition being consistently higher than when the same subjects were in the Aware condition

TABLE IV
Mood State Scores: Means (and SDs) by Condition and Group[a]

	Awareness condition[b]		Amnesia condition	
	LO-HYP	HI-HYP	LO-HYP	HI-HYP
Negative arousal (tense, restless, nervous, anxious, on edge)	1.51 (.81)	2.20 (1.06)	1.62 (.92)	2.73 (.99)
Vigor (lively, energetic, active, vigorous, alert)	1.82 (.80)	2.20 (.72)	1.96 (.65)	2.60 (.62)
Confusion (forgetful, muddled, bewildered, confused, uncertain)	.89 (.67)	1.07 (1.00)	1.09 (.76)	1.91 (1.18)
Anger (grouchy, annoyed, resentful, rebellious, angry)	.24 (.26)	.89 (1.09)	.44 (.46)	1.53 (1.37)
Depression (unhappy, blue, miserable, sad, discouraged)	.27 (.25)	.69 (.81)	.47 (.49)	1.09 (1.21)
Fatigue (exhausted, fatigued, listless, worn out, sluggish)	1.09 (.71)	1.58 (.81)	1.11 (.74)	1.71 (.87)

[a] From Zimbardo et al., 1993. Copyright © 1993 by the American Psychological Association. Reprinted with permission.
[b] LO-HYP, low hypnotizability; HI-HYP, high-hypnotizability.

(Negative Arousal: $F(1, 16) = 6.7$, $p < .02$; Confusion: $F(1, 16) = 9.4$, $p < .008$; Anger: $F(1, 16) - 9.9$, $p < .006$; and Depression: $F(1, 16) - 6.1$, $p < .03$).

Attributions for the arousal were obtained indirectly by means of the sentence-completion test and qualitative analysis of the subjects' answers. The apparent differences in the general cognitive-emotional state of HI-HYP Ss when they were in the Amnesia versus the Aware condition, and the lack of such differences in the responses of LO-HYP subjects across the two manipulated conditions (which were essentially the same) were tested by having independent judges predict from which experimental condition each response came. They were able to do so to a significant degree (binomial test, $p - .009$) for the HI-HYP subjects, but not for the LO-HYP group ($p - .30$). Consider next the different interpretations given by the same highly hypnotizable subjects when they were aware or had amnesia for their arousal as shown in this sample of reactions to the stem, "I feel the way I do right now because . . ."

S1 (AMN): I've been running and I'm trying to relax.
   (AWR): I'm following hypnotic suggestion.
S11 (AWR): He told me to do it, I think.
   (AMN): I don't know why—I think something is happening.
S14 (AMN): 'Cause I'm nervous.
   (AWR): I'm in an experiment.
S15 (AMN): Because she lied (he reported discovering his girlfriend was unfaithful).
   (AWR): I'm wired to a machine.
S19 (AWR): The EEG cap on my head is too tight.
   (AMN): Exams are coming up; I'm stressed.

This overall pattern of results (despite the relatively small sample size) is in line with the theoretical predictions from Discontinuity Theory. Creating discontinuity experimentally by means of unexplained arousal triggers a range of significant and dramatic effects on emotions, cognitions, and physiological functioning. Furthermore, these results show that the effects of unexplained arousal can be assessed at both autonomic and psychological levels. These effects were not only statistically significant, but were large enough in an absolute sense to represent dramatic increases in arousal intensity that were enduring over the course of the study and even personally disturbing to some of the subjects. The lack of an immediate and situationally appropriate explanation for their sudden arousal clearly heightened the generalized arousal being experienced by our hypnotizable-amnesic subjects.

Our findings also show that unexplained general arousal is a personally experienced discontinuity that is perceived as hedonically negative arousal, and as "aversive" in the moods it invokes. Those feelings are characterized by the research participants' self-reports as being angry, grouchy, annoyed,

resentful, rebellious, unfriendly, anxious, nervous, tense, and restless. I think it is this negative affective state that motivates a search for an appropriate causal explanation, one biased in the direction of selectively noticing or recalling cues that support a negative interpretation of the anomalous experience. Of further interest to the study of emotion was the complex of multiple negative affect states created by our somatic arousal with amnesia. We are reminded here of Polivy's (1981) demonstrations of several affects resulting from experimental attempts to induce one particular emotion. Her anger manipulations created not only hostility, but also high levels of correlated anxiety and depression—comparable to the pattern observed in our data reported above.

It should also be apparent that the obtained pattern of results cannot be attributed to experimental "demand characteristics" in which subjects simply give us back what we had instructed them to experience in our suggestions, or were elicited because of implicit communication between subject and experimenter. The pattern of psychophysiological responses shown by the highly hypnotizable subjects who experienced unexplained arousal goes well beyond the specifics of the suggestions they were given (merely HR and RR increases). Moreover, the taped instructions and all treatment of the subjects were identical for the high and low hypnotizable subjects throughout the experiment by the experimental assistant who was blind to their condition. This was equally true of the identical treatment of those in the amnesia and aware conditions, with the sole exception of the taped posthypnotic suggestion to be forgetful or knowledgeable of the source of the arousal. With this encouraging study deposited in the data bank, we move to consider the next, larger experiment, some of whose assets have not been reported previously to the authorities.

E. MULTIPLE PATHWAYS TO PARANOIA

The first of our studies to focus explicitly on inducing psychopathological reactions in normal individuals was conducted with Susan Andersen and Loren Kabat (Zimbardo, Andersen, & Kabat, 1981). Here I summarize the highlights of that study and add a treatment and additional features of the methodology and results that were not reported in the original article (see Zimbardo & Andersen, 1999). They were tangential to the limited focus of that brief report, but are central to the thesis being advanced in this chapter.

Recall Old Joe on the pharmacy line "going ballistic" when he misconstrued his inability to hear the nurse's kind comments to him as her indifference and possibly prejudice toward him? His partial deafness created a

perceptual disorder, which must have made his world confusing at times, and which could be resolved by developing causal attributions about other people acting malevolently toward him. It could be argued that he correctly reasoned (about social agents acting hostile toward him) from an initially false perception (being unaware that his hearing disorder was organic) given the confirmatory evidence he was able to uncover in his social setting. That line of reasoning may generate beliefs that qualify as paranoid delusions when they are held with conviction despite contrary evidence (Cameron, 1943). Such a view about the etiology of delusional thinking has been persuasively argued by Brendan Maher (1974a,b; Maher & Ross, 1984). His analysis is supported by clinical observations that paranoid reactions are often seen among the elderly when their hearing loss is gradual, thus they may be unaware of it as the source of perceptual anomalies (Cooper, 1976; Cooper & Curry, 1976; Cooper, Kay, Garside, & Roth, 1974; Post, 1966, and others).

As I mentioned earlier, of all mental disorders, paranoia should be of most interest to social psychologists. It involves real or imagined transactions between people, as well as fascinating self-attention and social perception-cognition processes (Butler, 1993). Moreover, much of paranoid thinking is characteristic of everyday thought (Artiss & Bullard, 1966; Fenigstein & Vanable, 1992).

Consider this scenario. If you could not hear what people were saying because they seemed to be whispering, and they denied that they were when confronted, it would be reasonable to conclude that they were lying or covering up something. When challenged, they would react with confusion, possibly anger, that could escalate into a hostile interaction. Observers, unaware of the hearing disorder, judge the hard-of-hearing person's actions as bizarre and as evidence that a "dangerous" thought disorder exists. Their interpretation, though false, constitutes a sufficient basis for excluding the person from their company. Perceiving signs of being socially excluded is a new source of ambiguity and confusion for that person, to which he or she responds with hostility and ideation of a now "obvious" conspiratorial threat (Lemert, 1962). Becoming isolated, the person loses opportunities for corrective social feedback, and any delusions of persecution become self-validating in a closed, autistic system. Thus, a once-normal person may spiral down this path to paranoid pathology.

Our research was designed to broaden the analytical focus of these earlier correlational and conceptual studies in several ways. First, we put the concept of perceptual anomaly (deafness without awareness) within the larger generic category of discontinuity. That led us to consider other paths to paranoia, such as that which might be based on a somatic anomaly of unexplained arousal, coupled with a socially focused biased search frame.

Second, we eliminated obvious alternative explanations based on biological aspects of the elderly with hearing deficits, because we studied young, healthy individuals as our subjects. Third, we experimentally created in the laboratory the conditions believed to play a causal role in the etiology of some forms of paranoia.

The purpose of this study was to demonstrate that it is possible to initiate paranoid thoughts and feelings in young, healthy, normal subjects by inducing either of two types of discontinuity, unexplained deafness or unexplained arousal, under certain conditions. One condition was to create a context for socially focused misattributions by having several others present and interacting in ways that could be interpreted as excluding the subject, or even making fun of him. The second condition was to add the social-focus explanatory search frame to the unexplained arousal manipulation.

We predicted that both experimental treatments of discontinuity would give rise to significant elevations in paranoid thinking as measured by standard and specially devised measures, as well as in self-ratings and judges' ratings of the subjects' actions and feelings. The subjects' reactions were compared with two control groups, one of explained deafness, and another for the effects of following posthypnotic suggestions. We did not make differential predictions about the ways the two experimental groups would respond on our various dependent measures.

There were some special features of this study's methodology (in addition to those common elements described in the earlier Overview) that deserve mention.

The 24 highly hypnotizable male students who participated in the training and testing phases of this study were randomly assigned to four treatments: Unexplained Deafness; Explained Deafness Control; Unexplained Arousal (with Social Bias), and a Posthypnotic Suggestion Control group. Amnesia was assessed and validated for all subjects both on the Harvard Group Scale of Hypnotizability and in individual assessment on the Stanford Scale, Form C. During hypnosis training, those assigned to the partial hearing loss conditions demonstrated their ability to experience hearing impairment by failing to repeat five or more of eight standard tape-presented phrases. The last item of subject selection was establishing their normal range of functioning on several scales of the MMPI (Dahlstrom, Welsh, & Dahlstrom, 1975) and on our medical evaluation form.

The paradigm used in this study was one in which individual subjects were led to believe we were studying creativity and problem solving of individuals and teams under varied hypnotic conditions, but they were unaware that the two others in the group were confederates. In phase one, the hypnotic induction of treatments, when the subject arrived at the laboratory, another "subject" was already there and the second confederate

joined them soon after, and all three participants were given hypnotic relaxation suggestions— to establish their comparable status. Next, they were told that they would be listening to special music to deepen their relaxation state, and would each go to separate listening rooms equipped with hi-fi stereo headsets. The real subjects then heard tape-recorded music followed by a tape of one of the four treatments, pre-selected by the research assistant (so all other researchers and confederates were ignorant of their condition).

The discontinuity-induced post hypnotic suggestions for all conditions used the same triggering cue: "When you see the word 'Focus' projected on the screen in the next room, and only in that room . . ."

1. *Unexplained Arousal (Social Bias):* Subjects were given our standard suggestions for that cue to induce increases in heart rate and respiration with amnesia for their source, to which were added, "You might find that what you are experiencing has something to do with other people."

2. *Unexplained Deafness:* Their instructions continued, "That will be a signal to you that your environment has changed so that sounds are reduced, making room noises and what other people are saying very low. It will thus making room noises and what other people are saying because it will be very difficult to understand what other people are saying because it will seem as if they are talking so low as to be nearly inaudible. You will be concerned by the fact that others appear to be talking so low you can't hear them well, as if they were whispering." Source amnesia was then suggested.

3. *Explained Deafness Control:* These subjects were treated identically to the Unexplained Deafness condition, but were explicitly told that they were aware of the suggested source of their experience of partial deafness. Those in both deafness conditions were also told that their hearing would return to its usual level as soon as the experimenter touched their shoulder, and then they would be able to understand perfectly what others are saying.

4. *Posthypnotic Control:* Their instructions continued, "You will begin to experience a change in you. Your left earlobe will begin to feel very itchy, and will continue to itch until you scratch it. You will feel compelled to scratch it. As soon as you do, you will feel fine again. You will not remember having been given this suggestion until the experimenter touches your shoulder. Then you will remember everything. You will not remember this suggestion until then."

This hypnosis control was included to assess whether some dynamic quality of carrying out a posthypnotic suggestion with amnesia might be sufficient to generate the predicted results. Data from the pair of control groups also help to rule out experimental demand characteristics (they were treated identically throughout the experiment and confederates and researchers were blind to conditions), subject selection traits (they were

equally hypnotizable and amnesic), and context features that might facilitate irrational reactions (they were the same).

In phase two of the experiment, the subject entered the familiar large laboratory room, (where hypnosis training sessions had been held), taking the empty seat near the two confederates who were sitting closer to each other. The experimenter gave a cover story about creativity, problem solving, and hypnosis, explained that all task instructions and most stimulus materials would be projected on the screen, there would be an initial problem-solving task (10 anagrams) during which they should decide to work alone or to collaborate on the next task of analyzing a picture (TAT card), after which there was a second creativity task to be done alone, followed by final reactions of each of them, also to be done separately in adjacent rooms. Seeming to check out the projector before leaving, the experimenter activated the first slide, "Focus," the posthypnotic cue. As the subject started working on the anagram task, the confederates engaged in a well-rehearsed, standard interaction. Their dialogue was designed to emphasize an alliance or comraderie as they recalled having met at a party, laughed at an incident mentioned, made funny faces, and eventually decided aloud to work together on the next task. Their verbal exchange and mannerisms were also an occasion for misunderstanding by subjects in the experimental conditions. Before turning to the anagram task, one of them casually asked the subject if he wanted to work with them on the next task and recorded any answer unobtrusively, as a measure of desire to affiliate. During the session, the confederates asked the subject three other questions, and they and a pair of observing judges (behind a two-way mirror) recorded the answers, if any. After completing the various timed tasks, subjects were instructed to return to their relaxation music listening rooms for the next part of the study. That gave the confederates the opportunity to immediately and independently give their reactions to the subject on a series of mood adjectives (which were averaged in the data presentation in Table V; their inter-rated reliability across all these measures was $r - .57$).

Subjects' behavior, thoughts, and feelings were assessed on the following dependent measures: number of correct anagram solutions; content analysis of "creative" stories written alone to the TAT picture; their self-assessed creativity on this task; the Multiple Affect Adjective Checklist (MAACL) (Zuckerman & Lubin, 1965), ratings on a series of self-descriptive adjectives; and the short form of the MMPI administered earlier in selection. On that form, subjects rated themselves on 207 items representing scales measuring Paranoia, Suspiciousness, and Grandiosity, as well as on two scales on which we did not expect to find treatment differences, Schizophrenia, and Preliminary Hypochondriasis. Indeed, no differences were found on those two measures. In addition, they also completed the Paranoia

TABLE V

MEANS ON A VARIETY OF MEASURES DISTINGUISHING EXPERIMENTAL FROM CONTROL GROUPS

Dependent measures	Experimental Unexplained arousal, social bias (n = 6)	Treatment Unexplained deafness (n = 6)	Control Explained deafness (n = 6)	Control Posthypnotic suggestion (itching ear) (n = 6)	F	t-value[a]
Paranoia measures[b]						
Paranoia clinical interview form	.33	.30	−.09	−.28	7.48***	4.63****
MMPI-Paranoia	2.33	1.50	.33	−.17	1.72	2.13**
MMPI-Suspicion	2.83	1.00	.00	.67	1.73	1.71*
MMPI-Grandiosity	−.83	1.33	−.83	−1.00	1.63	1.00
MAACL-Hostility	5.33	11.00	2.40	5.17	3.00	3.12****
Thematic Apperception Test						
Affective evaluation	75.00	83.35	16.55	33.50	3.68*	3.23****
Self-assessed creativity	67.50	42.83	68.33	73.33	4.66*	2.47**
Anagrams						
Number correct	2.67	3.00	4.17	4.83	1.19	1.87**
Affiliation (%)						
During experiment	17	17	50	100	8.22****	3.55***
Volunteered for future	17	0	50	67	6.75****	2.36***
Self-rated feelings						
Creative	54.17	34.17	55.83	65.83	1.72	−1.65*
Distracted	74.33	60.83	41.67	19.17	3.81*	3.02****
Confused	55.00	73.33	39.17	35.00	2.17	−1.65*
Relaxed	27.17	43.33	81.67	78.33	7.56***	4.61****
Agitated	74.33	73.33	14.17	15.33	22.72****	8.25****
Irritated	55.83	70.00	25.00	7.00	10.61****	5.34****
Friendly	33.83	26.67	53.33	56.67	2.16	2.48**
Hostile	56.83	38.33	13.33	13.33	3.83*	−3.16****
Happy	74.33	45.83	51.67	65.00	1.25	−1.61*
Judges' ratings						
Confused	33.00	40.83	27.08	17.67	.77	1.31
Relaxed	36.67	34.17	54.59	65.42	3.06	−2.89****
Agitated	38.17	51.25	24.59	13.75	2.62	2.54**
Irritated	28.50	45.84	18.92	11.25	2.75	2.46**
Friendly	35.50	23.34	48.34	65.00	4.87*	−3.39****
Hostile	8.00	18.75	5.00	1.67	2.00	1.92**
Happy	33.34	21.25	40.00	56.25	3.75**	−2.76***

[a] All t-tests are one-tailed and derived using a single planned comparison (Hays, 1965, p. 465).

[b] Reported paranoia means represent difference scores (post minus pre). MMPI, Minnesota Multiphasic Personality Inventory; MAACL, Multiple Affect Adjective Checklist.

[c] Chi square comparisons, experimental versus control groups.

* p < .10, ** p < .05, *** p < .01, **** p < .005

Clinical Interview Form, a specially designed instrument for this study that contained 15 declarative self-descriptive statements adapted from a British clinical study of paranoia in hard-of-hearing persons (Kay, Cooper, Garside, & Roth, 1976). All subjects went through an elaborate debriefing expertly administered by Susan Andersen (see Ethics section for details). All those showing strong reactions during the study were contacted the next day for reassurance, and again a month later when we readministered the relevant MMPI paranoia scales and the Paranoia Clinical Interview Form. As we expected, and I am pleased to report, every subject's scores returned to their normal, nonparanoid, pretest values.

I. Results and Discussion

The manipulations appeared to have worked as intended. The Unexplained Arousal subjects were significantly more agitated ($p < .001$) and less relaxed ($p < .005$) than the Controls, but equal to those in the Unexplained Deafness condition (See Table V). All those in the two deafness conditions informally reported difficulties in hearing the other subjects (confederates) during the experiment, felt their hearing was not "keen" on the final postexperimental rating (mean of 21 compared to 78 for the two nondeafness conditions, $p < .001$), and they answered fewer of the four questions posed by the confederates during the experiment than did the other subjects (averages of 1.4 versus 3.8, respectively, $p < .001$). All those in the Itching-ear, posthypnotic control condition scratched their left ears, as noted by both observers, and all of them also reported that they had experienced an itching sensation in their left earlobe. Finally, variations in the amnesia manipulation led all six subjects in the Deafness Explained condition to report (during debriefing) being fully aware of why they were having hearing difficulties, while none of the other 18 subjects reported any memory for that suggestion.

Table V summarizes the primary results for most of our measures. As predicted, experiencing a discontinuity, either perceptual or visceral, with amnesia for its source, produced significant changes in cognitive, emotional, and behavioral functioning. Those in the two discontinuity conditions became more paranoid as shown in a number of ways. Most directly, they showed significant elevations on the Paranoia Scale of the MMPI ($p < .05$) and on the clinically derived paranoia interview form ($p < .001$), and they showed marginally greater scores on the MMPI Suspiciousness scale ($p < .10$), one aspect of paranoid thinking. It is instructive to consider the total lack of face validity in the content of some items on the MMPI Paranoia Scale where discontinuity subjects changed in the paranoid direction from pre- to posttesting, while the controls did not: "If I were a reporter I would

very much like to report news of the theater"; "I have had no difficulty in starting or holding my bowel movements," and "I would like to wear expensive clothes." Something deeper than experimenter expectancy biases or subjects wanting to please the experimenter appears to be operating here.

Another aspect of paranoia is feelings of hostility that experimental subjects displayed at significantly higher levels on the MAACL than did controls ($p < .01$)—notably the enormously high hostility level expressed by the Unexplained Deafness subjects. That finding, when coupled with the absence of differences on other MAACL scales of anxiety and depression, supports the notion that these discontinuity inductions evoked specific affective responses considered most representative of preliminary stages of paranoid thinking (see Beck, 1974).

There were also a number of indicators of the social interplay between the negative feelings and actions of the experimental subjects and the reactions to them of the confederates, which contribute to the process of developing paranoid thinking and the labeling of someone as paranoid. The subjects were highly and significantly agitated, irritated, hostile, and distracted, while feeling neither friendly nor relaxed. The confederates responded to them in kind, perceiving the discontinuity subjects as agitated, irritated, hostile, unfriendly, and not relaxed or happy, all significantly more so than in their judgments of the control subjects. The restricted sense of social involvement accompanying paranoid reactions is seen in the low percentage of experimental subjects who chose to work together with the confederates on the TAT (where collaboration was expected to improve performance, according to the experimenter's depiction). Only 17% chose to affiliate on this task compared to 75% in the control conditions ($\chi^2 (1) = 8.22$, $p < .01$). When invited to participate in a future study with the same partners (the confederates), the majority of controls accepted (58%), while the majority of the experimentals declined (92%) ($\chi^2 (1) = 6.75, p < .01$).

The agitated–distracted state of the experimental subjects took its toll on cognitive processing required in the anagram task, where they solved significantly fewer anagrams than the controls ($p < .05$). They also felt that they were not as creative on the TAT task as did the controls ($p < .05$). However, one aspect of their TAT performance provides a subtle, indirect assessment of paranoid thinking that I especially like. All TAT stories were rated blind and independently by two student judges on a number of a priori dimensions (exact agreement of 83%). One such dimension was the degree to which they were "evaluative," both positively and negatively, regarding the actors in their stories. One hallmark of paranoia is the confident assessment and evaluation of other people, even in ambiguous behavioral situations, and this was exactly what our discontinuity subjects revealed. Their scores on this measure of affective evaluation of the TAT

actors were more than three times greater than those of the controls ($p < .005$).

Despite the overall similarity in the reactions of the two discontinuity conditions that took different paths to the common end-point of paranoia, there are several discrepancies to note in passing. I do so only for their provocative value in stimulating further, more process-oriented research on alternative dynamics in the creation of paranoia. The induction of paranoid reactions by means of unexplained deafness compared to unexplained arousal was marked by somewhat greater grandiosity, but less suspicion, much higher hostility, but lower feelings of creativity. Those experiencing unexplained arousal provided a paradoxical portrait of being least relaxed, most hostile, and yet most happy of any of the student-subjects (a high mean of 74 on a 100-point scale). The confederates did not pick up on their feelings of hostility (rating the unexplained deafness subjects higher, as they also did for agitation and irritation). Perhaps their negative feelings were masked by a show of happiness, which the confederates did judge as being higher among the unexplained arousal subjects than among those in the unexplained deafness condition.

The small sample size in this study constrains enthusiastic generalizations, yet points up the power of our manipulations (and the utility of pre–post, within-subject change scores) to generate so many significant effects that, without exception, support the predictions derived from Discontinuity Theory. It should be apparent that it is the labor-intensive nature of this research that limits sample sizes and not the researchers' lack of industriousness. We turn next to an experiment that expands the pathological consequences of inappropriate resolutions of discontinuities beyond paranoia to phobias, hypochrondriacal mental disorders, and more.

F. BIASED SEARCH FRAMES CREATE PREDICTABLE DIAGNOSTIC PATHOLOGIES

This study (Zimbardo & Piccione, 1999) explored the relationship between particular explanatory search frames and specific types of pathology that might result from relying on them to account for the experience of sudden somatic arousal without awareness of the cause of this discontinuity. We extended our basic paradigm to include the posthypnotic induction of three different biased search frames superimposed on the unexplained arousal manipulation: People, Environment, Body or Health. A host of reactions of these subjects were compared with those in two control conditions; explained and unexplained arousal, without any induced search frames. We assessed emotional, cognitive, perceptual, communicative, and

search behaviors by means of standard scales, projective tests, self-reports, observer ratings, and content analyses. In addition, videotape segments of interviews with the subjects were evaluated by clinical psychologists on a number of dimensions, most importantly, evidence of deficiencies in interpersonal functioning, pathology, and specific *DSM-III* diagnoses. We predicted the following:

1. All groups would show evidence of arousal.
2. The hedonic quality of that arousal would be largely negative.
3. Those given the Environment-search bias would show evidence of visually searching the laboratory environment, create misattributions based on physical features of the current behavioral setting, and be high on the MMPI Phobia scale.
4. Those given the Body/Health-search bias would show evidence of searching their bodies, create misattributions based on aspects of bodily functioning and health status, and be high on the MMPI Hypochondriasis scale.
5. Those given the People-search frame should create people-based misattributions, show emotional-cognitive signs of envy, jealousy, anger, suspicion, and vindictiveness, give more Rorschach human anatomy responses and more rejection responses to the Rorschach (an index of pathology), and also be high on the MMPI Paranoia scale.

We also expected that judgments by clinical raters would reveal evidence of symptomatic behaviors congruent with each of these explanatory biases. Finally, we were simply curious about the extent of "pathology" that these trained observers would find among our "normal" sample of college student-subjects.

The participants were 50 highly hypnotizable-amnesic students (of both sexes) from a Stanford Introductory Psychology class. They were randomly assigned to one of the five conditions described above, after having successfully completed several hypnosis-training sessions. Excluded from this sample were all students who were above the average on the Manifest Anxiety Scale, had reported any current medical or psychological problem, or did not pass several amnesia tests during the training sessions.

One special form of preparation for the current study included having all the subjects-in-training read a letter describing a posthypnotic arousal cue that would make them feel euphoric and happy, but they would not remember the suggestion, and might find that this unusual feeling had something to do with their past. The components of this letter parallel a letter they all would receive later during the study, some suggestions for the unexplained or explained arousal, and search biases. This procedure helped to determine the effectiveness of the manipulation, while also giving

subjects a specific positive association with the laboratory in which they would later be tested.

The guise of "a study of creative problem solving under varied conditions of hypnosis" enabled us to administer a series of projective tests and tasks to the subjects, after they had been deeply hypnotized and given the post-hypnotic suggestions. These standardized taped instructions were delivered through earphones, and at the point where the subject opened her or his eyes, the first experimenter handed over a personal letter to be read silently while simultaneously listening to its contents. The letter specified the terms of each of the five conditions. Since the letters and appropriate tapes were randomly selected by an assistant, the experimenter, as well as the second experimenter who conducted the debriefing, were blind to treatments. The somatic arousal suggestion was again for heart rate and respiration to increase on cue, but this study included a third arousal component of muscles becoming tight.

In the Explained Arousal condition, subjects were told they would re-member having read and heard this letter, while the No Bias Arousal subjects were informed that they would not remember these suggestions. But they, like the three biased groups, were told, "that it is important that you try to figure out the reason why you are feeling these reactions." Those in the biased conditions were given the added suggestion that, "they might find that the explanation for what you are feeling has something to do with the physical environment" (Environment-Bias); "your body or health" (Body-Bias); "people" (People-Bias).

The experiment was conducted in the same large room where hypnosis training had taken, subjects were in self-reported good health and mood at the start of the session, and they were alone during the procedure since all instructions and test materials were presented by an automated slide projector. Thus there were no obvious negative aspects of this behavioral context that could serve as a ready attributional focus for any of the three search biases.

After writing a story to a TAT card for 3 min, a buzzer sounded the posthypnotic signal. After a 1-min interval (for the arousal to start and be noticed), subjects completed the MAACL, a set of 10 Group Rorschach cards (Harrower & Steiner, 1951), and three scales from the MMPI: Phobia (PHO, Wiggins, 1966), Hypochondriasis (Hs', Welsh, 1948, and Simple Paranoia (Pa-S, Wiener & Harmon, 1946). After writing one more TAT story, they completed a personal reactions inventory that asked about their current feelings, and reasons for what they were experiencing. The second experimenter then conducted a semistructured interview (for 10 to 15 min), asking subjects to elaborate and clarify those thoughts and feelings. When-ever subjects generated an explanation that fit one of the three biases, the

interviewer challenged it by inviting them to consider other possibilities from the other two categories. A lengthy debriefing followed, and no subject left the experiment until the clinical psychologist (Piccione) felt assured that there was no evidence of symptomatic behavior. Subjects who had reacted strongly during the experiment were contacted the next day to treat any negative carry-overs (there were none), and all subjects were contacted again in a 1-year follow-up (the results of which are described in the Ethics section). The entire procedure was videotaped and parts of it were analyzed by raters who were ignorant of the hypotheses. Pairs of observers also rated subjects' search behaviors as they were directly observed from behind a special one-way window.

The last feature of this study, and perhaps its most important one, in-volved having ten clinical psychology interns from local Veterans Adminis-tration Hospitals review the videotapes of the final interviews between subjects and experimenters (prior to debriefing). Each pair of them viewed 10 of the 50 edited tapes (roughly equivalent lengths with the sequence of conditions randomly arranged). Each clinical intern separately provided a series of ratings and evaluations on a Clinical Observation Form that invited them to identify any students who should not be allowed to continue to participate in a second study on stress and its management. While carrying out this primary task (and ignorant of the experimental context of the interviews), they were also asked to note or rate the information category the subject predominately provided to the interviewer (our three biases plus several others); the subject's personal and interpersonal reaction styles (11-point scales on eight dimensions, such as sadistic-friendly, phobic-curious); individuals who seemed most "normal" and most "pathological," and finally, if justified, to give a DSM-III diagnosis of any student whose symptoms merited such a clinical judgment. (The interns participated at the encouragement of their supervisors, were given a fee for their services, and a lecture later about Discontinuity Theory, this experiment, and their collective results.)

1. Results and Discussion

Obviously this study generated a huge amount of data, only some of which can be reported briefly within the already overtaxed constraints of this chapter. I'll start with the good news that all of our predictions were supported, with two exceptions to be described.

The majority of subjects (70%) rated their experience as negative, 24% as a mix of negative and positive, and only 6% evaluated their arousal positively. Thus for 94% of the subjects this hypnotically induced arousal was interpreted as either totally negative or mixed. It was most clearly

negative for those in the People-Bias condition (90%, 10% mixed)—a powerfully negative reaction among these subjects that will resurface across many of the measures. The observational data offer another index of subjects' general distress and tension. Of the average number of 31 identifiable coded reactions per group (range: 27–36), fully 74% were of tension and emotional and behavioral signs of distress, whereas only .05% were of positive reactions, with the remainder being searching the environment, one's body, or other reactions.

A factor analysis of subjective mood appraisal on the MAACL generated five factors (principal components), on which only People-Bias subjects showed significant trends toward being least Positive, least Relaxed, and most Negative-Situationally, with no effects for Challenging or Negative-Personal. On specific adjectives, the People-Bias subjects were highest on Envy ($p - .05$), Guilty ($p = .09$), Angry ($p = .09$), and lowest on Friendly ($p - .08$), with no other clear trends. On composite scales, the People-Bias subjects were again highest on Disgust (Disgusted, Scornful, Contempt, Resentful, Envious) of any group ($p < .10$), lowest on Happiness (Amused, Elated, Excited, Thrilled, Happy, Contented) ($p < .05$), and Calm ($p < .10$). The only other effects of note were for the Body-Bias to be most Nervous ($p < .10$), and the No Bias group to be most Interested (Interested, Challenged, Expectant) ($p < .05$).

The rest of the data will be presented in terms of the predicted effects for each of the three biased conditions rather than by individual measures. Starting with subjects given the **Environment-Bias,** we found as expected, that they searched the experimental environment significantly more than any other group ($p < .005$) by looking around, touching things, checking out the equipment. Their mean of 4.2 was nearly twice as high as that of any other condition, which were comparably low. The reasons they gave (on the postexperimental questionnaire) for their unusual feelings were coded into 12 subcategories related to the environment, with 80% of these subjects resorting primarily to environment-based explanations. Ratings by the clinical judges of the nature of the information communicated during the interview phase of the study, again show that the majority (55%) of what these subjects said was related to the environment, as seen in Table VI. But it is the quality of their misattributions that is more important than that they simply followed the posthypnotic suggestion appropriately. Consider some of their causal explanations: "I really think that the fumes of the projector kind of made me sick . . . the ink fumes . . . not the ink fumes . . . maybe it was just the warm air"; "Well, I was feeling kind of claustrophobic . . . I was [seated] in a corner and stuff"; "Maybe from being alone, in a room alone"; "It was the heat of the projector blowing on me . . . that really bugged me. . . Well, I think it might have been that

TABLE VI
CATEGORICAL INFORMATION BIAS: CLINICAL JUDGES' RATINGS OF BIAS IN SUBJECTS' COMMUNICATED INFORMATION

Category[a]	Experimental conditions				
	Body	People	Environment	No bias	Explained
Body	77*	24	35	45	40
People	08	62*	05	25	30
Environment	04	03	55*	20	15
Other	11	11	05	10	15

[a] Percentage of "category of information predominantly presented."
* Predicted highest percentage.

camera actually." Others said their aroused state might be due to the uncomfortable chair, the stuffiness of the room, the rainy weather, the stimulus materials, or even the shape of the pencil they were given to write their reactions. Two other bits of evidence that mesh nicely are the clinical raters' judgments of phobic symptomatic behavior (see Table VII) and the MMPI data (see Table VIII). Those in the Environment condition were highest on displaying phobic behavior; their mean score is significantly higher than any other condition ($p = .01$). Moreover, their elevated mean

TABLE VII
INTERPERSONAL STYLE WITH INTERVIEWER: CLINICAL JUDGES' RATINGS ON ANCHORED DIMENSIONS[a]

Dimensions	Experimental conditions				
	Body	People	Environment	No Bias	Explained
Hostile versus friendly	15	.47*	.00	.05	.05
Dominant versus submissive	.23	.10	.05	.15	.25
Mistrusting versus trusting	.08	.60*	.20	.15	.20
Illness versus health bias	.58*	.23	.35	.15	.15
Avoiding versus exploring environment	.15	.40	.45*	.25	.30

[a] Eleven point scale: For example. -5 "hostile", 0 = neutral. +5 "friendly." Ratings are mean number of ratings in negative direction, divided by total ratings.
* Predicted highest value.

TABLE VIII

MEAN SCORES ON MINNESOTA MULTIPHASIC
PERSONALITY INVENTORY SUBSCALES BY
EXPERIMENTAL CONDITIONS (WITH COMPARATIVE
POPULATION MEANS FOR EACH SCALE)

Scale: Hs'	Hypochondria	
	Population Mean:	1.7
Conditions	**Body/health**	2.7
	Environment	1.3
	Explained arousal	1.1
	People	0.9
	No bias	0.8
Scale: PHO	Phobia	
	Population mean	7.3
Conditions	**Environment**	7.4
	Explained arousal	5.7
	No bias	4.9
	People	3.8
	Body/health	3.8
Scale: PA-S	Paranoia-simple	
	Population Mean	5.8
Conditions	**People**	7.5
	No bias	8.1
	Body/health	7.8
	Environment	7.3
	Explained arousal	6.4

score, which resembles the clinical outpatient population mean, is interpreted as "admitting to a number of fears, many of them of the classically phobic variety such as heights, dark, closed spaces, etc." (Wiggins, 1966, p. 13).

The **Body-Bias** subjects did not search their bodies, as we had predicted, any more than did the others. In retrospect this was a naive prediction since the induced action was happening inside their bodies and not externally. However, most (70%) of the reasons they gave for their feelings were in one of nine subcategories related to health or their bodily functioning, among them: not enough sleep, hungry, on a diet, exercised too much, drank coffee, ate something bad, or biological cycle. For example, "My muscles are a bit tense and I have a headache . . . I think it is because of today's early swimming practice . . . or maybe from horseback riding." Or consider these multiple attributions from another subject, "I'm uptight because my summer plans had not been all laid out, and also I'm coming down with a cold . . . I got a really bad headache on the right side. . . .

I haven't been getting much sleep because I went to the Formal (dance)." While subjects in all conditions communicated a lot of information during the interview about their bodies since their discontinuity was based on a visceral change of state, Table VI shows that the Body-Bias group spoke about little else, with 77% of their talk in the body category. As expected, their excessive concern about their health led the clinical raters to judge their symptomatic behavior as primarily hypochondriacal (see Table VII). Finally, their MMPI scores reveal them to be not only significantly more hypochondriacal than any other group ($p = .0003$), but even greater than the population comparison mean for the MMPI Hs' scale of hypochondriasis.

The **People-Bias** group is clearly the most fascinating for social psychologists because the manipulation was a powerful catalyst for attributions about the real and imagined social world. Although there were no actual people with them in the laboratory when they became aroused, and they had only positive prior contacts with the experimenters, these subjects "saw" people everywhere, and in very upsetting scenarios—in line with their negative mood state noted before. Nine of the subcategories in their interviews dealt with relationships with other people, which were the dominant explanatory category for 80% of them. Specifically, they felt guilty because they had "killed" the actors in their TAT stories; were sad because of how the TAT actors had died; were depressed by how the TAT actors looked; were upset by the "horrible, violent ending" of the TAT story; were angry at recalling recent confrontations with a boyfriend, roommate, and parents; and were angry at some mean people. One remarkable attribution of extreme jealousy may or may not have actually happened, but is surely unusual in this context: "I feel that I am under heavy stress right now. . . . It's like I remember something about two people I care about, and I am like a third person. . . . I turn around and I see my girlfriend and my brother is swinging my girlfriend around. . . . There should be a reason to be jealous. . . . We broke up 'cos my mom and dad asked me to because they didn't want me to get serious. . . . I still like her a lot . . . and to see her with my brother playing around triggered something." The subjects were also significantly more likely to report seeing human anatomy in the ambiguous Rorschach cards than any other group ($p < .05$), as well as reporting seeing "nothing at all," or rejecting a card, which clinicians regard as an index of pathological responding (7 of 10 subjects gave 24 rejection responses compared to only 3 of 10 in the other bias conditions who gave only 4 rejection responses). Table VI shows that their communication with the experimenter was judged to be primarily about people, whereas Table VII shows that the clinical judges rated their videotaped interaction with the experimenter as reflecting the highest levels of para-

noid, vindictive symptomatic behavior, but also very high degrees of hostile, sadistic symptoms. Curiously, these subjects were also relatively high on hypochondriacal symptoms. Note that among the two controls there was no predominant symptom category as perceived by these judges. The one fly in the otherwise soothing predictive ointment is the failure of our MMPI measure to reveal this paranoid orientation. Examination of Table VIII does show that the mean of the People-Bias subjects of 7.5 is well above the population mean for this PA-S measure, but so are all the others, with the No Bias control highest of all! Resolution of this anomaly comes from our later discovery that we had used the wrong scale, since the Subtle Paranoia Scale has been found to have poor validity with non-psychiatric populations (Wiener, 1947). But we shall see on the final measures provided by our clinicians that somehow imposing a people explanatory search frame on the motivation to understand unexplained arousal transformed the ordinarily normal cognitive and emotional functioning of these college students subjects into pathological realms.

Although the clinical judges saw only a relatively brief behavioral sample of all of our subjects, they decided in 78 of their 100 total judgments (50 subjects × 2 judges) that a particular student-subject should be allowed to continue onto a second experiment involving stress, and in 22 cases should not be allowed exposure to stress. Next, when asked to select those who would be judged most "normal" and the most "pathological," if any, from their set of 10 subjects, 30% were assigned to the pathology category and 70% to the normal. Finally, and most amazing, was their willingness to offer clinical diagnoses with certainty in a third of the cases, that is DSM-III diagnoses of Axis-1 (clinical syndromes) and Axis-2 (Personality Disorders). Diagnostic uncertainty was shown in two-thirds of the cases, where they either gave no diagnosis or deferred/provisional ones. Figure 5 graphs the clinicians' diagnostic evaluations of pathology of our "normal" subject population by the percentage of such ratings in each experimental condition. On this index, scores above 70 (when summed across both raters) reflect greater diagnostic certainty of psychopathology. Set against the low levels in the two control conditions is the increasing level of pathology from Environment-Bias (30%), to Body-Bias (50%), up to the highest level among People-Bias (80%). These differences are highly significant conceptually as well as statistically. The p value for the ANOVA is $< .002$, whereas the contrast of the three experimental groups with the two controls is greater than .0001, and the People-Bias condition is significantly higher than the other experimental conditions ($p < .0001$) or all the other groups ($p < .0001$).

When these results and the entire study were presented to the clinical interns and their supervisors, concern focused on the "symptomatic" evi-
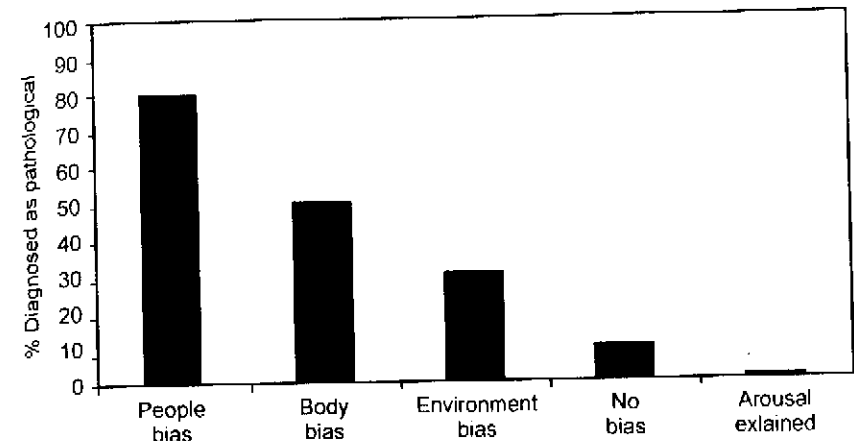
Fig. 5. Percentage of "normal" subjects judged with diagnostic certainty above DSM-III pathology criterion.

dence that may have been used to draw these diagnoses of pathology among these ordinarily sane students. Four causal candidates were rigidity, agitation, multiple attributions by the subjects, and the clinicians' expectations. Confidence in making pathology judgments seems to have been greater when interviewees rigidly stuck to a particular reason for being distressed and were unwilling to even consider the alternatives posed by the interviewer; were physically agitated (notably one woman in the People-Bias condition who began banging on the desk while recalling several confrontations); or gave several different attributions in close succession. In addition, because they had expected these college students to be rather normal except for the usual stress of academic pressures, the clinicians may have overreacted to the degree of emotional distress and cognitive confusion they witnessed in many cases. In a sense, our situation was the reverse of the one made famous by my colleague, David Rosenhan (1973), in his classic study of being sane in insane asylums. There the expectation was that anyone in a mental hospital who was not staff, must be crazy. Here the expectation was that anyone in a prestigious university must be smart and well functioning. So when the clinical judges observed someone who was relatively incoherent and dysfunctional, a contrast effect exaggerated the extent to which the evidence supported a pathology judgment. When psychiatrist David Spiegel reviewed some of these same tapes earlier as an ad hoc reviewer for the Stanford Human Subjects Research Committee, he saw many signs of distress in them, but not the level of pathology

reported by these judges. However, he was familiar with the context of the experiment and the reason for the subjects' arousal.

One final bit of data to support the claim of relative normality of the population from which our subjects were drawn comes from data on the general symptom inventory (GSI) given recently to several hundred Stanford Introductory Psychology students (Holman & Zimbardo, 1999). The student mean of .61 is less than—less disturbed than—the nonpatient adolescent norm of .76 on the highly correlated SCL-90-R (Derogatis, 1982, 1983). Nevertheless, in less than 1 hour of experiencing the discontinuity created in this research paradigm, some of these normal, healthy young men and women went "mad"—in the judgments of clinical psychologists and by their own assessments.

G. RULING OUT DEMAND CHARACTERISTICS, WHILE BROADENING THE RANGE OF DIAGNOSTIC EFFECTS

The next study had two aims, the first of which was to establish in a definitive fashion that results found with our hypnosis paradigm could not be explained away by resorting to notions of experimental demand characteristics in which subjects were consciously behaving as we had told them to, or as they imagined they should in order to please us. Instead, I want to argue that the manipulations initiate the predicted central motivational and cognitive processes that in turn generate the obtained outcomes found in the studies reported here. The second aim, and partially related to the first, was to broaden the range of measurable effects of coping with discontinuities by including a new psychophysiological measure—muscle tension—and several new measures diagnostic of emotional distress, cognitive worry, and interpersonal style.

One way to handle the issue of demand characteristics is to incorporate an hypnosis simulator control condition. Low hypnotizable subjects (from the same general student population) are given experimental instructions identical to those for the unexplained arousal subjects, and told to act as if they were hypnotized in carrying out any tasks and answering any scales or questionnaires. They need to be low in hypnotizability because highly hypnotizable subjects might spontaneously enter hypnosis while simulating the state. We expect these simulators to respond comparably to the experimental group they are mimicking when response measures have high face validity and it is obvious how one might react while following posthypnotic suggestions. However, on more subtle, nonobvious response indicators, they should not be able to match the experimental behavior of the unexplained arousal subjects. If so, then our confidence

increases in believing that something more is driving the behavior of the experimental subjects than mere demand characteristics or experimenter expectancies.

After describing the details of the simulator condition, I will outline the procedural features of this study that were rather complex, since its design required repeated assessments across many measures to detect specific changes at discrete phases of the experiment, as well as using a new arrangement in the onset-offset of the arousal manipulation. The low hypnotizable subjects scored only 1 or 2 on the Harvard Group Hypnotizability Scale (Shor & Orne, 1962) compared to 9–11 for the high hypnotizables. Like the highs who met in small groups for hypnosis-enhancement training, the lows met for the same amount of time to view a film on hypnosis that stressed the importance of simulator controls in the scientific investigation of hypnosis, and to listen to me lecture on and lead a discussion on myths, methods, and evidence for hypnotic phenomena. They were also made aware of their low hypnotizability scores. When they arrived at the laboratory, these students were given sealed instructions that read: "You will be instructed to simulate or pretend to be hypnotized during the study; to try to convince an observer that you are indeed hypnotized and following the hypnotic suggestions as are high hypnotizable subjects. They will be given suggestions to enter an hypnotic state and while in that state to experience certain reactions and to complete a series of ratings, scales, and experimental tasks."

The informed consent statement given to all subjects further reinforced this direct comparison between hypnotized and simulating subjects: "You will listen to taped instructions designed to induce a state of hypnosis. You may be given posthypnotic suggestions to act, feel, or think in certain ways. You may be in a condition in which you might react to the hypnotic suggestions by being deeply relaxed, confused, aroused, or distressed for a brief period of time. You might be in a control condition in which you are instructed to simulate, or role-play hypnosis—to act as if you were hypnotized even though you are not."

Throughout the rest of the study, simulators and hypnotizable subjects were treated identically, and research assistants were unaware of the status of any subject. Simulators were later given the same induction letter and heard the same tape (for relaxation, arousal, amnesia, and People-search bias) as did the Unexplained Arousal subjects. The instructions for the Explained Arousal group were the same as described in our previous research.

The reactions of the nine low hypnotizable Simulators (Sim) were compared to twenty high hypnotizable experimentals randomly assigned to conditions of Unexplained Arousal (UA) ($n = 11$) and Explained Arousal

(EA) ($n = 9$). We previously assessed the psychological adjustment of these and other potential subjects on the Weinberger Adjustment Inventory (Weinberger & Schwartz, 1990), using only those whose scores were within one SD of the normative mean. Those in the Sim and UA groups were given the suggestion that what they were feeling "might have something to do with people." To demonstrate the arbitrariness of the arousal cue and to examine differential reactions to its presentation sequence by the Sim and UA subjects, it was designed to be activated for the EA subjects when they started an experimental timer, and stopped when they turned it off. But for the other two conditions, stopping the timer was the onset cue that was to be sustained until the end of the experiment.

The subject was placed in a special chamber equipped for psychophysiological recording, and communicated throughout the study by intercom with the experimenter. Sensors were applied to the face to record facial muscle stress at various phases of the study. SUA ratings were recorded at seven different critical points in the procedure, to more closely monitor changes in arousal related to various experiences subjects were having. Two other measures that were each completed three times during the experiment were Plutchik's Emotion Circle (see Plutchik, 1980; Plutchik & Conte, 1997) and the Interpersonal Circle (Wiggins, 1979; Wiggins & Broughton, 1984), each to be described when their data are reported. Emotional reactions were assessed once on the MACL, and also on Endler's (1983) Personal Affect Reactions Questionnaire (PARQ). The PARQ also includes assessment of cognitive worry. Postexperimental feelings and attributions were collected prior to full debriefing. Finally, an ambiguous stimulus was shown that could be perceived as a human or animal, and also the paranoia subscale (Pb) of the MMPI—to assess possible effects of the People bias manipulation.

I. Results and Discussion

a. *Arousal.* All subjects reported being aroused at the onset of the arousal cue. While the EA subjects' arousal was immediately reduced at the offset cue, the UA and Sim subjects' reported arousal gradually diminished over the course of the experiment. There were no differences between conditions at the pre- or postmeasurement epochs, and both were at similar low levels (once again showing the effectiveness of our debriefing to return subjects to their pre-experimental levels). However, significant differences were found within the five other experimental epochs: (a) hypnotized; (b) arousal on for EA; (c) arousal off for EA, on for UA and Sim; (d) working on tasks; (e) debriefing. A repeated-measures, split-plot ANOVA on SUA ratings of the seven epochs, by condition and sex (about

equally divided in conditions) revealed a significant condition effect ($p < .05$), a robustly significant condition by epoch interaction ($p < .0001$), and no effect of sex (dropped from subsequent analyses). A priori orthogonal contrasts were carried out for the two hypnotizable groups for the five experimental epochs, with high values for the arousal-onset epoch. Both analyses were highly significant ($p < .002$). The most important comparison to be made here, and in other data sets, is the highest level of arousal reached by the UA and EA groups, in order to assess predicted incremental effects of amnesia for the arousal. From a comparable, low SUA level of 1.6 for EA and 1.9 for UA, the groups both rose to high levels immediately following the onset of their arousal cue— up to 4.8 for EA, but to a significantly higher SUA of 6.6 for UA ($p < .01$), as can be seen in Figure 6. Unexplained arousal adds something beyond the impact of the same arousal whose source is known.

The data for the Sim group both mimic the UA, yet differ from it in important ways. Neither pattern of orthogonal contrasts for the experimental groups was significantly different when applied to the SUA means for Sim. In general, they looked much like the UA group, with two notable exceptions. When the experimental subjects were at low of 1.7 during hypnosis, the Sim subjects "relaxed" mean was 3.3, an increase of 1.5 units from baseline. Next, when the on cue was given for the EA group the Sim subjects reacted most strongly, their mean of 5.1 being even higher than the 4.8 for the EA group, but recall that turning on the timer was *not* the arousal cue for Sim. Turning off the timer was the arousal cue for the UA
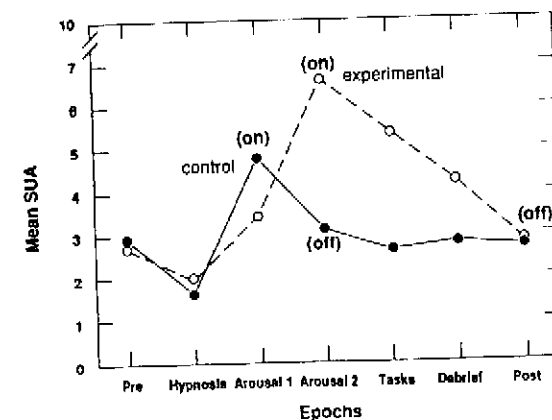

Fig. 6. Mean subjective arousal ratings for experimental conditions across epochs.

group, and they increased their SUA from 3.4 up to 6.6 ($p < .02$), whereas the Sim subjects increased only 0.9 units (ns) in response to their arousal cue from their "anticipatory arousal" prior level.

Another measure of arousal comes from the facial muscle EMG data reported in Figure 7 for the two experimental conditions. The pattern of tension as recorded from forehead and cheek muscles varies systematically in predicted directions across the experimental epochs. Similar to the SUA data, the EMG means decrease during hypnotic relaxation, increase with arousal onset, and decrease over the remainder of the study to return to levels at, or lower than, initial levels. The UA group shows a heightened anticipatory arousal effect, of tensing up when the clock is activated, although it is the onset cue for only the EA group. However, again the most important contrast here is the significantly higher level of facial muscle tension at the peak of arousal for those experiencing unexplained than explained arousal.

b. *Emotions.* Two measures of emotion/mood/affect come from the MACL, and the Emotion Circle. The strongest felt moods (on MACL) by
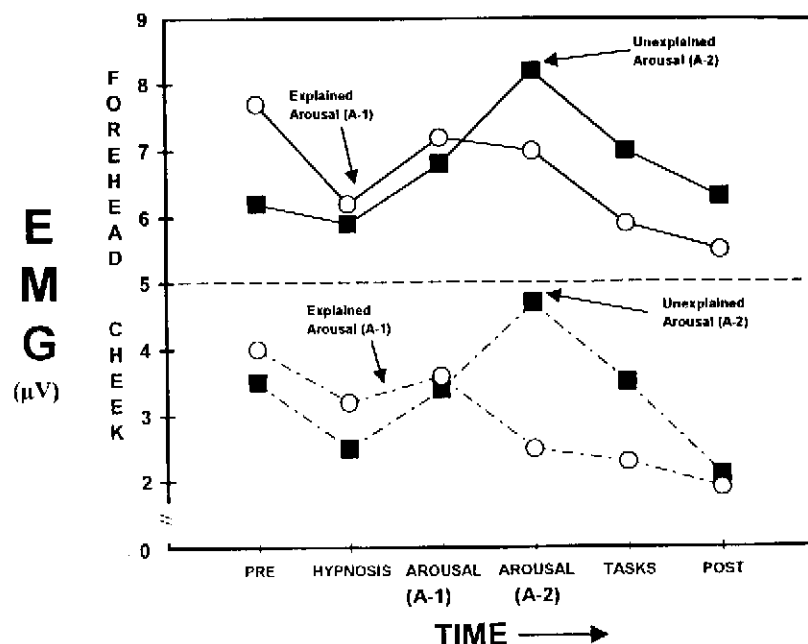
the EA group were rather mild and positive compared to those reported by the UA and Sim groups. They were in order of intensity, Friendly, Content, Happy, Anxious, and Excited, but at relatively low levels from 4.9 to 3.6 on this 9-point scale. By contrast, the UA subjects were most feeling Tense, Anxious, Frustrated, Nervous, and Excited, with a high averaged value across these mood states of 7 on the 9-point scale. The more negative experience of emotion by the UA than the EA was highly significant ($p < .003$, by contrast analysis following a significant ANOVA). The Sim group again mimicked the UA group closely, with no significant differences between them on this measure. However, their strongest felt negative moods were less intense than those reported by UA, 6.4 vs. 7.0. The biggest differences between these two groups were the greater levels of Frustration (7.1 vs. 5.1), Tension (7.5 vs. 6.8), and Resentment (5.0 vs. 4.3), in the UA than the Sim group, respectively.

The Emotion Circle consists of 16 emotions arrayed around an outer circle and 6 inner concentric circles of intensity of emotions being experienced, from neutral to extremely. Subjects placed one mark anywhere on the circle to indicate both their feeling and its intensity, at three times: baseline, arousal epoch 1 for EA; and arousal epoch 2 for UA and Sim. Here is the first measure on which the simulators fail to match the reactions of the unexplained arousal subjects. During the baseline epoch, the experimental groups were similar in choosing as their average emotion as Optimism/Anticipation, with mean ratings around 1.7 (between "slight" and "somewhat"). At that time, the Sim group selected Anticipation weakly, 0.5 intensity. During the first arousal period, these ratings shifted as follows: the EA shifted away from Optimism to more a more negative Anticipation (2.1 rating); the UA group was virtually unchanged; the Sim group became more positive in selecting as their representative emotion Optimism/Joy (1.8 rating). Differences emerged clearly in the next epoch, Arousal-2, as follows: EA, no longer aroused, moved four sectors positively from near Anticipation across Joy and Love to near Acceptance (1.4 rating); the UA group, now aroused, moved negatively from Optimism/Anticipation to Anticipation/Aggressiveness (1.3 rating); and the Sim moved into the dead center of the circle at Neutral. Because these mean ratings might distort individual changes in opposite directions, chi-square analyses were conducted on changes in individual subjects in emotions at the various rating periods. There were no differences on either the baseline or Arousal-1 epochs, but strong effects surfaced for Arousal-2 epoch. First, more EA subjects (89%) selected positive emotions than did the other groups who did not differ ($p < .01$). Second, more UA subjects (82%) selected negative emotional reactions from among the sectors of Anger/Aggressiveness; Aggressiveness/Anticipation; Disappointment/Sadness; and Fear/Submis-

sion than the EA subjects (11%) or Sim. subjects (22%) This difference was significant between all three conditions ($p < .02$), and also between UA and Sim ($p < .05$). Also comparing the use of these four categories versus all others from the Emotion Circle, the UA group was again statistically different from each of the other conditions. What most characterized the emotional reactions of the UA subjects on this measure was their high intensity scores on the Aggressivity dimension, where more of them gave ratings of 3 or higher (moderate, high, extremely) than did those in the other two conditions ($p < .05$). So on this measure, the Simulators did not duplicate the more intense, negative emotional reactions of the UA group.

The emotional and cognitive components of subjects' experience immediately after the second arousal cue was assessed by the PARQ, 20 self-report items answered on a 5-point scale of how much the affect or cognitive process is being felt "at this particular moment." After the ANOVA revealed highly significant between-group differences for emotional arousal and overall reaction ($p < .005$), with near significance for the cognitive component of worry ($p = .059$), individual group multiple comparisons were made. They show once again that the UA group differed significantly from its EA counterpart on all three indices ($p < .02$ or greater). The emotional arousal level for UA of 37 was higher than Endler's clinical norm of 23, equal to it for worry, and much above it for overall negative reactivity (67 vs. 53, respectively). However, on this measure where the face validity is high, the Sim group did not differ from the UA group on any of the PARQ components, although UA was higher on each of them.

c. *Interpersonal Style.* The Interpersonal Circle measure invites subjects to "imagine talking to someone right now," and to decide how they would relate to him or her by putting an X anywhere on the circle to indicate their interpersonal style. The opposite poles are Controlling/Dominant and Submissive/Docile (top to bottom), and Hostile/Antagonistic and Friendly/Cooperative (right to left sides). Clockwise we find Advising between Controlling and Friendly, Accepting between Friendly and Submissive, Sulking between Submissive and Hostile, ending with Criticizing between Hostile and Controlling. Like the Emotion Circle intensity is indicated by five inner concentric circles ending at the neutral center. This measure was taken at baseline and immediately after each arousal epoch. Subjects' single-point responses in this circular space have x, y coordinates, thus could be computed for each dimension by coding them separately on the x-axis (Friendly-Hostile) and on the y-axis (Controlling-Submissive) for quantitative analyses. Baseline scores were covaried in the analysis of Arousal-1 epoch, and baseline plus Arousal-1 scores were covaried in analysis of Arousal-2 epoch. The ANOVA on axis-y scores is significant for the three groups ($p = .01$), caused entirely by EA group becoming much more Controlling/Dominant

($+10.4$), whereas the other groups that were not yet aroused, had similar low scores on this dimension. On the warm-cold dimension of Friendly-Hostile, the significant overall effect ($p = .01$) was due to the EA group becoming slightly colder, while the other two, as yet unaroused, groups becoming much warmer. But the most powerful effect (that was delightful to behold) was the significant Arousal-2 effect ($p = .03$) as the EA group became very warm and friendly ($+14.6$), while the Sim group moved toward Neutral (-0.2), but the UA group became more negative and cold (-6.2). Their scores qualified them as being Hostile/Antagonistic -reactions comparable to those in several of our previously reported studies. This complex index of interpersonal style was thus able to differentiate between those experiencing unexplained arousal with a people-focused search frame from simulators given the same exact instructions.

d. *People-Related Measures.* On the next two measures, simulators also responded quite differently than UA, and surprisingly so. Although there were no group differences on the overall paranoia scale, there was a trend worth noting on a submeasure of the scale that identifies critical paranoid items, with the Sim group being much higher (2.9) than the UA group (1.0) or the EA group (0.7), with $p = .08$. Here the simulators over reacted in believing the UA group would respond with paranoid symptoms. However, this particular experimental setting mediated against that possibility since the UA subjects had little time alone to ruminate about the meaning of their discontinuity: they were in regular contact with the experimenter in the next room, calling out answers and being aware that their physiological reactions were being continuously monitored. Another unexpected difference was on the measure of seeing people or animals in the ambiguous "Rat/Man" picture. The significant condition effect ($p < .05$) was due to all of the EA seeing people, most of the Sim group (78%) also seeing people, while our UA group was evenly divided in seeing people and animals. Thus the effect of the People-bias, imposed on the experience of a discontinuity, does not lead to a mindless perception of people everywhere, certainly not in a cartoon-like ambiguous figure, but perhaps only of "people" who in some way might play a meaningful attributional role in understanding the cause of the unexplained arousal.

e. *Attributions.* Presentation of these results ends with but one more vital set of evidence in support of Discontinuity Theory, the explanations advanced for what the subjects were experiencing. Those whose arousal was explained all attributed their feelings of arousal to the letter they had read. The simulators again overshot their mark, by giving exaggerated, pathological explanations that differed from the UA group's explanations. Typical Sim attributions were "People are after me; out to get me, trying to beat me up"; "People are watching me." Or, they reiterated the instructions,

"People have something to do with it." There was a sharp contrast with the more thoughtful, varied attributions of those using the People-bias to help make sense of their unexplained arousal: "My girlfriend makes me feel jealous of her; it gets me mad because I feel so inadequate"; "It's hard to know what people expect of me, so I find it hard trying to deal with people"; "I am having trouble with people at work"; "I'm starting to panic because there should be people around here and there aren't any, so I am alone." Following debriefing, all subjects understood the reason for their arousal and their emotional reactions returned to the normal level they were initially.

This pattern of evidence helps rule out experimental demand characteristics as an alternative explanation for our previous results and the current ones. Simulators were able to match the reactions of the discontinuity group on measures where it was apparent how one should behave. But on some of these measures they overreacted in being much more extreme than the UA group, and on other more subtle or complex measures where it was not so clear how the UA might respond, the simulators were undone in their desire to mimic them. The second aim of this research was to extend the realm of observed differences between those experiencing discontinuities and those with similar arousal but aware of its origin. I think we have done so with the consistently significant differences found in this study on measures like: SUA, facial muscle tension; Mood Adjective Checklist (MACI); PARQ; Emotion Circle, and Interpersonal Circle. We did not see in this study the more pathological effects found in the previous studies for those with the phenomenological perspective of feeling aroused, without knowing why but thinking people might hold the answer. It is most likely due to the severe constraints imposed on the subjects by the restrictive facial physiological sensors, the many tasks, and the frequent interactions with the experimenter in the control room. All of which may have combined to limit time for reflection, memory search for available instances of relevant people, rumination, and some solitary incubation period that may be necessary to sow the seeds of pathological thinking and feeling.

H. FAILURES OF INTERPERSONAL DISCLOSURE OF DISCONTINUITIES

This research was stimulated by the case study example noted in an earlier section about the workers in the Bud Plastics Company suffering from neurotoxic-induced deficits in a range of behavior, thinking, and emotions. While unaware of the subtle environmental cause (chronic exposure to toxic substances on the job) of their severe dysfunctional state, they

chose to conceal their anomalous reactions from co-workers. They probably did so out of embarrassment, concerns about appearing strange, and fears of getting laid off. But had they disclosed their reactions and confusions immediately, it would have been possible to identify common situational elements in the workplace that were the causal agents for their shared symptoms. Their treatment then would not have been the unnecessary psychiatric care for mental disorders, but the required medical care, and it would have prompted earlier corporate prevention actions. However, the failure to disclose maintained the idiosyncratic interpretations of each affected man that "something is wrong (only) with me." When this view was aggregated, it created a state of general pluralistic ignorance that was a public health menace.

Disclosure to others of strong emotions, anxiety, distress, and uncertainty may have the potential gains of discovering an external, situational cause for one's symptoms, one that might be modifiable, as well as sympathy and understanding. On the other side of the scale are the anticipated costs of revealing a significant discontinuity to others in terms of vulnerability to negative social appraisals if these others do not share the same reactions, or may not show "attributional charity." Getting such unsupportive information pushes one toward concluding the problem is personal, dispositional, and deviant.

The issue of disclosing anomalous experiences raises a social dimension embedded in Discontinuity Theory. Many reactions to discontinuities are social to the extent that they involve other people who may notice and become concerned about the actor's atypical reactions, or are personally affected by their consequences. I have assumed that a basic motivation of the actor in a discontinuity scenario is a striving to sustain a positive self-image for one's self, and to project it to others. Given the etiological ambiguity of some discontinuities, especially the ones created in our research, the decision to disclose or not pits concerns for self-image maintenance against concerns for cognitive clarity and developing problem-solving coping strategies (Lazarus & Folkman, 1984).

Research on disclosure makes it clear that people do not make intimate self-disclosures to strangers (Snell, Miller, & Belk, 1988) because it would be judged inappropriate (Chaikin & Derlega, 1974). And disclosure is less likely as the dissimilarities in dyadic partners increase (Stephen, Wenzel, & Cornelius, 1991). However, since disclosure is often symptomatic of underlying anxiety (Stiles, Shuster, & Harrigan, 1992), it could be expected to decrease feelings of arousal and anxiety (Sholle, 1992) in some interpersonal settings. I wondered if it would do so in our experimental setting.

Two related studies were conducted in our laboratory (Zimbardo & Williams, 1998) to determine the extent of disclosure by subjects experienc-

ing unexplained arousal, and to study the consequences of such disclosure. We also wanted to explore the specific tactics and strategies of interpersonal disclosure used by various subjects. For instance, would they first question the other person about their feelings before giving up any personal information, or begin by putting out some minimal self-revelation to prime the other to reciprocate?

The first study examined pairs of subjects who were both experiencing our unexplained arousal manipulation, at the same time, in the same setting. The second study used different types of confederates to try to stimulate disclosure in subjects experiencing unexplained arousal. Both studies will be outlined only briefly because of their disappointing findings of *failures to disclose discontinuities*. However, their methodologies are sufficiently interesting, as are a few results, to warrant some consideration, especially in planning new research on this unstudied realm of disclosure.

The first study sought to examine disclosure among student-subjects in twelve dyads where each person was experiencing unexplained arousal. Four of the dyads were male, four female, and four mixed gender. Under the cover story of solo versus team problem solving and creativity when hypnotized or in ordinary consciousness, individual students were given the standard hypnotic induction tape with posthypnotic suggestions for later cued unexplained arousal in part 2. Then pairs of students were brought together to work on a series of problems and tasks, some alone, in the presence of the experimenter, and some as a team, without the experimenter present during the disclosure phase. On the solo tasks (writing creative TAT stories, solving word puzzles), a barrier separated the subjects. It was taken down as they started a shared anagram task on which they were encouraged to discuss solutions (to prime later verbal disclosure). The start of the next shared task included the posthypnotic arousal cue. The experimenter started an experimental clock for the 5-min task, left the pair alone, and discreetly videotaped their interaction.

In general, there was almost no disclosure of the high levels of arousal and uncertainty that both members of each dyad were experiencing (as determined from their posttest ratings). In only 2 of the 12 dyads was there any evidence of disclosure of emotions, or of the agitation and confusion created by the manipulation. In one of these dyads, the disclosure of the first person was seconded by the other, but quickly attributed to their mutual concern for final exams, which ended the search for causes in the experimental context. The second disclosing dyad came close to discovering the true situational cause of their common, unusual feelings as somehow related to hypnosis. But after some discussion about the hypnosis training and its usually relaxing effects, they dismissed it as the cause of their current

tension. Although the latter pair were females and the former was a mixed gender pair, the results are too lean to make any gender inferences.

Analysis of the tape-recordings revealed that distraction was the most common tactic employed during the period when the subjects might be privately disclosing to each other. They quizzed each other about school-related topics and avoided mention of the research underway. Such distracting talk may be a tactic to lower one's arousal, but it reduces the probability that the other person will then move from this banal communication mode to a more intense, personal mode involved in interpersonal disclosure of strong, confusing emotions. Also it allows the misinterpretation that the other person is not similarly aroused if they are casually talking about courses, sports teams, dorm food, and the like. The next experiment attempted to correct this problem by having an aroused subject interact with a confederate whose overt reactions clearly established an emotional similarity.

In this study, 33 high hypnotizable students were randomly assigned to either a condition where a confederate acted tense (CT), or a confederate acted calm (CC) while the subject was experiencing unexplained arousal. The gender of the confederate matched that of the aroused student, 7 males and 10 females in CT, 7 males and 9 females in CC.

We again used the cover story from the first experiment, but added repeated SUA measurements, and appropriate reasons for the confederate and subject to be separated at times and to be close together at other times. The first of five SUA ratings was made before starting an initial solo task. This was repeated after hypnotic relaxation, arousal induction, immediately after the disclosure period, and finally after debriefing. The taped hypnotic induction process was followed by the next SUA rating and the first of several mood ratings, Profile of Mood States (POMS) (McNair et al., 1971), and then oral answers were called out to word association and Stroop color naming tasks. Confederates were blind to the experimental hypotheses, and even to the knowledge that subjects were hypnotized, since they could not hear the taped hypnosis induction and were unaware of the contents of a letter subjects read privately informing them that they would experience somatic arousal (when activating a timer) and would have amnesia for the suggestion.

Following the solo task, the confederate was seated next to the subject to begin their shared creativity task. For 4 min, they were to write a story about a TAT picture by each writing one sentence and passing back and forth their response sheet. Next they did a similar task to a different TAT card but solo for 3 min, with each starting their own timers (arousal cue). In the CT condition the confederate began to make sounds and gestures intended to convey that she or he was feeling tense, which continued

throughout the rest of the writing and disclosure periods. In contrast, in the CC condition, the (same) confederate acted calm, smiled, and was at ease during this task and subsequently. After completing another SUA and POMS, the experimenter pretended to have made a mistake in not having the next form available in the folders of the two students, and excused himself for a few minutes while he went upstairs to get copies of them. This was the occasion for the subject and confederate to be alone, and ideally to disclose their thoughts and feelings.

During the 4-min Disclosure Period, videotaped by a concealed camera, the confederate enacted a scripted role by saying nothing for the first minute (if the subject did not speak) then asked, "Which of the two stories did you like writing best?" Any input by the subject was responded to in kind, but the confederate did not initiate conversation about hypnosis, emotion, or the experiment. If asked how the confederate felt, he or she replied either, "I feel fine" (CC), or "I don't know, I guess I feel a little tense" (CT).

When the experimenter returned with the missing forms to be completed separately, the postdisclosure SUA form and POMS were completed and the subject was then interviewed by me about her or his current feelings and awareness of the reason for them. Subjects' arousal and amnesia were lifted, they were fully debriefed, and they completed the final SUA.

1. Results and Discussion

The basic conditions for testing our hypotheses were clearly met: subjects experienced unexplained arousal, and the differences in the confederates' behavior were perceived veridically. Arousal level, as measured by SUA ratings, went down during hypnotic relaxation (change from initial baseline $= -3.2$), went far up following the arousal manipulation (change from relaxation $= +3.8$), down after the Disclosure Period (change from arousal $= -1.0$), and further down after debriefing to a final level that was much lower than the baseline (change from disclosure $= -1.4$). (This is further evidence of the efficacy of our debriefing procedure, as described in the later Ethics section). Each change was highly significant ($p < .001$). All but three experimental subjects gave evidence of complete amnesia for the arousal suggestions (and they were deleted from all analyses). Those in the CC condition rated their partners as quite relaxed (high mean of 67 on 100-point scale), and significantly more so ($p < .001$) than those in the CT condition (low mean of 29). The tense confederates were seen as significantly higher in anxiousness than were the confederates who had acted calm (57 vs. 20, $p < .005$), in agitation (50 vs. 12, $p < .001$), and in irritation (35 vs. 9, $p < .005$). Clearly, the confederates' scripted behavior

elicited divergent perceptions from the subjects in the two confederate conditions—of reacting like me (CT) or dissimilar to me (CC).

Another dimension of the unexplained arousal manipulation was manifest in the content and affect of subjects' solo TAT stories. A story's content was rated "violent" if its central or secondary theme explicitly involved violence, murder, or rape. Affect of the stories was rated on a 10-point violence, from $1 =$ very negative to $10 =$ very positive. Comparisons of these scale, from $1 =$ very negative to $10 =$ very positive. Comparisons of these ratings with those from a Control Group (of 18 high hypnotizables not given any treatment, 8 males, 10 females) indicated greater negativity in the stories of those with unexplained arousal (4.6 vs. 3.1, $p < .001$). There was also more violent content in the stories of the males experiencing discontinuity than in those of either all the Controls or the female Experimental subjects. Those comparison groups' data were violence-free, while 42% of the stories of the aroused males were aggressive ($p < .05$). Those who wrote such hostile stories during their arousal phase were also higher on the POMS Tension/Anxiety subscale ($p < .05$), and this POMS measure correlated significantly ($r = .49$) with the degree of negative affect in those stories.

Thus strong conditions were created that should have encouraged disclosure to another student who was in the same discontinuity situation and was also clearly demonstrating his or her similar arousal/anxiety. However, once again, very little disclosure occurred in any condition. Only 7 (23%) of the 30 aroused students disclosed at all, with no differences in gender or confederate condition. These few met the most minimal definition of disclosure, that is, the subject made a statement about what he/she was feeling—as reported by either confederates or the two videotape recording raters. And then subjects rarely followed through when the confederate acknowledged feeling similarly. This low rate of disclosure mimics our earlier results.

Three additional results are worth mentioning for their value in future research. Those who disclosed were more highly aroused (7.0 vs. 6.2, $p < .05$) prior to the disclosure period than those not disclosing, and they rated themselves as more creative on the POMS than did non-disclosers (71.7 vs. 51.7, $p < .05$). The only really positive result from my perspective is the final measure of the consequences of disclosure for those few who did so. There was a significantly greater decline in their arousal level after having disclosed than among the non-disclosers (-2.0 vs. -0.8, $p < .05$). (The general slight decline in arousal over the course of the experiment is a function of adaptation to the arousal, which we have found in all of our research.)

Why the failure to disclose in these studies? Several alternatives present themselves. First, it may be that the self-image costs of disclosing confusing

feelings of strong arousal/anxiety to a stranger are simply greater than the perceived gains in terms of enhanced understanding of a one's discontinuity. We know that people rely on different self-presentation strategies when relating to strangers than friends (Tice, Butler, Muraven & Stillwell, 1995). But this tendency for greater reliance on self-enhancing strategies in interactions with strangers is put in competition with the potential risks of disclosing one's unexplained arousal states, without even the assumed sympathetic ear of friends. We need to know more about this situation because of the practical consequences of learning how to create optimal conditions for effective self disclosures of strong, negative affective states that may be precursors to psychopathological reactions (Derlega, Margulis, & Winstead, 1987).

Future research should focus on eliciting high degrees of disclosure of discontinuities by using novel experimental strategies, such as, (a) having friends be confederates trained to induce disclosures from their buddies, to make them feel better; (b) informing subjects that their partner has successfully navigated the same situation, is nonjudgmental, good at psychological problem solving, and has other traits that might lower the threshold for disclosure; and (c) make the experimental subject's task to elicit or force disclosure from their partner-confederate under the guise that the partner is the target of research interest.

A second reason for the failure to find disclosure in these studies may simply be traced to the power of the hypnotic manipulation. The suggestion of not being able to remember why they were feeling aroused may have created a mental barrier in the subjects against sharing any information with others that might breach the amnesia, and thus "spill the beans." This potential constraint might be relaxed by new hypnotic suggestions that imply subjects might understand why they are feeling aroused while they exploring possible reasons with certain other people. Alternatively, other research needs to be done that does not use the hypnotic paradigm to generate the discontinuity to be disclosed. But these last suggestions all raise additional concerns about the ethics of such deceptive research and the elicitation of emotional arousal and cognitive misdirections. I address those ethical issues next.

V. Raising, Reconciling Some Critical Ethical Issues

Since the research presented in this chapter was explicitly designed to make normal, healthy college students "mad," if even for a short while, it raises serious ethical issues. It was necessary to address and resolve them

by working closely and creatively with Stanford's IRB in order to develop special procedures that enabled this research to be conducted while protecting the rights, dignity, and well-being of our student-research participants. This section describes how that trade-off was handled.

A psychological colleague, critical of some of the present research, as well as my earlier Stanford Prison Experiment (SPE) (Zimbardo, 1972; Zimbardo, Haney, Banks, & Jaffe, 1973), asserted, "It is difficult to imagine more extreme instances of deception than those provided by Zimbardo's experiments" (Baumrind, 1985, p. 167). A professor of pediatrics raised both ethical and scientific issues in his critique of the paranoia study reported earlier:

> The question to be considered here is the advisability of inducing paranoid behavior in a previously healthy individual. Aside from the other ethical questions . . . there is the questionable act of inducing a state about which we do not know a great deal. (Lewis, 1981, p. 9).

Science writer Morton Hunt (1982) centered his entire *New York Times Magazine* essay, "Research Through Deception," around our paranoia study (Zimbardo et al., 1981) while exploring the broader issue of social psychology's use of deception paradigms.

The debate within social psychology about the use and misuse of deception in experimental research has sensitized investigators about human subjects issues, and may be responsible for markedly reducing the number of studies employing deception in recent years. The advent of a cognitively focused social psychology also obviates the need to disguise experimental manipulations with "cover stories" and other forms of misdirection, since behavioral studies like those of Milgram (1974) and mine are replaced by deception-free, "quick-and-clean," paper-and-pencil questionnaire studies, where respondents only imagine how they might react to hypothetical scenarios. I believe that experimental social psychology still requires some behavioral research that involves "subjects" more personally and profoundly in studying a host of issues that are vital to the central themes of our discipline.

Readers are referred to my views on absolute versus relative ethical principles in human experimentation (Zimbardo, 1973) as summarized in reaction to published criticism of the SPE (Savin, 1973), and to my reply to Lewis (1981) about the ethics of the induced paranoia research (Zimbardo, 1981). Ethical issues of research using hypnosis are well presented by Coe and Ryken (1979). Here, I want to discuss briefly the following three points: (a) the necessity to employ some forms of deception in particular research paradigms when the phenomena of interest could not be investigated with-

out it: (b) the special demands imposed on researchers, who believe they must use deception and other ethically questionable procedures, to be extremely sensitive to all the ways they can minimize risks and promote the general well-being of their experimental participants, while also actively maximizing the potential of their research for scientific and societal gain; and (c) the need to increase the "gain factor" in the gain–loss equation for any ethically sensitive research, by insuring that the participants (and sometimes researchers) themselves derive maximum benefit from the power of "experiential learning" that may occur in such experiments.

A. WHY DECEPTION AND DISTRESS MAY BE NECESSARY TO STUDY THE "DARKER SIDE OF HUMAN NATURE"

It is my belief that one cannot sit on the side of the angels and study phenomena in the realms of social pathology or individual pathology using experimental paradigms that seek to discover causal relationships between situational, dispositional, and behavioral variables. By their very nature, such investigations move us beyond the boundaries of conventional research and force social scientists to face daunting ethical and moral dilemmas. In trying to understand the nature of the dynamic processes involved in powerful societal experiences—such as failures of bystanders to intervene in emergencies, group conflict and its resolution among children, blind obedience to unjust authority, the effects of anonymity or dehumanizing labels on aggression, the power of prison environments to elicit social pathology in good men, or the initiation of normal people into pathological ways of thinking and acting—some critical dimensions of the relevant situations must be functionally re-created by researchers, and experienced directly by participants. Those subjected to such procedures typically cannot know in advance all that will occur. otherwise, self-selection of those who stay versus those who quit distorts conclusions intended to generalize to all. For example, to demonstrate one of social psychology's enduring lessons, the power of the situation, individuals must experience its force first-hand from within its dynamic crucible. Reflective imagination cannot replace such direct involvement.

Recall that 40 psychiatrists predicted that fewer than 1% of U.S. citizens would go all the way up to 450 volts (only the sadists, they said) after they had listened to Milgram's experimental scenario. Aside from their dispositional bias (by virtue of medical school training), from their uninvolved and remote vantage point, they could not fully appreciate the situational forces impinging on the majority of average, normal, research subjects who delivered maximum shock to the victim. Or consider the design of a

proposed study where deception is the independent variable in establishing whether it could be eliminated in testing certain categories of causal hypotheses. To show that deception was superfluous, it would be necessary first to include a deception versus no-deception pair of research conditions. But that would not be permissible by current standards.

In my research, on the "psychology of evil,"—deindividuation, vandalism, prisons, and cults (Zimbardo, 1978), and more recently, institutionalized training of torturers (Huggins, Haritos-Fatouros, & Zimbardo, 1999)—I have been interested in the social conditions responsible for recruiting good people to engage in evil deeds. The research focus was on elucidating the process of human transformation among those who believed they would never do such bad things ("the just people") into becoming those who crossed the line to do so (as "the unjust"). Such knowledge may be used to identify the situational variables and processes involved so as to avoid, escape, or change them. The current set of studies, which can be classified as experimental-social psychopathology, are designed to explore the earliest stages in the initial processes of arousal, confusion, and distress (in response to significant personal discontinuities) that I believe may be responsible for the transformation of normal individuals without "premorbid" personalities into those who begin to suffer from some forms of mental disorders. The goal is to recommend new diagnostic and treatment modalities to clinicians based on the underlying conceptions, as well as to better inform the public about how misattributions could lead to pathological reactions.

Critics of the SPE have argued that everyone already knows prisons are violent places, so why do a study that shows it again? However, what our research showed was that it was the situational features of prison-like environments, not the "negative" dispositions of guards or prisoners, which creates violence. This is a more subtle, and I believe, more important insight. Critical reading of our induced paranoia study led to a similar rejection of the need for this empirical demonstration that deafness can lead to paranoid behavior among otherwise normal people. The counter-argument being, "it is a generally acknowledged clinical observation that unexplained deafness in older people induces suspiciousness" (Baumrind, 1985, p. 172). However, clinical *observation* may inform, but it does not confirm. Systematic, controlled experimental research is essential to go beyond anecdotes, observations, and correlational analyses if understanding causality and designing controls (in the form of therapeutic interventions) are among the goals of psychology and psychiatry. The field of psychology, and especially those who claim the higher moral ground, must answer the question I have asked myself often. Would it be better if none of the following "unethical" studies had ever been done: the Milgram (1974)

obedience studies; Latané and Darley (1970) and Darley and Batson (1973) unresponsive bystander studies; or the Stanford Prison Experiment (Haney & Zimbardo, 1998; Zimbardo, Maslach, & Haney, in press)? Is that knowledge gained about the human condition worth the alleged harm to the subjects, to society, and to the profession of psychology (as argued by Baumrind, 1985)?

At the core of the ethical dilemma for social scientists is creating a balance between what a given researcher believes is necessary for the conduct of socially or theoretically significant research and what will safeguard the well-being and promote the dignity of research participants. Since researchers' self-serving biases may push them toward more of the former than the latter, external reviewers need to serve as ombudspersons for the relatively powerless participants. But these IRBs must also act in the interest of "science" and "society" to determine whether, and to what degree, some deception, emotional arousal, or other aversive states can be permitted, assuming the negative impact of such procedures is not likely to endure beyond the confines of the experiment. Let's consider next how those competing interests were served in the present research.

B. SPECIAL CONSTRAINTS/DEMANDS IMPOSED ON ETHICALLY CHALLENGING RESEARCH

Throughout the many years of the current research program. I worked closely with Stanford University's Panel for Human Subjects in Behavioral Science Research to help develop and maintain the delicate balance between what I believed was theoretically novel and clinically significant experimental research on one side, and the necessity for minimizing risks to subjects while maximizing the educational value of their participation, on the other. Let me outline how and why I was allowed to conduct this research program and the ways in which I went beyond the tough demands of this IRB to raise the standard for debriefing and concern for the well-being of my research participants. It is my aim to communicate to both researchers and IRBs that ethically challenging research can still be conducted in an ethical fashion.

1. I appeared a number of times in person at the IRB to discuss the nature of the research, its methodology, and to consider alternative approaches. The entire committee met in my laboratory to view randomly chosen videotapes of pilot research subjects undergoing the experimental tasks. The committee also reserved the right to monitor any study in person or to view tapes on demand and to rescind approval if the monitor believed that subject reactions were extreme enough to warrant terminating the research.

2. I was required to personally conduct all the hypnosis training, and to be present as experimenter or observer in the control room during all experimental testing. In addition, I was required to be assisted by a clinical psychologist or to have one on call to cope with any emergency reactions that might arise.

3. An expert on hypnosis and psychopathology, Dr. David Spiegel of Stanford's Psychiatry Department, served as the IRB's ad hoc reviewer to evaluate the paradigm and the impact on participants based on viewing videotapes from various experimental conditions. He approved continuing the research.

4. Extensive pretesting of each aspect of our research methodology included lengthy discussions with participants about their immediate and delayed reactions, interpretations of the manipulations, and the adequacy of the debriefing procedure. All of this helped minimize risk and increase subject power. Those goals were achieved by (a) using the briefest possible duration of arousal (b) inducing arousal by means of minimal physical symptoms rather than "anxiety" priming; (c) cuing arousal to situationally specific stimuli unique to our laboratory setting; (d) developing "partially informed" consent forms (described below) for each separate component of our procedure; (e) utilizing a formally structured triple-phase debriefing; (f) not terminating the debriefing of any subject until the staff consensus was that he or she was responding again in a normal, healthy manner; (g) conducting 24-h phone call follow-ups for all experimental subjects, as well as long-term evaluations (up to a year later) in some studies; and finally, (h) enabling subjects to withdraw their data or to use it selectively after they had been thoroughly debriefed.

5. Subjects completed five separate consent forms, one each for hypnotic susceptibility screening; hypnosis enhancement training; any personality testing; the experiment proper; and use of their videotape data following participation. The partially-informed consent stated: "The researchers cannot fully disclose to you in advance all of the information about which you may experience. However, they promise to do so in a thorough debriefing session at the conclusion of your participation." They were also told orally and in writing that they could quit at any time without penalty even after signing the consent forms. Each form was completed just prior to engaging in the task so its content would be in the subject's awareness during the task. Consent to use the subjects' audio or videotaped reactions was separated into three categories of increasing public use, from only scientific data reduction to educational use in classrooms, and to professional use at scientific meetings. A fourth consent was requested to use the rest of their test data for scientific research purposes. Students were further informed that even after having given their consent, they could change their mind

at any time in the future, and whenever they withdrew their original consent in writing, we would destroy their data. Although none did the latter, there was variation in the degree to which they were willing to give consent to the various uses of their data.

6. A highly structured, thorough debriefing (lasting longer than the entire experiment, usually 45 min to 1 h) was conducted by either myself, a clinical psychologist (Carlo Piccione), or an advanced graduate student working closely with me (Susan Andersen or Lisa Butler). The three-page debriefing procedure outline made explicit that the researcher was to conduct the initial inquiry into the subject's emotional and physical state and beliefs about the nature of the research "within a supportive interview context between researcher and student participant." (For specific details about this and the other aspects of my IRB protocol, see Stanford Sponsored Projects Office Protocol: 8586-77; renewal of 845-101, 12/13/85).

The first part of the three-phase debriefing was conducted with the subject in the alert state, following lifting of hypnotic arousal, amnesia, and any search frame biases. Part 2 involved rehypnotizing subjects and instructing them to "disconnect" their arousal (and search frame explanations, where given) from the experimental stimulus cue so that those reactions would no longer be elicited by similar cues in their everyday lives. To ensure that these instructions were understood and internalized, the disconnect instructions were administered again in Part 3 when subjects were again in the alert state. The content of the debriefing included a full presentation of the experimental hypothesis, and of the purposes and justifications for using deception. We ended with the statement of our personal concern: "We are sorry for not fully informing you of our procedures in advance, but we hope you can appreciate that it would not be possible to study the effects of *unexplained arousal* if we explained everything first." Each subject was then fully "dehoaxed," by informing him or her that any behavior they displayed was due to the experimental manipulation and was not unusual or atypical in this setting, since most other students react comparably in the condition to which they had been randomly assigned (and thus any unusual reactions should not be seen as idiosyncratic or personally symptomatic). The "desensitization" then involved establishing that the mental–physiological state of the subject was now comparable to what it had been initially, and if not, "the researcher must do all in his power to bring about that process of appropriate desensitization of distress and a return to normalcy."

Subjects then completed a form describing what they now knew about the nature of the research and the true cause of their reactions. If there was any indication that our debriefing had not been adequate, the subject was rehypnotized and given the relevant instructions to enhance memory,

mood, or understanding. Following all this, subjects gave their consent for data use, were asked to maintain experimental secrecy, and were given the office and home phone numbers of the principal investigator and clinical psychologist to call if they experienced any unusual reactions.

7. Further respect for our research subjects was shown by providing them with special training in several hypnotic phenomena unrelated to the research, but of potential value to them personally, such as concentrated focus during academic study and testing, stress management, pain control, and self-esteem building.

8. All potential subjects completed a Medical Evaluation Survey, Health Survey, and premeasure of manifest anxiety and/or selected scales of the MMPI. No student was included in the research sample who (a) had scored outside the "normal-average" range on any of these measures, (b) was experiencing any symptoms; (c) was in therapy or on psychiatric medication; or (d) who gave any indication of being in other than "good, well, or great" health at the start of an experiment.

1. Reframing the Cost/Benefit Equation for Ethical Analyses of Research

In my 40 years of research and teaching experience, it has been my consistent impression that the majority of students engaged in research using deception—and given adequate debriefing—find it more interesting than most other research they participate in as part of an introductory psychology course requirement. They are less distressed at being fooled than they are surprised that they could be deceived. Moreover, they readily appreciate the reason why deception was necessary for testing a particular hypothesis, when the justification for the "cover story" is carefully presented. In addition, some of this research elicits "dramatic" individual reactions during the study, such as agreeing to take more painful shock when in a high dissonance condition, or giving shock to another woman when the subject is in a deindividuation condition. Those reactions become part of the experiential learning of the participants to understand how and why they behaved so. This is in contrast to most other research where any participant's minimal experimental reactions are not individually salient but must be aggregated across all subjects to demonstrate any effect.

In our research program, we conducted follow-up surveys several weeks and up to a year after each study, with subjects indicating the positive and negative effects of each part of their experience in the research. For example, in a 1-year follow-up survey of the "three bias study" study (with a high 74% return rate) none of 37 subjects reported any negative effects of the hypnosis training whereas 26 (70%) reported positive effects. When

asked about any lasting effects of participating in the discontinuity experiment proper, most reported that it had none, but 5 (14%) reported positive effects, and only one reported a minor negative effect of remembering a TAT slide that had made him upset during the experiment. Finally, students reported on the personal value, if any, of having participated in this research on a 100-pt scale, where "0 = of no value, preferred not to participate"; "50 – moderate value, about as much as typical psych. experiments"; and "100 = of great value, pleased that I participated." The mean for these 37 students was a high 83.0, with a positively skewed range of 60–100. Thus, all subjects rated the value of being in one of the currently reported studies as higher than the other research in which they had participated (four other required studies in their introductory psychology course).

Among the gains reported from having had this unique experimental treatment and debriefing are the following personally valuable changes reported by some participants in this follow-up survey: (a) "Now I can notice these 'strange' things in myself if they ever come up, also I can see these results applied to friends and relatives" (People Bias Condition); (b) "increased self-awareness, ability to focus, more self confidence and ability to control my emotions" (Body Bias Condition); and (c) "learned how to relax and how to prepare myself for potentially tense or stressful situations" (Environment Bias Condition). Such mindful reactions seem to me like more than simply dissonance-reduction reactions following a tension-filled experience.

Following the SPE we got similarly positive feedback from our former prisoners and guards. They reported that they learned more about themselves from their atypical behavior in that mock prison than from most other ordinary situations they experienced regularly (see Zimbardo, 1975). Moreover, in some individual cases, participating in the study profoundly changed their entire lives in prosocial ways. For example, one ex-prisoner became a forensic psychologist working in the California prison system to improve prisoner guard relationships (for other examples see Zimbardo, Maslach, & Haney, in press). Also noteworthy is the impact of such research on the researchers who may also be changed in positive ways by their experience (see Haney & Zimbardo, 1998; Zimbardo, et al., in press). We also felt that it was incumbent on us to go beyond simply publishing our research in academic journals to optimizing its impact on opinion leaders and by "giving it away to the public" in various ways (see Miller, 1980).

The problem with the usual cost–benefit analysis of ethical decisions regarding research is that the costs to the subjects are tangible, real, and upfront. The alleged benefits to science and society are probable and delayed, if any. Many experiments don't work, don't even get published, don't

get noticed, don't have action or policy implications, don't change anything. Therefore, those that do add special demands on the researchers to use all their resources to disseminate their message widely, to become advocates of their viewpoint, and even willing to act as social-change agents for their recommendations (see Zimbardo, 1975).

Perhaps an appropriate way to conclude this section is to return to the critique of deception research by science writer Morton Hunt (1982) in his provocative New York Times Magazine essay. Hunt used as the journalistic device for his piece an in-depth analysis of one student-subject, Steve K., in the induced paranoia study, who was distressed during the study by feeling paranoid, but upset after the study because he had expected to be called back to be in further research using hypnosis and was not. Two years after his research participation, Steve is described by Hunt as looking back "on the period of his participation in Zimbardo's research as one of the high points of his life thus far" (p. 145). That his experience with induced mood changes and deception made this young man think deeply about the ethics of research, is evident from his final statement to the investigative reporter: "I agree with people who say it's not right to deceive human beings; it's not right to treat people as if they were mice. But I agree with Professor Zimbardo that he couldn't do his work on paranoia and deafness without deceiving his subjects, because if they knew what was going on, they wouldn't react the same as if they didn't. I can see both sides. That's my dilemma, and I don't think there's any simple answer to it, only complicated ones" (p. 145).

VI. Conclusions and Reflections

So there you have it—a simple conceptual model elaborated to incorporate and integrate social, cognitive, and clinical concepts, with a set of supporting experimental evidence. Enough of the predictions advanced from Discontinuity Theory have been validated to warrant its serious consideration, refinement, and extension by other scholars, experimenters, and clinicians. After 30 years of working on this program of research, I feel comfortable in drawing some tentative conclusions, and in proposing some reflections about future research and applications. I will start with a few grandiose ones and work down to the more mundane.

The seeds of madness can be planted in anyone's backyard, given transient perturbations in the life cycle of ordinary experiences. I think the general approach proposed here can help rescue the study of psychopathology from the confines of psychiatry and clinical psychology since it suggests

that fundamental cognitive, social, and cultural processes are involved in its development. Bringing the knowledge we have in those realms to bear on a fuller understanding of the mechanisms involved in the transformation of normal behavior into dysfunctional, symptomatic behavior can yield important insights regarding prevention, diagnosis, and treatment. Rather than seeking to find evidence of "premorbid" personality factors in those with "mental disorders," we need to switch out of this medical model to a more socially oriented, public health model that seeks to find situational vectors of individual and societal disturbance.

We have seen that the basic motivational trilogy of needs to understand, to belong, and to sustain self-esteem, which sometimes lead to scientific discoveries, friendships, and heroic deeds, can at times also fuel the machine of madness, when misused. Violations of expectations about matters central to one's self-image can trigger a cascade of cognitive, emotional, and motivational processes that, taken together, may start that person down the path to madness. While acknowledging the role of genetic and biological factors in some forms of psychopathology, I believe we need to chart their limitations in our understanding of how the human mind and spirit may be radically transformed by certain personal and social experiences. This research, and the model giving rise to it, has shown that specific types of symptoms, such as paranoia, phobia, or hypochondria, can be predicted by knowing the nature of a person's cognitive search biases that are activated when trying to make sense of personal discontinuities.

It should also be evident that hypnosis is a powerful methodological tool for manipulating motivational, cognitive and affective states. As such, it deserves wider utilization by social psychologists and other researchers for its many values that go beyond the realm of the relatively small number of psychologists who primarily study hypnosis itself. In a similar vein, I think that this report also makes clear the possibility of studying dynamic aspects of human functioning in rigorously focused laboratory research. The once active area of experimental psychopathology needs to be revived, and can, with the current research program serving as an exemplar. It is possible to conduct "ethically challenging" research, like my own, by working closely and sensitively with IRBs. Without prospective studies of the first stages in the development of symptomatic thinking, feeling, and acting, how can we ever really know about the origins of psychopathology? Surely, not from the traditional historical reconstruction of what must have been predisposing and precipitating factors derived from the long delayed recall of clients and patients. Beyond the statistically significant effects reported in my research are the dramatic, qualitative transformations in behavior that I observed among intelligent, normally functioning colleges students

that I knew reasonably well (from intensive contacts in our training sessions). Suddenly, they became inarticulate, confused, hyperactive, angrily banging on the desk, in near tears, frightened, picking away at a scab, anxious, or developing an uncontrollable muscle tic. That is the stuff of madness in the "real world," the origins of which we must understand in order to act against it more effectively.

However, it is equally important to note that within a minute of lifting the amnesia suggestion, and restoring memory for the source of the discontinuity, we witnessed dramatic, sudden reversals of the delusions that our subjects had been maintaining with conviction and vigor. Typically, there was a moment of confusion, followed by smiling, laughter, or shows of amazement by the debriefed subjects about the fact that they had believed so strongly in their false interpretation of what they were experiencing. The formation of delusions, along with other symptoms of psychopathology, revealed in our laboratory model using hypnosis to create subjectively compelling anomalies in personal experience, presupposes attributional explanations at work. One test of that assumption is offered by Kihlstrom and Hoyt (1988) who propose,

> If the attributional explanation is correct, delusions should form, as they did in the Zimbardo experiment, when subjects are amnesic for the hypnotic suggestion that is the true source of their experience; but they should drop the delusion as soon as the amnesia suggestion is canceled, and memory restored. (p. 99)

That is precisely what we found in every one of the hundreds of "discontinuity subjects" we have studied.

Let's consider next some *limitations* of this research. Obviously, the generalizability of the findings I have reported are constrained by reliance on a subject population that was highly hypnotizable, able to experience amnesia, and to follow posthypnotic suggestions. Because this trait is not shared by the majority of adults, caution must be exercised in how far one is willing to go beyond the evidence presented. However, since there are no reported data relating hypnotizability to virtually any other trait or personal attribute, it is unlikely that our most important findings were due to the operation of some pathological thought process characteristic of the special subject population we have utilized. Also the many predicted differential outcomes in conditions to which high hypnotizables were assigned randomly argue against a main effect of hypnotizability. Nevertheless, we need to develop other methods of inducing discontinuities that do not rely on hypnosis so that our conceptual assertions are not limited by any of its properties. Also, it is well to explore situations where naturally

occurring discontinuities might be expected, so that prospective studies can be done with pre–post-assessments.

Another limitation comes from the use of relatively small size samples drawn from college student populations. We can assume they are generally biased toward being "explanatory-prone" when faced with discontinuities, rather than not thinking about them. We might seek out other convenient populations for future controlled laboratory research, which better represent the general population. More serious limitations on my theory itself come from its culture-bound nature. It is clearly based on an individualistic cultural orientation, in which self-image is vital, and people seek explanations for discontinuities through personal cognitive searches, rather than collective ones. Only cultural extensions of this theory will inform us of what may prove to be fascinating differences across societies in how people deal with their significant violations of expectations.

A further limitation to be faced are the severe constraints imposed by IRBs on conducting future research to replicate these studies, or to move the theory in new directions. Just as I anticipate getting some negative feedback from readers of this chapter not satisfied with the ethical resolutions reported in the previous section, I wonder how many other social psychologists would be willing to undergo the high costs incurred in doing such experimental research by satisfying the demands of their IRBs?

There are a number of *extensions and refinements* of the ideas presented here that we and other researchers might consider in our future research.

- To assess and study the operation of naturally existing explanatory search biases
- To compare reactions to discontinuity among experimental subjects for whom the induced search bias is either congruent or incongruent with their own preferred search bias, starting with a standard 2 × 2 design
- To study the social dimension of Discontinuity Theory, its normalizing aspect, its role in joining or starting nontraditional groups, such as cults and antisocial movements
- To study the behavioral search process that may, for example, lead to addictive and destructive behaviors as one outcome of drinking, taking drugs, or other actions designed to reduce the distress of unexplained arousal
- To study cultural variations in processing discontinuities
- To create conditions that facilitate self-disclosure of discontinuities so as to better study the strategies and tactics used in this special form of interpersonal communication
- To more fully explore the social pathology side of the predictions advanced in Table II.

- To study hemispheric differences in brain functioning with EEG recordings and fMRI effects of unexplained arousal.

There are some *practical applications and extensions* of the line of thinking advanced in this chapter that I would like to highlight briefly. Although costly, patients should receive medical checkups prior to any final, serious psychiatric diagnosis, treatment, and commitment to mental health facilities. For example, hearing tests, and providing hearing aids to the partially deaf, could prevent and treat early stages of paranoia better than psychotherapy and medications. Therapists might be encouraged to be more sensitive to establishing timelines for causal sequences related to the possible origins of mental disorders in their clients/patients. They should also be more aware of the explanatory search biases of those they treat, as well as recognizing their own biases toward overemphasizing inner, dispositional determinants, while minimizing situational influences on mental and behavioral functioning. They also need to combat the biased conceptual frameworks their training may have imposed on their attributional thinking.

At a more general level, greater efforts need to be made in education to extend the basic kinds of critical thinking skills of scientists to the general population, so as to reduce the faulty thinking often associated with trying to understand personal and natural discontinuities. The canons of the scientific method should be integrated into school curricula so that, for example, students learn why correlation is not causation, why it is wrong to seek only confirmatory evidence for theories, why it is essential to consider the fullest possible range of alternative explanations, and not to become a biased theorist prematurely. We should also develop educational modules with a variety of violation-of-expectation exercises, demonstrations, and experiments to promote training in the process of searching for explanations within the context of discovery of how our physical, social, and psychological worlds work.

The dynamic role that intellectual discontinuities play in scientific discoveries is clearly illustrated in Albert Einstein's reply to a student's inquiry about the nature of productive thinking. She had asked many noted intellectual figures of the time, "When do productive thinking processes arise, and what occurs in such a sharp, lively process?" That student later became the renown psychologist Erika Fromm, who recently found that lost letter, and published it in the *American Psychologist* (Fromm, 1998). Einstein noted that while inertial frames are equivalent in mechanics and optics, it should also have been so in electrodynamics, but such equivalence appeared to be "unachievable" within the theoretical framework of electrodynamics. Einstein goes on to frame his self-analysis of the motivating effect of perceiv-

ing this anomaly in terms that support the underlying assumptions of my Discontinuity Theory:

> The desire to discover and remove it [the defect in the traditional theory] led to state of psychic tension in me, which after seven years of fruitless search was released through the relativization of the concept of time and distance. It was similar for the general theory of relativity. . . . It was always the search for a logically simple meaning of empirically established relationships, propelled by the conviction that there existed a simple logical meaning. (Fromm, 1998, p. 1198; Einstein's letter was written in 1932).

Finally, this theory and research has a broader realm of applicability for all of us. Because well-adjusted individuals, our research participants, could so readily move across the line between sanity and madness for a while, it should increase our compassion for the mentally ill and reduce our tolerance for stigmatizing them as deviants in our society. We need to recognize the fluidity of the boundaries between normal and abnormal, between wellness and illness. Doing so may enable us to begin to see the "righteous Us" and the "wrong-headed Them" as kindred spirits trying to make sense of the puzzles and challenges of human existence.

Perhaps the following assertion by the poet, Ralph Waldo Emerson, from his *Essays and Lectures* (1983) may serve as a fitting thematic conclusion to this chapter, and the appropriate book-end to its opening literary quotations.

> The sun shines and warms and lights us,
> yet we have no curiosity to know why this is so
> but we ask the reason of all evil, of pain, and hunger,
> and mosquitoes, and silly people . . .
> [and of our personally significant discontinuities].

Acknowledgments

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