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Contents

- 51 Chaos Theory and the Hollander Psychodrama
Curve: Trusting the Process
Rory Remer
- 71 Theoretical and Methodological Issues in Group
Support Systems Research: Learning From
Groups Gone Awry
Leonard M. Jessup
Joey F. George
- 89 Book Reviews
Changing the Past: Creating Future Futures
From Past Futures Through Psychodrama by
Donnell Miller. Reviewed by *Michael*
McCloskey
Who Calls the Tune: A Psychodramatic
Approach to Child Therapy by Bernadette Hoey.
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Chaos Theory and the Hollander Psychodrama Curve: Trusting the Process

RORY REMER

ABSTRACT. Both psychodrama and chaos theories address the complex dynamics of human interaction and change. When juxtaposed, not only can their commonalities be seen, but also each theory can contribute synergistically to the utility of the other. To accomplish that end, the author presents the constructs of chaos theory first. Then, the major constructs of psychodrama theory are reviewed, through the use of the Hollander (1969) Psychodrama Curve. Finally, each theory is employed to enhance the understanding and application of the other. The case is made that accommodating the melding of subjective and objective perspectives, sought by Moreno (1951), may finally be accomplished through the combination of the two theories. Particular attention is paid to the philosophical consistency of the theories. Two major conclusions are reached: Spontaneity is essential to dealing with dynamical systems; and trust in the process—psychodramatic and chaotic—is key to change involving human dynamical systems.

CHAOS THEORY DEALS WITH nonlinear, nonindependent systems. Although that statement seems esoteric and remote, it is not, particularly if the systems involve human beings.

Human dynamical systems—families, couples, groups, organizations, communities, individuals—are fascinating, complex, interactive, and unpredictable (Butz, 1997) and present exciting challenges to those who work with them. Because of the complicated nature of the systems, psychodrama has proved an exceptionally rich and effective method for approaching them.

The chaos theory and psychodrama theory are compatible (Remer, 1996), and each has much to contribute to our understanding and application of the other. My aim in this article is to illustrate that point and to examine the interface between chaos theory, described by Butz (1997) and Goerner (1994), and

psychodrama theory, depicted by the Hollander Psychodrama Curve (Hollander, 1969).

Chaos Theory: A Brief Exposition

For those readers not familiar with chaos theory (also termed nonlinear/nonindependent systems theory, dynamical systems theory, ecological theory, and complexity theory), a brief overview with illustrations may prove useful. Doing justice to the topic about which books have been written is beyond the scope of this article. However, familiarity with the primary constructs or terms involved is essential. I hope an introduction to the terms and their implications will be enlightening and encourage further exploration by the reader. For much more detailed explanations, I suggest articles and books by Crutchfield, Farmer, Packard, and Shaw (1995), Gleick (1987), Goerner (1994), Remer (1996), and Wildman and Russell (1995). In this article, I will address some of the most basic constructs—strange attractors, fractals, self-similarity, bifurcation, self-organization, and unpredictability.

Strange Attractors and Basins of Attraction

Strange attractors are focal points for patterns generated by dynamical systems. Their basins of attraction are the areas containing those patterns within their boundaries. Strange attractors and their basins are similar to homeostatic points in general systems theory. An example of a strange attractor and its basin is an open drain in a bathtub with the water running fast enough to fill the tub. Should an object such as a ping pong ball (buoyant but too big to be sucked down the drain) be dropped into the tub, it will continue to circulate in a quasi-predictable manner—predictable in the sense that it will not be able to escape the tub and so its general location is well established (at least until the tub is filled to overflowing); quasi in the sense that how near to or how far from the drain (strange attractor) it will be at anytime cannot be readily foreseen, particularly for far future times. Strange attractors and basins of attraction capture the actuality—consistencies and vagaries—of human behavior patterns.

Fractal Boundaries and Dimensions

Fractal boundaries are the irregular “lines” of demarcation between separate units. Fractal boundaries and their measure or dimensions convey, in a systematic (and possibly quantitative) way, that reality is rarely as clear cut as we picture it. Unlike the dimensions with which we usually deal, fractal boundaries can have fractional dimensions. Shorelines are good examples.

From a far distance (e.g., outer space), shorelines appear to be continuous, curved lines of long, relatively smooth segments. Walking the shoreline gives one a quite different impression. What becomes apparent is that all the seemingly long, smooth segments are actually made up of many shorter convoluted pieces. Measuring the overall length of the shoreline will vary with the “fineness” or applicability of the measuring instrument. Use of a yardstick and a micrometer often produces grossly disparate outcomes (e.g., measuring the distance around every indentation of every rock and pebble is not done very accurately, if it is even possible, with a yardstick). Fractals convey two very important concepts. First, what you see depends largely on your perspective (e.g., Remer, 1983). Second, accuracy of measurement often depends on the definition of the process—even though results may be internally consistent employing the same method of assessment, they can vary greatly, even by an order of magnitude, depending on the different approaches. Fractal boundaries and dimensions capture the fuzziness or gray areas of behavior patterns. In doing so, they also emphasize the impossibility of separate systems ever meshing perfectly (much like trying to glue two pieces of a broken cup together so the weld is not visible).

Self-Similarity and Self-Affinity

Self-similarity and the more general, inclusive term, self-affinity, denote the tendency for processes and other phenomena to have recurring patterns. The constructs of self-similarity and self-affinity capture the sense that motifs seem to be part of nature. Patterns tend to repeat themselves, not exactly, not perfectly, but still enough to be recognizable. Similarities, not only of boundaries but of patterns in general, have proved fascinating, valuable, and enlightening (Hofstadter, 1979). Parenting, both on a reproductive and a behavioral level, offers a good example. We tend to resemble our parents genetically, physically, and behaviorally. On the other hand, in every situation, as many points of nonsimilarity can be found as points of similarity. Behavior patterns have tendencies to repeat themselves, although not exactly. Over time and in situations and generations, consistencies can be found. And so can inconsistencies.

Bifurcation and Bifurcation Cascade

Bifurcation means splitting in two. When a process or pattern bifurcates, complexity is added to a system by the addition of strange attractors. Bifurcation cascade means that the splitting is happening at such a rate that no discernible patterns are in evidence. After a period of time, many natural processes tend to bifurcate as the type of process changes. Then, after another period of stability, another bifurcation takes place. As long as the bifurcations stay

within limits or happen at long enough intervals so that the system's resources can accommodate the new conditions gradually, stability can be maintained. If either of these conditions is violated, bifurcation cascade occurs. The system goes out of control; it becomes chaotic. Whereas such a state may seem catastrophic, it need not be. At that crisis point, the system must reorganize into a different, although perhaps similar, pattern, essentially creating a new strange attractor. Thus, the "confused" states can serve as opportunities for creative, functional change. Organizational growth can serve as a good example. If the tasks demanded of an organization exceed the capacity of it to adjust, overload (bifurcation cascade) causes the system to become chaotic. Possible solutions to restabilize the system are different forms of reorganization—new units established to handle new tasks, shifting tasks to different units within the organization, or farming out tasks to other organizations, which, in effect, produces a meta-organization. Bifurcation and bifurcation cascade encompass many of the notions that general systems theory addresses through positive and negative feedback loops. Conceptualizing these processes in discrete stages, however, provides a somewhat better grasp of the contributing factors and their interaction (i.e., how a new strange attractor might be the result of a system torn asunder by the interplay of numerous conflicting forces).

Self-Organization

Self-organization is the inherent tendency for dynamical systems in a chaotic state to form a new coherent pattern. An important characteristic of chaotic systems is their innate ability to reorganize, based only on the interactions of their components. Self-organization establishes new patterns of behavior, particularly after chaos has been reached, accommodating the new demands on the system. The example of an organization that has undergone bifurcation cascade, as noted previously, shows evidence of that attribute. However, it is not usually possible to predict exactly, if at all, how the self-organization will manifest itself.

Unpredictability

Unpredictability is the inability to describe with certainty the next state of a system, given the knowledge of its present state. One aspect of unpredictability, defined from a chaos theory perspective, is similar in sense to that conveyed by Heisenberg's uncertainty principle or Bell's theorem (Bell in Kafatos, 1989; Heisenberg in Price & Chissick, 1977); that is, everything about a system cannot be known to absolute certainty. I mentioned this aspect of unpredictability in discussing strange attractors, which I termed quasi-predictability. Another, more commonly known aspect, has been called "the but-

terfly effect" (Gleick, 1987). For example, a butterfly beating its wings in China might cause a hurricane in the Bahamas. Small differences in the initial conditions of a process can produce large differences in outcomes; conversely, large initial differences can have very little impact. This second aspect subsumes the concepts of equipotentiality and equifinality from general systems theory. Unpredictability goes far beyond these ideas and differs drastically when it conveys the humbling, daunting, realistic perspective of how little control or certainty of predictability we actually have.

The Hollander Psychodrama Curve: A Brief Review

Before presenting a comparison between chaos and psychodrama theories, I concisely review the latter theory. The Hollander (1969) Psychodrama Curve is an excellent vehicle for doing so. My brief exposition can serve as either an introduction or a refresher. The curve is also a graphic that illustrates the interface between chaos and psychodrama theories.

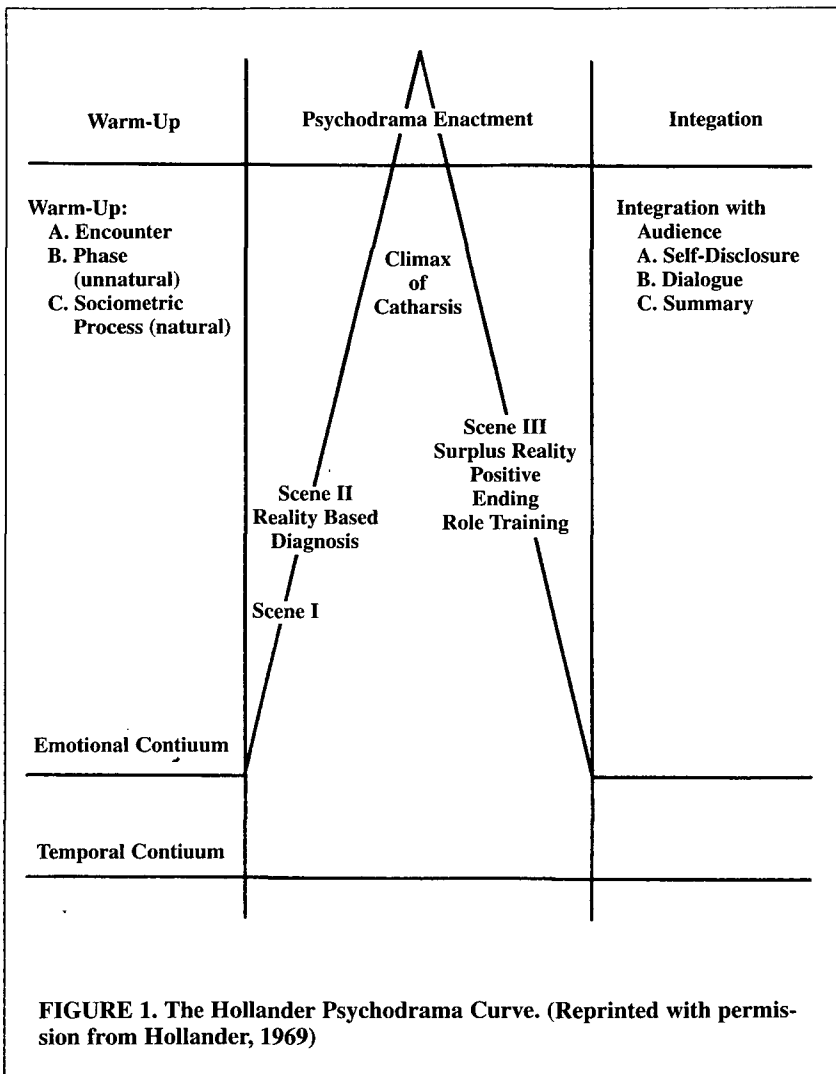
Hollander (1969) made a major contribution to clarifying the classic psychodrama process. He characterized and depicted the flow of a psychodrama session as a curve divided into three major segments—the warm-up, the enactment, and the integration. The curve is further divided into the components of each of the segments (see Figure 1). One note of caution, although the curve seems linear, at least along the time dimension, choices can be made to move nonlinearly (e.g., replaying a scene repeatedly or moving between segments) when deemed necessary. The interactions between and among roles/participants within segments are often nonlinear.

Warm-Up

The warm-up is a group-oriented stage. It comprises three aspects: encounter, starters, and sociometric process. Encounter allows the individual (self-self) and group (self-other) assessment of readiness for action. Starters are artificial methods—exercises, games, spontaneity tests, and so forth—to begin to engage group members in working together in the action process. The sociometric process accesses the telic connections extant to allow the identification of the group wishes, theme, and the sociometric star (protagonist). Through the realization of these three aspects, the group spontaneity is engaged for the ensuing enactment.

Enactment

During the enactment, which is predominantly protagonist oriented, scenes are set and anchored in time, auxiliaries are chosen, and action is engaged.



The protagonist's reality (conserve) is displayed (first scene), explored (modified through interaction), and rewritten (surplus reality). The full resources of those involved aid in producing the release of energy (catharsis of abreaction) blocked (as indicated by act-hunger) so that a new cognitive structure can provide the basis for spontaneous action in the future. The process may appear linear from a time perspective, as the group moves from scene to scene. The experience of both catharses (abreaction, during the first part of the enact-

ment, and integration, during closure/surplus reality), not only for the protagonist but also for auxiliaries and audience members, may occur in any or all scenes.

Once the enactment, in its fullness, has reached a point of closure (at least for the moment), a time is needed to pull everything together and return to the present moment. Integration is focused on accomplishing that end.

Integration

Integration, again a group-oriented stage, is achieved through sharing (audience disclosure), group dialogue, and summary. Of the three, sharing is the most essential.

Although the enactment is focused on the protagonist, she or he is still representing the group theme. No one present during the enactment is uninvolved. As a result, emotional reactions are pervasive throughout the group. The sharing addresses two important considerations. First, the protagonist is reassimilated into the group, receiving emotional energy in kind for that which has been expended on the group's behalf. Second, group members, who may need to reach personal closure for the act-hunger the drama has triggered in them or for them, can seek and find needed support.

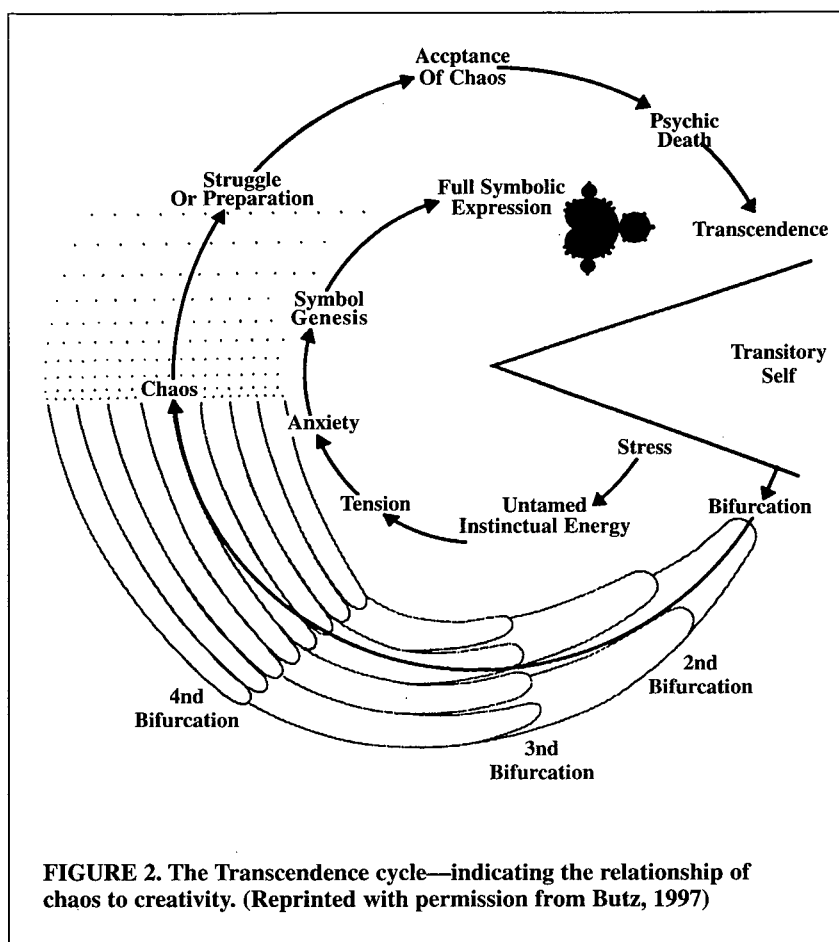
The group dialogue "is equivalent to group discussion, group psychotherapy, or didactic experience in group dynamics" (Hollander, 1969, p. 11). In this way (interpretations, analyses, questions, evaluations, etc.), the group reestablishes a sense of cohesion, through attention to all members.

The summary, presented by the protagonist, audience, and/or director, promotes a further sense of closure by presenting a complete view of the session. During both the summary and the dialogue, interaction is more cognitively oriented, reducing the level of emotion by allowing members to "get back in their heads" and anchor the learning that has taken place.

The Chaos/Psychodrama Interface

For a more detailed explanation of the Hollander thesis and chaos theory, I encourage readers to consult the original works. I hope I have provided a basis for seeing the connection between the psychodrama and chaos theories.

Because spontaneity—the ability to function at least adequately, as situations demand—is the essential ingredient for any psychodramatic process, part of the similarity can be seen in comparing chaos theory to spontaneity theory. I (Remer, 1996) have already compared the two, but the overlap can be further accentuated by noting the similarity of Butz's (1997) depiction of the creative process from a chaos perspective (see Figure 2) to the canon of creativity. The parallels go beyond the creative process, although that process



is central. To see more of the interplay, we can examine the psychodrama curve and its components.

Warm-Up

During the warm-up, the cohesion of the systems involved, both individual and group, are addressed. The sociometry incorporates the strange attractor(s) and basin of attraction of group behavior/interaction.

Encountering. First, during encounter, the readiness of individuals and the group as a whole for engaging in a chaotic process is assessed and fostered.

Consistent with Hollander's (1969) description, Butz (1997) contends that cohesion is essential to productive change at the boundaries of chaotic systems.

Using starters. Beyond attempting to ensure the viability of the process, the warm-up brings together and focuses the components of the system (the group members), initiating the interplay of their conserves/strange attractors at multiple levels of interaction (e.g., verbal, physical). In particular, the tele between and among group members and the therapist/director is engaged. Through the use of specific starters, warm-up techniques, the reproduction and recollection of self-affine/repetitive patterns of interaction are engendered, promoting the selection of both a group theme and a sociometric star to represent it.

Attending to sociometry. The sociometric identification of a protagonist is like choosing a strange attractor and basin of attraction—a conserved behavior pattern—to examine, to appreciate, and to change. Coming full-circle to encounter again, the cohesion and resources of the group are marshaled for the enactment.

Enactment

At the enactment stage, the most complex, dynamical interaction occurs on multiple levels. Strange attractors of all participants come into play, providing the potential for chaos and change.

Setting the scene. The initial requirement of the enactment is the setting of the scene in which the first interactions will occur. Protagonists concretize for themselves, directors, and audiences the protagonists' conserves—their views of reality.

At that point, the necessity for approaching the goal from a chaos perspective becomes more obvious (see Figure 3). The conserved scene can be viewed as a schema (Piaget & Inhelder, 1976) or schema/strange attractor (Butz, 1997). It is not simply a visual representation (particularly to the protagonist) but a multileveled construction based on all the senses. As the protagonist is instructed to relate the components of the scene, recall is enhanced by referring to and engaging the protagonist in a nonlinear, interactive process. The interaction of present stimuli (such as props, auxiliaries) and their spatial relationships with other multisensory input (e.g., how the room smells, how the carpet feels, what sounds are present) produces a re- or disorientation—a type of bifurcation. "As the scene is relived, often sounds, smells, and bodily sensations are revitalized carrying with them the uncon-

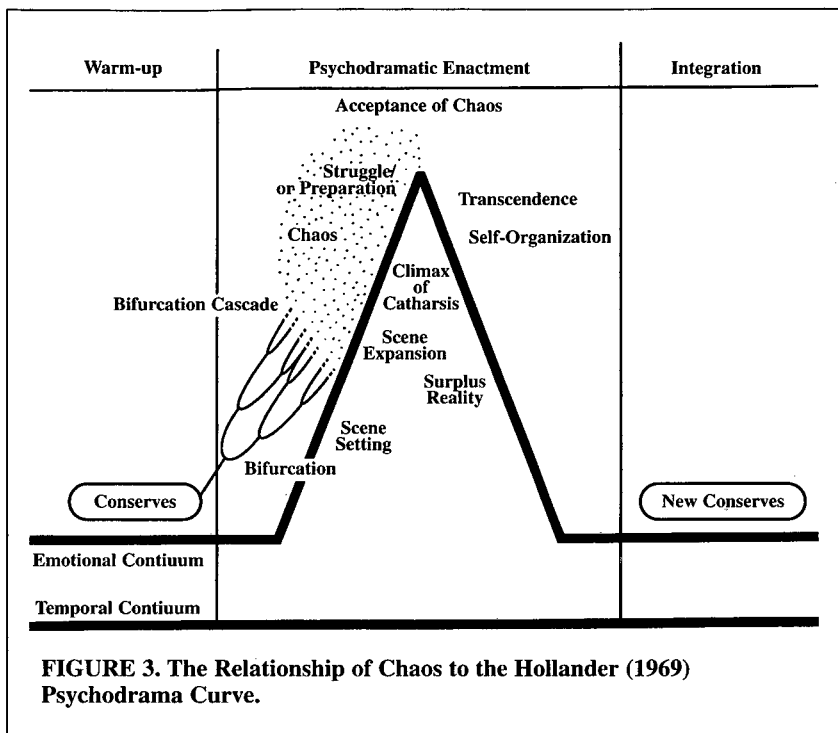


FIGURE 3. The Relationship of Chaos to the Hollander (1969) Psychodrama Curve.

scious associations which will frequently surface as part of the psychodrama” (Hollander, 1969, pp. 5–6).

Establishing time. Also, the use of present stimuli and patterns relies on the self-similar quality of the interaction that produces the effective orientation (or reorientation) to time. “Individuals are linked to both time and space . . . [and] there is simultaneously a vital link to the other variables. As time, place, and people are woven together, there is a greater potential for emotional involvement and clarification for both rational and emotional integration later in the psychodrama session” (Hollander, 1969, p. 6).

Selecting auxiliary egos. The selection of auxiliary egos depends on self-affinity as well, along with the fractal nature of recollection. After protagonists set the superstructure of their scenes, they are helped through interview and role reversal to recapture for themselves and to present to the audience the conserved significant others’ roles (more strange attractors) central to the enactment of the scene. The selection, even more than the scene setting, is accomplished through an interactive, nonlinear process. (In fact, reading

accounts of some of Moreno's interviews of protagonists may leave the impression, from his disconnected interview style, that he is purposely being nonlinear, much like a hypnotic confusion induction.) Once that impact has been achieved, the protagonists are asked, "Who can be those significant others for you?" Often protagonists will fight the disorienting, nonlinear aspects by trying to resort to choosing auxiliaries on physical similarities. Selections are usually more effective, however, if the choices are made on the telic level instead, capitalizing on self-affinity on an intuitive, holistic level. Even with designated, trained auxiliaries, their effectiveness is based on promoting the self-affinities. Their training can be viewed as learning how to engage the dynamical process to do just that (i.e., capitalizing on gestures, specific words, or voice peculiarities of the significant others presented and portrayed by the protagonist).

Once the essentials are in place, the action is entered at the role-taking level—staying as close as possible to the protagonist's conserve/within the basin of attraction presented. Regardless of whether the auxiliaries are representing members of the protagonist's social atom, abstract concepts (like dissertations), or fantasy figures, enactment requires interaction. Because the auxiliaries and the director have conserves/strange attractors of their own triggered by engaging in their own roles (director, auxiliary ego, double, audience) in the enactment, a tension is induced between the protagonist's "reality" and the "realities" of the others present. Even in the initial scene, while the basin of attraction—how the "biases and assumptions are rationally and emotionally maintained"—of the protagonist is being depicted and explored, bifurcation is being initiated. The "atmosphere of permissiveness which nurtures a feeling of trust and freedom" (Hollander, 1969, p. 7), created by initially staying primarily with the protagonist's conserve(s), establishes the foundation necessary for the protagonist, the director, and the group to tolerate and to cope with the increase in chaos as the enactment moves from the periphery to the core.

Moving to catharsis. Chaos is usually already abundant in the core scene, as represented by the confusion/ambivalence and lack of closure/act-hunger of the protagonist. The self-organization necessary for the formation of a functional, stable strange attractor has not occurred, although the basin of attraction may contain the behavior pattern with a high degree of bifurcation (ambivalence). As the enactment progresses, the ever increasingly spontaneous interactions between the director and the cast and among all the individuals present (role-playing/expanding the patterns of behavior presented) increase the bifurcations, the chaos, even more. When the boundaries of the basin of attraction are breached, the chaos can provide the energy and necessity for the self-organization required for the establishment of a new, viable

strange attractor. An indication that this characterization is apt is that “the exactness of detail becomes less significant than the emotional qualities related to the experiences” (Hollander, 1969, p. 7). In other words, the interaction produces a nonlinear, complex reaction experienced on multiple levels, as the basins of attraction are challenged to contain changes in patterns.

“As the affective climax approaches, the director confronts, supports, and encourages the protagonist to release in action those emotions which have remained unexpressed or disintegrated” (Hollander, 1969, p. 7). The height of chaos is reached during the catharsis of abreaction—bifurcation cascade, a disorienting and disconcerting state—at which point the system must perforce reorganize.

Moving to closure. The chaotic energy released during catharsis must be channeled and focused so that the systems (protagonist, audience, and group) can be restabilized and new strange attractors/conserves be established. The first part of this goal, the protagonist’s, is influenced and fostered through surplus reality. Experimenting is done with different new behavior patterns. New basins of attraction are defined (role creating) through role training (anchoring the new conserve/strange attractor) and spontaneity training (exploring the basin of attraction), preparing for the unpredictability of real-life interactions.

Every attempt is made to influence the installation of a functional basin/conserves. Only productive patterns are reinforced through positive endings; destructive patterns are reworked and suppressed. During the enactment closure, the reorganization of the audience and group strange attractors may be influenced vicariously and indirectly. Direct attention is paid to these goals in the last stage of the psychodrama session, the integration.

Integration

Although the integration—particularly the sharing (audience disclosure), if done correctly—may further self-organization of the protagonist, it is aimed more at the self-organization of the audience (individual member strange attractors) and the group self-organization/sociometry (group strange attractor).

Sharing. Through the sharing, four objectives can be realized. First, the support of the protagonist during the self-organization process can be accomplished by other group members’ (especially those who have been protagonists) normalizing and validating the reaction to experiencing chaos (disorientation and disquiet). Second, by the “disclosure in kind,” a new group basin of attraction, reincluding the protagonist, is instituted. Third, the degree of

chaos in the individual audience members can be assessed by noting the act-hunger, disorientation, and emotional agitation present. Fourth, self-organization can be promoted by brief work by and/or support for participants other than the protagonist.

Dialogue. The dialogue promotes the sense of stability, for both the group as a whole and the individual group members, that the closure produces for the protagonist. First, a new basin of attraction is established for the group as a whole, as the sociometry of the group is addressed. Trust, confidence, and comfort with the group interaction reaffirm the group cohesion within the new basin. Second, a move to a more cognitive level reduces the interaction with other dimensions restraining chaos and promoting the opportunity for further self-organization, at least in the cognitive dimension (somewhat like inserting damping rods in a reactor to lessen the reaction).

Summarizing. In a somewhat more succinct, holistic, and less provocative way, summarizing finishes the process of the integration stage and the entire drama. It closes down the overt dynamical process, although self-organization certainly continues until adequate stability is reached.

The summary and the dialogue portions build from an affective focus to a cognitive one. As the members endeavor to integrate their feelings, experiences and thoughts into a congruous whole [i.e., establish a new basin of attraction], they simultaneously insure *themselves* [emphasis added] against the possibility that anyone will exit from the session in "psychodramatic shock" or in a state of incompleteness, pain, or panic [i.e., in a continuing chaotic state]. One way to close an emotionally energized group is to help members return to their "heads," i.e. [sic], their intellectual processes. (Hollander, 1969, p. 11)

What Chaos Theory Offers Psychodrama

Foremost, chaos theory provides or reinforces an understanding of the underlying dynamics of the psychodramatic process. It also directly links that process to other human dynamical processes and to dynamical processes in general. The heuristic potential is extraordinary as constructs/concepts from chaos theory are applied to the psychodrama experience and analogies to psychodramatic construct/concepts are examined (see Figure 3). Beyond that promise is the possibility of empirically exploring and supporting the applicability and effectiveness of psychodramatic interventions as never before. Attendant on the growth in the number of chaos theory adherents, the research methodology, unfortunately still in its nascent stage, is being developed.

On a more specific, and perhaps concrete, level, chaos theory provides guidance, as well as recognition and support, for the way psychodramas are

conducted. Foremost is the recognition of the unpredictability and lack of total control attendant on the nonlinear process. For example,

If the protagonist manifests resistance while drawing near the emotional climax, the director has the option to become firm and supportively urge the completion of the abreaction and catharsis, to detour the route undertaken by the protagonist while opting for an alternative, or to deal with the protagonist's resistance. Whichever choice the director makes, the emerging emotions must be handled with care and sensitivity. (Hollander, 1969, p. 7)

Experience with certain techniques and interventions can provide therapists with a sense of the patterns of response that may be manifested. At best, they may influence the results produced by the interventions. The actual impact may be self-affined and resemble, more or less, what we have come to expect because the interactions are too complex to predict or to control. That fact is recognized and addressed by the focus on spontaneity of action by all participants, using or coping with what is produced in the here and now. Knowing and sensing what is happening with the identified patterns may increase the probability of staying within the basin of attraction or being able to cope more effectively and efficiently with moving beyond those boundaries. However, according to the butterfly effect, we have no guarantees. Chaos theory indicates that this multileveled, complex interaction (internal/external, protagonist/director/auxiliaries/audience, multi-sensory, cognitive/affective, cerebral/physiological/physical) will self-organize. As Moreno (and chaos theory) implore, "Trust in the process."

Chaos to some degree and at some level is attendant upon change. Disorientation, discomfort, anxiety, or fear is engendered and encountered. Those reactions promote, are signs of, and are chaos (a "strangely" self-reflexive process). Changing conserves/strange attractors/schemata requires dissembling, to some degree. Because psychodrama is so effective at inducing just such a result, we must not only recognize it will happen but also be prepared to address the profusion and confusion of feeling, action, and thought to which all involved will be exposed. The chaos must be expected, engendered, and normalized for all participants—chaos must become a symbol (Butz, 1997). Again, we must trust in the process.

Chaos is difficult to assess (Butz, 1997). It may be far more a subjective than an objective experience, at least in human dynamical systems. The cues available—anxiety, emotional agitation, dissociation—may help, but the telic bond among participants may offer the best sense of how chaotic the process is at any moment. Possibly, chaos is sensed and transmitted more as an analog/left brain function or even at physiological levels below the cortex (e.g., like fight-or-flight reactions through the limbic system). Much like human beings' ability to detect or to construe patterns and symbols, grasp the gestalt of a situation, chaos may be most effectively addressed by trusting the

process, at a more intuitive level. Being objective, as either a director, an audience member, or even a researcher, is a recognized impossibility. In fact, simply being present affects one's interactions and perceptions. Accepting the situation, not as limiting but rather as an alternative, possibly more efficient and effective mode, requires learning to trust many of the attendant dynamical processes beyond our usual, familiar, and comfortable practices.

These general implications pertain to all participants. Implications for dealing with the specific psychodramatic process roles (director, protagonist, audience, double, and auxiliaries) can also be considered.

Audience

Audience members would benefit from understanding how and why the psychodramatic process will affect them. When the chaotic reactions are normalized for them, they then can be better prepared to understand, accept, foster, and benefit from their experiences. They need not be so knocked-off-balance, a fear that seems to deter many people from being willing to participate fully or even at all.

Auxiliaries

By accepting their reactions as paralleling those of the protagonist and the director, auxiliaries can learn not only to expect a degree of tension and discomfort in moving from role taking to role playing but also to understand and even capitalize on their own confusion, frustration, and hesitance. Instead of being stymied, they might then be able use those reactions spontaneously to promote the warm-up of the others involved.

An understanding of the flow of chaos can also help auxiliaries in fostering the establishment of new strange attractors during the integration (role-creating) stage of the psychodramatic process. By knowing how to avoid more chaos, the auxiliaries can take appropriate actions to influence the self-organization that is progressing. For auxiliaries, learning what to expect (i.e., anything) and knowing more about how strange attractors/conserves interact can enhance their spontaneity. Auxiliaries can learn to trust their own processes and intuitions, the processes and intuitions of the director and protagonist, as well as the psychodrama process as a whole.

Protagonists

Some explanation of the chaotic tenor of the psychodramatic process can demystify it for protagonists. Their knowledge and acceptance of the disorganization and discomfort involved may allow protagonists to be better prepared

for those reactions. As a consequence, they can give themselves over to the process, not fighting the flow/chaos—a mistake—and benefiting from and even capitalizing on the possibilities for changing strange attractors.

Directors

Of all those present at a psychodrama, the director will benefit most from an understanding of the chaotic nature of the psychodramatic process experienced by all participants. The director as leader is the star/strange attractor at the center of the various interconnected patterns (e.g., sociometry, enactment flow) and has the responsibility of working with the chaos generated at all levels and in all participants. If anyone is in danger of being overwhelmed by not being adequately prepared, it is the director.

First and foremost, directors must understand and accept their limitations. As chaos increases, the need for control does also. Because interventions are unpredictable, directors must influence the interactions spontaneously, adapting in the moment. Conserved reactions may prove to be ineffective or even self-defeating. Most of all, the process must be trusted to promote self-organization. Excessive control may be inhibiting.

The best response a director may give is attention to the intuitive assessment of the level of chaos, attempting to make it overt and normalizing it for all participants. In observing the movement toward self-organization at all levels from a distance, the director may facilitate formation of functional new strange attractors. For example, by viewing the whole group as a larger basin of attraction, the director can bring the more or less energized participants into the action to modulate it to a degree, rather like inserting or removing the damping rods in a nuclear reactor. Participants with their own unstable basins of attraction can be regulated, increasing the chances that the interaction will be spontaneous rather than impulsive.

Even if directors cannot predict the impact of their interventions/structures, they may be able to rely on the dynamical processes at higher levels (e.g., the group) to help contain or promote the chaos at lower levels. By bringing the group and the individual strange attractors together, at opportune times, within the larger basin of attraction of the psychodramatic process, bifurcation leading to necessary chaos can be engendered to support change. Although the dynamical process may explode, the group interaction and the confines of the strange attractor of the psychodramatic process provide encompassing basins of attraction likely to contain the interaction patterns within acceptable boundaries.

Another important lesson that chaos teaches concerns the limits of communication. Directors direct. To do so, they communicate their ideas to auxiliaries and protagonists who enact them. Most often, those visions are com-

municated through words. However, communication is fractal in nature, so the message sent is never exactly the message received. To increase the probability that the actions taken are more like those envisioned, directors can be more specific in their instructions or enhance the communication by using more than one modality. The drawback to this method is that it can encourage directors to over control and to move too close to the action, diminishing their ability to view from multiple perspectives. Fortunately, communication is also self-affine, with the general meanings of the communication being shared. Thus, if directors set the general patterns in motion, allowing the auxiliaries and protagonists to interact, the dynamical process should take a course of its own. Directors will then be outside the action, better placed to perceive the patterns from a distance and to influence the process toward more functional self-organization, rather than being part of the chaos at the action level.

If directors understand the implications of chaos theory for psychodrama, they can better comprehend the importance of the various stages and components represented by the curve and the necessity of a complete process or the impact of a truncated one. Recognizing the levels at which the dynamical processes are occurring (intrapsychic, individual, group) and their parallels (self-affinities), the directors can promote or capitalize on them. For example, Corsini and Cardone (1966) recommend dismissing the protagonist after the enactment, before the sharing, dialogue, and summary. Although the intent of shielding the protagonist from the promotion of further chaos and allowing self-organization to proceed is admirable, the overall impact is likely to increase chaos and impede self-organization at all levels.

By recognizing the whole psychodramatic process as a large basin of attraction containing the patterns of psychodramatic behavior, the director may be better able to influence those patterns to stay within the defined boundaries. Although that goal may not be always attainable, when chaos increases to the point where the boundaries are exceeded, directors can better recognize the occurrence if they are familiar with chaos theory and cope with it more effectively if they are more comfortable with the experience.

What Psychodrama Offers Chaos Theory

An examination of the chaos theory/psychodrama theory interface provides a heuristic process for better understanding psychodrama, and the same holds true in the other direction. For instance, our analogy of constructs such as conserve and sociometry helps us understand strange attractors, basins of attraction, self-affinity, and so forth. Beyond the theoretical level, however, psychodrama has even more to offer.

Chaos theory can be viewed as an underlying, general structure for under-

standing dynamical systems. Although it certainly enhances the understanding and practice of many more specific theories, it has no praxis dimension. For human dynamical systems, psychodrama may be uniquely suited for implementing the tenets of chaos theory. The concept of spontaneity fits the necessity of dealing with human dynamical, complex, interactive, unpredictable systems *perforce*. In fact, few psychological constructs from other theories are as process oriented and, by specific design, as compatible with the demands of dealing with dynamical human systems.

Unlike many of the other theories dealing with human change, psychodramatic theory is in and of itself nonlinear, holistic, nonreductionistic, and multileveled. What is experienced as chaos on one level may seem to be a pattern when viewed from a larger basin of attraction, rather like viewing an abstract, pointillist painting. Psychodrama depends on recognizing, moving between, and capitalizing on these shifts between perspectives. Part of the skill of directing depends on the ability to recognize, to move between, and to change the level of interaction/perception. Another part relies on the director's ability to engage multiple strange attractors and bring them into juxtaposition for optimal effect. Yet another is the ability of the director to establish a large enough basin of attraction to contain the chaos at other levels.

Psychodrama is a meld of the linear and the nonlinear, the right and the left brain. It respects both logic and intuition. Because of its ability to recognize, tolerate, and integrate the contradictory aspects of reality, psychodrama theory and practice can extend the reach of chaos theory to have a practical impact.

Psychodrama process can be used to influence the production of chaos. Hollander's Psychodrama Curve provides a general map to the basin of attraction (the more general pattern of interaction). By using the map and the techniques developed to negotiate it, therapists will find that possibilities exist not only for working with chaos therapeutically but also for studying chaotic systems/interactions (Remer & Betts, 1997).

Just as chaos theory is more accepting of and congruent with analog, right-brain, intuitive recognition of patterns, the reciprocal influence of chaos and psychodramatic theories can prove beneficial. If, as suggested, chaos is more easily detected from the subjective/intuitive/qualitative perspective, then those trained in and adept at telic interaction and sociometric research philosophy (Moreno, 1951) may provide a means for studying chaos. The tension between the subjective and objective points of reference so evident in the logical positivist view and many more linear change approaches can be addressed effectively, as Moreno long ago struggled to do. Coupled with approaches being developed and explored—consensual qualitative research (Hill, Thompson & Williams, 1997), synergistic analysis of structured essays (Tinsley, 1997), and retroflective auto-analysis (Remer, 1990) or those abandoned as too subjective (Wundt, 1912)—the rapprochement of objective and subjective

envisioned by Moreno (1951) may find its greatest impact in the study of chaos.

Conclusion

The match between psychodrama and chaos theories is notable. The commonalities of the perspectives are synergistic and beneficial to both. Unlike the tensions and incompatibility encountered when chaos theory contacts other therapeutic perspectives that are linear and reductionistic, even the philosophical underpinnings of psychodramatic theory coincide well with those of chaos theory. The acceptance of the complexity of human interactions coincides with the recognition of nature's own tendency toward order.

Both theories view reality as fluid, subjective, and ever-changing, a process to be influenced and dealt with rather than a product to be controlled. They can thus accommodate the seeming polarities and contradictions of life. Multiplicity (e.g., ambivalence) is accepted and even welcomed as a positive resource to be integrated and reconciled, rather than as something to be eliminated. Both attend to patterns at various levels—what they are, how they can be represented, what impact they have, and how they can be viewed and used more productively and functionally.

We cannot control the totality of life, which is too complex for us to control, and we can accept that truth as a challenge. Both theories suggest we must take life as it comes and deal with it as best we can. Spontaneity, the key concept in psychodrama theory, offers both a skill and a positive frame from which to approach this challenge. The single most important message derived from both theories that can provide direction and reassurance is that we have to "trust in the process." To do so, we must understand and accept the type of process life is—a chaotic, self-organizing one. The marriage of psychodrama and chaos theories provides a better basis to achieve that end than either can individually.

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Theoretical and Methodological Issues in Group Support Systems Research: Learning From Groups Gone Awry

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ABSTRACT. The amount of research on group support systems (GSS) is growing quickly. One component of GSS, anonymous interaction, has received a great deal of attention recently. The quantitative and qualitative research thus far on anonymous GSS interaction suggests that the effects of GSS anonymity on group processes and outcomes are positive and/or neutral. In this article, the authors explore the potential for negative and/or dysfunctional consequences of GSS anonymity and discuss the relevant implications and research questions to be asked and answered.

THE DEVELOPMENT OF COMPUTER-BASED INFORMATION systems to support collaborative work—referred to here as group support systems (GSS)—is growing quickly. GSS combine networked personal computers, group decision support software, and structured group problem-solving methodologies to support group problem solving and decision making, typically in a setting much like a corporate board room. There are now more than 40 such facilities on university campuses, more than 100 such facilities in business settings, and there are a myriad of GSS software packages available commercially (see Jessup & Valacich, 1993, for discussion).

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The research literature on GSS is also growing quickly. For example, at a recent meeting of the Hawaii International Conference on Systems Sciences, approximately 100 researchers, representing nearly 50 institutions, collaborated on papers presented on GSS. Of the various components of GSS discussed throughout the research literature, one component of GSS—anonymous interaction—has received a great deal of attention (see, for example, published experimental investigations of GSS anonymity: Connolly, Jessup, & Valacich, 1990; George, Easton, Nunamaker, & Northcraft, 1990; Jessup & Tansik, 1991). By anonymity we mean the extent to which group member contributions are identified to others; that is, group members can make contributions without being identified as the author of those contributions. Similarly, when an individual receives a contribution from another member, she or he cannot identify the author of that contribution.

In a GSS setting, group members can potentially be anonymous either to other group members participating in the session or to individuals who are not participating directly in the group's GSS session (e.g., to the experimenter in a research setting or, in a work setting, to the group's manager or to coworkers who do not participate directly in the session but may be privy to transcripts of the session). Valacich, Jessup, Dennis, and Nunamaker (1992) described this as local and global anonymity, respectively. Further, GSS participants may detect the identity of the contributions during the GSS session based on seeing a participant physically enter a comment that then immediately appears on participants' screens or based on some cues in the content of a message that indicate the author of that message. Valacich et al. described these as process and content anonymity, respectively. For content anonymity, the history of the group and the familiarity of the members with each other will determine, in part, how anonymous the members are to one another during the GSS sessions.

The quantitative and qualitative research thus far on anonymous GSS interaction suggests that the effects of GSS anonymity on group process and outcomes are either positive or neutral. However, social psychological research on anonymity shows quite strongly that anonymity in interpersonal interaction can be quite dysfunctional (see, for example, Diener, Fraser, Beaman, & Kelem, 1976; Kerr & Brunn, 1981; Weldon & Mustari, 1988; Williams, Harkins, & Latane, 1981; Zimbardo, 1970). Thus, it seems reasonable to assume that there might be some negative aspects of GSS anonymity or at least situations in which anonymous interaction is not favorable in a GSS environment.

In this article, we will explore the potential for negative and/or dysfunctional consequences of GSS anonymity by analyzing four aberrant subject groups in four separate investigations of GSS. As Watson, DeSanctis, and Poole (1988) have shown, the unintended consequences of GSS investigations can be as enlightening as are the intended consequences. Our exploration of

these aberrant subject groups helps to understand anonymous GSS interaction. However, the value of the exploration is that it causes us to question our fundamental theoretical and methodological premises and predilections.

We offer next a review of some relevant literature in the area of small group and GSS research. We then present our summaries of four aberrant subject groups in four separate investigations of GSS. We follow that section with a theory of the effects, positive and negative, of GSS anonymity on group process and outcome. Finally, we discuss the relevant implications and research questions to be asked and answered.

Review of Relevant Literature

There are similarities between the study of GSS anonymity and the study of earlier methods for supporting group work. Structured group problem-solving methods, such as brainstorming (Osborn, 1957), the nominal group technique (Delbecq, Van de Ven, & Gustafson, 1975), and the delphi technique (Dalkey & Halmer, 1963), were believed to have functionally positive effects on interpersonal interaction, due in part to the fact that these techniques forced a relative degree of anonymity in the process. Similarly, early writings on GSS espouse the benefits of anonymous interaction in GSS supported group work (see, for example, Huber, 1982; Nunamaker, Applegate, & Konsynski, 1987). By positive effects we mean that anonymity helps to reduce barriers to open, effective communication and thus promotes full participation, which in turn serves to improve the products of group decision making and problem solving.

Calls for empirical GSS research (see, for example, DeSanctis & Gallupe, 1987) argued for the need to more rigorously investigate the effects of GSS anonymity on group process and outcomes. However, these calls to action have, for the most part, spoken to the positive aspects of the anonymity construct. Following these calls to action, subsequent empirical investigations of GSS anonymity brought to this line of research a much needed infusion of rigorous, objective inquiry.

Published empirical investigations of GSS anonymity (see, for example, Connolly et al., 1990; George et al., 1990; Jessup, Connolly, & Galegher, 1990; Jessup & Tansik, 1991) appear to be consistent. Collectively, this empirical work suggests positive or neutral effects of anonymity in enhancing group process to improve group outcomes.

Statement of the Problem

Although the literature on GSS anonymity is becoming increasingly empirical, the conclusions suggest only positive or no effects for anonymous GSS

interaction. The disparity becomes clear when one considers social psychological research on interpersonal processes. This line of research shows conclusively that anonymous interaction does not always result in positive outcomes. Indeed, this research shows that anonymity can have some very dysfunctional results.

For example, Zimbardo (1970) showed that subjects who were made to feel anonymous (by wearing identical white coats and hoods) delivered longer electric shocks to others than did subjects who were visible and wore large name tags. Diener et al. (1976) showed less frightening, yet equally devious consequences of anonymity. They secretly observed more than 1,300 Seattle children trick-or-treating. Experimenters greeted children, invited them to take one of the candies, and then left the room. Anonymous children were more than twice as likely to take extra candies than were those who had been asked their name and address. Although these examples are of research settings and subjects that are quite different than the settings and subjects used in GSS research, the examples show that in some contexts anonymity's influence can be dysfunctional.

Perhaps more relevant to research on GSS anonymity are studies of social loafing (Kerr & Bruun, 1981; Williams et al., 1981), which suggest that identified group members generally exert greater physical effort than those working anonymously. Weldon and her associates (Weldon & Mustari, 1988; Weldon, Mustari, & Brett, 1989) found that anonymity reduced cognitive effort in a parallel "cognitive loafing" paradigm. In these studies, identified group members were found to exert greater mental effort than those working anonymously.

These studies in social psychology show that anonymity can have detrimental effects on process and outcomes, in contrast to the general findings of studies of GSS anonymity. Despite the lack of published findings of a negative relationship between GSS anonymity and group outcomes, there are examples of potential negative effects of anonymity in GSS environments.

Example 1: an explosion of caustic comments in a group in an experimental investigation of GSS anonymity. In an experimental investigation published in *Management Science* (Connolly et al., 1990), the interaction within one experimental group exploded. The group experienced the electronic equivalent of a heated argument in a meeting, with an explosion in caustic remarks within the group. In this experiment, Connolly et al. (1990) used a 2×2 factorial design, crossing anonymity (anonymous/identified) with evaluative tone (critical/supportive), with 72 upper division business students satisfying a course requirement for experimental participation serving as subjects.

The study called for 24 4-person groups. Of the 6 groups in the anonymous, supportive condition, Connolly et al. (1990) discussed the problematic group:

One group, in the anonymous/supportive condition, was dropped from the analysis. In this group, the members became infuriated with the consistently positive but nonsubstantive comments of the confederate, and spent much of their time in taunting and abusing him, rather than generating substantive output. The members of this group, unlike other subjects in our sample, became impatient and would not tolerate the apparent loafing of the confederate. There is no evidence that subjects suspected deception, but the pattern of comments generated by this group was so atypical that we judged it best to drop them from the analysis. (p. 696)

This problematic group demonstrates the potential for anonymity to allow the group process to degenerate into overly caustic interaction, reminiscent of the phenomenon of “flaming” discussed in studies of electronic mail (Siegel, Dubrovsky, Kiesler, & McGuire, 1986).

Example 2: a degeneration into silliness in a group in an experimental investigation of GSS interaction frequency. Another example of the potential negative implications of anonymous GSS interaction comes from an experimental investigation of interaction frequency with a GSS (Jessup, Egbert, & Connolly, 1991). In this study, researchers tested for the effects of interaction frequency on group process and outcomes. Interaction frequency was defined as the length of time subjects worked alone generating ideas and the frequency at which group members then exchanged files with other group members. The researchers tested for three levels of interaction—no exchange of files, a 2-minute exchange, and a 10-minute exchange—with 70 business students satisfying a course requirement for experimental participation serving as subjects. The study called for 10 3-person groups in each of the exchange conditions plus 10 subjects working alone, which served as a control. In this study, all subjects worked anonymously.

Compared to the Connolly et al. (1990) experiment described above, in which the problematic group members became overly caustic with each other, the group in the Jessup and Connolly (1991) experiment degenerated into complete silliness and generated useless comments. At first, one group member contributed silly comments that were off the topic. Eventually, a second group member engaged in the frivolous commentary. The third group member pleaded that the other two group members return to the task but then gave in, joining in the frivolity. As did the researchers in the first experiment discussed above, the researchers in this experiment decided to throw out the data from this problem group. An interesting point is that, amid the silliness within this group, some comments were caustic and were directed not at each other (group members) but rather at issues external to the group (e.g., at administrative and policy issues within the College of Business).

Example 3: a distracting argument in a group in an experimental investigation of GSS anonymity and group leadership. A third example of the poten-

tial negative implications of anonymous GSS interaction comes from a pilot study for an experimental investigation of anonymity and leadership with a GSS (George et al., 1990). In this study, researchers tested for the effects of the use of a GSS anonymous interaction and leadership (either assigned in the group or not assigned). As in the previous examples, in this study the researchers used as subjects business students satisfying a course requirement for experimental participation. The design called for five 6-person groups in each cell.

One of these 6-person groups in the pilot for this investigation—within the condition in which groups used the GSS, were anonymous, and had no assigned leader—experienced problems that are very similar to the problems experienced by the groups in the first and second examples described above. The problematic subject group in this third example engaged in a heated electronic debate over alternatives to the problem at hand and simultaneously degenerated into silliness. A review of the group's transcript reveals repeated incidents of flaming toward the end of the session. For example, in the four (nonsequential) comments reproduced below, the group members used caps and exclamation points to make their points. Finally, at the end of the session, one of the group members, exasperated, made the fourth comment reproduced below.

WHAT ABOUT SIMPSON'S TERRITORY . . . !!!

—split the territories!!!!!!!!!!!! it is the only way to make everyone happy

SPLITTING THE TERRITORY WILL NOT SOLVE THE PROBLEM

BECAUSE THEY BOTH WANT THE TERRITORY TO THEIR OWN.

I VOTE SPLIT!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! SPLIT, SPLIT, SPLIT!!!

Surprisingly, whereas the transcripts suggest that the group members were engaged in emphatic, fruitless disagreement, the researchers' lab notes reveal a different story. Although the seemingly fierce electronic exchange was happening, the group's verbal and nonverbal interaction was quite different. The group was reported as "loud and rowdy," with group members frequently "laughing." In any event, the group was not as task oriented as were other groups in the pilot and the actual experiment.

Example 4: contradictory results for GSS anonymity in a dissertation on the effects of GSS anonymity on group process and outcome. A fourth example of the potential detrimental effects of GSS anonymity comes from a dissertation (Jessup, 1989; reported in part in Jessup & Connolly, 1990) on the effects of GSS anonymity on idea generation. Undergraduate business students, fulfilling a course requirement, were randomly assigned to one of four conditions in a 2 (identifiability) $\times$ 2 (shared responsibility) design. Cell sizes of 17, 17, 18, and 19 were achieved. Subjects were asked to work on an idea-generation task using microcomputers and were allowed to leave whenever they wished.

Jessup (1989) concluded that anonymous subjects "loafed." Identified subjects were apparently compelled to stay longer and type more than did subjects who were anonymous. Anonymous subjects expended much less effort, leaving earlier and typing less than did identified subjects. Jessup did not use a true GSS (subjects worked independently on personal computers under the impression that their ideas would later be pooled with those of other group members). However, the setting closely approximated a GSS, and the study certainly helps us to understand motivation in a context where individuals work together anonymously via computers.

These four examples are striking and point to the potential for the negative effects of GSS anonymity. In each of the four cases, the subjects were anonymous to each other and to the experimenter. The 3 groups discussed above in the first three examples—3 out of the approximately 100 groups observed across the three experiments—deviated markedly in process and outcome from the other groups in the studies. In addition, in the fourth experiment described, the results suggest that anonymous subjects loafed, working less than did identified subjects. These examples suggest that the prevailing beliefs of the effects of GSS anonymity may be unnecessarily unidimensional.

Theory

The examples described above are perplexing. We do not and cannot know exactly what these subjects were thinking nor why they did the things they did. However, we must explain these events, or at least develop a theory of GSS anonymity that explains these events, if we are to truly understand anonymous GSS interaction. Why and how did these contradictory events happen? Why is anonymity's influence sometimes positive and sometimes negative?

We suspect that the first step in answering these questions lies not solely in the technology—not in the GSS per se—but in the subjects. What were the subjects thinking and doing? To begin to answer this question, we must look into the inner state of the individual and the combined forces that compel that person to act. What is this inner state, and what are the external forces that shape this individual's propensity to act? This is as much, if not more, about motivation and about the psychology of GSS anonymity than it is about technology and management information systems. We begin to answer these questions by discussing the issues in pieces: those issues that are part of the individual's external environment, those issues internal to the individual, outcomes, and the role of anonymity.

Piece 1: external forces. What forces serve to promote or inhibit an individual? Small group research and organizational behavior research on moti-

vational processes offer rich literature from which to begin answering this question. Research suggests that external forces that influence a group member can be categorized into three levels: components of the group, the job, and the organization.

First, there are a number of ways that the group members influence each other. Beginning with the work of Zajonc (1965) and Cottrell (1972), social facilitation research shows that the presence of others, whether part of the group or not, influences an individual's behavior. Similarly, Asch (1952) began a line of research that shows that there is strong conformity to norms within groups. Seashore (1954), Lott and Lott (1961), and others showed how group cohesiveness can lead to social influence and group member conformity. Janis (1972) showed how the group's desire for self-preservation can have dysfunctional effects on member behavior. Connolly et al. (1990) suggested that in a GSS setting multiple social forces serve potentially to enhance or stifle an individual. These forces include the encouragement and stimulation group members provide (or the lack of it), pressures to conform, or even hostile evaluations of contributions (see Connolly et al., 1990, for a complete discussion).

At the level of the individual's job, several forces will shape the individual's propensity to act. For example, Hackman and Oldham (1975, 1976) identified core dimensions of the job that affect an individual's psychological state. These dimensions include skill variety, task identity, task significance, autonomy, and feedback. Similarly, Steers and Porter (1987) identified several variables affecting individuals in organizational settings. Among these are the extent to which the job provides mechanisms for intrinsic rewards, autonomy, direct performance feedback, and variety in tasks.

At the organizational level, forces that will affect an individual include characteristics of the immediate work environment, such as peers and supervisors, and organizational actions, such as reward practices and organizational climate (Steers & Porter, 1987). These characteristics of the organization can carry over to the work that individuals perform in a GSS setting. For example, the pressure to work hard or perform well is likely to exist in and out of the GSS setting. Similarly, a reward system that rewards for hard work or good ideas, or that administers sanctions for poor work, is likely to operate in the GSS setting as well.

Piece 2: internal processes. What influence do these external forces have on an individual's psychological state? The external forces discussed above help to shape and continually influence an individual and his or her propensity to act and the level and nature of the individual's actions. Hackman and Oldham (1975, 1976) suggest that these forces influence critical psychological states that are important in the organizational motivational process. These

states include the extent to which individuals experience meaningfulness in their work, responsibility for outcomes of their work, have knowledge of the actual results of the work activities, and feel the need for personal and professional growth.

Steers and Porter (1987) suggest a similar set of variables affecting the motivational process in organizational settings. Relevant individual characteristics include the individual's interests; attitudes toward self, job, and aspects of the work situation; and the individual's needs for security, social relationships, and achievement.

Research on creativity supports the argument that external forces (aspects of task) are influential. Creativity research suggests that people are most creative when they are intrinsically motivated; that is, people will be most creative when they feel motivated primarily by the interest, enjoyment, satisfaction, and challenge of the work itself (Amabile, 1983, 1988; Hennessey & Amabile, 1988). Shalley (1989) proposed that thinking creatively requires a great deal of mental effort. To be creative, individuals thus have to be inherently interested in the task and motivated to find a solution (Barron, 1965; Steiner, 1965). In a GSS setting, Jessup (1989) reasoned that the individual's interest in and commitment to the task will influence the outcomes achieved through GSS interaction.

Piece 3: outcomes. What are the relevant outcomes and how are they influenced? Relevant personal and work outcomes include an individual's work performance, satisfaction, absenteeism, and turnover. In a GSS setting, outcomes might include, for example, the extent of effort that group members put forth, the quality of a decision made by the group, the group members' perceptions of the quality of their outputs, the extent to which a group was able to communicate effectively and efficiently, and the level of group member satisfaction with the process and output of their GSS-supported interaction. The forces described above influence how the individual will behave, how the group members will interact, and whether the outcomes described here will be either functional or dysfunctional for the group and the organization.

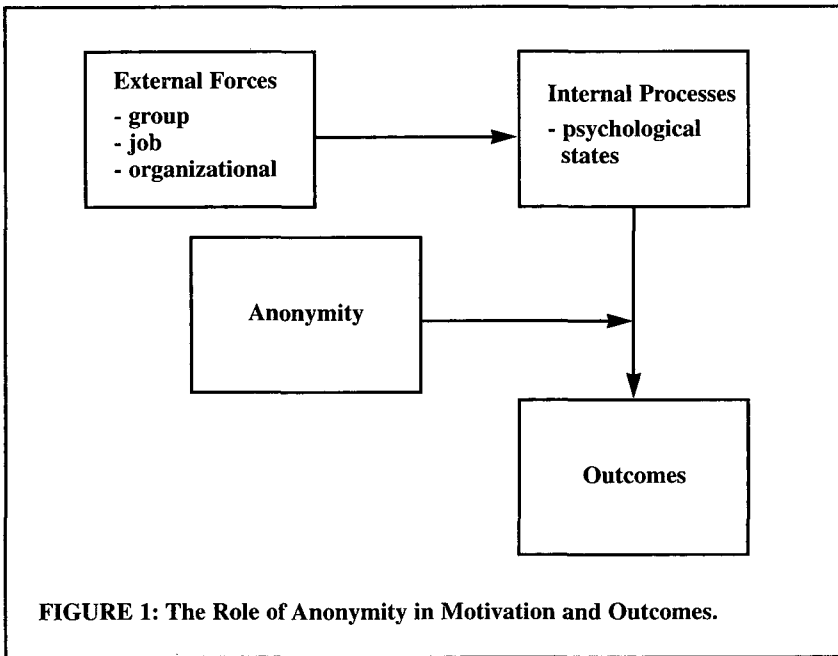
To better explain this, we describe as an example the potential effects of the degree of interdependence among groups' members and the extent to which social controls operate within or on the group. The degree of interdependence among group members, or the extent to which members must rely on each other to complete their work, is determined by the nature of the work that they perform together. The various social controls operating in and on the group may originate from within the group or from outside of the group and tend to serve to moderate member behavior. For example, social controls may result in conformity, performance norms, or groupthink. Interdependence and social

control are critical factors in determining how the group members will interact and what kinds of outcomes they will achieve.

We believe that interdependence and social controls act independently of each other. Interdependence can be conceptualized for simplicity as being bipolar, either low or high. Social controls can be either absent or present and when present can be either productive or not. Conceptually, one can think of this as a 2×3 matrix of possible outcomes. If a group is highly interdependent and productive social controls are present, then very positive outcomes are likely to occur. If a group is minimally interdependent and social controls are absent, then negative outcomes are likely to occur. If interdependence is high and social controls are absent, then outcomes are likely to be mixed. If interdependence is high and social controls are present and not productive, the group may well view the outcomes as positive, although outsiders may view the outcomes as negative. If the group lacks interdependence but there are high levels of productive social control, then the outcomes are likely to be positive. If the group lacks interdependence and there are high levels of unproductive social control, then the outcomes are likely to be very negative. Interdependence and social control are but two of many forces that influence how group members behave, how they interact with each other, and whether their outcomes will be functional or dysfunctional for the group and the organization.¹

Piece 4: the role of anonymity. What role does GSS anonymity play in GSS interaction? As Figure 1 suggests, the role of anonymity is perhaps best thought of as mediator. Anonymity mediates the relationship between the internal psychological processes, the individual's thoughts and feelings, and the actions the individual takes, which in turn shape outcomes for the individual and the group. Anonymity is thus not a phenomenon that directly influences the individual; rather, anonymity is a contextual variable that may influence the level and nature of the individual's behavior.

The question, then, is what role does GSS anonymity play in influencing group process and outcomes? The answer depends on the context, the forces that serve to influence individuals and shape their propensity to act. Are the individuals committed to the task? Do they believe that the task and their job are important and that their contributions are useful and necessary? Do they believe that they need to work with the other group members to complete the task well? Is there pressure, either from other group members or from outside the group, to work hard and perform well? These are the types of conditions that are likely to lead to positive outcomes. If, on the other hand, these conditions are not present and the group is able to interact with each other anonymously, then the outcomes are likely to be negative. For example, if the individual is not committed to the task, there is no reward for contributing, and



there are no social controls against loafing, then anonymity's influence is likely to be negative or dysfunctional.

Anonymity plays a role in one other way. The group may meet the conditions described above, but the group members may feel too uncomfortable, or even threatened, to speak out and to contribute to the group. Perhaps the task or issues under consideration are too sensitive to speak out on or the individual's ideas and opinions are not shared by others in the group. Perhaps someone else in the group is overly dominant and openly critical of the ideas and opinions of others. It may also be that speaking out against, or not being supportive of, the ideas of someone in authority will incur that person's wrath or worse. If these types of conditions exist, then group member behavior is likely to be inhibited, creativity and diversity of contributions are likely to be stifled, and the group is not as likely to be as productive as they might have been otherwise. If these conditions exist and the group is able to interact anonymously, then the group member behavior and contributions are likely to be less constrained, exchanges are likely to be more candid and open, and, consequently, outcomes are likely to be more positive. Under these conditions, anonymity's influence will likely be strong and positive and functional for the individual and the group.

Viewing anonymity this way, we can now understand the contradictory

findings for anonymity between the GSS and the social/cognitive loafing paradigms (see Jessup, 1989, for a more complete discussion). We suggest that in research on social and cognitive loafing, assumptions about task motivation are very distinct. The assumption is that individuals will loaf if given the chance. Loafing research thus attempts to identify situations (e.g., anonymous interaction) in which individuals will reduce their effort. We suggest that the perspective of (some) GSS researchers is fundamentally different. These researchers assume that individuals anxiously await participation. GSS researchers thus search for factors (e.g., anonymity) that foster interaction.

These are paradigmatic differences—differences in assumptions and theory—that also drive two very different sets of methodological choices (e.g., selection of experimental task and incentives). On one hand, researchers in the loafing paradigm choose complex, repetitive, quantitative tasks (e.g., systematically evaluating student job descriptions). On the other hand, GSS researchers choose relevant, straightforward brainstorming tasks (e.g., generating and evaluating solutions to the campus parking problem). In each case, anonymity serves as the shield, with different outcomes depending on the setting.

We argue, then, that within the GSS paradigm the results of studies on anonymity (whether the results be positive, neutral, or negative) are not a completely accurate reflection of the effects of anonymity, *per se*, but rather are a function of (a) the context in which anonymity was observed and (b) the subsequent motivational processes.

Implications

We believe that there are several implications of our model and related arguments for GSS research and practice. For researchers of GSS anonymity, or of any other context where human interaction is mediated electronically, the implications are clear. Researchers studying anonymity must be more sensitive to context. Researchers of GSS anonymity must somehow incorporate external forces into their model, either as an independent variable or as a control or constant. For example, researchers might consciously manipulate elements of context to better understand the role that anonymity plays. The researcher might manipulate the subjects' commitment to the task, the sensitivity of the task, the evaluation apprehension of the subjects, the social controls on member behavior, the rewards on individual and group performance, or any other contextual variable to better understand the mediating effects of GSS anonymity under those contextual conditions. Studies such as this would help us to discover under what conditions GSS anonymity will conceal the reduced effort of a loafer, or shield the guarded effort of an eager participant, or do nothing at all.

The four examples discussed here suggest that in settings where extrinsic rewards for participating or performing well are low, intrinsic motivation induced by the task is low, or if the maturity of the group members is low, anonymity's influence may be negative and detrimental. Alternatively, in settings where the extrinsic rewards for participation or performance are high or the intrinsic motivation induced by the task is high but where individuals feel inhibited in expressing their opinions or in offering their ideas the payoff of anonymity may be high.

There are also implications for the broader study of GSS. In all phases of GSS research, whether they be studies of group size, interaction frequency, structure, parallelism, proximity, or influence, we cannot ignore context. We may find that these other variables (e.g., elements of the organizational culture and reward system, group norms, standard operating procedures, attitudes toward the use of teams in the organization, and so on) are themselves simply mediators, or we may find that they are indeed part of the complex web of constructs that interact and make up the context in which GSS participants do their work.

Thinking in terms of context puts experimental laboratory research in a better light. Not only do the four examples described here testify to the difficulty of conducting experimental laboratory research with student subjects, but they suggest that we might do better to think of this research, where subjects are given tasks and roles, as but one of many useful contexts worth investigating. Experimental laboratory settings are thus not merely artificial, with little or no semblance of the "real" world; rather, the laboratory is a contextual setting, with a particular set of participant motivations (among other aspects), that approximates very well some settings and is very much worth exploring (see Swieringa & Weick, 1982; and DeSanctis, 1989, for similar arguments). Additionally, our difficulty thus far in understanding subject motivation in the laboratory setting, under relatively controlled situations, argues all the more for the importance of contextual factors in the relatively uncontrolled field setting.

For the practitioner or user of GSS, of groupware applications like Lotus Notes, or of other electronic communication systems such as electronic mail, the implications are more tentative but the implications are nonetheless important. We cannot simply think of anonymity as an entity that is good or bad in and of itself. The research suggests that our use of anonymity should depend on the context in which it will be used. For example, it may not be wise, in some situations, to use anonymity in GSS-supported idea generation for individuals who work physically alone, or for individuals whose work will later be pooled with the work of others, or for less interesting, less important, or disdainful tasks. Conversely, it may be wise to use anonymity for GSS-supported groups that experience a high level of creativity-stifling factors such as criticism or ridicule.

At an even broader level, the implication is that for GSS research, design, and use, we should take very seriously our unexpected results. They may be as beneficial to us as those results we expect.

NOTE

1. We thank an anonymous reviewer for his or her helpful suggestions for strengthening our discussion of outcomes and the relationships among components of the model.

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Book Reviews

Miller, D. (1997). *Changing the Past: Creating Future Futures From Past Futures Through Psychodrama*. Redlands: Beacon Book Remainders, Monograph No. 6, 1997. 106 pp. (softcover); \$10.00.

The past as we know it is not an immutable structure. It is a reconstruction in memory that can borrow from other sources to the point of confabulation. Furthermore, the reconstructed past usually serves to maintain a personal identity and to perpetuate a selected life script. Future choices are affected by our beliefs about our past experiences and often serve to reinforce them. Armed with this knowledge, the psychodramatist can re-enact past difficulties to a beneficial resolution. By changing the protagonists' views of their past experience, the psychodramatist positively affects future choices and experiences. This is the thesis of Donnell Miller's monograph *Changing the Past: Creating Future Futures From Past Futures Through Psychodrama*. Miller blends theoretical constructs with reports of actual psychodrama sessions to show how working through past conflict can change present choices, and consequently, future futures.

For the psychodrama novice who is used to a linear style of writing in which connections between concepts and each other as well as the overall theory are explicit, *Changing the Past* will pose quite a challenge. Miller's writing is often difficult to understand, particularly in the early chapters on theoretical concepts. Miller introduces concepts without making clear the relationship between that concept and the one preceding it or how it relates to his thesis. It is left to the reader to find where those connections lie. The book is clearly intended for practitioners or those who have had experience with psychodrama.

In the preface, Miller contends that the field of psychology has been unsuccessful in predicting behavior through the use of traits. He suggests that psychology has not, among other things, adequately taken into consideration the individual's perception of reinforcement value and expectations for different situations. However, Miller does not mention Rotter's social learning theory (1982), which deals specifically with the role of expectancies and reinforcement value on behavior. Miller then concludes the preface with a brief

description of psychodrama and how it enables those who often feel out of control to have control over their own outcome.

Changing the Past consists of 10 chapters. In the first 3 chapters, the author discusses a number of concepts related to psychodrama. The chapter, "Living Through Time," concerns how our use of words affects our thinking about people. Miller suggests that the use of nouns and adjectives (what the author calls "entity thinking") hampers our ability to understand the changing nature of human behavior. Miller proposes a system of identifying human interactions based on verbs, which he calls "plots." Each plot involves a wish, a fear, and a secondary gain that helps sustain the plot. For example, one might be the verb *to rescue*. When we attempt to rescue in an interaction, we are hoping to be the hero, while we fear failing by not pushing ourselves hard enough. Even if we do fail, we expect to receive the secondary gain of feeling we did more than others. The plots correspond to the roles we play in psychodrama and in life.

In the 2nd chapter, Miller discusses the concept of time and advocates changing from the view of the client's past as fixed to one in which all memories are active constructions that affect and are affected by our views of ourselves. Through psychodramatic enactment, the client has the unique opportunity to go back into the past and negotiate a new role, thus changing the past to make it more congruent with what the client wants.

Miller points out the difference between the persona we take on in our interactions with others (Moreno's "tele") and the part of our selves that decides which role or persona will be presented (Moreno's "auto"). How do memory and identity interact? As Miller explains:

The self is the conserve in which we are maximally invested. Various selves of the past may function as frozen dynamisms, captured as if they were entities. I may identify with my father, but the father I identify with may not be the father as he is today. I may have a stake in denying the difference. What do I gain through glossing over the difference between then and now? This supports angry or fearful current attitudes, justified by past perceptions of past relationships. May we borrow from the THEN to rewrite NOW, or from the NOW to rewrite THEN? In psychodrama we create a new symbol to place alongside the old, which may come to displace the old, when no one's looking. (p. 27)

The last 7 chapters focus on the application of psychodramatic principles. In Chapter 5, concepts basic to the psychodrama are reviewed for the novice psychodramatist. The remainder of the monograph contains examples of how psychodrama is used to deal with a number of problems, including incest, post-traumatic stress disorder, psychosis, and bereavement. Most of the examples are reports of actual psychodramas with Miller as director. The most effective is an example, a hypothetical psychodrama with a person suffering from PTSD, based on Susan Baur's *Dinosaur Man* (1991). A particularly

insightful interaction between the protagonist and the director exemplifies the message of Miller's monograph. After re-creating a scene in which Ivan was able to say goodbye to a childhood pet that had passed away, Ivan exclaimed, "Why do I feel better? That is not the way it happened." To which the director replied, "Not then, but this is the way it happens now . . ." (p. 72).

Changing the Past has flaws. The organization and writing style of the early chapters are often unclear, leaving the reader to assume how the different concepts are meant to be related. Furthermore, there are a number of superficial errors (e.g., misspellings, random font changes, and words hyphenated when not at the end of a sentence) that should have been corrected before publication. Nonetheless, the advanced psychodrama student will find the book helpful. The examples are clear, concise, and varied enough to give the reader a sense of how psychodrama can be enlisted to work with a diversity of people and problems. The examples help the reader see how the roles people assume in life are highlighted and worked through by a psychodrama. The examples help make *Changing the Past, Creating Future Futures From Past Futures Through Psychodrama* a valuable resource for those involved in psychodrama.

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MICHAEL McCLOSKEY
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Hoey, B. (1997). *Who Calls the Tune: A Psychodramatic Approach to Child Therapy*. New York: Routledge. 146 pages, paperback.

This is a lovely book, full of surprises, and at times deeply touching. The author, a play therapist and psychodramatist in Victoria, Australia, weaves together theory and practice so that her book presents a most articulate description of how psychodrama may best be integrated into a multimodal approach to child psychotherapy. Her examples mainly describe one-to-one forms of treatment with children ranging in age from 3 to 15. Sometimes family therapy is used, with one or both parents or with a sibling included in the

session. She is especially adept at the use of puppets, and she keeps a rich collection of them.

Ms. Hoey's writing is clear, articulate, and appropriately dramatic. The chief value of the book for the psychodramatist is the way the author considers and addresses the challenge of using a psychodramatic approach with children. Her flexibility, creativity, and wisdom in the use of therapy are more important than any techniques.

I was impressed by the author's general scholarship. She draws on a wide range of contemporary writers and researchers in child development, child therapy, and basic psychodynamic theory. This is the direction in which psychodrama needs to go, to integrate and go beyond Moreno, informed by the best elements of his vision but not constrained by the obligation to remain within the confines of his limitations. It is necessary to honor and critically examine the "cultural conserve" of Moreno's writings. Ms. Hoey does that with tact and grace.

The author begins with a fairly rich theoretical review of some of the themes involved in supporting and using an action-oriented approach to child therapy. She offers some substantially new integrations with other approaches, which deepen the theoretical foundations of psychodrama. Hoey discusses therapeutic metaphors, Jung's concepts of archetypal images, Bettelheim's insights on fairy tales, and other sources that enrich our matrix of associations.

In the second part of the book, Hoey offers 10 extended vignettes of her work with various kinds of children and their problems. A number of techniques are presented that complement psychodramatic methods and are stimulating to read about. Hoey describes her own thoughts and her rationale for many of her interventions, which increases the value of the case descriptions.

In addition to a creative use of puppets, the author weaves together the use of fabrics, therapeutic story telling, ordinary play therapy, and other techniques. She allows herself to follow at times, with extraordinary patience, and at other times, she boldly leads.

My criticisms are very slight. I wished she knew more about—or alluded more to—books in psychodrama other than Moreno's. She does acknowledge Max Clayton, the most influential trainer in the Australia–New Zealand area, who wrote the interesting foreword.

I recommend the book for play therapists and psychodramatists who work with children. Drama therapists with a like interest would also find it helpful.

ADAM BLATNER, MD
Georgetown, Texas

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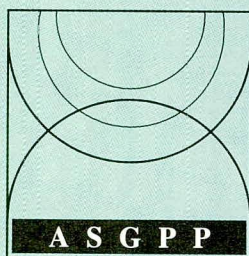
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