

## 5. Brain Damage and Humor: Not a Laughing Matter

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In this article I will discuss a topic, the effects of brain damage on the appreciation of humor, that in my view is far from trivial. The meaning of humor and laughter has been a preoccupation of philosophers and social scientists since antiquity, but most of the rich literature that exists on attempts to understand or explain humor has focused on social interactive or emotional variables. Humor has not attracted much serious attention from empirical scientists. That is unfortunate, because the social functions of humor are widely recognized, and humor and laughter have been characterized as "one of life's most subtle and sublime forms of communication" (LaPointe, Mowrer, & Case, 1990). This unique communicative behavior calls for closer participation than do most other forms of group behavior (Coser, 1960). The use of humor serves as an invitation to those who are present to join in laughter. It highlights or creates group or dyad consensus at the same time that it permits all to withdraw together, for a moment, from the seriousness of the concerns that face them (Coser, 1960).

Theories abound on the meaning and bases of humor. In addition to incongruity, humor is alleged to spring from relief, from a sense of well-being, or in some cases from aggression. Immanuel Kant has called laughter an "affectation arising from the sudden transformation of a strained expectation into nothing" (Black, 1984, p. 2995).

Laughter is a particularly human trait, and it has been stated that animals do not laugh—with the exception of the hyena. Across humans, humor and laughter are thought to be culturally universal. Aborigines, Polynesians, the Chippewa, and even Norwegians appear to enjoy the blessing of humor. Sigmund Freud, in addition to his wonderful contributions to aphasia and dream analysis and his remarkable insight into cigar symbolism, suggested that humor is "the loftiest of the mechanisms available to [humans] for adaptation to suffering" (Freud, 1928).

However, when stroke, disease, or injury damages the brain, the loss of linguistic or emotional skills can alter a person's ability to enjoy this most

subtle and sublime form of communication—humor. This great loss has not been afforded much attention in the collected works of the Clinical Aphasiology Conference during the last 20 years. In this article, I shall attempt to summarize some of what we do know about brain damage and loss of this gift.

## RIGHT-HEMISPHERE DAMAGE AND HUMOR

As many realize, functional language can remain intact even with a modest amount of right-hemisphere damage. The literature is abundant, however, with observations of other behavioral changes, including an "atypical sense of humor" after right-brain damage (Gainotti, 1973; Gardner, 1975; Weinstein & Kahn, 1955). According to Myers and Mackisack (1990), one of the hallmarks of the communication of those who are right hemisphere damaged is failure to appreciate implicit or implied meanings, which of course are replete with humor. These authors also detail the extralinguistic deficits associated with right brain damage, including difficulty in integration and interpretation, two skills upon which humor is very dependent. Therefore, deficits in interpreting the situational, facial, and prosodic cues that signal the emotional content of a message can sabotage even some of the most overt attempts at humor.

In one of the few careful attempts at empirical humor research with right-brain-damaged subjects, Brownell, Michel, Powelson, and Gardner (1983) studied two groups of subjects, 12 with right brain damage and 12 with no brain damage. Sixteen jokes were presented to all 24 subjects. They were presented in random order with the punch line missing. Each subject was required to select the appropriate punch line from four choices presented graphically. The choices included (a) a correct and appropriate one, (b) a non sequitur ending, (c) a straightforward neutral ending, and (d) a straightforward sad ending.

The results of this study revealed that not only were right-brain-damaged subjects markedly impaired in selecting the correct punch lines, but they were significantly fooled by or attracted to the non sequitur endings. Brownell and colleagues concluded, as have Myers and Mackisack (1990), that right-brain-damaged subjects have difficulty integrating content across parts of a narrative. Whether the poorer performance of the right-brain-damaged subjects is the result of cohesion deficit across a narrative or results instead from the well-known tendency of these individuals to respond abnormally to emotional-affective material is an issue that could use a good deal more research.

As Foldi, Cicone, and Gardner (1983) have summarized,

Right hemisphere patients seem to be characterized by an inappropriate sense of humor; they seem oblivious to the attitudes of other individuals and they have a well-documented penchant for making inappropriate jokes, and for doing so in inappropriate contexts. (p. 77)

This has led to a reputation of those with right-hemisphere damage as exhibiting what has been called "gallows humor," or inordinate jocularity at the misfortunes of others. Observing someone slipping on a banana peel or falling down stairs is alleged to elicit big laughs from this population. Watching the Three Stooges punch, poke, hammer, and twist the ears off one another appears to be an ideal evening's entertainment for those who delight in gallows humor.

## **LEFT-HEMISPHERE DAMAGE**

Left-brain-damaged people, on the other hand, seem to be somewhat more predictable in their responses to humor. There are two good reasons to expect that moderately and severely impaired left-hemisphere-damaged people will have some difficulty with humor: (a) a majority of left-hemisphere-damaged people suffer from aphasia and (b) much humor requires recognition of associations among various aspects of language. The interaction of aphasia and humor has been studied with some degree of scientific rigor only relatively recently, by such researchers as Gardner, Ling, Flamm, and Silverman (1975); Hailparn (1980); and Weiler-Weiner (1981). In another study of two aphasic subjects by Potter and Goodman (1983), the use of tape-recorded laughter was investigated as a therapy facilitator on tasks of manual expression of object function and correct production of plosive phonemes. A positive effect was reported by these authors in a single-subject A-B-A experiment.

Several of these studies have reported modality-specific deficits, characteristic of aphasia, that affected the understanding of visually and aurally presented humorous material.

## **WATCHING THE CENTIPEDE'S LEGS: DISSECTING HUMOR**

A frequent warning in the popular humor literature is that the phenomenon cannot be studied or dissected without the risk of destroying its very nature. Much like the fear that if the centipede were to watch its legs to see how it is able to walk, it would end up writhing and disoriented,

the warning exists that one cannot dissect humor. Obviously, we do not agree with this view. While some of the spontaneity and impact of humor may dissolve, the benefits include the potential for greater understanding and explanation.

Many researchers in aphasia have suggested that comprehension of a joke is a function of the type of linguistic ambiguity upon which the humor is based. We conducted some research on this with aphasic subjects and the results were subsequently reported at the World Humor Conference and then in the publication *Cognitive Rehabilitation* by LaPointe, Katz, and Kraemer (1985). We studied 6 fluent and 6 nonfluent aphasic subjects and 12 normal subjects on reliably measured mirth and funniness ratings of 20 jokes with punch lines that contained lexical or semantic ambiguity. In addition, a secondary purpose was to determine if aphasic subjects reacted appropriately to lexical elements of humor or merely responded with a "humor set" even to items with neutral or buffer punch lines. Some studies conducted with people with mental retardation suggest that when subjects are told, "This is going to be funny," they will laugh when presented with either a joke or a nonfunny, neutral punch line. As examples, a real joke with true lexical ambiguity in its punch line might be, "My wife [or husband] is a light eater. As soon as it gets light she [he] starts eating." An example of a neutral or buffer punch line might be, "Did you take a bath this morning? No, I took a shower."

All 20 of these jokes were rehearsed and audiotaped by a professional actor and a speech-language pathologist with some experience in amateur theater and joke telling, and were then presented to each subject individually. Subjects' reactions to each joke were videotaped and later evaluated on a 5-point scale ranging from 1 (blank or quizzical expression) to 5 (open-mouthed laughter). Statistical analysis of the results revealed that the aphasic subjects had significantly lower mirth and funniness scores than did the control group. In addition, aphasic and normal subjects showed no significant differences in mirth and funniness responses for the buffer items. That is, although aphasic subjects demonstrated reduced responses to the jokes, they responded appropriately to the buffer punch lines. If it wasn't funny, they didn't laugh. No differences were found between fluent and nonfluent subjects. Although the study was quite a bit more detailed than reported here, essentially we drew the following conclusions: First, aphasic subjects do not respond to humor to the same degree as nonaphasic subjects. At the same time, these subjects are not humorless, and humor geared to their level of linguistic ability can be a vital part of interaction with them. Further, the more we can discover about the precise nature of how aphasia reduces the ability to appreciate the joy of humor, the more likely we will be to develop strategies that circumvent or compensate for this loss.

Another research tack that we have taken on this topic is an in-depth look at that "strange and complicated behavior," human laughter. My colleagues Donald Mowrer and James Case and I at Arizona State University have conducted a series of experiments on this unique form of communication and, relating more to the interests of the readers of this publication, lately we have described age-related changes across several acoustic parameters of human laughter.

We recently described acoustic correlates of laughter in young adults in the *Journal of Nonverbal Behavior* (Mowrer, LaPointe, & Case, 1987) and reported our work on age-related changes in the *International Journal of Aging and Human Development* (LaPointe, Mowrer, & Case, 1990).

Without going into all the methodological details, we extracted spontaneous laughs from subjects who watched a Bill Cosby videotape and analyzed several acoustic parameters such as Initiation of Laugh Fundamental Frequency, Mean Laugh Fundamental Frequency, Duration of Laugh Response, Number of Laugh Bursts, and Speech Fundamental Frequency. These parameters were analyzed in our speech and voice physiology laboratory using microcomputer-based Visipitch and Micro-Speech Lab signal analysis equipment.

Significant differences between 20-year-old and 70-year-old males were found in (a) Initiation of Laugh Fundamental Frequency (older subjects were significantly higher, 163.70 Hz vs. 134.31 Hz for the younger subjects), (b) Mean Laugh Fundamental Frequency (older subjects, 153.62 Hz vs. 128.02 Hz for younger subjects), and Peak Laugh Fundamental Frequency (older subjects, 191.01 Hz vs. 300.04 Hz for younger subjects). These data indicate that younger subjects appear to use a much larger dynamic range of laugh fundamental frequency than do older subjects. Through these studies, which are continuing across a range of demographic and cultural variables, we hope to build a firm foundation for a better understanding of this complicated yet universal aspect of human behavior (LaPointe, Mowrer, & Case, 1990).

## REPORTS FROM THE CLINICS: TROUBLESOME PUNS

The observation that aphasic individuals have difficulty with the lexical ambiguity in humor is most evident in those forms of humor that depend heavily on subtle unexpectedness in word meanings. I recently received correspondence from a friend and colleague, Dr. James Shanks (1990), in which he described some of the problems in the appreciation of humor by an aphasic person he was seeing. This man brought into the clinic several examples of puns that were particularly difficult for him. Some of these eventually served as therapeutic targets, with the goal of restoring some

degree of appreciation of these fairly subtle linguistic nuances. Examples of puns that might be expected to be particularly confounding in the presence of aphasia, as provided by Dr. Shanks's patient, included double-meaning, cartoon treatments of the concepts *paradox*, *facial hare*, *sheep dip*, *wiring ahead for a reservation*, and *asphalt* (Rubens, 1982).

## PHILOSOPHY AND CLINICAL IMPLICATIONS

In conclusion, I would like to comment on some aspects of a philosophy of humor and the implications inherent in this topic to our clinical practices. As many of you may have discovered, in my view, humor is not so much a *sense* as it is a *value* that can be cultivated and exercised. "Laughter," someone once said, "is the shortest distance between two people." That can have profound clinical implications in instances where at least some of our progress can be attributed to the quality of the relationship that develops between the clinician and client.

The effects of humor have been popularized a great deal lately and its relationship to illness or, more accurately, to wellness, is coming under increasing scrutiny. Many scientists are becoming involved in the study of the links between mental and physical well-being. Norman Cousins (1979) was one of the first to popularize this concept, and his new book, *Head First: The Biology of Hope* (Cousins, 1990), documents recent advances in mind-body research. While anecdotes of seemingly miraculous recoveries may attract the public's attention, much of the legitimate research is being done quietly and out of sight in laboratories and clinics around the world where health care researchers are exploring the mind-body connection, separating myth from reality, intuition from fact, and belief from science. We will know a lot more several years from now about the link between mental and physical well-being, but for now, we can be sure that appropriate humor and laughter are good companions for all of us, especially those of us in the health professions who are bombarded every day with bad things happening to good people. We know how easy it is to become overwhelmed, overloaded, and burned out. Appropriate humor can be a remarkable antidote to these forces. In the immortal words of Alfred E. Newman, to be found in nearly any issue of a popular humor magazine, "He who laughs, lasts."

The effects of brain damage to either the right or left hemisphere can have a profound effect on the lives of those who suffer it. Although volumes of work have been written about the constellation of behavioral deficits that follow brain damage, relatively little effort has been directed to understanding the effects of this damage on the appreciation of one of life's most vital gifts and important forms of communication.

As R. Dale Liechty, a physician at the University of Colorado, has implied, carnival is as important to life as is work, and one is sterile without the other (Liechty, 1979).

Even in the face of all the negative emotions associated with insecurity and disease and loss and fear and syntactic entanglement, a small laser of humor and laughter can help eliminate these negative emotions, because the two states are incompatible and cannot coexist at precisely the same time. Sometimes a laugh, at least for the moment, can be everything. The connection between humor and brain damage is indeed not a laughing matter and deserves further study.

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