

COGNITION AND FIGURATIVE LANGUAGE

Edited by
Richard P. Honeck and Robert R. Hoffman

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FIGURATIVE LANGUAGE



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**RICHARD P. HONECK AND
ROBERT R. HOFFMAN**

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Edited by

RICHARD P. HONECK

University of Cincinnati

ROBERT R. HOFFMAN

University of Minnesota



1980

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Preface

This is a book about the psychology of figurative language. Of necessity, however, it is eclectic. Therefore, it should be of interest to professionals, graduate students, and advanced undergraduates in education, linguistics, philosophy, sociolinguistics, and others concerned with meaning and cognition.

The idea for this book arose in 1977 when it became clear to us that there was a pressing need to bring together the growing empirical efforts on the topic. In a sense, recognition of the theoretical importance of figurative language symbolizes the transition from the psycholinguistics of the 1960's to that of today, that is, from a linguistic semantics to a more comprehensive psychological semantics with a healthy respect for context, inference, world knowledge, and, above all, creative imagination. As befits today's mood, a number of conferences and symposia on figurative language have been held. Many of the book's contributors participated, for example, in symposia sponsored in 1977, 1978, and 1979 by the Experimental Psychology Division of the American Psychological Association. In fact, it was through various discussions at the 1977 meeting in San Francisco that our interest in this volume was finally catalyzed. The excitement and controversy generated at this symposium convinced us that experimental psychology had formally announced a lively courtship with figurative language. The Illinois conference on metaphor was convened shortly thereafter, and it rounded out the picture through its emphasis upon philosophical and linguistic inquiry. Hence, the outgrowth of this conference (Ortony, A. (Ed.) *Metaphor and Thought*, Cambridge, England: Cambridge University Press, 1979) and the present volume should complement one another.

In planning the book we had several goals. First, we wanted to provide a forum for those who have been innovators in the area in the 1970's (and some

before that). Second, we wanted these authors to provide an original essay, with a summary of their past research and, more importantly, a statement of their newest empirical and theoretical efforts. Third, by virtue of the first two points, we wanted the book to be tutorial on the issues, problems, questions, procedures, theoretical directions, etc., that define the area. Looking back on the project, we are pleased to have met all these goals. And while the authors focus on a few varieties of figurative language, their underlying concern is with cognition. So issues that appear to be unique to figurative language (e.g., How is metaphor identified? What makes for a good metaphor?) turn out to have more general significance in cognition. As rhetorician I. A. Richards put it, "*Thought* is metaphoric." Mainstream semantics in the form of network theory and similar "Literalist" approaches will not be found here. Rather, these approaches are challenged, even ignored, as the authors analyze the complexities and the creativity of figurative language. The organization of the volume reflects the more basic, general concerns with cognition—from historical and philosophical background, through problems of mental representation and semantic theory, to developmental trends, and to applications in problem solving.

There are a number of people who supported this project in one way or another. In Cincinnati, Richard Honeck would like to thank his colleagues and students for having created an atmosphere conducive to intellectual fulfillment. Special thanks are due Garnett Pugh for her efficiency in handling the brunt of the secretarial activities associated with this volume. Thanks for secretarial assistance are also due Karen Wall, Olive Beard, Margo Harris, and Ann Cavan. In Minneapolis, Robert Hoffman would like to thank his sponsor, James J. Jenkins, and Winifred Strange, Kathy Casey, Gerald Siegel, Herb Pick, Jr., and all the faculty, staff, and trainees at the Center for Research in Human Learning for providing material and spiritual support, and also for providing what have been perhaps the most stimulating and exciting years of his life. Thanks are also due Elizabeth Webster and Sue Salm for helping with the typing of manuscripts and Meg Sherburne for copying manuscripts and voluminous correspondence.

Editing this volume has been hard work, though a labor of love. We hope that it stimulates others and advances our knowledge.

Richard P. Honeck
Robert R. Hoffman

I HISTORICAL AND PHILOSOPHICAL PERSPECTIVES



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1 A Peacock Looks at its Legs: Cognitive Science and Figurative Language

Robert R. Hoffman
University of Minnesota

Richard P. Honeck
University of Cincinnati

INTRODUCTION

In the 1970s we have witnessed an expansion of the psychology of language to embrace new and more complex theories, new methods and new materials. There is a willingness to explore a broader range of the human potential to create, communicate, and think via the medium of language. It is fitting, therefore, that this is a book by Young Turks—Turks at least—and that their common fascination is with figurative language, since it so keenly illustrates and epitomizes the new wave of our times.

In this chapter we introduce the standard descriptions and terminology used to talk about figurative language and point out the main issues that are dealt with in the book. The chapter is organized according to some reasons why figurative language phenomena are important to theories of cognition and meaning. These reasons are discussed in an order corresponding to the major sections in the book.

THE VARIETIES OF FIGURATIVE EXPERIENCE

Before diving into the currents and undertows of methodology and theoretics, we want to do a quick freestyle: Research on figurative language is fun. It leads one to find all sorts of intriguing phenomena. Thus, we believe we should begin with a very broad conception of the subject matter. Some figurative language forms available for study are: poetry, irony, similes, idioms, addages, intentional nonsense or anomaly, and more. There are verbal beasts like the proverbs studied by Karl Bühler and the Wurzburg group, e.g., *The most glowing colors in which*

the virtues shine are the inventions of those who lack them—which seems torturous in its demand on both the concrete and the abstract levels. There are also verbal beauties like this quip by BBC commentator Ned Sherrin: *I prefer reading to sex because you can stop without losing your place*. There are “perverbs,” or perverted proverbs, e.g., *Time wounds all heels*. In puns there is a phonological clang, called “paranomasia,” that leads to a reconsideration of word meaning, as in *Bird cage for sale, cheep*. The homophony here involves lexical ambiguity. Groaning usually occurs as a response when the pun is “stretched.” In order to forge an ambiguous meaning, some sounds are shifted to, in effect, create a new homophone: *The theoreticians disgusted the new experiment*.

Figurative Language: Forms and Structures

One of the first things one notices about figures-of-speech, as rhetoricians call them, is that there are so many of them and they all have such unusual names. Corbett (1971) lists 17 different ways of constructing figures-of-speech so as to achieve special effects. For example, *One small step for man, one giant leap for mankind*, contains “polyptoton” in that it uses two words derived from the same root, it contains “ellipsis” in that the act to which the sentence refers is only implied, it contains “asyndeton” in that the conjunction between clauses is deliberately left out, and this list goes on.

In addition to the structural-syntactical aspects, rhetoricians have also distinguished different types of figurative meaning. In “metonymy” an attribute or cause is substituted for the whole as in *The crown made an announcement*. In “synechdoche” there is an exchange of superordinates or subordinates, e.g., *The hands were at work*. Metaphor can involve “hyperbole” or overstatement as in *His eloquence could split rocks*, and it can involve “litote” or understatement as in *Frank Sinatra is not the slow-burn type*. In “oxymoron” the use of contradictory or anomalous word combinations appear, as in *sweet pain* and *thundering silence*.

The standard way of talking about the parts and structure of *metaphors* (as a distinct kind of figurative language) has evolved like slow jello into a convention. We prefer to describe it explicitly here because it is a useful scheme and because it is used throughout this volume. We start with two simple and regular, but predictably prosaic metaphors from William James (1902), the first two examples in Table 1.1.

The rhetorician I. A. Richards (1936) distinguished the thing that is being commented upon, the *topic* (he called it the *tenor*), and the thing used to talk about the topic, called the *vehicle*. The implicit relation between the topic and vehicle, the semantic basis for the metaphor, is called the *ground*. The topic and vehicle do not necessarily correspond with the subject and predicate in the sentence, as in the examples from James, but can appear as any type of word (see the third and fourth examples in Table 1.1).

TABLE 1.1
Illustrative Metaphors According to the Standard Richards-Perrine
Scheme^a

<i>Metaphor</i>	<i>Topic</i>	<i>Vehicle</i>	<i>Ground^b</i>
The author's writings are useful groceries.	author's writings	useful groceries	The writings contain important ideas.
The optimist has congenital anaesthesia.	optimist's attitude	congenital anaesthesia	The optimist is ignorant or unaware.
The chairman plowed through the discussion.	chairman	plowed	Committee work is hard.
He flung himself on his horse and rode madly off in all directions.	manner of riding (implicit)	madly in all directions	He was in a mental state of excited confusion.
The furious phenomenon of five o'clock.	rush hour (implicit)	furious phenomenon of five o'clock	Traffic is overwhelming and amazing.
Great weights hang on small wires.	outcomes (implicit)	minor details ^c (implicit)	Important events can depend on less important ones.

^a The first two examples are from James (1902). Example 3 is from Black (1962), example 4 is from Leacock (1912), example 5 is from e.e. cummings (1954), and example 6 is from Smith & Heseltine (1935).

^b These are not *the* grounds of the metaphors, but our illustrations. Topic, vehicle, and ground are abstract concepts only approximated in one person's interpretation. For example, to some, the ground of example 3 involves something like, *The chairman followed only his own opinion*.

^c Technically, the proverb statement itself is the vehicle, while the topic is implicit in Perrine's scheme.

Another rhetorician, Lawrence Perrine (1971), refined Richards' notions. He emphasized that the explicit topic and vehicle *terms* (words and phrases) need not be the intended topic and vehicle *concepts*. The concepts or domains may also be represented implicitly, as in the fifth and sixth examples in Table 1.1. Thus, because both the topic and vehicle can be either explicit or implicit, a simple fourfold classification scheme emerges.

Aristotle and Quintilian, a Roman rhetorician of the first Century A.D., started it all going by classifying figures-of-speech. Actually, the phrase *figure-of-speech* is part of an ancient distinction between it and *figure-of-thought*. Technically, the term figure-of-thought refers to figurative meaning. The category figure-of-speech contains everything else, from paranomasia to isocolon, presumably aspects of style and sentence construction as opposed to figurative meaning. Couched in the phrase, figure-of-speech, and other distinctions in rhetoric, is the belief that nonliteral meanings are special. For instance, to the eighteenth century poet Samuel Taylor Coleridge, all figures-of-speech were a form of metaphor. In modern rhetoric some regard figurative meaning and inference as defining aspects of poetry (Perrine, 1971; Reddy, 1979). In fact, it has

been the expressed goal of some rhetoricians to come to an understanding of the *cognition* of figurative language through analyses and classifications of figures (e.g., Arthos, 1965; Manns, 1977).

Historical and Philosophical Roots

The study of figurative language has intellectual roots in several disciplines as well as rhetoric. Chapter 2 by Honeck in this volume describes the trends of thought in some of these disciplines, with a focus on experimental psychology, psychodynamic psychology, linguistic theory, and philosophy. Honeck discusses certain "landmark papers" within these disciplines that appear to be relevant to the *Zeitgeist* in cognitive psychology in the 1970s. The personalistic aspect of history is not overlooked in Honeck's account as he ties the current preoccupation with figurative language to the backgrounds and interests of some of the researchers involved.

In Chapter 3 Johnson reviews treatments of figurative language in linguistics and philosophy and presents the major theories of metaphor in philosophy from Plato and Kant to modern times, including the logical positivists' view that metaphor possesses connotative value but not truth value. Johnson considers how metaphor is identified ("We seem to interpret an utterance metaphorically when to do so makes sense of more aspects of the total context than if the sentence is read literally") and how it works. On this latter question, Johnson extends the so-called "Interaction" view. He argues that metaphors have a "canonical" (comparative, simile) aspect but also a noncanonical (interactive) aspect. In a discussion that should be of great interest to psychologists, Johnson uses Kant's account of reflective judgment to explicate these two aspects. One consequence of this strategy is that the canonical aspect is considered to be mechanical (rule-governed) and the noncanonical aspect is considered a form of "genius," non-rule-governed and aesthetical ("a rationality without rules").

FIGURATIVE LANGUAGE AND GENERAL LANGUAGE COMPREHENSION

By the estimation of Pollio, Barlow, Fine and Pollio (1977) about four figures of speech are uttered per speaking minute on the average in free discourse. Including both novel forms and common idiomatic or frozen forms, this works out to about 21 million figures-of-speech per lifetime. Indeed, some linguists, philosophers, and psychologists have wondered whether *all* word meanings might not have metaphorical origins. As a psychological point, numerous scholars have proposed that analogic and metaphoric reasoning form the basis of all cognition (Cassirer, 1953; Edie, 1963; Jaynes, 1977; Langer, 1957; Müller, 1873; Sapir, 1977; and others). Even in traditional verbal learning tasks people

spontaneously generate poetic or metaphoric mediators (Paivio, 1971, 1979). On a grander scale, idioms, metaphors and proverbs can be essential data in the anthropologist's analysis of the premises and values of an entire social group. A study can be made of the social uses of metaphor in person perception, in the expression of social mores, and in persuasion (see Bateson, 1972; Crocker, 1977).

Figurative language, we have said, is not so uncommon as it might appear at first blush. Therefore, there may not be anything psychologically special about it, in that its comprehension involves every problem in general language comprehension and semantics—e.g., encoding, implication and inference, world knowledge and contextual constraints, imagery, imagination and creativity, the problem of semantic primitives, and the problem of the relation of language and perception, and so on.

Context and World Knowledge

In what Reddy (1979) and Ortony (1979) refer to as “whole sentence metaphors,” one and the same statement can be literal in one context and figurative in another: *The old rock was becoming brittle with age*, in reference to either geology or to a professor emeritus. In order to interpret such figures-of-speech, one needs knowledge and contextual information. Indeed, whether a sentence is a metaphor, a line of poetry, a literal statement, intentional nonsense, or genuine anomaly, often cannot be decided on the basis of the sentence alone.

Prior to recent experiments on context dependence (Bransford & Johnson, 1972; Jenkins, 1977) it was widely assumed that psycholinguistics in the tradition of verbal learning psychology could lead to unambiguous statements of what *the* meaning of a sentence is. Contextualism suggests a profound relativity: The reality to be captured by psycholinguistic description is not what the meaning is, but what the comprehender might experience. Indeed, linguistic constructions do not even “have” meaning: People do, and they can attribute multiple meanings to any construction. The problem then becomes one of explaining how people *constrain* the possible meanings to arrive at particular candidate interpretations. Figurative language certainly highlights this problem.

In Chapter 4, Ortony looks at the “standard definition” of metaphor, the application of language to something it does not literally denote. He finds this view and its more sophisticated linguistics version—selection restriction rule violation—inadequate for a variety of reasons. He goes on to consider the difficulties raised for this view by whole-sentence metaphors, and provides his own definition of metaphor, noting that, “it is not linguistic expressions themselves that are metaphors, but particular uses of them.” Ortony's definition concentrates on the criteria of contextual anomaly, elimination of “tension” between topic and vehicle, and speaker intention, criteria he details via the work of Grice and others. Tension elimination, a part of the interpretation process, is discussed

in connection with some functions performed by metaphor such as “compactness,” i.e. that metaphors economically compress a great deal of information. Finally, Ortony considers the implication of his approach for psychological processing models and the distinction between metaphor and simile.

Language and Perception

As with general language comprehension, the comprehension of figurative language involves perception. This was demonstrated in a series of studies by Verbrugge and McCarrell (1977). They constructed pairs of metaphors. The metaphors in each pair had the same topic, but different vehicles—and therefore different grounds and figurative meanings. Due to the sharing of topics, however, the ground of one metaphor in a pair was true of the topic of the other metaphor. Thus, the metaphor *Billboards are warts on the landscape* could be successfully cued by the relevant ground, *Ugly protrusions on a surface*. The irrelevant ground for this metaphor was *tell you where to find businesses in the area*. Though true of the topic, the irrelevant ground did not work as a recall cue. This indicated that people were remembering the specific figurative meanings and not verbatim phrases or word meanings. The literal features appropriate for describing the word *tree* differ for *Tree trunks are straws for thirsty leaves and branches*, and *Tree trunks are pillars for a roof of leaves and branches*. In the former, a tree trunk is perceived as a hollow tube, in the latter it is perceived as a solid column. Recall, therefore, seemed due not to any fixed features of words, but to a *perceptual* act in which word meanings are restructured or a property resemblance is created.

In Chapter 5 Verbrugge refines his perception-based theory of metaphor comprehension and extends it to reconsider representation and processing notions. He reviews standard theories of metaphor comprehension from the perspective of attitudes about epistemology, such as Phenomenalism and Realism. In a new experiment reported here, Verbrugge the Realist examines and classifies people’s interpretations of metaphors in order to demonstrate the operation of knowledge-based perceptual transformations. The emphasis is on how people often create fantastic or surreal images in their search for an understanding of a metaphor.

THE CANON OF COMPOSITIONALITY

The basic phenomenon is the distinction between the figurative and literal meaning of a statement, where these levels are related in nonarbitrary ways. Corresponding to it is a basic problem—how to describe, formally, the nature of this relationship. Now—most of the outstanding theories of language are built on the “canon of compositionality,” that is, sentences are treated as inputs into a logical calculus, with meaning derived as a rule-based concatenation of the

meanings of the component words (or morphemes). This is true for the linguistic theories of Chomsky (1965) and Fillmore (1968). Psychologists Anderson and Bower (1973) developed a theory based on binary associative relationships and pathways within a sentence. Kintsch (1974), and others following his lead, describe sentences in terms of predicate calculus and propositions. As background theories in psychology these will serve as a springboard. However, it turns out that they deal primarily, and most deal exclusively, with the literal level of meaning. This is another reason for all the recent fuss. Available theories of language structure and processing have not yet captured the relation between literal and figurative meaning. As a consequence, figurative meaning cannot be derived by these theories as a composition of the (literal) meanings of the words.

Figure 1.1 presents representations of a metaphor, *A poem is a pheasant*, according to the major theories of language. Note that in no case is figurative meaning fully explicated. The views that incorporate semantic features come close—we'll have more to say about features later.

Another good example of how figurative language violates the compositionality principle is provided by idioms. *He let the cat out of the bag* cannot be interpreted as *He started some trouble* on the basis of the literal meanings of the component words. Thus, idioms seemingly defy structural analysis. *We pulled Tom's leg* has Tom as the object of teasing in the idiom and leg as the object of pulling in the literal expression. The usual theoretical resolution of this problem is to treat idioms as complex dictionary entries akin to words (Katz & Postal, 1964; Weinreich, 1969). However, this position is challenged by Bobrow and Bell's (1973) finding that people given an "idiomatic set" (versus a "literal set") prior to seeing a potential idiom did not report "seeing the idiom first" (e.g., *John gave Mary the slip*) any more often than a control group given neither set. Moreover, Ortony, Schallert, Reynolds and Antos (1978) argue that idioms cannot involve special processing mechanisms since the nonliteral meaning cannot be derived from the words—idioms must be learned rather than figured out. This hypothesis is supported in recent studies by Swinney and Cutler (1979).

Other figurative language forms besides metaphors and idioms strain the canon of compositionality and they do so in theoretically interesting ways. Consider the proverb, *Great weights hang on small wires*; an interpretation of it, *Outcomes of important events often depend on minor details*; and an instantiation of it, *The outfielder just missed catching the fly ball when he tripped on a coke bottle. The winning run scored and they lost the game.* The proverb, interpretation, and instantiation differ in words and structures, yet they are clearly related in conceptual ways that outstrip the compositionality principle. In Chapter 6 in this volume, Honeck, Voegtle, Dorfmueller, and Hoffman argue that, in general, proverbs constrain but do not determine (i.e., compositionality does not apply) their abstract figurative meanings. Partly for this reason, proverbs constitute ideal materials for the elucidation of the abstractness of mental entities and the problem of generativity or creativity. Honeck et al. review the literature and

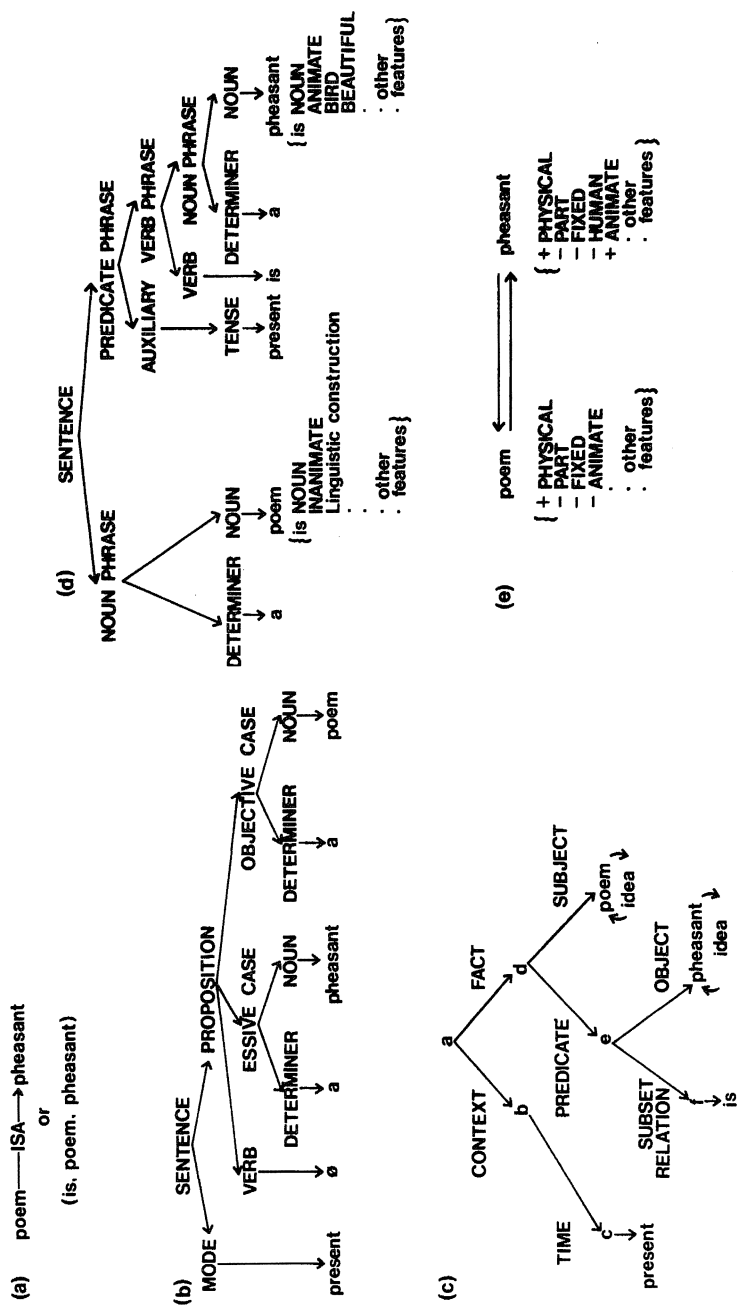


FIG. 1.1 Representations of *A poem is a pheasant* according to major theories of sentence structure. In (a) is the representation according to theories that describe meaning in terms of propositions or labeled relations (after Kintsch, 1974; Rumelhart, Lindsay & Norman, 1972; Miller & Johnson-Laird, 1976). In (b) is the representation according to Fillmore's (1968) Case grammar. The symbol, ϕ , indicates that this sentence, technically, has no verb. In (c) is the representation according to Anderson and Bower's (1973) associationistic theory. In (d) is something like what would be the Chomskyan deep structure, accompanied by a listing of the semantic features of the content words according to the dictionary semantics view of Katz and Fodor (1963). Finally, (e) presents the metaphor according to the conceptual dependency view of Schank (1972; Russell, 1976). The arrows in (e) indicate that the concept here is a relation proposing a state of the topic (i.e., that being a poem is a property of pheasants).

research on proverbs and compare proverbs to metaphors. This forms a foundation for their critique of what they call the "Literalist" approach to meaning, and for an elaboration of their "Conceptual Base" theory of semantics. Briefly, they assert that complete understanding of a proverb involves the creation of a micro-theory that is nonlinguistic, non-imagistic, abstract, and generative, thereby allowing for the recognition and production of new instances.

ABSTRACT CONCEPTS AND MENTAL IMAGES

One source of constraints for the interpretation of figurative language often arises from imagery. A metaphor can be abstract (e.g., *A theory is a wish*) but many metaphors act as an "invitation to perceive a resemblance" (Verbrugge, 1977). The psychologists of the Wurzburg school engaged in heated debates over whether metaphors are understood in terms of images or in terms of *Gesamtvorstellung* (conceptual understanding) (see Downey, 1919). Later, the Gestalt psychologists emphasized the perceptual role of metaphors in problem-solving and creative thinking (Köhler, 1929; Werner & Kaplan, 1963). Metaphors result in the creation of a percept or image that need not be filled in with details yet has rich potential for details and symbolism. Metaphors also result in vivid images because of their emotional content and because of the bizarre or surreal character of the meaning they often suggest when taken literally. Thus, Paivio (1971, 1979) has argued that images themselves may be the medium for discovery of the figurative meaning—part and parcel of the comprehension process. These speculations, which are mirrored in discussions by linguists, poets, rhetoricians, and philosophers (e.g., Brown, 1966; Burklund, 1964; Isenberg, 1963; Shibles, 1971; Snell, 1960; Sticht, 1979) fit nicely with psychological studies of learning that show how mental imagery seems to facilitate acquisition and retention of verbal material.

The intersection of the study of imagery, verbal memory, and figurative language is mapped out in Chapter 7 by Harris, Lahey and Marsalek. Earlier experiments by Harris had shown that memory for metaphors is not necessarily less than memory for literal sentences with similar meaning. Yet, imagery is involved—people often report the experience of vivid, surreal images in reaction to metaphors. Such images sometimes fuse the topic and vehicle terms in creative ways. In some new studies presented here, Harris et al. coordinate memory data with people's verbal reports of imagery and their imagery ratings. Imagery may be reported more frequently to metaphors than literal expressions, even though metaphors are judged more difficult to imagine. Harris et al show that the results of metalinguistic tasks must be interpreted with great caution.

The use of figurative language to examine memory has been extended in a clever paradigm by Riechmann (1977). In this method, people are asked to recognize the *interpretations* of the acquisition sentences. The key is to use

proverbs that, by the Richards-Perrine scheme, have implicit topics. For example, *He who spits above himself will have it all in his face*, does not refer only to spit and faces; it uses these terms to refer to underlying concepts. Thus, a literal image of the proverb differs from what most people would regard as a good interpretation, something like *Reaction against powerful people can backfire on you*. In Riechmann's original study, people who were told to concentrate on the figurative meaning of the proverbs during acquisition were better at recognizing abstractly stated interpretations of the proverbs than people told to concentrate on a mental image of what the proverbs literally described. Moreover, interpretations for high-imagery, high-comprehensibility proverbs were most difficult to recognize for both groups. In Chapter 8 Riechmann and Coste report some methodological refinements of this paradigm. They also compare some of their results with those of Harris et al. In general, Riechmann and Coste argue that there may be a trade-off between abstract understanding and imaging, and that their results define boundary conditions on the role of imagery as described by the dual-coding view.

SEMANTICS AND FEATURES

Psychologists sometimes distinguish memory for personal knowledge from memory for the meanings of the concepts and words that are used to express knowledge. This latter form, called *semantic memory*, is the aspect of cognition that is often of central concern in treatments of figurative language. There is an emphasis in linguistic theories of language (e.g., Katz, 1972) on explaining all meaning in terms of a finite set of separate, irreducible semantic units, features, or atoms, out of which all complex meanings are built. This also holds for psychological network-node theories (Anderson & Bower, 1973; Rumelhart, Lindsay & Norman, 1972). There have been extensive debates about such an approach. Some of the arguments are these:

Semantic features or primitives for words or propositions are themselves defined with words or propositions. This leads to infinite regress (Hall, 1972). As Searle (1972) put it,

either the analysis of meaning itself contains crucial elements of the notion to be analyzed, in which case the theory fails because of circularity; or the analysis reduces the thing to be analyzed into simpler elements which lack its crucial features, in which case the theory fails because of inadequacy (p. 21).

Another argument against features is that they provide only apparent exactitude. Although semantic features are reasonably explicit and therefore amenable to test, any given listing of features can be shown to be inadequate, if only because word meanings vary from individual to individual, context to context,

and time to time (Bolinger, 1965; Olson, 1970; Pollio, et al., 1977; Verbrugge & McCarrell, 1977). It is not clear, in other words, how semantic feature theories can cope with figurative "compactness" (Ortony, this volume). For figurative forms such as metaphors and proverbs, a variety of meanings can be perceived that any one feature description may fail to encompass.

A third argument against features is that it is often not clear how specific features can be justified (if at all) except in an *ad hoc* manner, nor is it clear how the features should be ordered or interrelated. It is often assumed that a linguistic description should be a model for the mental dictionary in which words are "looked up" and meanings "searched out." For example, the word "bachelor" would have as features the distinction between HUMAN and ANIMAL. Under ANIMAL would be the single sense of MALE, WITHOUT MATE. Under HUMAN would be the *two* senses of NOT MARRIED, and, HAVING LOW-EST ACADEMIC DEGREE. The problem is that any given system for ordering the features can be shown to be inadequate. Again, figurative language enters as the acid test. *She welded her eyes on the bachelor*, and, *She walked right through the bachelor*, would attribute to *bachelor* features like METALLIC and NONMATERIAL. If these figurative comparisons were to be incorporated into the hierarchy, a new level of generalization would be required to define *bachelor* as both ORGANIC and METALLIC, both MATERIAL and NON-MATERIAL. The thrust of this is that any fixed, static, unalterable semantic feature system may be unable to deal with metaphor, to distinguish figurative senses of words, and to show how a word can have multiple meanings in a single figure-of-speech (Bolinger, 1965; Campbell, 1975).

Those who favor the semantic feature approach reply that a set of rules can be devised to encompass figurative language. The rules would allow the semantic features to be changed, marked, altered in salience, ignored, transferred from one word to another, or in some way made flexible, fuzzy, abstract, or a matter of degree (Bickerton, 1969; Cohen, 1979; Henle, 1958; Levin, 1979; Searle, 1972; Sternberg, Tourangeau & Nigro, 1979).

Of the psychologists interested in cognition in the present century, perhaps none has paid so much attention to metaphoric meaning, in staunch defiance of the Zeitgeist, as Charles Osgood. From his earliest work on synesthesia, to the discoveries using the Semantic Differential—and the metaphorlike comparisons the instrument involves, Osgood has sought an understanding of cognition in terms of a set of basic dimensions of meaning. In Chapter 9, Osgood summarizes his work as it bears on figurative language and the mechanisms involved in metaphoric perceiving. He begins with a personal account of his past work on synesthesia. He then discusses the relationship between language and perception and postulates a "deep cognitive system" as a mediational necessity. His section on "Congruence Dynamics" presents a summary of work using the Semantic Differential and calls upon his newer "Abstract Performance Grammer" to address metaphor. Osgood presents a system for assigning algebraic signs (+,

—, and 0 or neutral) to features which interact across semantic dimensions to yield figurative meanings somewhere along the “‘appositeness-acceptableness-anomalousness dimension.” The results of some of the “new wave” of metaphor experiments are also discussed by Osgood in terms of this approach.

Explicit semantic feature-based theories of the comprehension of metaphor were proposed independently by Johnson (1975), Ortony (1975), and Smith, Rips and Shoben (1974). Though the models differ in some subtle ways, they can be seen as special cases of Tversky’s (1977) mathematicization of the axioms of the feature view. In the general theory, the perceived similarity of any two comparison stimuli—geometric shapes, pictures of faces, and, presumably, semantic-linguistic stimuli as well—is described in terms of the features that are common to the stimuli relative to the features that they do not share. An important aspect of Tversky’s theory is that the order of the two stimuli in a comparison can make a difference in their perceived similarity. As one example, Tversky used the metaphorical comparison *A man is like a tree*, which has decidedly different implications than, *A tree is like a man*. In both cases, the topic makes certain features of the vehicle more salient. In the mathematics of the theory, these features are raised in weighting, leading to asymmetries in the similarity judgments.

In Chapter 10 Malgady and Johnson present a sophisticated feature-based approach. Their earlier work had revealed that the judged similarity of topic and vehicle terms is directly related to the judged ease of interpretation and judged goodness of metaphors. Moreover, judged similarity could in turn be predicted by an independent index of the number of properties shared by the topic and vehicle. Also, in metaphors as opposed to anomalies topic and vehicle were more likely to share *some* (not all, or no) properties and be rated logically false. Malgady and Johnson then showed that manipulations that increase topic-vehicle feature overlap also increase ratings of their similarity and of metaphor goodness. The next step was to refine the theoretical basis of feature theory by using Tversky’s linear contrast model in conjunction with Information Theory. This scheme is used to predict asymmetry of tenor-vehicle similarity judgments, recall of metaphor, and the effects of contextual variety on comprehension and appreciation of similes. Malgady and Johnson suggest that semantic “space” models of meaning, related to modern associationism, are misguided and that scaling models of another kind are needed.

In Chapter 11, Johnson and Malgady describe a feature-system based on contextualist principles. Contextualism insists on the theoretical relevance of situational factors and on the distinction between speaker and hearer perspectives. From the contextualist view, Johnson and Malgady integrate perception concepts, such as Gibson’s notion of “affordance,” with notions in feature theory and Information Theory. Johnson and Malgady present a study that explores the properties people give in response to nouns, their ratings of figurativeness, and ratings of feature salience. Rated figurativeness was clearly related to

potential richness of interpretation, that is, the presence of a large number of salient features made for potential. In another study, Johnson and Malgady explore people's interpretations of the abstract paintings of surrealist Rene Magritte. Here too, preference on the basis of aesthetic judgments seems related to the potential richness of interpretation. In looking over the fledgling field of the experimental analysis of figurative language, Johnson and Malgady discern an underlying attitude: Our theoretical-structuralistic descriptions (of features, encodings, or whatever) are usually abstracted from group data and, in effect, reified—that is, they are assumed to represent any one person's mental contents. A contextualist approach does not encourage such head-strong mechanistic analyses. Rather, it encourages the use of concepts in perception to describe the potential range and distribution of the properties or features people might ascribe to figurative meanings.

A vexing problem in the study of simile and metaphor, as the chapters in Section III in this volume show, is the problem of asymmetry. These forms show so clearly how apparently simple alterations in word order or meaning can make great differences in sentence meaning. The fact that asymmetry should be vexing to modern theorists can be regarded as a consequence of failure to grapple with figurative meaning at the level of syntactical theorizing. The representations in Figure 1.1 do not indicate any dramatic semantic changes that may occur if the noun phrases and verb phrases were switched in order.

Chapter 12 by Connor and Kogan deals with the asymmetry problem. Past research on their "Metaphor Triads Task" is summarized, as is the available evidence for asymmetry in semantic similarity judgments, such as Rosch's work on natural categories. In the new experiment Connor and Kogan present, people generated metaphors on the basis of sentence frames and candidate topics and vehicles (e.g., *balerina*, *top*). A main issue here concerns the sorts of comparisons that evoke asymmetry and the sorts that do not. As Connor and Kogan show, task constraints play a role, as do stimulus materials, whether pictorial or verbal. Aspects of reference also play a role. For instance, in comparisons involving humans, the human is usually the topic term. Connor and Kogan point out other challenges for feature theories, notably the need to incorporate features having variable salience.

DEVELOPMENTAL TRENDS

Much of the recent research on the development of figurative language understanding, which constitutes the bulk of the literature, has been reviewed elsewhere (Billow, 1977; Gardner, Winner, Bechhofer & Wolf, 1979; Pollio, et al., 1977) and we will not attempt a review here. We do want to make some general points to introduce the papers on development in this volume.

Educators have expressed mixed feelings about the use of metaphors as tutorial devices. Some assume that children take metaphors literally, thus deceiving themselves (cf., R. Miller, 1976). Since metaphor is considered a complex form of reasoning, any metaphors a child happens to create (as, *Look at those butterflies playing together*, in response to seeing snow) are presumed to reflect an impoverished vocabulary rather than a creative act (Brooke-Rose, 1965; Leonard, 1975). In "linguistic hygienics" (Rapoport, 1953), metaphors should be made explicit and their limitations pointed out. In other words, "teacher beware!" (Watts, 1944). On the other hand, some argue that metaphor and analogy are, for the child as well as the adult, a necessary aspect of conceptualizing, learning, and understanding the world (Edie, 1963; Emig, 1972; Newton, 1964; Petrie, 1979). Yet, metaphor receives little, if any, attention in language arts classes, and is relegated to the section on poetry in most language texts. The teaching of the understanding of metaphor is given little treatment in teacher education texts—however, many metaphors are *used* in school texts (see Pollio, et al., 1977). It is a euphemism to say that there is a deficiency in the way our educational system treats the understanding of metaphor. Yet, educators have claimed that reading and writing difficulties very often involve poetic or metaphorical language (Burklund, 1964; Foerster, 1974; Yandell & Zintz, 1961).

Children, it may be noted, deliberately use metaphor in their speech. Chukovsky (1968) gives the example of a child who described a bald man as having a *barefoot head*. Books by Bettelheim (1976) and Koch (1970) indicate that there is much spontaneous poetry and metaphor in children's language. One argument, probably correct, is that the "gems from babes" are delusions of the observer—because the gems are, in reality, the productions of the child's undisciplined mind. Another argument, also probably correct, is that they represent a freedom to exploit the ways in which language can express meanings. This is important, for to the extent that children understand metaphors, and to the extent that metaphor is a form of abstract reasoning, then to this extent there may be required a reworking of theories of cognitive development, such as Piaget's.

Piaget (1926) provided some now-classic examples of the interpretations of proverbs, given by children ages 9 to 11. He required the children to align interpretations with proverbs and to give their rationales for the matchings. One child matched the proverb *White dust never comes out of a coal sack* with an interpretation about wasting time—the rationale being that people who waste their time do not properly care for their children—clearly a failure to comprehend. Piaget's demonstrations of such syncretism were consistent with the notion that only older children can fully understand metaphor. Analogic "as if" sorts of reasoning are an aspect of the concrete operations and formal operations stages of intellectual development, expected only of older children and adolescents.

One may speculate whether Piaget's choice of novel, often abstract proverbs

as materials and of a potentially confusing matching task, led him to this conclusion. Gentner (1977) has clearly shown that a highly simplified task involving analogies between domains that are familiar to kids (e.g., *If a mountain had a knee, where would it be?*) results in no difference between preschoolers, first graders, and adults—the kids, in short, do well at this task. So young children may be capable of some use of analogy in metaphor understanding.

As Gardner (1974) and Kogan (1975) have asserted, one must avoid confounding the child's ability to *comprehend* a metaphor with the ability to *explain* (verbally) what it is that is comprehended. Perhaps children can understand more than they can tell. The use of nonverbal tasks, for example, might "push back" the ages at which concepts or operations are attained and metaphoric reasoning is possible. Cometa and Eson (1978) tried recently to test this notion. Children of various ages were first tested on Piagetian tasks and also asked to interpret (paraphrase) metaphors such as *My thoughts are all twisted when I wake up*. The ability to paraphrase a metaphor emerged in the stage of concrete operations, but only those children who were accomplished at intersectional (cross-category) thinking could explain their paraphrases.

Stronger tests of the comprehension-explanation relationship involve getting out of the verbal domain and using picture-matching sorts of tasks. Kogan (1975) had children match pairs of pictures and then give a rationale for their matching. The pairs could represent literal comparisons (e.g., a bird and a plane can both fly) and figurative ones (e.g., an old man and a low flame are both dying). By this means, Kogan found some evidence that even 7-year-olds can understand some metaphoric comparisons. Similarly, Honeck, Sowry, and Voegtle (1978) report that 7-year-olds could understand proverbs whose meaning was displayed pictorially.

Chapter 13 by Pollio and Pickens focuses on clarification of the comprehension-explanation relationship. They begin with a summary of the area, a description of views about the epistemological status of children's metaphors, and a description of available theories of the development of metaphor comprehension. The new study they present is an extensive analysis of the performance of a large group of children, ages 8 to 17 years, on metaphor comprehension and explanation tasks. Children had to select from among candidate interpretations of metaphors (e.g., *I ate up a storm*) and, in the explanation task, they had to rationalize their interpretations of metaphors. Pollio and Pickens' analysis clearly shows the trends of figurative language understanding that occur over the years—in terms of use and in terms of preference for novel as opposed to frozen figures. Their results also implicate schooling as an inhibitor of metaphor production and so effecting an "age of literalness."

Another way to study children's figurative language is to try and coordinate the content of their productions with their perceptions of events in the world. What sort of events stimulate kids to produce metaphors, for example? This is the question addressed by Winner, McCarthy and Gardner in Chapter 14. They

explore the nature of the actions or percepts that elicit metaphoric or pretend namings and word uses. First, they examine some of the metaphors spontaneously made by Adam (the child studied extensively by Brown), showing the theoretical issues that arise here in the establishment of criteria by which to judge the protocols. In contrast to the view that metaphor is mistake, children's productions do not seem to be misclassifications, but deliberate referencings (e.g., *The letter J is a cane*). In a second new study they use a game with puppets to encourage children to produce pretend names; e.g., for a small green block that the puppet made "hop." Even the preschoolers showed considerable use and understanding of metaphorical comparisons on this task. The authors liken the use of figurative language to symbolic play with perception. They describe developmental stages that begin with nonmetaphorical perception of similarity and differentiate into skills specific to metaphor and figurative language. Their study also demonstrates the possibly adverse effect that schooling may have on metaphor production, suggesting further that it is due to motivational (production) factors rather than to competence (comprehension) factors.

In conclusion, it is not yet clear how figurative understanding relates to the development of overall cognitive and linguistic skills. Nor is it clear how various tasks, such as comprehension, paraphrase, interpretation, explanation, and picture-matching, relate to one another. That the situation is so complex—as in the appearance of a stage of "literalism"—was not appreciated until the recent research was carried out. It is clear that kids possess remarkable capacities for figurative thought. When presented with tasks that enable them to express their full limits of cognition, those limits appear to be very wide.

FIGURATIVE LANGUAGE AND PROBLEM SOLVING

Perhaps the most extreme variety of potentially figurative language is the poetic anomaly. Example anomalous strings are: *Crackle babies furiously cellophane foreign*, and, *A legal glittering the exposed picnic knight* (from Marks & Miller, 1964). To some in philosophy, linguistics, and psychology (at least those before the 1970s), figurative language samples are merely "deviant strings" or even "meaningless" (Berggren, 1963; Carnap, 1937; Fowler, 1969; Quine, 1967). Such strings violate the rules of a theory of language, of the sort envisioned by Chomsky, for instance (1965, Chapter 5). Such a theory rests on rule-based definitions of supposed linguistic regularities representing the ideal speaker's competence for using acceptable language. It perhaps comes as little surprise that early experiments in psycholinguistics regarded anomalies as controls for the effects of syntax and semantics on information processing tasks. Most of the recall studies showed that less grammatical sentences are less well remembered (Downey & Hakes, 1968).

On the basis of the linguistic view one might also predict that people can

reliably judge the grammaticality of sentences, though perhaps they are not armed with exactly the linguists' jargon. Indeed, sometimes judgments do reflect departure from grammaticality (Coleman, 1965; Danks & Glucksberg, 1973; Fillenbaum, 1970; Maclay & Sleator, 1960). This constituted early evidence for the psychological reality of the sort of grammar envisioned by Chomsky. But as some philosophers and linguists claimed (Butters, 1969; Drange, 1966), anomalies can be regarded as poetic or meaningful. The anomalous sentences Miller and Isard (1963) used were mechanically generated in a way typical to experiments that used them: The words were shuffled between sentences of similar or different structure. Yet, some meaning was creeping in: "some ingenuity is required to insure that when the words are recombined the result will be more or less anomalous" (Miller & Isard, 1963, p. 220).

Recent experiments have made the point about the meaningfulness of anomalies more forcefully. Pollio and Burns (1977) had people learn lists of anomalies taken from the classic Miller and Isard (1963) experiment, but with a twist. People who had to interpret the anomalies during acquisition remembered them about as well as were grammatical sentences by another group. We recently carried out some studies (Hoffman & Honeck, 1979; Honeck & Hoffman, 1979) that capitalized on e. e. cummings's flagrant violation of linguistic rules. Lines violating various possible combinations of linguistic rules were selected, such as, *Quarreling in a luxury of telescoped languages*, and *People move love hurry in a gently*, and, *With almost melancholy delicacy night gargles windows*. Analyses of semantic similarity judgments and of hundreds of interpretations revealed that people can reliably judge the semantic relatedness of anomalies and their interpretations—even when the interpretations themselves are metaphors, proverbs, or anomalies. The linguistic view, essentially reductionist, cannot readily countenance the interpretation of one deviant string in terms of another! If given enough semantic rope, people can conceive of a meaning for strings that are meaningless as far as some linguistics theories of truth are concerned.

In this extreme form the construal of anomaly as figurative language can be regarded as a clear case of creative discovery. In fact, the connection between figurative language and creative problem-solving is a natural one. Metaphors may be involved in solving problems which come in the form of anomalous phenomena. In Chapter 15, Pollio and Smith begin by summarizing their past work on anomaly, metaphor, and problem-solving. Extending Steinberg's (1970) work along new lines, Pollio and Smith (1979) found clear individual differences in preference for regarding anomalies as metaphorical. In a new experiment reported here, people were given a set of verbal problem-solving tasks and a set of metaphoric reasoning tasks—in an attempt to converge on the commonalities. Illustrative tasks were syllogistic reasoning, creative composition, and metaphor explanation. Using factor-analytic techniques, Pollio and Smith found that the various measures—presumably of the same mental process—appear to tap *different* processes. Pollio and Smith conclude that figurative understanding may

not be a uniform set of skills, and that it cannot be equated with analogistic reasoning.

Chapter 16 by Hoffman is, in a sense, a “wrap up” and perspective on the issues raised in this volume. This conglomerative aspect is due to Hoffman’s subject matter itself—the use of metaphor in scientific discovery and problem-solving, the context in which the “anomaly” that is being made sense of is the world itself (e.g., *Atoms are like solar systems; The ego is a helmsman*). Hoffman reviews some of the literature in philosophy and psychology on the status of metaphor in scientific theories—as a teaching device, and as an aspect of the psychology of science. Though there is a large literature of ideas on this subject, no one has tried to derive criteria for assessing a metaphorical theory on the basis of its metaphoricalness. It is by no means clear that metaphoricalness per se (as opposed to analogy, similarity, or imagery) is the crucial property that makes metaphorical theories either crucial (useful) or misleading. Hoffman describes the place of a metaphor in a nomological network of propositions in a theory and discusses criteria for deciding where, when, and how a metaphor will be useful to science. From the computer metaphor for mind, to the holographic model of memory and imagery, to the use of metaphors in “world views” and even in theories of metaphor itself, Hoffman’s paper touches on a wide range of the uses of figurative language in the human’s efforts to understand.

ON TO WHAT’S NEW

Although figurative language was a hot topic throughout much of the history of rhetoric, it certainly has been a taboo topic throughout much of the history of Western science. Beginning with Aristotle, there was a tendency to deplore it as unnecessary (albeit aesthetic) and to praise objectivity. As Anderson (1964) put it:

As the medieval world disappeared in the face of scientific and technical advances . . . so too was metaphor classified as an embellishment designed to dupe the unwary. Bacon placed metaphors among the “fantasies of the marketplace,” a position followed by Hobbes, Locke, and Hume. This tradition was carried on and extended by Bentham who regarded metaphor as a ruse (p. 54).

Figurative language might have been entirely relegated to rhetoric were it not for treatments of metaphor by Freudians and by philosophers who were interested in its role in scientific theories. Much of this analytical work belongs to the present century.

This volume is organized into five sections. This one is on philosophical, historical, and psychological perspectives. The second considers issues of processing and representation. The third is on semantics and features, the fourth on developmental work, and the final section is on problem-solving. This parsing

“leads” the reader through the concepts, issues, and theories involved in a nice way . . . a bit at a time. This organization also reflects the areas of concentrated experimental and theoretical work on figurative language. So . . . on to what’s new.

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2 Historical Notes on Figurative Language

Richard P. Honeck
University of Cincinnati

INTRODUCTION

This chapter provides a historical sketch of the intellectual background for recent psychological research on figurative language. The 1970s have seen the renaissance of figurative language. It is now a “hot” topic. Whether it will remain hot and then suffer the fate of assimilation by the ideational mainstream, as happens to most truly significant topics, is another matter. It is too early to fully assess its import. Nevertheless, figurative language phenomena do provide an important perspective on a number of issues concerning linguistic understanding. As a strong claim, they constitute a serious challenge for theories of understanding.

One dilemma in all of this concerns the nature of figurative language itself. No general, commonly accepted criteria exist by which figurative language phenomena can be distinguished from one another or from non-figurative phenomena. The historian is therefore put in the position of either accepting or rejecting an author’s claim that he or she is addressing such phenomena. Most often this is an easy chore, but not always, since the boundaries of figurative language are no less fuzzy, squishy, and ill-defined than language in general. There appear to be prototypical figurative forms, such as metaphors, similes, and idioms, which most analysts have seized upon. However, there are lesser known and less well studied forms such as proverbs, metonymy, synecdoche, oxymoron, and so on. Should we also include allegory, parables, fables, and aphorisms? How about studies that *use* figurative language but do not analyze it directly? If the answers here are definitely yes, the reasons are less clear.

INTELLECTUAL ROOTS

Despite this dilemma, it is clear that current goings-on do have an intellectual history. Within this context my approach will be to describe landmark papers within psychology and allied disciplines. As such, however, this essay is less a history than a noting of streams of thought about apparently similar phenomena. Four general enterprises are traced from their late nineteenth and twentieth century “beginnings”—experimental psychology, the philosophical-rhetorical tradition, linguistics, and dynamic psychology. The chapter closes with a discussion of the 1960s and 1970s and a look into the future.

Experimental Psychology

Treatments of figurative language within the experimental framework include the post-Content psychology of Bühler; the mental testing movement, developed by Binet, Henri, and Simon, and redirected by Piaget; Gestalt psychology as interpreted by Werner and Asch; and the Neo-Behavioristic writings of Osgood and Brown.

Bühler and the Wurzburg Group. As a member of the famous Wurzburg Group, Karl Bühler was more interested in the nature of thought than in figurative language. Bühler sought to give “thought elements” the same respectability accorded sensations, images, and affects by the Content psychologists. In fact, it was Bühler more than any other Wurzbürger who argued on behalf of these elements as part of the Bewusstseinslage or “imageless thoughts” made so controversial by this group. Aphorisms and proverbs were part of his methodological staples. Sometimes he used the Ausfrage method (Boring, 1950), a simple question-answer technique used previously, though more informally, by Binet in France and Woodworth in the United States (Murphy, 1929). His subjects introspected about their interpretation of a proverb, for example. He also conducted “analogy experiments” in which subjects were asked to provide a semantic match between two different series of proverbs. For example, the proverb *When the calf is stolen the farmer repairs the stall* might be linked to *One looks to the cask when the wine escapes into the cellar*. Recall of the first series, given the second, was usually excellent. Bühler concluded that the proverbs had forced subjects to think, thereby producing an effective retrieval form. This form for Bühler was unconscious, non-sensory, wholistic and at the core of meaning (cf. Blumenthal, 1970; Bühler, 1908).

Upon Wundt’s death in 1920, Bühler became the leading linguistic authority in Europe, and this as a functionalist who emphasized the total field of language. Was it functionalism that sparked his interest in figurative materials? I think not. The Wurzburg milieu was critical but a more thorough answer leads us to the mental testing movement.

Mental Testing. In the late 1880s Alfred Binet and Henri published together on memory for ideas, extending Binet's 1886 work, *The Psychology of Reasoning*. At the turn of the century and for a time thereafter Binet wrote discursively about the thought processes of his two daughters. His method too was question-answer, the results satisfying Binet that thinking need not involve imagery. As such, the Wurzburger's thesis was confirmed although Binet claimed precedence on the whole matter of imageless thought (Humphrey, 1963).

Enter Bühler, circa 1905. Bühler had read Binet, for he defers to Binet's simple term—"thought"—to describe nonsensory mental elements (Humphrey, 1963). Perhaps Bühler borrowed Binet's method and supplemented it with figurative materials. Perhaps not. What is clear is Binet's influence, although indirect, on Piaget.

After a brief post-doctoral stint at Bleuler's psychiatric clinic, Piaget came, around 1920, to the now famous Binet-Simon Lab in Paris. Binet having died in 1910, Simon asked Piaget to translate and standardize the Englishman Burt's Test of Reasoning. Fortunately, Piaget was diverted from psychometry owing to his fascination with the children's misunderstandings (Flavell, 1963). In his *Language and Thought of the Child* (1926), originally published in 1923, Piaget devotes an entire chapter to young children's understanding of proverbs, the same materials used in Burt's test. Later, at the Institute Rousseau, Piaget had children match two series of proverbs. The children's performance was quite poor, due to "syncretism," itself a product of egocentrism. Syncretism occurs when two propositions are fused idiosyncratically into a common schema. The result is that the two propositions, the proverbs in Piaget's studies, imply one another. Unfortunately, there has been little theoretical advance beyond Piaget's interpretation of children's misunderstandings of complex language.

Gestalt Influences. Figurative language seems to be an emergent and so "natural" that it could not possibly arise through associative processes. Not surprising, therefore, that Gestalt psychology represents another vector on figurative language, and this despite the fact that the original core of Gestaltists ignored language.

The broad base Gestalt influence is clear in the case of Heinz Werner. A young Werner detailed the human imitation of animal sounds in a 1919 paper. His first book, *Comparative Psychology of Mental Development* (1940) laid an incredibly eclectic groundwork for later efforts—*Expressive Language* (1955), which he edited and wrote an article for, and *Symbol Formation* (1963), written with Kaplan. Incidentally, *Comparative Psychology* contains numerous references to both Piaget's *Language and Thought of the Child* and to Bühler's early work. And *Symbol Formation* presents an entire chapter on Bühler's view of language, one of the very few airings provided Bühler in a book written in English. As we shall see, however, Werner focuses on the origins of figurative

language, and simple forms at that, for he rarely considers expressive language in its full-blown, mature forms.

In *Comparative Psychology* Werner states that all forms of mature differentiated perception, including sophisticated forms of figurative language, derive from a syncretic state of the organism. This state is a primordial blending of affective, interoceptive, postural-motor, and imaginal components. Differentiation of this syncretic state has a number of products. Most important for our purposes, syncretism effects physiognomic perception whose derivatives, in turn, are multiple. For Werner (1955) physiognomic perception has four characteristics. First, it has a dynamic character as evidenced through phonetic symbolism and the young child's motor schemas. Incidentally, Werner regards phonetic symbolism as evidence for the unity of the senses, or a "sensorium commune" that allows reciprocal influence between different sensory fields. Second, it is psychophysically undifferentiated—for example, the meaning of gesture is an unanalyzable whole. Third, the total organismic character of physiognomic perception gives rise to synaesthesia in which a sensory event is interpreted in terms of a different modality—colored tone hearing (chromesthesia) is an example. The final characteristic, embeddedness in a total context of feeling and action, eventuates in the physiognomization of words. Through all of this, Werner constantly contrasts physiognomic perception with "geometrical-technical" perception, a more physical form upon which the former is dependent.

Additional evidence for physiognomic perception comes from consensual validity regarding the affective content of line drawings, from artists' self reports of their perceptions, and from children's descriptions—the dark is "like whispering," a towel hook is "cruel," and so on. Obviously, various adult descriptions as of a person's face as "sad," a building as "dreary," fit here as well. Physiognomic perception also leads to anthropomorphism, personification, magical thinking, and panpsychism. If the child treats objects as if they were persons, personification occurs. When the child considers a desired object to be alive, magical thinking and panpsychism may result. Werner also claims that sympathy and empathy derive from physiognomic perception, as do some verbal expressions in certain cultures—a shamed woman in one culture may say, "My forehead is biting me"; a child asked whether his mother is good says, "No, she's sour." In general, physiognomic perception is characteristic of "primitivity"—of children, schizophrenics, preliterate peoples, and brain trauma cases. Increasing age and cultural sophistication tend to reduce the varieties of physiognomic perception.

In their book *Symbol Formation* (1963) Werner and Kaplan flesh out Werner's earlier arguments. Their basic thesis is that because physiognomic qualities can be perceived in a wide variety of events, the "symbolic vehicle" can come into being. To quote, "It is this transcendence of expressive qualities, that is, their amenability to materialization in disparate things and happenings that makes it possible for one to feel and see equations and similarities that find

no place in the physical-technical construction of the world" (p. 21). This transcendence is presumed to prompt the development of similes, metaphors, and analogies, although no details of the process are provided.

Werner and Kaplan's conception of the symbolic vehicle is interesting. Given an organism in a syncretic state there must be some mechanism that guides the state into a more specific, articulated perceptual activity. This mechanism is "dynamic schematization," which allows for the establishment of semantic correspondence between symbolic vehicle (i.e., language) and referent. This correspondence is latent, however, and requires productive thought. In other words, because dissimilar events possess similar nonphysical expressive properties, and because the organism develops an intention to use one experience to denote another, a conceptual relation between symbol and referent is establishable. This idea is similar to Ogden and Richards' (1923) triangle of reference in which thought mediates symbol and referent.

There is a natural progression from Gestalt-influenced Werner's views to Solomon Asch's contributions to the study of metaphor. In a volume edited by Werner on expressive language, Asch (1955) reports that the words "warm" and "cold" were sufficient in one study to polarize impressions of an otherwise identical personality description. Asch further notes that terms used to describe experiences in every sensory modality are also used to describe psychological properties. People are experienced as "bitter," "hard," "bright," and so on. In a later study, Asch demonstrated that certain "double function" terms have similar connotations in relatively unrelated languages. For example, the morpheme for "hot" means rage in Hebrew, enthusiasm in Chinese, sexual arousal in Thai, and energy in Hausa, a Western African language. Although the exact meaning is different there is a core meaning of sorts.

In a more theoretical 1958 paper Asch discusses the theoretical basis of metaphor, and of dual function terms in particular. Dismissing explanations appealing to intrinsic similarities between physical and psychological phenomena, or to association by contiguity, as well as generalizations from supposed commonalities, he reasons that double function terms refer to "functional properties or modes of interaction" (p. 93). For example, the term "hard" refers to something which resists change when pushed, pressed, or otherwise contacted. A hard person, then, is someone not easily swayed or influenced, and it is this imperviousness that is naively perceived.

In a seminal developmental study published in 1960, Asch and Nerlove concluded that the dual meanings of double function terms exist first as separate lexical entries, being conceptually related only in late childhood. Thus, 3-6-year-olds understood the literal physical meaning, 7-9-year-olds also applied the terms to people, but only 11-year-olds could explicitly relate the separate usages of the terms.

Little if any research on double function terms appeared for some 13 years after this study, a hiatus induced first by the predominant verbal learning psy-

chology and, second, by syntax-oriented transformational linguistics. In any case, Asch, like Werner, saw the broader implications of figurative language, having examined its manifestations cross-culturally, developmentally, and in person perception.

Neo-Behaviorism. That brings us to the fourth experimental approach—Behaviorism. Understandably, Behaviorists have not pursued the implications of figurative language, for to do so is to credit the language user with a complex analysis of and elaboration upon the stimulus. Radical Behaviorists have taken passing shots at the topic, however. In his *Verbal Behavior* (1957) Skinner considers metaphor a matter of transferring an old reinforced response to a new stimulus that shares sensory qualities with the old stimulus. Other treatments of the topic in the early 1950s are equally lean. George Miller's 1951 book, *Language and Communication*, contains but a few lines on metaphor. Charles Osgood's 1953 tome, *Method and Theory in Experimental Psychology*, has two pages on metaphor, devoted almost exclusively to older studies of synaesthesia. And the famous 1954 psycholinguistics conference (Osgood & Sebeok, 1965) produced no reference to figurative language.

By the mid-fifties, however, Behaviorism had loosened up enough to admit mediational mechanisms. These mechanisms were used by two Neo-Behaviorists, Osgood and Roger Brown. In *The Measurement of Meaning* (1957), Osgood, Suci, and Tannenbaum report studies of lexical metaphor and of synaesthesia conducted by Osgood as a young undergraduate. Drawing on earlier collaborative work of Osgood, the authors say, "the process of metaphor in language as well as in color-music synesthesia can be described as the parallel alignment of two or more dimensions of experience, definable verbally by pairs of polar adjectives, with translations occurring between equivalent portions of continua" (p. 23). Both phenomena are subsumed under the broader principle of "mediated generalization." Accordingly, low pitch tones are represented as large, and high tones as small because large things tend to produce relatively low tones and small things high tones. Thus, a common mediation process underlies lexical metaphor as well as the synaesthete's reaction to pitch. (See Osgood, this volume, for an update and autobiography of these phenomena.)

A similar tack is taken by Roger Brown in his 1958 analysis of lexical metaphor. Brown reviews his own research showing consensual validity in the use of nonauditory words to describe opera singing. Brown explains that it is the "natural correlation of sense qualities" that provides for metaphorical extension of the names of sensory qualities. The mechanism is one of "mediated association"—someone is "cold" because their behavior is stiff and stiff things are often cold.

Brown goes beyond Osgood, however, in considering the role of context. Attention to language in isolation stimulates metaphor. One can argue just the opposite, of course, but Brown says that, "A metaphor lives in language so long

as it causes a word to appear in improbable contexts, the word suggesting one reference, the context another. When the word becomes as familiar in its new context as it was in the old, the metaphor dies" (p. 142). When the word and its context are at odds different referents are evoked that somehow enrich one another. This view is a curious mixture of mechanistic associationism, the reference theory of meaning, and a latent tribute to the creative aspect of metaphor, a tribute sparked perhaps by I. A. Richards, whom Brown cites, and to whom we now turn.

Philosophy and Rhetoric

The second and most positive, direct influence on current psychological research stems from the philosophical-rhetorical tradition. The major figures herewith are Richards and Max Black, although Ernst Cassirer (1946, 1953) would be included by some.

Richards' ideas on metaphor are detailed in his *Philosophy of Rhetoric*, published in 1936. For Richards, words do not have a fixed or correct usage. They are everywhere contextually determined by accompanying words. It follows that he rejects the Aristotelian view that metaphor is idiosyncratic, unlearnable or special. Metaphor is in Richards' words, "the omnipresent principle of language." Moreover, verbal metaphor is a product of a more basic perceptual metaphorical apprehension of the world.

The key word in his analysis is "interaction," which he explains in terms of the relationships between three concepts—tenor (topic), vehicle, and ground. In *A woman is a song* "woman" is the tenor, "song" the vehicle, and whatever woman and song share, the ground. But this oversimplifies Richards' view, for he considers metaphor, "a borrowing between and intercourse of *thoughts*, a transaction between contexts. *Thought* is metaphoric, and proceeds by comparison" (p. 94). Thus, tenor and vehicle *give us* the ideas and need not be explicitly stated in the metaphor. The sentence might be a vehicle, the vehicle and tenor may be reversible, and the ways in which we use them may be limitless. Obviously, therefore, the ground potentially shows a wide range of complexity.

Richards is quick to point out that the interaction need not work through inherent resemblances between tenor and vehicle. Disparities between them are as common. An important point, for as Richards suggests, to speak of the "fusion" effected by metaphor is nearly always misleading. In fact, a variety of interactions may take place between tenor and vehicle, from apparent random clash to obvious similarities to mutual selection of common features, and more recondite relationships as well.

Richards' ideas were refined by Black in the early 1960s. (Black's 1962 paper has most influenced psychologists, although he had written in 1954 on the topic.) However, Black is unhappy with the "inconvenient fiction" of two ideas in-