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Categories of Environmental Scenes

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Environmental scenes are the settings in which human action occurs: since they constrain behavior, they are of interest to social, personality, and environmental psychologists. Scenes can also be viewed as a spatial generalization of objects, as well as the spatial contexts in which objects appear. As such, they are studied in perception and memory. Previous approaches to characterizing environments have relied on scaling techniques to yield a manageable number of dimensions or attributes by which environments can be compared. In contrast, the present research demonstrates development of a taxonomy of kinds of environmental scenes, where perceived attributes are obtained as a byproduct. A *basic* or preferred level of categorization in the taxonomy is also identified, based on measures of cognition, behavior, and communication. The basic level, for example, *school, home, beach, mountains,* corresponds to the level commonly used in the study of scene schemas in perception, memory, and environmental psychology, as well as to the level apparently most useful in other domains of knowledge concerned with environments, for example, architecture and geography.

INTRODUCTION

Basic Level Categorization

In the fifties, there was a popular satire of noncommunicative teenagers called "'Where did you go?' 'Out.' 'What did you do?' 'Nothing'" (Smith, 1958). Their parents, of course, expected more informative answers, such as, "Well, first I went to school, then to the beach for a run, then to a restaurant for a bite to eat, and then I came home." But their parents did not expect answers more informative than that, either (unless they were suspicious), so they probably were not interested in which beach or what kind of restaurant. Why *school, beach, restaurant, home?* Why not just "Out," and why not answers that are more specific?

A similar question was posed by Roger Brown (1958), in his classic paper "How shall a thing be called?" Why is it that we refer to the thing we sit on as a *chair,* and not as *desk chair* or a piece of *furniture;* to our

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midafternoon snack as an *apple*, and not a *pippin apple* or a piece of *fruit?* Brown argued persuasively against some of the more obvious explanations for this phenomenon. True, we generally prefer short labels to long ones, but length in turn is dependent on frequency, as reflected in Zipf's law. However, the preferred level of naming systematically violates frequency; for example, *pineapple* instead of *fruit*, *hammer* instead of *tool*. The preferred level of naming corresponds to the level that parents choose in describing the world to children. Since children are notoriously concrete, perhaps a concrete level is selected for their benefit. But no, our labels are not as concrete as they could be, they seem to be at an intermediate level. We normally refer to *green seedless grapes* as simply *grapes*, to a *ballpeen hammer* as just a *hammer*. After rejecting these explanations, Brown argued that the level selected seems to be the level that is most "useful" in most contexts, in picking out the referent from the scene. Naturally, what is useful may change, depending on the context and on mutual knowledge or common ground (Clark & Carlson, 1981). Both psychologists and anthropologists have sought answers to Brown's question (Berlin, Breedlove, & Raven, 1973; Berlin, 1978; Brown, 1977, 1979; Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976; Rosch, 1978). The work of Rosch and her collaborators has been especially influential in providing insight into what makes one level of description more "useful" than other levels. Objects may be grouped into categories varying in level of abstraction or degree of inclusiveness, for example, *pippin apple*, or an *apple*, or *fruit*. In general, people refer to objects at what Rosch et al. termed the *basic level*, for instance, *chair* or *apple*. This basic level of categorization is a compromise between two opposing goals of categorization (Rosch, 1978). On the one hand, we want categories to be informative, so that knowing what category a thing belongs to will reveal many of its attributes. Knowing that your car is a 1975 blue Datsun 210 station wagon is more informative than knowing that it is a car. The more specific the category, the more informative. On the other hand, we want to minimize the number of different categories we have to deal with, and, particularly, to minimize categories based on irrelevant distinctions. The more general the categories, the fewer their number, and the fewer distinctions needed to categorize. If you offer to give me a lift, all I need to know is that you have a car. Although the informativeness of a category increases with its specificity in a taxonomy, it has been shown in a variety of object taxonomies that some shifts in taxonomic level yield relatively larger gains in informativeness than others. In particular, going from the superordinate level, for example, *furniture*, *fruit*, to the basic level, for example, *chair*, *apple*, of categorization yields a relatively large increase in informativeness, whereas going from the basic level to the subordinate level, for example, *desk chair*, *pippin apple*, yields only a

small addition to informativeness (Rosch et al., 1976). Informativeness is reflected in people's perception or representations of the objects as well as in people's behavior toward the objects. That is, people perceive that members of superordinate categories have very few common attributes and very few common human behaviors, but that members of basic level categories have many attributes and behaviors in common. Members of more specific, subordinate categories share a few more attributes and behaviors than basic level categories, but the increase is relatively slight. Many other experimental operations converge on the basic level. It is the highest level of abstraction where people can identify an averaged shape, the level yielding fastest naming by adults, and the level first named by children (Rosch et al., 1976). Objects at the basic level are typically named by simple, short labels, termed primary lexemes (Berlin et al., 1973). In the development of a taxonomy of a knowledge domain, basic level terms are generally differentiated first, and only later, more specific and more general terms enter the lexicon (Berlin et al., 1973). Thus, measures of our perception of stimuli, our responses to those stimuli, and our communication about them all converge on the same basic level.

Characterization of Environments

Let us now return to our opening example. Why are the parents of teenagers interested in where they were anyway? Presumably because knowing where they were would reveal what they had been doing. At the library, studying. At a restaurant, eating. This intuition, that the environment accounts for a considerable portion of our behavior has been substantiated by personality, social, organizational, and environmental psychologists alike (e.g., Barker, 1968; Bandura, 1977; Mischel, 1968, 1973; Moos, 1973). Evidence that behavior settings play a substantial role in determining behavior has led to numerous attempts to characterize environments (see reviews by Craik, 1973; Fredricksen, 1972; Moos, 1973; Russell & Ward, 1982; Stokols, 1978; Ward & Russell, 1981). Many of these attempts to characterize environments have applied techniques like multidimensional scaling and factor analysis to uncover a manageable set of dimensions or factors by which to compare environments. In other words, researchers have sought to uncover the "personalities" of environments by applying the techniques of individual difference research. Many of the reviewers of these attempts have lamented the lack of consensus across investigations as to the important or basic dimensions of environments. Of course, different investigations have explored different environments, at different levels of analysis. Some studies have compared highly diverse sets of environments, including situations for work, for recreation, for living, and so on, whereas other studies have compared highly similar and specialized environments, such as groups of prisons or

of industrial settings. It is not surprising to find that the dimensions that emerge from studying prisons differ from those that emerge from studying industry, which, in turn, differ from those that emerge from studying a broader set of situations.

The recent research on categorization, discussed in the first section, suggests a different, but complementary, approach to the problem of characterizing environments. Instead of looking for a set of underlying dimensions that describe a set of stimuli, the research on natural categories attempts to construct a taxonomy of kinds of environments. The construction is based on the assumption that the distinctions that are important for human perception, behavior, and communication will be reflected in language (Brown, Note 1). Moreover, by Zipf's law, the more frequent, presumably more useful categories, will have short labels. Secondly, because categories are related by inclusiveness in a taxonomy of different levels of abstraction, there is no reason to believe that the same dimensions or attributes appear at each taxonomic level. For instance, for object taxonomies, the attributes subjects list for basic level and subordinate categories tend to be perceptual attributes, particularly parts, whereas the attributes listed for superordinate categories tend to be abstract and/or functional (Rosch et al., 1976; Hemenway, 1981; Hemenway & Tversky, Note 2; Murphy & Smith, 1982). Furthermore, even at a given taxonomic level, the attributes informants list differ from category to category, and sets of attributes tend to co-occur. In the world, things that have beaks tend to have feathers rather than fur (Bruner, Goodnow, & Austin, 1956; Rosch, 1978), and perception of attributes tends to follow this fact about the world (Malt & Smith, Note 3). Finally, a taxonomy of categories related by inclusiveness may have a preferred level of reference, where most of the early differentiations of interest are made. As a taxonomy is developed, more distinctions are made both above and below the basic level (Berlin et al., 1973). In short, many previous approaches to characterizing environments have attempted to uncover a set of dimensions according to which environments could be cross-classified. In contrast, we attempt to uncover a taxonomy of environmental categories from perception of attributes and activities of behavior settings, and from communication about them. One byproduct of this analysis is a set of attributes that informants agree describe various environments. The taxonomy developed here will be a skeletal, demonstrative taxonomy, rather than a comprehensive one that includes all the environments potentially important to environmental psychology. However, it should be readily apparent how to extend the methods to other behavior settings of interest.

Constructing a Taxonomy of Environments

Can the notion of *basic level* be extended to other, more abstract, categories, such as environments or scenes? An object is a concrete, typically moveable entity with an identifiable shape. Scenes are a perceptual, spatial generalization of objects; they are the setting or context for objects, the background where objects are figural. Scenes are typically composed of objects, but in particular combinations and configurations. A school contains desks and chairs, baseballs and basketballs, pianos and trumpets, as well as other things, like walls and windows. A restaurant has tables and chairs, tomatoes and lettuce, and cooks, customers, and cash registers. So it seems possible that a taxonomy of scenes might have a preferred level of usefulness, a basic level, based on informativeness in cognition, behavior, and communication. Not all of the operations converging on a basic level for object concepts should be expected to apply to scenes. Scenes, like objects, have primarily perceptual referents, though scenes have fewer constraints on the arrangements of components than objects. In a school scene, the desks, chairs, books, and blackboards can be arranged and rearranged and still be a school, but many rearrangements of the legs of a table will yield something that is no longer a table. Scenes, like objects, are three-dimensional, though typically, we, as human observers and actors, are immersed in scenes, are potentially parts of scenes, whereas we are typically neither immersed in nor potentially parts of objects. Thus we would not expect scenes to have recognizable averaged shapes.

One of the reservations expressed about the notion of a *basic level* of categorization has been that the level of categorization or description selected depends on the context of description. So, for example, in a store specializing in office furniture, even the term, *desk chair,* would be too general, whereas in a catalog of export items, a term like *furniture* might conceivably be too specific, and a term like *manufactured item* might be preferred. That the level of description depends on context is an undeniable fact, but not one that obviates the establishment of a preferred level in a "neutral" (Cruse, 1977) or typical or average context. To strengthen the evidence for a basic level, Rosch (1978) embarked on a study of the temporal contexts of objects, events. Another approach to the study of contexts of objects is spatial, rather than temporal, and the spatial contexts of objects are one focus of this project on environmental scenes.

The present research is an attempt to build a taxonomy for scene categories, and to provide evidence for a basic or preferred level of categorization for scenes. The first set of experiments develops a skeletal taxonomy of scenes and reports evidence for a preferred or basic level of

scene category based on perceived attributes, activities, and parts. These measures reflect the perceptual and behavioral aspects of categorization. Our investigations attempt to characterize knowledge about classes of scenes, not memory for any particular scene or group of scenes. The second set of studies reports evidence for basic level scene categories derived from naming, in both a pictorial and a verbal context, reflecting the communicative aspects of categories.

CATEGORIES, ATTRIBUTES, ACTIVITIES, AND PARTS

A. Selection of Categories

The first step was to generate a list of scene categories. *Indoors* and *outdoors* were selected as superordinates because they come close to being mutually exclusive and jointly exhaustive of scene categories. Then, a group of 80 Stanford students in a psychology of language class were asked to generate categories and subcategories either of indoor or of outdoor scenes. The presumed basic level categories selected were the four most frequently mentioned indoor scenes and the four most frequently mentioned outdoor scenes. This procedure yielded category labels with high frequency in the language (33 or more in the Kucera–Francis (1967) corpus). For subordinate categories, we could not rely entirely on our informants since in some cases there was little consensus and idiosyncratic responding (e.g., naming places near their residences). Based on a pilot study, informal discussion with other informants, and our own intuitions, the subordinates displayed in Fig. 1 were selected. We attempted to find familiar, distinctive subordinates and to avoid proper names wherever possible (e.g., Chicago, Lake Michigan, Macy's), but were unable to find familiar names of kinds of mountains.

A potential problem in the taxonomy produced by our subjects is that the *indoor* categories can also be conceived of as instances of the category *building* as well as of indoor scenes. We collected another set of attribute, part, and activity norms using *building* as a superordinate rather than *indoor scene*. The quantitative aspects of the data were essentially identical to those to be reported using *indoor* as the superordinate.

B. Attribute and Activity Norms

The purpose of collecting these norms was two-fold: first, in order to identify a basic or preferred level of categorization, and second, in order to provide a representative list of attributes and activities that subjects agree apply to scene categories at various levels of abstraction. The attributes subjects list are presumed to derive from their internal representations of the scenes; the attributes refer primarily to visual features of the scenes. Thus, we interpret the attributes listed as reflecting the appearance or perception or cognition of the scenes, and the activities listed

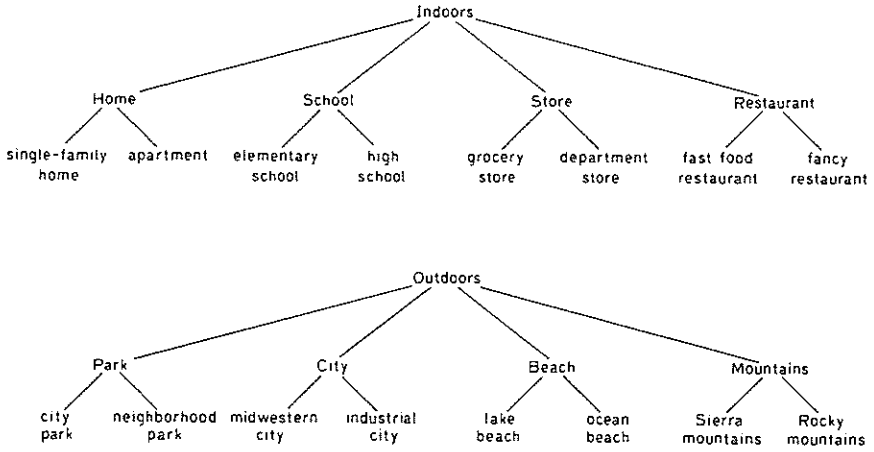

FIG. 1. Hierarchy of scenes.

as reflecting responses or behavior in the scenes. Rosch and her collaborators (1976) found that subjects listed very few attributes or activities (motor programs) common to members of superordinate categories but listed a relatively large number of attributes or activities common to members of basic level categories. Increasing the specificity of the categories by descending the taxonomy to the subordinate level did not appreciably increase the numbers of attributes and activities listed. Going from the superordinate level to the basic level, then, yielded a large increase in the informativeness of the categories, but going from the basic to the subordinate level yielded only a minor increase in informativeness at the cost of a large increase in number of categories. In compiling these norms, we attempted to replicate the procedures of Rosch et al. (1976).

Methods

Compiling Norms

A total of 210 subjects, Stanford students completing a course requirement, participated in the study. Subjects were run in groups on this and other unrelated experiments. Subjects produced either attributes or activities for categories at a single level of abstraction. Two groups of 15 subjects listed attributes or activities at the superordinate level, four groups of 15 subjects each listed attributes of activities for either the indoor or the outdoor basic level categories, and eight groups of 15 subjects each listed attributes or activities for either the indoor or the outdoor categories. Subjects given subordinate categories listed attributes or activities for one category from each basic level category. Subjects completed booklets with instructions on the cover and a separate page for each category's listing, collated in random order for each subject. The cover instructions explained the task. In addition, subjects listing *attributes* were instructed

> "On each of the following pages is the name of a setting or a kind of scene. You will have two minutes to write down the names of as many ATTRIBUTES or

FEATURES of that setting you can think of. For instance, if you had the setting *forest*, you might write down, 'is *dark*, has *trees*, has *animals*,' and so on."

The instructions to subjects listing *activities* requested "the names of as many ACTIVITIES that are appropriate to that setting as you can think of. For instance, if you had the setting *forest*, you might write down *hunting, hiking, climbing trees*, and so on."

The instructions and examples varied to fit the level of categorization and the superordinate of the requested listing. Subjects were given 2 min to list attributes or activities for each category.

In compiling the norms, attributes or activities listed by five or more subjects were included in the final raw data tally. In addition, attributes listed for a higher level category were included in the listings of its subordinate categories.

Judgment of Attributes

Two new groups of subjects were asked to judge the "truth" of the attributes or the "appropriateness" of the activities listed in the raw data tallies. This procedure is typically adopted to ensure that attributes true of two settings but mentioned for only one will be included in the list of attributes of both settings. So, for example, *bedroom* was listed only for *single-family home*, but was judged true of both *single-family home* and *apartment*, so it is not included in the raw data tallies for *apartment*, but it is included in the judge-amended norms. The subjects were Stanford students fulfilling a course requirement, and they were run in two groups. Nine subjects judged attribute truth and 10 subjects judged activity appropriateness. They were given pages with categories listed across the top of the page; each page contained one basic level category, its superordinate, and its subordinates. The attributes or activities from the raw data tallies were listed in random order down the page. Subjects were asked to judge the degree of truth of the attributes or the degree of appropriateness of the activities for each scene listed at the top on a 7-point scale, where 7 was very true or very appropriate to the setting, and 1 was not true or inappropriate. They were given detailed oral and written instructions, explaining the origin of the attributes or activities and explaining how to make the ratings. Subjects entered a number in every cell corresponding to their judgment of that attribute or activity for that category. Attributes or activities with a median rating of 6 or more were included in the final judge-amended tally and attributes or activities judged true or appropriate to a higher level category, but not judged true or appropriate to its subordinate categories were eliminated from the higher level categories.

Results

The raw data and judge-amended tallies of scene attributes are displayed in Table 1, and the raw data and judge-amended tallies of scene activities are displayed in Table 2. In all but one case, the increases in number of attributes or activities between the superordinate and basic levels was significantly greater than the increases in number of attributes or activities between the basic and subordinate levels (raw attributes $t(7) = 2.71, p < .05$; judge-amended attributes $t(7) = 1.74$, n.s.; raw activities $t(7) = 3.19, p < .05$; judge-amended activities $t(7) = 4.99, p < .05$). Examples of attributes and activities from the judge-amended tallies are listed in the Appendix.

TABLE 1
Scene Attributes

	Subordinate	Basic	Superordinate
	Raw data tally		
Mountain	10	7	
Park	13	10	Outdoors
Beach	11	9	5
City	11	9	
Home	12.5	11	
Restaurant	16	13	Indoors
Store	11.5	8	5
School	13	10	
$t(7) = 2.71, p < .05$			
	Judge-amended tally		
Mountain	7	5	
Park	13.5	10	Outdoors
Beach	8.5	5	1
City	8.5	6	
Home	10.5	8	
Restaurant	12	5	Indoors
Store	10.5	5	1
School	14.5	13	
$t(7) = 1.74$, n.s.			

C. Part Norms

Inspection of the attribute norms revealed that 95% of the attribute types (and even more of the tokens) listed (in the judge-amended list) were parts of scenes. The only nonpart attributes listed were *high* for *mountains* and its subordinates, and *cold, tall, small,* and *warm* listed for various subordinates. For object categories, research has demonstrated that an increase in shared parts is particularly diagnostic of basic levelness and that other attributes, mainly descriptors, increase at the subordinate level (Hemenway, 1981; Hemenway & Tversky, Note 1). When the attributes listed by subjects in the Rosch et al. (1976) study are divided into parts (e.g., wheel, stem, handle) and nonparts (e.g., red, large), it is apparent that most of the dramatic increase in attributes listed from the superordinate to the basic level is due to parts, rather than other attributes. On a theoretical level, parts seem to underlie the convergence of perceptual and behavioral measures onto the same basic level. Presumably, part configuration determines object shape, and thereby, the perceptual aspect of a preferred level. When we interact with objects, we typically interact with their parts; we sit on the seat of a couch, lean on the back, remove

TABLE 2
Scene Activities

Scene	Activities		
	Subordinate	Basic	Superordinate
	Raw data tally		
Mountain	6	4	
Park	6.5	6	Outdoors
Beach	6.5	5	2
City	6	6	
Home	9	7	
Restaurant	7	7	Indoors
Store	8.5	7	5
School	9	9	
$t(7) = 3.19, p < .05$			
	Judge-amended tally		
Mountain	7	7	
Park	6	6	Outdoors
Beach	10	9	0
City	3.5	3	
Home	9	8	
Restaurant	4	3	Indoors
Store	4.5	4	1
School	6	5	
$t(7) = 4.99, p < .05$			

the peel of a banana, and eat the pulp. Thus, parts also determine our responses toward objects to a large extent, and thereby underlie the behavioral aspect of a preferred level. Because of the special role of parts in determining the basic level, we decided to compile norms for parts of scenes directly.

Method

Our methods for collecting raw and judge-amended tallies for parts were nearly identical to our methods of collecting attribute and activity norms. One hundred and five Stanford students completing a course requirement participated in the experiment. Any one student produced parts at a single level of abstraction, and, except for the superordinate group, for a single superordinate. The instructions, varying slightly depending on the particular category, went as follows:

> "On each of the following pages is the name of a setting, like a *forest*. You will have two minutes to write down the names of as many PARTS of the setting as you can think of. For instance, you might write down such things as *trees, shrubs, grass, wildlife,* etc., for parts of a forest."

As before, a scene name was listed at the top of each page, and pages were randomly ordered for each subject. Eleven judges evaluated the truth of the parts obtained in the raw data tallies.

TABLE 3
Scene Parts

Scene	Parts		
	Subordinate	Basic	Superordinate
	Raw data tally		
Mountain	16.5	16	
Park	19	16	Outdoors
Beach	22	21	14
City	29	27	
Home	33	28	
Restaurant	30.5	27	Indoors
Store	23.5	19	15
School	29.5	26	
$t(7) = 3.21, p < .05$			
	Judge-amended tally		
Mountain	14.5	13	
Park	15.5	15	Outdoors
Beach	11	6	3
City	22.5	17	
Home	32.5	30	
Restaurant	26	17	Indoors
Store	21	11	6
School	29	26	
$t(7) = 2.41, p < .05$			

Results

The raw data and judge-amended parts tallies are displayed in Table 3. As before, the increase in parts from the superordinate to the basic level was significantly greater than the increase from the basic to the subordinate level (raw data tally $t(7) = 3.21, p < .05$; judge-amended $t(7) = 2.41$, $p < .05$.). Examples of parts from the judge-amended tallies are listed in the Appendix.

Both the *attribute* and the *part* data were analyzed for the level of

TABLE 4
Level of Categorization of Objects Listed in Judge-Amended Tallies

Level	Tally	
	Attributes	Parts
Superordinate	2	8
Basic	21	43
Subordinate	1	1

Note. Entries are frequencies.

categorization, superordinate, basic, or subordinate, of the objects listed in the judge-amended tallies. Only those elements whose level of categorization had been ascertained by Rosch et al. (1976) or by Hemenway (1981) were included in the count, displayed in Table 4. The vast majority of objects listed in the scene norms were listed at the basic level. Moreover, the preferred level of description of the objects did not depend on the taxonomic level of the scene.

Discussion

A taxonomy of kinds of environmental scenes was developed, within which a basic or preferred level has been established. The basic level was determined using the major operation defining basic level, a substantial gain in informativeness at that level accompanied by only a minor gain in informativeness at a more specific level of categorization. The result was obtained for norms whose content was derived from the representation of the appearance of the scenes, that is, attributes and parts, as well as for norms based on the activities or behavior appropriate to the scenes.

Scenes are not only categories in and of themselves, they are also the spatial contexts in which basic level objects appear. As such, they allow us to ascertain whether objects are referred to at the same level of description across a set of contexts. We found that the preferred level of description for objects embedded in spatial contexts, varying in both content and level of abstraction, is the level previously determined to be basic. Currently, there is interest (Rosch, 1978; Rifkin, Note 4) in determining a basic level in taxonomies of activities or events. The activities listed by our subjects appear to be at a single level of analysis; it would be interesting to determine if that level corresponds to a basic level in an action taxonomy.

In spite of the fact that classes of scenes were referred to by name only, most of the attributes, parts, and activities produced were, in fact, observable, perceptible properties and activities of scenes, rather than more abstract features. Ninety-five percent of the attribute types listed were in fact *parts* of scenes, indicating that subjects viewed parts as a major subset of attributes. However, asking subjects to list parts as opposed to attributes yielded considerably longer lists, despite the fact that, potentially, there are more attributes than parts. Presumably, asking for parts produced a concrete retrieval plan, namely, search the scene for its parts, but a request for attributes was apparently too abstract to produce a thorough search strategy. Like labels for objects and scenes, retrieval cues may be most effective at an intermediate level of specificity.

A basic level for scenes has been demonstrated, based on perceived appearance of the scenes and perceived behavior in them. The basic level is preferred in categorization because for a relatively small increase in the

number of categories, or, for a relatively small increase in number of discriminations, a large increase in informativeness is obtained. Generic outdoor and indoor scenes share relatively few attributes and activities; more specific categories, such as *beach* or *school*, have many common attributes and activities, but still more specific ones do not share appreciably more qualities. To a certain extent, nature gives us these categories, whether through natural correlations and discontinuities of features in the real world or through our perceptual apparatus, or both (see Rosch, 1978; Mervis & Rosch, 1981). Just as things that have wings also have feathers and fly, scenes that have swings tend to have slides, grass, and children.

It is significant that the basic level defined in terms of appearance coincides with the basic level defined in terms of behavior. Elsewhere (Hemenway, 1981; Hemenway & Tversky, Note 1), we have presented evidence that shared parts is particularly diagnostic of the preferred level in object categories. Part configuration forms a natural bridge between the perceptual aspect of categories and the behavioral aspect of categories of objects. On the perceptual side, part configuration strongly determines shape; on the behavioral side, part configuration strongly determines human responses. Thus, in the case of objects, natural and manufactured, part configuration seems to underlie the coincidence of the basic level determined perceptually and the basic level determined behaviorally. A similar argument can be developed for scene categories. The desks and chairs in a school, the tables, chairs, food, and cash register in a restaurant, the sand and water at a beach, the streets and buildings in a city, seem to play a major role in both the appearance of a school, restaurant, beach, or city scene and in the activities appropriate to them. The basic level for scenes, then, like the basic level for objects seems to reflect perceived correlations and discontinuities of naturally occurring attributes and activities. Moreover, for scenes as well as objects, part configurations seems to underlie the convergence of the basic level determined by appearance and the basic level determined by behavior.

NAMING SCENES

Is the level determined to be basic in terms of appearance and behavior also the level most useful in communication? Basic level categories, whether objects or scenes, seem to correspond to naturally occurring correlations and discontinuities of features, at least as perceived by our perceptual apparatus (Rosch, 1978; Mervis & Rosch, 1981). Communication about objects or scenes undoubtedly utilizes terms that capture these naturally occurring correlations and discontinuities. However, communication is also context bound in a way that mental representations of categories and taxonomies of categories need not be; in communicating