The International Society **ISEP** *for Ecological Psychology*

ANNUAL MEETING
PHILADELPHIA COLLEGES OF ART
October 18-19, 1986

Warm sunshine, art, and the amenities of the city provided an amiable setting for our meeting. Abstracts of most of the presentations follow later in this issue.

ELECTION

Seven people were elected to the Board at the meeting. They will serve two year terms, until October, 1988. Current Board members, then, are:

'86–'88	'85–'87
Alan Costall	Claudia Carello
Eleanor Gibson	Mari Riess Jones
James Jenkins	John M. Kennedy
Ulric Neisser	William M. Mace
Anne Pick	Claire F. Michaels
Edward Reed	Robert E. Shaw
Sverker Runeson	James Todd
	William H. Warren, Jr.

JOURNAL

Much of the business meeting was spent discussing the journal. The new wrinkle was the news that we must raise $15,000 in order to begin. This is because (1) we want to keep the price to members (indeed, all subscribers) low relative to other journals, (2) our membership of about 250 is not nearly enough to support a journal at the desired "reasonable" price, and (3) library subscriptions, the backbone of most viable scholarly periodicals, take a minimum of three years to build up.

The primary effort of fundraising is being directed toward foundations. Since the deadlines for some promising foundations are this spring, we will not have much to report until we hear from them. There is no reason to be pessimistic about our ability to produce a journal in the long run, but don't send in your manuscripts tomorrow.

Members at the business meeting suggested looking for ways to exploit our own financial potential as thoroughly as possible. Examples include increasing the dues to more realistic levels and establishing categories of Life Membership (say for $250 or $500) that would allow us to seek larger amounts from those who could afford it. Anyone with serious fund raising suggestions and/or willingness to help with the efforts should contact Bill Mace immediately. The last prudent recommendation was that we do more comparative shopping among publishers. Are the LEA requirements shared by others?

ATLANTA MEETING

The previously announced spring meeting will be held at Emory University in Atlanta, Georgia 30322, on May 22–23 (Friday and Saturday). Beth Shapiro is in charge of local arrangements. You should have received the basic information from Beth by now. Let me know if you want it but have not received it. Dormitory rooms are available for $15 per night for singles and $13 per person per night for double rooms.

PROGRAM. Posters. Any of you who can get to Atlanta, and have material to report, should think seriously about presenting a poster. The poster session is a good vehicle for presenting the full sweep of ecological psychology. If you will give a poster, contact Claudia Carello at Trinity College (Hartford, CT 06106).

The list of expected speakers includes Tom Alley, Tim Johnston, Scott Kelso, Len Mark, Dick Neisser, John Pittenger, John Scholz, Beth Shapiro, and Jim Todd. Other commitments soon will be confirmed.

TRIESTE

All members should have received the registration materials from Walter Gerbino long ago. The response has been very great. By early February Walter reported that there were already 100 participants.

For people traveling from the U.S.: Yugoslavian Airlines has low cost flights from New York to Ljubljana. Because Ljubljana is only an hour from Trieste by bus or car, Walter could have a bus sent from Trieste to meet people at the airport if enough people arrived at the same time. Anyone interested in organizing to travel together this way should contact Bill Mace. (203) 527-3151 X334, or X408.

For an account of what it is like to travel the Yugoslavian airway from the U. S., you may consult

Claudia Carello or any others from the merry band of travellers that shuttle between Haskins Labs and Belgrade. We hope that ISEP's Yugoslavian members and friends will be a noticeable presence at the conference.

ISEP IN BRITAIN

Ecological and Social Psychology

Arthur Still

The second Durham meeting of ISEP was held on 19 September 1986. The theme was Ecological Psychology and Language and papers given were: Realist Approaches to Speech Perception and Production in Infants (Mary Smith, APU, Cambridge), Ecological Psychology, Phenomenology and Speech Perception (Helen Fraser, Linguistics, Edinburgh), The Impersonal Nature of Perception and Communication: Some Thoughts on Mead and Gibson (John Morss, Psychology, Ulster), and Meaning and Ecological Psychology (Irana Markova, Psychology, Stirling). Eric Clarke (Music, City University) acted as a discussant with, Thoughts on the Concrete and the Symbolic in Language.

Abstracts of these papers and information about the activities of this British group are available from Arthur Still, Dept. of Psychology, University of Durham, Science Laboratories, South Road, Durham DH1 3LE, ENGLAND.

ELECTRONIC MAIL

A number of us have found it more and more convenient to communicate by computer network. The University and Research Institute based network that we are using is called BITNET. A number of other widely used networks are also connected through gateways. I am in touch with members in Canada, England, The Netherlands, and Sweden. Many connections exist in Europe, Israel, Canada, and the U.S.. Some are available in Japan, and there should be some in Australia in the near future if not now. In most cases, papers as well as mail messages can be sent over the computers. I have typed this newsletter on Trinity's mainframe VAX. Because it is just a file on the system, it can be sent immediately to anyone else who is connected. For the first time, I received some material for the Newsletter over BITNET. This meant that I did not have to retype it, but could insert it directly in the appropriate place in this issue.

Many of you are at institutions that have mainframe computers tied into BITNET or an associated network. If you have an account at your friendly computer center, you probably can use BITNET now whether you know it or not. If you are interested, in-

quire. All you need, then, to reach other ISEP members, is their computer address. Here are some:

Bill Mace   WMACE@TRINCC
Claes von Hofsten   CLAES@SEUMDC51

Figuring out how to get mail correctly through gateways can take a while, but I've managed to work out all of the addressing problems I've encountered so far. To get to Alan Costall in Southampton, England, for example, I have to write: PYI008%UK.AC. SOTON.IBM@AC.UK. But it works!

If (or when) you have an account on a BITNET connected system, please let me know so that we can compile a complete set of addresses.

ABSTRACTS OF PRESENTATIONS AT PHILADELPHIA

Natural Kinds and Natural Categories

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If objects and events are real and can be perceived directly, then are *kinds* of objects and events real and directly perceptible? The idea that similarity exists to be perceived and that kinds of objects exist in reality and not just as human definitions is one consequence of a direct realist approach to perception.

According to J. S. Mill (1843) kinds are groups of objects that share a common character with observable features that are caused by or are sure marks of that character. The character that members of a kind share is not enumerable, but the properties that mark or index that character are observable; the only way we can know kinds is through direct observation. Animals, plants, and chemical elements are kinds, species are kinds, e.g., horse . White things, white horses, things of the same specific gravity are not kinds —they have no common character. Mill's system does not include events, constructed objects (artifacts), nor the idea that kinds can change and evolve.

C. S. Peirce (1901) modified Mill's definition thus: the innumerable common properties that members of a natural kind share that other kinds do not share index a character that is of *permanent* interest to us. Peirce makes more explicit that the kind exists in relation to the knower. The kind is not a mental construction of the knower, but a group whose character is important to the knower. His definition excludes, as does Mill's, events, artifacts, and change of kinds.

Ghiselin (1981) in discussing systematic biology states that classes are real, that the members of a class share more than just a name, and classes are not "abstractions." Ghiselin makes a radical proposal about species—that they are individuals, that is, composite wholes. An individual is a single thing, located in space and time; it is integrated in one way or another, i.e., joined by physical or social forces or common descent, rather than the mere sharing of traits. One test for individuals is whether it makes sense to say they can have instance. For example the United States is an individual. There cannot be an instance of the United States. Ghiselin's system does not include constructed objects or events, but can be adapted to include these, and it does explicitly include changes or evolution in kinds. Like the other systems, it does not encompass events.

In order to study how ordinary people of all ages, as opposed to just adults who are scientists or logicians, know about kinds we need a more general definition. I propose to extend Ghiselin's definition to constructed objects and events. Thus the following definition: naturally occurring kinds of objects or events are those that are composite wholes sharing a common character, history, and/or set of causal forces. Many artifacts show what has been done to construct them, those made by hand showing their history most plainly. Therefore, humanly constructed objects fall under this definition as well as biologically or geologically evolved objects. Events are not reducible to the objects that participate in them so the definition of kinds must apply to events. Examples of different kinds of events are bending and stretching, or human activity vs. mechanical change, or action types such as climbing or sitting.

Following this idea further, any particular object is an index of its kind, not an instance of it and not a prototype of it. Any particular person is not an instance of *Homo sapiens*, but an index of *Homo sapiens*. Also kinds can be nested. Ohio is an individual. There is no instance of Ohio, but it is nested within the United States; I am an individual and I am nested within *Homo sapiens*.

We can use this idea or definition of kinds to guide explanations of how people group objects based on detecting the kind of object it is. The main question of my empirical study is whether children make a distinction between objects being the same in kind vs. just similar in some way. To study this question I used a sorting technique with photographs of naturally occurring objects, including constructed objects, and worked with children of 4, 6, 8, and 10 years, and adults.

I collected 10 metaphors produced by children in the 4-10 range because in verbal metaphor one thing is talked about in terms of a different-kind thing in order to draw the listener's attention to something about the topic. I then found photographs of the objects referenced in the metaphors resulting in a set of 20 realistic scenes. Examples are: ice skater on one leg and phonograph needle on a record "The skater is a record needle", whale spouting and fountain going "The whale is a fountain", solitary tree and king "The tree stands, monarch of the field". I obtained sorting data from 30 participants at each age showing and naming all the photographs in random order. Then I chose a standard and asked for matches to the standard. Fifteen at each age were asked "Is there anything here that is the same kind of thing as X?" and the other 15 were asked "Is there anything here that is like X?" about six standards. The matches were scored as either literal (objects the same in kind), or metaphoric (objects different in kind).

There were many literal matches at every age. Matches based on metaphor were rare in the kind condition and more frequent in the like condition at all ages. The results show that children at least by age four make a distinction between objects that are the same kind and objects that are alike on other grounds, including metaphoric grounds. Presumably, both of these abilities are the result of experience perceiving the natural world. Beyond this, it may be (as Mill posited) that direct experience with natural kinds is necessary for the ability to abstract a finite list of properties and group objects that have the properties. Empirical evidence on this point would be very important.

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Children's Manual and Visual Exploration within Selective Learning Tasks

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In experiments on selective learning, where children are given an opportunity to find a valued object (e.g., a small plastic horse or an M & M candy) which is occluded by one of two choice objects, young

children (CA 3 to 8) often choose first the novel occluding object. This "error" occurs repetitively across problems, even when the child is shown first which of the two choice objects occludes the valued object. The most common interpretation of this error is that young children attend to the novel perceptual features of the occluding object which they have not previously seen, and therefore are motivated to choose first the new occluding object. Zeaman (1976) equated this phenomenon with dishabituation and discussed the possibility of a developmental parameter to this effect: all humans are predisposed to attend to novel events, but with cumulative experience, children gradually learn to attend to familiar events and objects in tasks which differentially reward responses. Familiar objects, the argument goes, may have had a history of being instrumentally useful, but novel objects have unknown histories.

An alternative to Zeaman's conjecture on developmental changes in children's attention to novelty is implicit in the review of research on perceptual development by Gibson and Spelke (1983). These authors reason that with the acquisition of new knowledge and, hence, new actions, the child's exploration becomes diversified and her goals become more specific—namely, to discover new affordances. Furthermore, exploration should become more systematic and economical. Their perspective does *not* predict a general developmental trend in the frequency or intensity of exploration, but it does predict a change in the contextual specificity of exploration. Older children, by their account, should show a more economical and effective style of exploration in tasks where the goal is set by another—a style that is more successful in revealing the affordances of objects which are relevant for successful completion of an extrinsically designed task.

Within the domain of research in children's selective learning, relatively little has been written about developmental differences in the style of visual and manual exploration by children, or how these differences may relate to age differences in performance. The goal of the present study was to examine the pattern of hand and head movements (proxy measures of manual and visual exploration, respectively) prior to choice in selective learning and, hence, to evaluate the usefulness of Gibson and Spelke's perspective for understanding developmental changes in the style of exploration within this task domain.

Sixteen children within each of two age groups (CA 4 and 7) were tested on 20 Moss-Harlow learning set problems (Trial 1: present one object for inspection by subject; Trial 2: choice between two objects,

one familiar and one new). On half of the learning set problems, the object demonstrated on Trial 1 occluded a valued toy (small plastic horse charm); on the other half, no toy was occluded. Each subject's hand and head movements were recorded with a video tape system, mounted directly overhead.

Analysis revealed that (1) both age groups first visual orientation on the choice trial was *not* systematically related to novelty - familiarity or to whether a toy was seen under that object, (2) older children look longer at the pair of objects prior to choice than do younger children, (3) older children typically shift their gaze from one object to the other more often than do younger children, (4) both older and younger children look longer at the new object prior to choice, (5) both older and younger children are more likely to manipulate (and, hence, choose) a new object, and (6) younger children spend more time in manipulation of the first object handled prior to looking for the occluded toy than do older children.

These results indicate that the distribution of attentional activity across space and time in selective learning varies in a coherent manner across age. Older children, in comparison to younger children, are slower, more likely to adjust visual exploratory activity, and less likely to engage in manual exploration of objects—a mode of exploration which reveals little about the extent to which the object occludes another from view.

On Becoming a Crawler: The Assembly of a Special-Purpose Device During Infancy

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Human infants must solve a problem in learning to crawl: how to use the hands and legs to both provide support of the body off the ground and move the body forward along the surface of support. Based upon ideas owing to Bernstein, it was hypothesized in this study that to solve the problem, infants capitalize both on the inherent motion generated during rocking back and forth in prone and on asymmetries of hand use in order to induce a temporally sequential pattern of hand placement and kicking (i.e., crawling). Here I report results from a longitudinal study of the transition from rocking to crawling. Fifteen infants were observed weekly in their homes from age 6 months until they began to crawl. Kinematic analysis of video records of rocking indicated that (a) the fore-aft oscillation of rocking was temporally stable over cycles, (b) amplitude was greater in the aftward than

in the forward direction and (c) acceleration was significantly greater before midcycle than after during forward motion. The effect of bilateral asymmetry of hand use on the coordination between arms and legs during crawling was examined by analysis of the relationship of hand use preference during reaching for toys and the pattern of falling on the hands in beginning to crawl. Infants were significantly more likely to fall on their non-preferred hand and then extend their preferred hand to begin to crawl. Results suggest that stages in the achievement of crawling reflect the introduction of asymmetries into the oscillatory forces generated by motion along the support surface.

Children's Graphic Depiction
of Events
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The development of children's graphic representation of events is examined in two studies. The first explores (1) what information about events is preserved, (2) how that information is depicted, and (3) how each of these develops during the pre and early gradeschool (elementary school) years. The second explores children's use of flow- or action-lines to depict action in events.

In the first study, 4-, 5-, 6-, and 8-year-old children drew a child, a child playing ball, and a child pushing a wagon. At all ages, children's drawings differentiated both children in portrait from those in action, as well as children in the two agentive roles. Younger children transform the body by either deleting the arm not involved in the action or exaggerating the one that was. Older children transformed the agent so that it was oriented toward the object and a few 8-year-old children depicted biomechanics by representing the arms, legs or torso as bent. The actions were differentiated both in terms of the ecological constraints specifying the action, pushing necessarily implies agent and object on the same ground plane while playing ball does not, and orientation of agent to object. The latter ultimately involves acquiring techniques for preserving ecological constraints.

There were few instances of flow-lines, and when they did occur, they were used by children depicting biomechanics. The second study explored whether this relation is developmental or due to the type of action represented. Young children's drawings of playing or pushing need not incorporate biomechanics, both can be effectively by composition rules that specify the ecological and orientational structure of an event. In the second study 4-, 6-, 8-, and 10-year-old children drew a human and rocket spinning, falling or flying.

In addition, they drew the human running, an action that involves explicit biomechanical transformations.

Approximately 50% of the youngest children incorporated flow-lines into one of their drawings while 25% depicted biomechanics. Both percentages increased with age but did so selectively. Flow-lines were more often incorporated when drawing the rocket and when drawing either object spinning. The former may be due to the fact that the rocket is rigid and therefore biomechanical information is not valid and is rarely incorporated metaphorically. The latter may occur because drawing a spinning object "freezes" it in a vertical orientation that is ambiguous with respect to the action depicted. Moreover, it cannot be disambiguated by ecological or orientational information which may motivate children to incorporate flow-lines to specify angular rotation.

In conclusion, pictorial transformations depicting biomechanics and flow-lines appear to be used for the same reasons, to specify information that differentiates events. The earlier development of flow-lines may be due to the fact that they are graphically simpler techniques. However, their simplicity does not lead children to deploy them in every representation of events. They are used selectively, and the specific form of the flow line develops with age. These facts suggest that they are not arbitrary and need not be acquired by acquaintance with a cultural style. Rather they are intended to depict information specific to the perceived event.

Flaps, Arcs, and Spokes
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Devices relevant to perception of force and motion were investigated. It was noted that subjects severely underestimate the angle of a flap supported by a vertical cone of wind, when they are asked to predict the position of the flap, and are initially shown where the flap will be supported by a horizontal wind. A horizontal cone of wind which pushes the flap to 60 degrees away from the vertical can support the flap at about 175 degrees to the vertical when the wind is vertical. Subjects anticipate the angle to be lower than 90 degrees, and the modal response is often less than 60 degrees. Subjects fail to notice how the hinge provides support for the flap. Consequently they also underestimate weight of the flap in a vertical wind.

Subjects are consistent, but wrong. Consistencies in subjects using a line of trailing arcs behind a rolling ball were noted—subjects often used density of arcs to show speed. A more sophisticated response was distance between arcs to show speed, stroboscopically. Consistency in the use of spokes in drawings of wheels was noted. Subjects used nonliteral shapes and locations of spokes to show different kinds of motion.

Haptically Perceiving the Length of Hand Held Objects

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Nine experiments were reported on the ability of people to perceive the distances reachable with hand-held rods which they could wield by movements about the wrist but not see. An observed linear relation between perceived and actual reaching distances with the rods held at one end was found to be unaffected by the density of the rods, the direction relative to the body in which they were wielded and the frequency at which they were wielded. Manipulating (a) the position of an attached weight on an otherwise uniformly dense rod and (b) where a rod was grasped, revealed that perceived reaching distance was governed by the principal moment(s) of inertia, I, of the hand-rod system about the axis of rotation and not by the rod's length nor by the length of an equivalent simple pendulum. This dependency on I was found to hold even when the reaching distance was limited to the length of rod extending beyond an intermediate grasp. An account was given of the haptic subsystem (hand–muscles–joints– nerves) as a smart perceptual instrument in the Runeson (1977) sense, characterizable by an operator equation in which one operator diagonalizes the inertia and strain tensors. Attunement to the invariants of the inertia tensor over major physical transformations may be the defining property of the haptic subsystem. This symmetry was discussed from the Gibsonian (ecological) perspectives of information as invariants over transformations and intentions as extraordinary constraints on natural law.

Issues in the Transfer of Skill

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Skill instruction has tended to ignore the nature of what is learned in favor of specifying the conditions for learning. That approach is useful for applied research in that if we can show students to be more skilled following practice, we can infer that learning has occurred, and that the training program is effective. Nevertheless, it remains difficult to identify why a successful instructional program works, or why an unsuccessful one does not. Identification of component skills to be learned would allow a more detailed understanding of how students improve, and what promotes that improvement.

Transfer of skill is an important issue in flight training. Several notions have been proposed to guide training in a manner that will maximize transfer. Some of these are nontheoretical (e.g., maximize similarity, optimize difficulty). Others are based in the motor skill research (e.g., Schmidt's schema theory, Pew's process oriented theory, motor programs, internal models, etc.). A wide range of transfer data can be brought to bear on this problem. Some of it is from the study of linear movement or of other simple skills as, for example, those commonly used in tests of schema theory. Other data are available from basic tracking research and from applied flight training research. When viewed as a whole, these data do not fit easily with more usual explanations of transfer.

In fact, manipulations that appear to affect the perceptual dimension of manual control skills have been far more successful in producing significant transfer effects than have manipulations that affect only the response dimension. A perceptual learning approach can be used to account for opposing trends in a wide range of experimental paradigms. Thus, the significant problem in learning a manual control skill may lie in learning to detect, discriminate, and differentiate critical features, patterns, dimensions of difference, and consistencies, rather than in learning to control muscle action and in programming movement patterns. While it is inappropriate to ignore response manipulations entirely, it does seem that the historical emphasis on them has been misplaced and that more attention to perceptual manipulations would be amply rewarded.

The perceptual differentiation theory of perceptual learning (E. Gibson, 1969) may provide a useful starting point for understanding skill transfer. Within the differentiation framework, perceptual learning is accompanied by an increase in the specificity of correspondence between stimulus information and the observer's perception of that information. The changes that occur can be described in several ways. For example, there may be reduced generalization and increased discrimination of fine differences along a stimulus dimension. Stimulus structure or relationships that could not be detected previously may become perceptible. Detection of distinctive features of ob-

jects or events may improve. In general, the theory explains improved perception in terms of accentuated sensitivity to relationships, patterns, and features that are spatially or temporally invariant.

Several teaching strategies are consistent with E. Gibson's (1969) perceptual differentiation theory. For example, transfer along a continuum embodies a strategy in which the difficult perceptual discrimination is first learned by practice with easier discriminations on the dimension that defines the critical criterion discrimination. Thus, invariants that support flight control might be modified during early instruction to provide an easier discrimination. If, for example, the center of optical outflow is used for guidance, the rate of element flow might be artificially increased to more clearly identify the center of outflow.

Close comparison and contrast along the critical dimension of difference is another technique that can enhance perceptual training (L. Tighe & T. Tighe, 1979). If it can be shown that an observer gauges velocity of self movement from the rate of peripheral optic flow, prior training with specific velocities may help tune the observer's perceptual system to discrimination of different values along that dimensional invariant. During instruction, specific rates of flow might be presented to the student in close temporal or spatial proximity. Accentuation of critical perceptual invariants by highlighting, caricature, or abstraction has been shown to facilitate perceptual learning (T. Tighe & L. Tighe, 1978). For flight instruction, pointers or emphasis by color or brightness might help, as could deletion of irrelevant or distracting information. Augmented feedback is thought to facilitate learning by highlighting the dimension along which the student must make the perceptual judgment (Lintern, 1978).

The perceptual differentiation approach has clear implications for flight training. Techniques that enhance perceptual learning should improve instructional efficiency. The benefits could be substantial and may lead to better asymptotic performance as well as to faster learning. Recent discussions of the role of simulators in flight training (e.g., Wightman, in press; Lintern and Roscoe, 1980) have noted the potential value of special instructional techniques, many of which are not feasible when aircraft are used for flight instruction. Thus, flight simulators offer potential benefits in addition to their cost advantage for training. The challenge for psychology is to determine how these simulators can be used to maximize training effectiveness.

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Conditions for Reversal and Nonreversal of the Three-dimensional Necker Cube

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Although a few accounts are to be found in the literature about reversal in apparent orientation of objects in the world under certain viewing conditions, the phenomenon has not been the subject of detailed experimental study with respect to conditions that do and do not allow such reversal. The issue has significance in the debate between "constructivist" and "ecological" perceptual theorists, for the latter would argue that viewers cannot simply "entertain hypotheses" about the layout of surfaces at the ecological optical level. A number of naturalistic and experimental settings were devised, resulting in confirmation of the idea that a special visual "attitude" or "posture" is needed for reversal of the 3-D Necker cube to be achieved. Study using a range of cuboid forms exhibiting increasing "objectness" (surfacedness, opacity, convexity, solidity, "realness") showed that certain object qualities afford resistance to reversal, even under the special visual attitude. The outcome of these investigations supports a conclusion that the primary condition for reversal is adoption of an unnatural visual attitude. The absence of this attitude together with the occurrence of "decorated surfacedness" accounts for the nonexistence of reversal in ordinary real - world conditions.

Representation in the Environment

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Our thesis is that linguistic sign relations are actually exhibited in the environment and are perceptible. The relation between a linguistic sign and what it stands for is conventional. A convention is a social regularity which is displayed through behavior that *conforms* to it. The members of a community, by observing a custom or convention, naturally perform activities that exhibit the convention at the nonconventional and natural level of action and perception. Linguistic representation, being conventional, has its force through genuine sign relations evident in the relation between the environment and the practices of members of speech communities.

An ecological approach to representation does not assume that linguistic representation in natural language is purely a formal relation divorced from language users and the world in which they live *or* that the psychological states of language users constitute the natural language system and what it represents. Rather, linguistic representation has its source and existence in the interaction of language users with each other and with their environment.

Adopting an ecological rather than a formal or cognitive approach to linguistic representation shifts the emphasis from describing hypothetical mental representations to investigating perception of the actual, nonmental signs which are present and observable in the environment. there are many aspects of linguistic representation including written language, conversation, and discourse. We present research on two examples of representation in the environment, the emergence of linguistic representation in the first-language learner, and the nature and development of metaphor.

I. In learning the relation between a linguistic sign and what it stands for the preverbal child confronts a perceptual problem. Preverbal children do not innately know or invent the words of their native language. These, being socially derived, must be learned. Moreover, before she can *abstract* the meaning of a word on the basis of experience, the child must *extract* the relation between the word and what it stands for (Schmidt & Dent, 1985). Research on language acquisition reveals that caregivers of very young children foster this perceptual activity by continually engaging in behavior that serves to actualize and demonstrate the relation between what represents and what is represented (Carter, 1978; Messer, 1981; Tomasello & Todd, 1983; Zukow, 1985, 1986; Zukow & Schmidt, in preparation). We term such events *ostensive naming events.*

Ostensive naming events have the following important characteristics. First, the relation between a word and what it represents can only be learned from someone who already knows the convention. Thus, ostensive naming involves *social interaction* with language users. Second, in order for the preverbal child to learn what a word stands for, the word, what it represents, and their relation to one another must be present—i.e., *perceptually available.* The relation between a word and what it stands for cannot be *imputed*; it must exist independently of the processes through which the preverbal child is held to grasp it. Finally, and most critically, there must be some activity which *nonconventionally* directs the child's attention to the relation between the word and what it stands for—some *nonverbal* means of indicating or demonstrating the representational relation.

In ostensive naming events a word and what it represents, gesture and word, and gesture and what is represented are spatiotemporally united in one complex action. Attention to one relation compels attention to the others. Natural interactions (taken from videotape and transcripts made by P. Zukow, J. Reilly, and P. Greenfield, 1982) have been analyzed to see how the form of the gestures used in ostensive naming events might contribute to the specification of what is represented by the accompanying speech. The categories for gesture and focus of gesture were taken from Zukow (1985, 1986). Examples are presented of the following ostensive naming events: (1) showing an object, caregiver displays labelled object to child "*(thi)s the purse?*" (Zukow, Reilly, & Greenfield, videotape and transcript LPI 7/15/76); (2) demonstrating an action, caregiver raises a feather overhead and drops it "*Watch it—way high. See? Here it comes down.*" (ibid., LPII 8/16/76); (3) pointing to an attribute, caregiver uses index finger to rub a spot on the floor "*Yes. That's dirty.*" (ibid., LPI 7/15/76); (4) pointing to a location, caregiver throws seed pod towards location when conventional point fails to induce child to look in the appropriate direction "*He's over there on the grass. Look at the bird—over there.*" (ibid., JAII 9/1/76).

II. Verbal metaphor involves a special type of representation because the figurative term in an utterance that uses metaphor simultaneously refers to the literal referent of that term and to the literal referent of the topic term in the utterance (Dent, 1986). For

example, in the utterance, "The fireworks are flowers" the word "flowers" simultaneously refers to real flowers and to real fireworks. The fact that a resemblance exists between the two real objects allows the use of metaphor to talk about one thing in terms of a different-kind thing. The figurative term comments on the topic term. The important point is that the resemblance between topic and figurative *objects* is perceptible; the word-object relations are also perceptible. We do not yet know how caretakers use metaphoric reference with very young children, but children do produce metaphors from an early age. The example used above was produced by a child of three and one half years. Like naming events, metaphoric representation is by nature integral to the human environment.

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BOOK REVIEW
Ethogeny and ecology: A
Link Made and Broken
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In their germinal text, *The Explanation of Social Behaviour* (1972), Harré and Secord, criticising the mechanistic social psychological models prevalent in psychology (though not, I would stress, elsewhere), pointed to the theory of J. J. Gibson (1966) as the one current position in psychology with which they could identify. Gibson's theory, with its focus on the ubiquity of activity in the pick-up of information in the perceptible environment, nicely complemented, it seemed, the "action theory" concept Harré and Secord employed to model an essential feature of certain episodes in social life, namely that they are achievements of members, conducting themselves in planful ways. Furthermore, Gibson's reference to "rules" for successful action in relation to environmental surfaces (how to drive your car, land your airlane), seems to do the same conceptual job as the "rules" Harré and Secord proposed were implicit in the successful performance of social occasions (how to have a conversation, greet a friend).

This early salute, by the founders of *ethogenics* (a system of analysis claiming to join ethnography and ethnomethodology), to a theoretical apparatus in the very discipline under attack, might have led to fancier formations. But no subsequent, meaningful notice has been given to the ecological approach in perception by proponents of the ethogenic approach in psychology. Indeed the early signs of friendly attention seem to have given way to a somewhat hostile stance.

Following are selected passages from a recent review (Noble, 1986a, in press) of Harré's *Personal Being* (1983). These indicate something of the way the "hostility" is couched (Gibson–Skinner), and, more to the point, reveal the problem the ethogenic cam makes for itself, with regard to a concetion of the "self" devoid of a sound ecological component.

The first passage comes after an analysis of Harré's critique of a study by Duval, Duval and Neely (1979).

The key manipulation in the Duval et. al. experiments was so-called "self-focus", which was brought about by having participants look at their own facial image. Harré finds untenable the notion that consciousness of self can derive from something like perceiving a feature of the body, even one so salient

as the face. Later in *Personal Being* the concept of "self-consciousness" is considered, but no reference is enlisted to perception by the perceiver of their own body. There is reference to "self-conscious"—i.e. "embarrassed"—awareness of others' perceptions of one's appearance, a matter quite distinct from self-perception of the perceiver's own body. Such an exclusion seems to me a significant problem for a study of personal being . . .

The review goes on to a discussion of how Harré seems to get caught up by words and their meanings, then picks up again on the issue of "self".

The tendency to be ensnared by words and their reifying propensity may be what lies behind the problem mentioned earlier, with reference to "self-consciousness". Perhaps the ordinary meaning of that term has intruded too much to allow an important yet highly literal meaning to reveal itself to Harré in his reflections upon the matter. That meaning is to do with the perception of the embodied self as an irremovable feature of the environment. Harré wants to deny the possibility of such a treatment of the body—as a perceptible object like any other in certain important respects ("myself as perceiver could never be an intentional object for me" p. 153)—and is forced thereby into a catalogue of self-consciousness that lists: awareness of how we may be appearing to others; awareness of our perception of the environment beyond ourselves; and awareness of our awareness (of our thoughts, feelings, etc.). Awareness of ourselves as visible, audible, tangible, tastable, smellable objects (as intentional objects for ourselves) is quite overlooked. Yet this is a commonplace in our experience. And it surely must be the touchstone of "self-consciousness" (i.e., awareness by perceivers of their own bodies). Every action, from infancy, entails such self-perception. The body is the one and only constant in the perceivable environment. Though all else changes as one moves from one environmental area to another, the complex, elastic, and subdividing surface that specifies (in this case) the visible body is irremovable. Freud observed (1927) that the embodied self is unmistakably marked by the fact of bodily pain: its inescapability, untransferability, like that of one's shadow, also determines the self as embodied at its point of view. Such "self"-perception in humans is of course socially mediated; a point that does not affect the material status of the "thing perceived" which I am discussing here.

The one contemporary theorist in psychology who has articulated the information for the self, as specified by the perceived body in its ongoing relation with the environment beyond itself, is Gibson, especially in his 1979 work. Now I stress this because in the work that established the "ethogenic" approach, Harré and Secord (1972) identify Gibson's (1966) theory as the closest in psychology to their own position. Harré's neglect of Gibson (1979) in the present work (1983) is significant, not just because the resulting view of the "self" is missing the fundamental feature described above; it is also symptomatic of a broader issue of unrecognized or unacknowledged scholarly relationship.

In the case of Gibson, it is clear why Harré and Secord (1972) would have claimed affiliation. their project was to emphasise the capacities and propensities ("powers") of humans to initiate and reflect upon their actions: Gibson's to show how activity is integral to the extraction of perceptual information from the environment. But the linkage goes further than Harré and colleagues recognize. Given his lineage in Koffka's gestaltist approach, and in the realist tradition through Holt to William James (Gibson, 1967a; High, 1981), Gibson champions a metaphysic of realism (1967b). "Realism" is the "new" philosophy of science that Manicas and Secord (1983) point to as having profound implications for psychology. But far from enlisting Gibson's realist outlook, these authors instead lump him with Skinner, as a behaviourist, hence to be ignored by proponents of the ethogenic approach. Harré (1983) makes one fleeting reference to Gibson, and that still to his 1966 work. There is no recognition of development in Gibson's thinking in subsequent years, and, most critically of course, his 1979 work.

Consideration is given at this point in the reviews to links between G. H. Mead and Wundt (Mead, 1904), Mead and (non-Watsonian) behaviourism, and Berger and Luckman's (1967) synthesis of Mead's and Schutz's constructs: all matters unrealized or overlooked by Harré and colleagues (though they recognize Mead as a key theorist with respect to their purposes). The concluding reference to the issue of self that follows contains an allusion to a "trilogy" of texts by Harré. The first of these was *Social Being* (1979), the second is *Personal Being*, and the third, still to appear, is *Physical Being*.

Harré may be planning to cover self-perception of the embodied perceiver in the third of the trilogy (on "physical being"). But if the "physical", "social", and "personal" aspects of the person are to be thus treated as separate, rather than as "moments" in a dialectical complex (as Berger and Luckman (1967) would see), then the theory of human "being" becomes fragmented and incoherent. It might be argued that Harré (1983) recognizes something of a dialec-

tical approach in his diagrammatic presentation of axes referring to "public" and "private" aspects of personhood. But his final image (the "cycle of development") is much more like a "process" (a la cognitivist) theory than a dialectical one.

I return to one point in the preceding quote presently. Let me first note a small matter that seems to support the new, "hostile" attitude to ecological perceptual theory aong the ethogenists. In the commodious *Encyclopedic Dictionary of Psychology* (Harré and Lamb, 1983), the ecological approach to perception does not rate a separate entry, and the person engaged to write about "perception" is R. L. Gregory, who does not, of course, waste this opportunity to naysay about "direct" theories like Gibson's.

It would be feasible to posit that the "cognitivist" element identified above in the model of personal being, and indeed the "cognitivism" that generally permeates ethogenic discourse, is the feature that its protagonists believe makes rapprochement with Gibsonian "monism" unworkable. Whether that's the case or no is not of material concern in this text. What I do want to draw as conclusion is the need, in ecological theorizing, for better coverage of issues the ethogenic approach has on its agenda. If they can be criticized for failing to "see" the perceiver perceived as foundational to any theory of self, ecological perceptionists can be criticized for failing to "see" the political and moral dimensions that penetrate the whole of conscious (i.e., human, reflexive) life, hence the whole of (conscious) perception.

I don't want to expatiate here on that point (it is touched on in Noble, 1981, and 1986b, in press). I will be happy to remark further on the issue in response to whatever interest is sparked by the preceding observations.

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