The International Society for Ecological Psychology

Volume 2 Number 4 NEWSLETTER June 1986

ISEP SPRING MEETING
LAKE FOREST COLLEGE
LAKE FOREST , IL USA
(Meeting IX)
May 23 - 24, 1986

Abstracts of two presentations from Lake Forest appear later in this Newsletter, others will be in the next one. Claire Michaels arranged for a beautiful, if cool, weekend that went very smoothly. The advantages of the two day format were amply appreciated. It allowed for much more discussion among participants than was possible with one day meetings, made it possible for people with conflicts on one day to attend the other, and encouraged longer distance travel.

Publications

Bill Mace reported that the series, Resources for Ecological Psychology, has several new books due to appear between August and January. These are: Viki McCabe and Jerry Balzano (Eds.), Event Cognition: An Ecological Perspective; Peter Kugler and Michael Turvey, Information, Natural Law, and the Self - Assembly of Rhythmic Movement; and Tom Lombardo's book on the history of James Gibson's approach to perception (the book is finished, the title is pending). In addition, Jackie Gibson has arranged with LEA, the publisher of the series, to reprint a paperback version of The Ecological Approach to Visual Perception by James J. Gibson. Write to Lawrence Erlbaum Associates, 365 Broadway, Hillsdale, NJ 07642 to find out when the Gibson reprint will be available. It might make it by this fall. Don't forget that graduate students can arrange to purchase books (except those recently published) at a 50% discount from LEA and that Society members get a 30% discount on series books and a 20% discount on LEA journals.

The reason people have not heard much about the Society's journal, Ecological Psychology, for some time is that we cannot make announcements that represent definite commitments until papers are available and the publisher is ready. As Ed Reed reported, both conditions are close to being satisfied. We will begin to collect and review papers either this summer or next for publication the following January (either '87 or '88). The decision about which schedule is to be followed depends on how fast we can get about 70 new members (the first year's subscription to the journal is covered by the membership dues). As soon as we get the approval to proceed, general calls for papers will be sent out.

Member Responses Wanted

Reviewers. Members who are willing to referee papers for the journal may write to Bill Mace (at the Society address) now. List your areas of expertise (substantive and methodological) so that we can develop a good file to draw on. Please note anything else that might be relevant to the reviewing you could do, such as times of year that would be especially inconvenient. It is important at the beginning to be able to deliver constructive and prompt reviews. Can you translate articles? What languages? The language of the journal will be English, but knowledge of people who could translate articles would allow us to consider accepting articles or publishing abstracts in other languages.

Opinions. Last October we agreed to set aside a small amount of money (on the order of a few hundred dollars) to defray the expenses of a speaker or speakers for a Society program. Ed Reed was appointed to study ways to determine when and how such money should be spent. Ed made an additional proposal at Lake Forest. He suggested that a prize of, say, $100 be

awarded for the best graduate student poster presented at a given Society meeting. Publication in the journal might also be part of the recognition. This would be a way to stimulate students and advisers to participate in poster sessions. The money would be enough to be meaningful to a student, but probably not enough to stimulate greed or to undermine the original purpose of supporting speakers. What do you think? Send your comments to Ed Reed, Dept. of Humanities / Communications, Drexel University, Philadelphia, PA 19104.

Board Member Candidates. Since not everyone in the Society knows everyone else, elections for the Board must be arranged further in advance with some description of a potential set of candidates provided to all members. A list of names of the members is no longer so helpful. Therefore, if you would like to be placed in a pool of people to be considered, send your name and pertinent descriptive facts to Bill Warren, Dept. of Psychology, Brown University, Providence, Rhode Island 02912.

Publication Lists. The major purpose of the ISEP is to provide a central forum for communication among people from many disciplines and countries whose interests bear on ecological psychology. Relevant publications and meetings are scattered about so much that it is very difficult to find out what exists much less collect it and assimilate it. Claudia Carello suggested that one way we could use the Newsletter to inform members about the field as well as one another would be to print titles and sources of a sample of members' publications. A few have been assembled for this issue to convey the flavor of what this might be like. Please send any citations that you think would be helpful to Bill Mace. The idea is to communicate what is being done, who is doing it, and where to find it (without any pretense to being exhaustive).

Newsletter Contributions. The more people who contribute to the Newsletter, the more we will serve the purpose of informing the Society about its members. This is meant to be a vehicle for relatively informal communication, a place to share ideas, discoveries (books, articles, tools), whimsy (relevant), and humor. News about courses being taught and ISEP related meetings (such as those in Britain described below) are welcome contributions. If you have something to say, send it along. As you can no doubt tell, this is not where the heavy editing goes on. It is by the members and for the members. Send contributions to Bill Mace at the Society address.

NEXT SOCIETY AND CLOSELY RELATED MEETINGS

ISEP ANNUAL MEETING
October 18, 1986
Philadelphia

Keep in mind that the annual business meeting is always the third Saturday in October. Nathan Knobler has graciously offered to host the next meeting at the Philadelphia College of Art. Because of the success of the two day format, this will probably be a two day meeting, but the second day (Friday or Sunday) has not been chosen yet.

ISEP SPRING MEETING
May, 1987
Atlanta

Ordinarily we do not have a meeting in the spring of a year when we have an Event Conference. However, since the 1987 Event Conference in Trieste is late in August, we decided to accept the invitation of Beth Shapiro and Ulric Neisser to meet at Emory University in late May, 1987. The weekend before the U.S. Memorial Day

weekend is likely, but no date has been set yet.

TRIESTE --
Fourth International
Conference on Event
Perception and Action

August 24 - 28, 1987

Preliminary mailings will be sent out by Walter Gerbino very soon. If you need information about the Trieste Conference, write to:

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University of Trieste
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ISEP IN BRITAIN --
Ecological and Social Psychology

In 1984, Arthur Still of the University of Durham and Alan Costall of the University of Southampton organized an ISEP interest group meeting in London followed by a more formal one at Durham at the end of September last year. There will be a second Durham gathering this coming September (1986). The theme of the 1985 meeting was Ecological and Social Psychology. Papers given were: Michotte on the Perception of Intentionality (Alan Costall), The Perception of Social Actions from Point Light Displays: a paradigm for an Ecological Approach to Social Perception? (Jim Good), and Affordances: The Social Dimension (John Pickering). John Churcher and John Shotter acted as discussants. 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.

ABSTRACTS OF PRESENTATIONS AT LAKE FOREST

An Ecological Theory of Orientation and the Vestibular System

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and

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In this paper we provide evidence against a fundamental assumption of traditional theories of orientation -- that gravitoinertial force is perceived. We argue that spatial orientation is based on information that is available in patterns of motion of the organism. We further argue that perception and control of orientation depend not only on information about an organism's motions relative to the local force environment, but also on information about the surface of support. We describe both of these kinds of information, and discuss their availability to, and across, different perceptual systems in the context of postural maintenance, aircraft control, and gaze stabilization. The use of this information for active control is particularly emphasized.

Affordances and S-R Compatibilities in Reaction Time

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"S-R compatibility" and the "Simon Effect" label phenomena in choice reaction time where certain responses are more rapid than other responses to certain

stimuli. The most potent S-R compatibilities are based on spatial arrangement, e.g., responses on the right are faster to stimuli on the right. I sought to determine how ecological theory might explain these effects and to evaluate choice RT as a paradigm for ecological research. It was claimed that both phenomena could be understood as the consequences of affordances. In particular, spatial location affords reaching to, grasping at, or pointing at, so reactions in the direction of a stimulus ought to be faster than in other directions. If the affordance interpretation of the spatial effects is correct, one would expect that other affordances ought to yield the effects on reaction time as those observed with position. To test this, the affordance of catching or intercepting was used by having optical patterns specify that an object moved toward one of the perceiver's hands. Subjects responded to initial position of a moving square (left or right of a computer screen) either compatibly (left square - left hand) or incompatibly (left square - right hand). On half the trials the square appeared to move toward the ipsilateral hand and on half toward the contralateral hand. The results revealed a "Simon effect" for direction of movement: The left hand responded more quickly when the direction of movement was toward the left hand -- even though direction of movement was nominally irrelevant to the task. Similarly, in a second part of the experiment, when responses were made on the basis of direction of movement (compatibly -- left hand when moving toward the left hand -- or incompatibly -- right hand when moving toward the left hand), powerful "S-R Compatibility" effects were observed. It was concluded that the typically observed spatial S-R compatibility effects are not unique but rather illustrative of a general principle, one captured nicely by the Gibsonian idea of affordances, which claims that information is about the actions permitted in a situation. Whether the RT paradigm can be a meaningful too for ecological research was deemed less certain.

POSTERS AT LAKE FOREST

Rosemary Mills and John M. Kennedy (U. of Toronto). Perception and x-ray images: A review.

William Simpson and John M. Kennedy (U. of Toronto). Time - to - Collision: Information present but sensitivity degraded by rotation.

John M. Kennedy and Andrew Portal (U. of Toronto). Gibsonian theory of constructed and geometrical illusions, and a new class of illusions.

Claudia Carello and Greg Williams (Trinity College). Manipulating the effectiveness of styles of depiction and pictorial devices.

Robert E. Shaw and Thomas Barrieau (U. of Connecticut). Rules for intelligent behavior: Cognitive and ecological approaches.

Thomas Carolan and Jeffrey Shaw (U. of Connecticut). Rules for the perceptual control of action: An ecological intrepretation.

Jeffrey Shaw, Robert E. Shaw and Thomas Carolan (U. of Connecticut). I. Four kinds of information flow.

Thomas Carolan, Jeffrey Shaw and Robert E. Shaw (U. of Connecticut). II. The sensorimotor integration problem.

Robert E. Shaw, Thomas Carolan and Jeffrey Shaw (U. of Connecticut). III. Sensorimotor mapping over the perceiving - acting cycle.

MEMBER PUBLICATIONS

The purpose of this feature is to inform Society members about who is doing what. It is not meant to be promotional and it certainly is not meant to be exhaustive. Thus, if a person has 20 papers on the same topic, one citation here will do. By the same token, if 20

people are doing the same thing, we need not list works from all 20. The items that will appear here are samples selected for (if any selecting is required) what they reveal about our collective interests and expertise.

James E. Cutting (Cornell University)

Cutting, J. E. (1986). Perception with an Eye for Motion. Cambridge, MA: MIT/Bradford Books.

Margaret A. Hagen (Boston University)

Hagen, M. A. (1985). Varieties of Realism. New York and Cambridge: Cambridge University Press. This is a book on art, geometry, and psychology.

Nathan Knobler (Philadelphia College of Art)

Knobler, N. (1980). The Visual Dialogue. Third edition. New York: Holt, Rinehart & Winston. A widely used text on art appreciation.

Claire F. Michaels (Lake Forest College)

Michaels, C. F., Prindle, S. & Turvey, M. T. (1985). A note on the natural basis of action categories: The catching distance of mantids. Journal of Motor Behavior, 17, 255 - 264.

Michaels, C. F. (1986). An ecological analysis of binocular vision. Psychological Research, 48, 1 - 22.

Thomas Natsoulas (University of California at Davis)

Natsoulas, T. (1985). An introduction to the perceptual kind of conception of direct (reflective) consciousness. The Journal of Mind and Behavior, 6, 333 - 356.

Sverker Runeson (Uppsala University)

Runeson, S. & Frykholm, G. (1983). Kinematic specification of dynamics as an informational basis for person - and - action perception: Expectation, gender recognition, and deceptive intention. Journal of Experimental Psychology: General, 112, 585 - 615.

FROM THE ARTS

Artists and architects have often chided psychologists for identifying (in practice anyway) the visual arts with painting and drawing. Even considering only artifacts (as opposed to "nature"), there is little psychology addressed to sculpture and interiors as objects of perception. Koenderink (1984) has opened the study of solid shape and Benedikt & Burnham (1985) have presented a pioneering study of interior "space" perception. However, if one asks, "How do we tell the difference between outdoors, indoors, and a picture or either one?", aside from the fact that these are trivially easy in practice, it is not clear how our actual theories would answer the question. There are many artists (some even called Environmental Artists) who are vitally interested in such questions.

Robert Irwin, James Turrell, and Meg Webster are three contemporary artists whose work is worth our attention. They work by arranging surfaces and light at the scale of interiors and even exteriors (that is, large chunks of the earth, the "outdoors") to explore the range of perceptual as well as aesthetic effects that can be achieved. The fact that much of what they are doing is scale dependent is surely significant. Do any current theories of vision (physiological, psychophysical, computer or what have you) suggest the existence of such effects much less explain them? What is special about a whole desert as a perceptual "object" (Weschler, 1985)? Why is Turrell spending many years and millions of dollars building a framework for looking at the sky out of a whole crater (Rodan Crater) in the U.S. Southwest (Failing, 1985)? Could he do the same thing on a much smaller scale? What has Webster done in her indoor construction that makes one feel buried up to the nose under an open

sky? People in Pittsburgh can examine the last question by going to the permanent construction at a gallery called The Mattress Factory (Baker, 1985). Write in to the Newsletter to describe what the effects (and causes) seem to be if you have the opportunity to experience any of these displays. One problem with reviews of art works is that the descriptions are often filtered through only one frame of reference and vocabulary (that established by art critics).

I mention these three artists in particular only because they have come to my attention at a time when I am sensitive to the issues raised by their work. There may be better ones to cite. The purpose of this note is to give people a place to start if this kind of art and its implications for psychology interests them.

Adcock, C. (1985). Perceptual edges: The psychology of James Turrell's light and space. Arts Magazine, 59 (February), 124 - 128.

Baker, K. (1985). Meg Webster and James Turrell at the Mattress Factory. Art in America (May), 179.

Benedikt, M. & Burnham, C. (1985). Perceiving architectural space: From optic arrays to isovists. In W.H. Warren and R. E. Shaw (Eds.), Persistence and Change. Hillsdale, NJ: Lawrence Erlbaum Associates.

Failing, P. (1985). In Art News, 84 (April), 71 - 78.

Koenderink, J. J. (1984). The internal representation of solid shape and visual exploration. In L. Spillmann and B. R. Wooten (Eds.), Sensory Experience, Adaptation, and Perception. Hillsdale, NJ: Lawrence Erlbaum Associates.

Weschler, L. (1982). Seeing is Forgetting the Name of the Thing One Sees: A Life of Contemporary Artist Robert Irwin. Berkeley, CA: University of California Press.

--Bill Mace

BOOK REVIEWS
From Bob Shaw

Valentino Braitenberg (1984). Vehicles: Experiments in Synthetic Psychology. Cambridge, MA: M.I.T. Press. $14.95.

This eloquent little book explores mechanistic psychology in an enjoyable witty prose topped off with delightfully whimsical illustrations. The author, a noted cyberneticist and neuroanatomist, takes the reader on a magical odyssey through nested grades of robotic mechanisms that he calls "vehicles". As each vehicle is upgraded, we confront simple mechanisms that putatively simulate psychological functions.

Early chapters in the book cogently and lightheartedly sustain the mechanistic thesis. However, this thesis fails where vehicles aspire to true conceptual thinking, leaving them stranded at a crude level of Piagetian sensorimotor functioning. From here the arguments become somewhat strained and the prose more ponderous, requiring the reader to accept implicitly the questionable adequacy of feature detectors, associative bonds, and feedback as explanatory mechanisms. Modesty in artifactual design places demands on theoretical gullibility.

This hardly matters, for the book's purpose is not to propose serious psychological models but to dispose of certain modelling prejudices. Here, by the author's candid confession, we have science fiction, not for amusement, but "in the service of science". In this service, the book clearly succeeds.

Careful consideration of the author's insights and critical comments will no doubt raise questions for expert and student alike about what counts as a successful simulation. For instance, much wisdom is encapsulated in what he calls the "law of uphill analysis and downhill invention". Namely, that it is easier to invent machines to produce desired actions than to infer from the actions how complex the machines must be.

In final analysis, the purpose of the book is provocatively equivocal -- Is it to purify our minds of phony attribution theory by dispelling the aura of mystery associated with psychological predicates, admonishing us to avoid overestimating the complexity of living systems? Or, is it to caution us that simulation theorists are just as likely to violate the canon of parsimony by attributing greater psychological relevance to their models than they deserve?

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BOOK REVIEW REPLY

The Resolution of Theoretical Issues in Perception through a "Levels of Analysis" Argument

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The main thrust of Reed's critique of Visual Perception (ISEP Newsletter (1986), 2, No. 3 (January)) is that a "levels of analysis" argument cannot achieve a reconciliation between the information processing and ecological theories of perception. Briefly, this argument is that the two theories are concerned with complementary problems at different levels of analysis; ecological theory with problems of identifying the patterns of light which specify surfaces, objects or events of importance to a perceiver, and information processing theory with the algorithms which extract such information from the pattern of light reaching the eyes. A consequence of this view is that disputes between the two theories are unnecessary and prevent advances in our understanding of perception.

Reed takes us to be strong advocates of the "levels of analysis" argument and to claim that it can resolve all differences between the ecological and information processing theories. While we accept that our emphasis in Visual Perception was on the scope for resolution rather than on obstacles to it, we did not intend to make so sweeping a claim, and we will therefore use this reply to clarify just what we believe can and cannot be achieved with a "levels of analysis" argument.

We argue that two disputes between the ecological and information processing positions can be resolved by recognising different levels of analysis. First, it is mistaken to insist on a reductionist description of the information available for vision, as many of Gibson's critics have done. Different descriptions of the input are appropriate for problems at different levels of analysis. For questions of receptor photochemistry, the input is a stream of photons; for questions of interaction between retinal cells, it is a matrix of light intensity values; and for certain treatments of problems such as colour vision or depth perception, it is some complex ratio of simpler parameters. For any particular problem in the physiology and psychology of perception, the appropriate description of the input should be used, without misleading argument about what the input "really" is.

Our second way of using the "levels" argument concerns the question of how links can be made between psychological and physiological accounts of perception. We believe that this cannot be achieved without a decomposition of the process of perception into operations, or algorithms, of some kind. Examples of this algorithmic level of analysis include Marr and Hildreth's (1980) algorithm for locating gradients in an image and Buxton and Buxton's (1983) analysis of the extraction of time to collision from optic flow.

In one sense, an algorithmic analysis of some aspect of perception implies that it is mediated, but we would distinguish two possible meanings of the word "mediation". One is that inference, problem-solving, memory or other processes at a psychological level intervene between world and percept; this is the traditional Helmholtzian position which Gibson argued against. The other is that perception, although not decomposable into psychological processes, corresponds to a number of separable operations at an algorithmic level. We argue that the mediation of perception in this second sense (but not in the first) can be reconciled with an ecological analysis of the information available to a perceiver, and becomes necessary if any correspondence is sought between ecological and physiological levels.

A consequence of this argument is that we do not, as Reed believes, regard algorithmic models such as those of Marr (1982) as constituting a psychological level of analysis of perception. We readily accept Reed's point that such models give no account of some psychological aspects of perception. Whether algorithmic accounts of more complex perceptual achievements could be given is not certain, but they are possible for simple phenomena, such as the detection of time to collision.

Our claim is therefore not for a general synthesis between ecological and information processing theories, but for the possibility of collaboration between the two approaches on some specific problems in perception. Turning now to our reasons for not claiming that the "levels of analysis" argument offers a general synthesis, we see two important controversies which cannot be resolved in this way.

The first problem is the kind of physiological account of perception invoked by the two theories. For the information processing approach, this has usually been a description of how nerve cells are organized into a passive, unidirectional processing channel. We accept Reed's argument that Gibson (1966) made a significant challenge to physiological accounts of this kind, showing that perception is an activity and that physiological models of passive input channels will not suffice to explain it. This problem need not arise for some specific problems in perception -- for example, it would not prevent an analysis of the neural interactions involved in detecting time to collision -- but it certainly must be taken into account by general theories of the physiology of perception. Neurophysiologists have failed to take up this challenge, but we do not accept that Gibson made significant progress in this direction either. Also, we disagree with Reed's assertion that physiological knowledge gained within an "input channel" framework is <u>irrelevant</u> to understanding perception; when physiological models of perception as an activity are developed, they will surely encompass rather than ignore our present knowledge of the properties of retinal and cortical cells.

A second difference between ecological and information processing theories which cannot be resolved in "levels of analysis" terms is the question of the role of memory. The core of this issue is whether there is sufficient information in the light reaching perceivers to specify the structures, events and affordances which they can perceive. Information processing theories maintain that, in general, there is not and that information in the light must therefore be supplemented by information in internal representations. Ecological theory claims that there is always enough information in light,

provided that a sufficiently extended sample of light, actively obtained by the perceiver, is considered.

Where appropriate invariants in the pattern of light can be demonstrated, the ecological argument is persuasive, but where they cannot, the question simply cannot be answered and debate becomes a matter of assertion. One answer to this problem is to define perception as the direct detection of invariant information and to treat cases of "seeing as" as judgment, inference or cognition. We take Reed's point that Gibson did indeed make the distinction between "seeing" and "seeing as" in these terms, but we do not accept that either he, or Fodor and Pylyshyn (1981), provided criteria for making the distinction in any particular case.

We believe that the problem underlying this debate is the lack of any powerful models, or even metaphors, for the changes occurring in animals or people which result in perception being influenced by past events. Information processing theories offer the metaphor of knowledge being stored as representations in some memory structure similar to a filing system, while ecological theory talks in terms of attunement and resonance. We regard both conceptions as weak, and suspect that, with further theoretical development, the present controversy over the representation issue will be bypassed. We believe that the most promising developments of this kind presently lie in Shepard's (1984) work on the resonance metaphor, and especially in models of memory which make use of distributed patterns of activity rather than discrete symbolic traces (e.g. Hinton and Anderson, 1981).

In conclusion, we accept a number of the points which Reed makes, but we disagree with his view that the ecological and information processing theories are clear, well defined positions separated by radical differences in their principles. We see both approaches as more diffuse and less broad in their scope than each claims. The "levels of analysis" argument allows some reconciliation between them, and at least enough to allow progress on some questions in visual perception. The remaining differences are certainly important ones, but we suspect that their resolution will come with imaginative theoretical developments transcending our present debates.

References

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Fodor, J. A. and Pylyshyn, Z. (1981). How direct is visual perception? Some reflections on Gibson's "Ecological Approach". Cognition, 9, 139 - 196.

Gibson, J. J. (1966). The Senses Considered as Perceptual Systems. London: George Allen and Unwin.

Hinton, G. E. and Anderson, J. A. (Eds.) (1981). Parallel Models of Associative Memory. Hillsdale, NJ: Lawrence Erlbaum Associates.

Marr, D. (1982). Vision. San Francisco : W. H. Freeman.

Marr, D. and Hildreth, E. (1980). Theory of edge detection. Proceedings of the Royal Society of London B, 207, 187 - 217.

Shepard, R. N. (1984). Ecological constraints on internal representation: resonant kinematics of perceiving, imagining, thinking and dreaming. Psychological Review, 91, 417 - 447.

LETTER

The Country Western Theory of Information Conservation -- There has been some controversy within the ranks of the ISEP as to whether information (like energy) is conserved [e.g. last chapter of W. H. Warren & R. E. Shaw (Eds.) Persistence and Change]. The following comment on the issue courtesy of Fred Rose (composer) and Willie Nelson (performer) is offered to help settle the dispute.

In the twilight glow, I see
-- blue eyes cryin' in the
rain.
When we kissed goodbye and
parted, I knew we'd never
meet again.
Love is like a dying ember;
only memories remain.
And thru the ages I'll
remember, blue eyes cryin'
in the rain.

I hope this clears the matter up.

Peace,

Viki McCabe

"Oh, for heaven's sake! Twenty years from now, will it matter whether the italics are yours or his?"

TABLE OF CONTENTS

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