# An Ecological Approach to Semiotics

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# INTRODUCTION

Within the field of semiotics a distinction is normally made between an event which is perceived (the expression, sign or signifier) and the meaning which is interpreted (the content, signified or interpretant) (see e.g. Saussure, 1983; Peirce, 1991; see also Eco, 1979). Note that although the first of these entities is physical (e.g. a sound, a mark on paper) the second is not the same as the referent, and is not normally regarded as a physical event or object. A referent is a real object or event, whereas the signified is generally assumed to the meaning of a sign. The relationship between sign and signified is assumed to be socially convened in most cases, and although open to change, such change is assumed to be slow: most semiotic systems are constrained by a socially-convened system of relationships between signs which is shared by a community (e.g. Saussure, 1983: 74–78). Hence, a crucial aspect of semiotics is the notion of interpretation, where objects and events furnish us with information not about themselves, but about other objects or events.

For Saussure, and many other semioticians (such as Eco, 1979), it is not at all clear how signs are related to reality, indeed it has been argued that it is unnecessary to relate meaning to any physical referent. Meaning, within this view, is determined by a system of oppositional relationships between signifiers, and between signifieds, not by the recovery of an intended message, or by reference to the world. For example, freedom is understood in relation to imprisonment, tiger in opposition to lion, gryphon in opposition to chimera. Referents, therefore are not a necessary condition for semiosis to occur. Moreover, the relationship between signifier and signified is often characterised as a mental association between signifier (physical) and signified (mental). Semiotics can therefore appear to be a solipsistic endeavour, in which meaning is completely arbitrary and unbounded by ecological constraints. Indeed, Eco (1979: 58–9) regards signs as anything that can be used to lie, in order to highlight the interpretative nature of semiotic meaning and to deny what he terms the "referential fallacy".

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Such a perspective on meaning begs questions regarding the relationship between signs and reality. In this paper an attempt will be made to show how ecological psychology might help us to relate sign-functions to the physical environment, through the concept of *affordance*. Affordances are relational properties which pertain between organisms and their environment. Affordances are functional meanings, and depend upon the perception of invariant properties in the environment which are detected through the pick-up of structured stimulus information (Gibson, 1979). An example might be the affordance of throwing which may be perceived when manipulating a "graspable object of moderate size and weight" (Gibson, 1979: 133). Such a project is related to that of Noble (1981; 1991), who attempts to supplement Gibson's ecological approach with the ideas of Mead (e.g. 1934): Noble argues that underlying the perception of many affordances is the perception of social agreements. However, Noble does not explicitly and extensively deal with the perception of signs in this work, and here the central issue will be signs, and not just the concept of social affordances, although the latter will need to be acknowledged in order to deal with signs within an ecological framework.

Previous attempts to deal with signs within an ecological approach have tended to accept Gibson's classification of semiotic behaviour as an example of indirect (as opposed to direct) perception (see e.g. Gibson, 1979; Reed, 1991), perhaps because this view is coherent with the notion that direct perception, unmediated by language or other distorting influences (such as instruments or depictions) is the "simplest and best kind of knowing" (Gibson, 1979: 263). Reed is perhaps the clearest and most explicit writer on this distinction between indirect and direct perception, and given his extremely sophisticated views on how an ecological approach can be applied to the widest range of human perception and action (Reed, 1996a) it is interesting to note that he develops this distinction towards a moral philosophy in his Necessity of Experience (1996b); indeed this distinction is fundamental to his argument in this book. He claims that "firsthand experience" (direct) and "secondhand experience" (indirect) differ in terms of the shared and selective nature of the latter in contrast with the "comprehensiveness and openness" of the former (Reed, 1996b: 94). Distinguishing direct and indirect perception on these grounds is curious, given the selective nature of much perception (see e.g. Neisser, 1979). Nonetheless, even the most recent and successful attempts to apply ecological psychology to the study of knowledge retain a fundamental distinction between indirect and direct perception and place the use and perception of signs firmly with the former, mostly for quite pragmatic reasons: indirect perception allows us to perceive objects and events that are not directly and immediately specified in stimulus information. Heft (2001: 350) makes this point forcefully, re-asserting the need to distinguish between the dual experiences of direct and indirect perception, reminding us that in Gibson's eyes a drawing can be perceived directly (giving no information about its referent) but also indirectly, providing "secondhand information about another object".

181

The majority of this paper will be an attempt to show how this distinction between indirect and direct perception need not be maintained as far as the interpretation of signs is concerned, indeed that it is misleading. This intention comes from a desire to clarify what kind of perceptual work we do when we listen to, look at, watch or read signs, whether in a narrow communicational sense, or in the domain of the visual, text-based, or performing arts. A subsidiary aim is to identify the way in which our perception of signs' meanings might be seen as the perception of affordances, rather than the perception of the signs' interpretants, or their referent objects or events.

# EXTENDING AFFORDANCES

In order to meet these aims, a broader definition of affordances than that sometimes supposed will have to be accepted: one in which objects and events may afford different things depending upon the needs and effectivities (capabilities for action) of the perceiving organism (Heft, 1989), one in which affordances themselves are culturally relative, and open to social mediation (Noble, 1981; Costall and Still, 1989; Heft, 1989) and one in which affordances are the result of a mutual relationship between organism and object or event (see e.g. Ben-Zeev, 1984; Heft, 1989, Stoffregen, 2000a and b). Moreover, within this paper it is assumed that affordances are directly perceived, and not mediated, even in cases where the organism seems to be making choices between different interpretations of the same stimulus-information based on contextual information. Like Heft (1990) this paper will assume that schemata are not necessary in such situations (see Chow, 1989) but instead that the organism is perceiving a "focal" object or event within the context of surrounding contextual stimulus information, and that the perceived affordance is the result of this complex of stimulus information (see also Chemero, 2001). Ginsburg (1990) reviews the extensive debate in this journal regarding affordances, and notes, in agreement with Costall and Still (1989) that even within the field of ecological psychology there is considerable disagreement about the extent to which the term affordance can be used in a cultural setting and that this diversity of views is to an extent the result of some vagueness about how to deal with social and cultural perception in Gibson's own work (Gibson, 1979).

The arguments in this paper will extend those advanced by Noble (1981; 1991), who, according to Ginsburg (1990: 353) "criticised Gibson for conceptual temerity, saying he was not true to his relational conception of perception". Noble argues that Gibson positions affordances too much in the environment, and fails to highlight the role played by an organism's potential actions in determining just what these affordances are. He argues that the affordances of a mailbox cannot reside purely in the visual or haptic information it provides, but that if we are to perceive that it affords "posting of letters" we must perceive it in relation to ourselves, and indeed to our social selves. Noble argues that perception of such social

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objects may be thought of in terms of affordances, but that these affordances depend upon the perception of social conventions. The mailbox continues to afford posting during a strike if we fail to perceive that a strike is being held, and stops affording such actions if we perceive the strike action.

Noble's extension of the concept of affordances to the social and cultural can be seen as an attempt to better engage with the direct perception of the human environment in all its messy cultural and social complexity, and this paper seeks to develop this through a study of how information can specify affordances in situations which seem to rely upon cultural conventions. The concept of the affordance will help ground semiotics in a pragmatic sense without making it deterministic, by suggesting, for example, that a bell sound might afford particular courses of action ("attention", "looking", "running", "attendance" . . . ) depending upon the listener's particular environmental context.

As Sanders (1997: 108) suggests, we should not be afraid of attempting to apply ecological thinking, affordances included, to the widest context of the human environment:

"... affordances are opportunities for action in the environment of an organism, the opportunities in question include everything the organism can do, and the environment includes the entire realm of potential activity for that organism..."

Although this paper will not extend the concept of affordances fully into the "realm of the conceptual and the realm of imagination" (Sanders, 1997: 108) it will try to show how semiotic behaviour can be better integrated within ecological theory.

# PERCEPTION IN A CULTURAL AND SOCIAL ENVIRONMENT

In what ways, then, can one reinterpret semiotics in terms of affordances? As noted above, it is traditional in semiotics to distinguish between 'signifiers' which have physical reality and 'signifieds' which exist as a system of cultural conventions (see e.g. Saussure, 1983; Eco, 1979). Within such a perspective the relationship between an expression and its meaning or content is not thought of as being governed by any directly perceivable connection between, for example, an acoustic signal and its interpretation: such links are regarded as arbitrary, as they differ between languages and cultures, or are at most "motivated" by some form of similarity or isomorphism between signifier and signified. Nonetheless, such arbitrary relationships are not free to vary without constraint: the systems of cultural conventions which link signifier and signified are thought of as being relatively stable over time and within a community (especially in relation to language communities: see e.g. Saussure, 1983: 74–78).

The main reason that semiotics seems so incompatible with ecological perception lies in its insistence this duality between signifier and signified. Signifiers are physical, whilst signifieds are cultural or social (and by implication, mental), recalling

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the distinction between sensation and representation in cognitive science. Eco, for example, distinguishes between "signals" or "stimuli" in themselves and their interpretation as signs (Eco, 1979) despite extending semiotics to all but the most automated or biological processes. Indeed he sees semiotics as playing a role in identifying the "missing link" between signals (which are perceived automatically) and signs (which are open to interpretation) (Eco, 1979: 21).

Within the ecological approach such distinctions are meaningless: the organism neither reacts to stimuli, nor does it interpret them; rather, the organism discovers the affordances of events and objects through the pick-up of stimulus information. This process neither determines meaning nor allows for completely arbitrary relationships between organism and environment: affordances are relational, and depend both on the structure of the environment and of the perceiving and acting organism. Hence, interpreting a sign becomes not a matter of decoding, but a matter of perceiving an affordance. The knowledge which makes this possible is not solely physical, nor mental, but the result of gathering structured stimulus information furnished by our environment: in other words the understanding that results is distributed in nature, given that it is the sum of what we can perceive of others' actions (see Heft, 2001: 327–370).

In an ecological approach, signs must be approached functionally, and signs described in terms of the information they offer to a human organism, rather than in terms of how they describe static events or objects. For example, rather than ask what the word 'freedom' means we should ask what it affords to a particular individual. This is not the same as arguing that semantics can be *replaced* by pragmatics, given that pragmatics is generally defined as being that portion of meaning which is not determined directly through attention to what is said. It is more of a pragmatic approach to semantics, one in which the meaning of what is said is not only constrained by wider social conventions, but also the immediate context of speakers' and listeners' potential actions. Such an approach bears some similarity to attempts to show that pragmatics and semantics might be unified (see e.g. Jaszczolt, 1999).

Within this view a system of cultural agreements is neither internal nor external to the organism, but is instead a relational property emerging from acting and perceiving within a social environment within which other organisms produce structured information in the form of utterances, books, films, music, tools, facial expressions, gestures and so on. These forms of information are not transmitted from one individual to another, but discovered, or *made*, through co-operative perception and action. The exploration of the human environment makes such information available, and such information provides affordances which constrain the actions of individuals, but do not determine them: just as a rock affords many possible actions, so a sentence may afford different actions. Asking an individual what a word means leads might lead them to produce a definition, to make a gesture, to point to the American flag (or burn it, or salute it). From a purely semiotic perspective such an observation clarifies the flexibility and self-referentiality of codes and their interpretation, the way in which systems of signs rely upon what has been termed "infinite semiosis" (Eco, 1979), but such an approach cannot easily explain why a sign results in particular courses of action in a particular case, whereas an ecological approach can: rather than asking why "freedom" is used and interpreted in so many different ways, one should ask what stimulus information is available to a particular individual in a particular instance and how this affords behaviour. This entails not only analysing the acoustic or visual structure of a sign itself, but also the structured information available to the organism which complements such information, whether directly available from a book or from the gesture which accompanies a word, or from a blow from a policeman's baton. Given that a sign might afford different actions, it is necessary to take into account both the way in which different affordances are perceived according to the attentional focus of the organism and the fact that signs are not perceived in isolation from their context (see Chemero, 2001). Heft (1989: 21-22) has suggested that in order to understand how we "choose" one affordance over another we have to accept that the intentional (and therefore attentional) focus of an individual singles out particular aspects of the environment for scrutiny and action. Moreover, we must always bear in mind the perception of a sign is not just the result of a singular object or event, but a complex of different sources of stimulus information (Heft, 1990; Chemero, 2001): we might perceive the threatening words of a man walking towards us with a gun rather differently to the same man behind bars: the difference here is in the visual scene, and is directly perceptible.

Some of this supplementary information is provided through perceiving other humans' non-verbal behaviour: the human body is open to exploration of a very direct kind. One may perceive the movements of another human through looking, listening, smelling, tasting or touching. Such information specifies not only aspects of the activity of that human, but also detailed information regarding gender and even aesthetic intentions (Runeson and Frykholm, 1983; Davidson, 1993). Although such research has concentrated upon visual perception, a degree of intermodality has been demonstrated for visual and acoustic information in musical performance (Davidson, 1993) and it can be assumed that such information may be picked up regardless of the particular perceptual system involved. Such pick-up of structured information can be interpreted in terms of the perception of affordances: the perception of gender, for example affords many constraints upon behaviour dependant upon the gender of the perceiver, just as the perception of intentions may constrain and offer certain courses of action. However, such affordances are often culturally relative. Movements may specify what kind of human performs them, and what the intended result might be, hence providing social affordances which constrain the way in which the perceiver might interact with the individual involved.

However, these affordances look rather more complex when one considers the cultural relativity of gestures and movements or the kinds of aesthetic intentions which might be picked up. Perceiving that another human is of a different gender in itself does not necessarily explain the way in which human beings' courting and mating behaviour is constrained by moral codes which seem to differ between different social and cultural groups. Similarly, perceiving the different expressive intentions of a musical performer (Davidson, 1993) cannot be easily explained without such cultural context. Understanding whether a performance is the result of an under-expressive or over-expressive intention is not just relative to the visual and acoustic information available at the time: familiarity with culturally specific information must be assumed. Although perceiving such an intention can only occur within a particular culture, just as in Noble's postbox example (Noble, 1991), this does not make this perception any less ecological. In Western "serious" music culture, that in which a performer does not compose the music that is performed, it becomes possible to distinguish between a satisfactory and unsatisfactory performance of a canonic composition, but it does so because we perceive the results of this practice in our everyday experience. Such distinctions are made relative to other performances of this piece, contact with similar pieces, or, in the case of the musically literate, with some coded representation (such as a musical analysis) of the score upon which the performer draws, or upon explicit information regarding performance practice and music theoretical conventions: note that all of these sources of information may be engaged with directly. We hear the other performances, we listen to or read about the music. It is through such direct contact that we become sensitive to such fine distinctions within artistic behaviour.

As well as producing information specifying their intentions and activity per se, humans produce structured information specifying events and objects that exist in a shared environment. The weight of an object may be specified by the movements of someone lifting it (Runeson and Frykholm, 1983), just as we may be informed of the presence of an event by observing the actions of another (see e.g. A look of surprise, pointing toward an object, an ostensive linguistic construction, may afford attention to an event which lies outside our visual field, for example. Just as social information provided by another through ostension may direct attention to an event which is behind us, so coded signs produced by another human provide information about events and objects which are not immediately perceptible. Within this perspective a road sign, a book, and a facial expression of surprise are more similar than they might at first appear: they all inform us about events we have yet to perceive. Just as a facial expression provided by an onlooker may afford "ducking" to avoid a missile approaching from the rear, or the successful perception of a visual cliff (see e.g. Sorce, Emde, Campos, & Klinnert, 1985), a road sign may afford the necessary adjustments to driving necessary to avoid crashing on a sharp bend, and a book (such as Orwell's 1984) might afford one to avoid being duped by a totalitarian regime. Within Peirce's trichotomy of signs (see e.g. Peirce, 1991: 239-240) the "facial expression" seems closest to an index, in that there is a causal connection between sign and event (despite its possible social mediation), the road sign an icon, having a resemblance to an event (despite the coded conventions which may govern the precise way in which this icon is formed), and the book a symbol, having only a conventional relationship between sign and event. However, all three of these signs are social, in that they are made available by other human beings. Moreover, they can all be considered in terms of their affordance of avoidance. In each case it is how the signs are used by the perceiver, what they afford, which is at issue here.

The key here is to recognise that the human environment is not only social in that we perceive other human beings, but also in that we perceive the artefacts and expressions which are produced by their activities (Mead, 1934; Noble, 1981). Just because some of these artefacts inform us about unforeseen situations and may be perceived relative to cultural agreements does not make them any less perceptual. As I shall go on to argue, the cultural agreements which structure language or other symbolic codes are not of a different order from the structures provided by inanimate or animal sources of stimulus information: they are lawful, and result in the perception of affordances.

#### TOOLS, SIGNS, CODES AND LANGUAGE

To summarise the argument thus far, it has been proposed that the perception of other human beings, and their immediate and more permanent artefactual products can be explained within an ecological account of perception. Codes are to be seen in terms of what they afford and how they are made and used by individuals within a social and cultural environment, rather than as static analytical descriptions of a speech community's synchronic understanding of their language. Codes within this view are to be considered real agglomerations of distributed knowledge, which are the result of many individual acts of signification within a socially cooperative setting. Rather than assuming a sharp distinction between direct and indirect perception, an approach has been taken which subsumes cultural and social knowledge within a wholly ecological description, as suggested by Costall and Still (1989). Society and culture emerge from the perception of the social and cultural transactions between individuals, however mediate, secondhand or indirect this might seem.

Indeed, some of these transactions occur through the production of artefacts that are discovered and manipulated by individuals, through the perception of tools. Tools make stimulus information and affordances, which might be otherwise unavailable, directly perceptible, and often serve a similar function to more explicit signs:

"most of these (the affordances of objects in our surroundings) are actually designed and constructed in order not only to function appropriately but also to be conspicuously meaningful to a potential user." (Costall, 1989: 19)

Tools not only afford things which exceed the limitations of the human body and perceptual systems through making available stimulus information and effectivities, but also afford social and cultural transactions. A tool's affordances are manufactured by others, and they are in a sense, whether coded or not, a transmission of information. This transmission is not meant in any naive communicational sense: certain tools may be used in ways unforeseen by their originator, but the use of a tool made by another both relies upon social interaction and may afford perception of the social and cultural information relevant to a particular environment (see e.g. Gaver, 1996 for a discussion of the affordances of paper). Using a screwdriver embeds an individual within a cultural context suffused with implications about that culture's character: through examining its highly immediate affordances, in relation to screws, various materials and so on, the individual is already embedded within a culture in which such technology is shared. Similarly, through extended familiarity with written and spoken language, and the environmental contexts within which certain stimulus information becomes available, the affordances of these codes may be explored and developed. Each user of a tool may discover novel affordances just as each user of language may do so: but such novelty is constrained by the social connections between individuals as much as by the structure of an individual artefact or utterance. It is not that a screwdriver cannot be used as a pointing device (it can) but that it is not conventional to do so (and observably so) that might constrain its use in this context.

In a similar sense, just as artefacts may inform us about the environment's socio-cultural aspects, so may natural events and objects be manipulated by human agency in such a way as to afford coded meanings. Just as a screwdriver might be used metonymically to refer to the technological or craftsmanlike, as a sign with very different affordances from that provided by its affordance of "screwing", or the sound of a bell be used in a context affording "worship" or "community", so might a piece of rock from the moon come to stand for the boundaries of human exploration. Such use of events and objects does not entail a change in their physical structure, but an exploration of that structure within a social and cultural environment. The rock might in one case afford "throwing" or, in another it might afford the communication of the concept of "constancy", or to stand metonymically for "geology". The association of an event with another event is not just "imposed" by the perceiver or by someone wishing to communicate, but is to be found in the mutual relationship between perception or action and the cultural environment which is perceived or acted upon. The proposal that "associations" are not made in the head, but due to our relationship to an environment in which events are lawfully related, and hence predictable (Gibson, 1966, pp. 271–273), is just as pertinent for man-made objects and events as it is for natural ones. Associations between events and cultural or social affordances may be made, but they are also, once prevalent, open to discovery by the perceiver in the course of exploration and perceptual development.

Hence, in this respect, there is no difference between "cultural" and "natural" environments. Rather, the environment within which the human organism exists *includes* symbolic, coded systems. Signification is possible because the human

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organism learns to perceive the cultural affordances of events, relative to the social agreements of a group of individuals. In other words, we do not perceive these events in isolation from others' interpretative and communicative behaviour. Observation of, and sensitivity to, such behaviour is the source of our growing ability to discern fine grained distinctions between signs' affordances. Moreover, just as affordances vary according to the context provided by the particular needs of a non-human organism and the particular state of an environment, so the affordances of signs are rich and flexible to human beings, embedded as they are in a cultural environment. The sound of a lion might afford the need to hide to a hunter equipped with a high-powered rifle, but might also afford an opportunity for hunting, just as the word /danger/ could afford many different interpretations depending upon the particular context it is placed within. This context could be provided by a paralinguistic inflection or its position within an extended text. <</p>

Although it is at first unclear how a cultural event may lawfully specify an affordance, one must remember that cultural environments are relatively stable. Diachronic change in the relationships between expressive acts and their content are, to an extent, limited by the social necessity for communicational clarity. Cultural conventions require a certain degree of permanence if they are to serve as means for communicating bodies of knowledge over long periods of time. Nonetheless, cultures change, and languages in turn may change to provide the expressions demanded by changes in the natural or social environment, which are in turn produced by the actions and perceptions of individuals and groups of individuals. Clearly there is more to language change than this limited view would suggest, but the relationship between language and ecology (and evolution) is one that after many years of disregard (see e.g. McMahon, 1994) has begun to receive new attention, especially in the study of creoles and dialects (see e.g. Mufwene, 2001), and even from a fairly ecological approach (see Ingold, 2000: 392-405). Ingold's approach is highly relevant here: he strongly argues for a dynamic view of language, one in which language is related to the changing constraints and affordances of a peopled environment. This might help explain how signs can be at the same time considered both dynamic and static: changes in cultural "agreements" are not only slow, they are predictably related to the ways in which we live our lives. It is this predictability that allows for the direct perception of culturally relative meanings; we do not agree the arbitrary relationships between signifier and signified with others, we perceive them in the use of others. This does not preclude inventive uses of language, but it does better describe why such inventiveness is constrained. It is not so much that novel uses of a signifier are "yet to be agreed", more that they are yet to be encountered in a consistent form.

Given that the cultural environment is a dynamic system of agreed relationships between expressive acts, or signs, one can see that the perception of events is not so different from the perception of coded meaning, in the sense implied by Gibson's use of the term "affordance". Both our natural and cultural environments change over time, but these changes are bounded by certain ecological limitations. On the one hand, nature seems, at the level of human perception, to obey certain physical laws. On the other, culture remains to a certain degree bounded by the limitations of communicability. Certain changes in cultural or natural environments may demand adjustive behaviour for a group of organisms. This requires dynamic adaptation, or learning. As Gibson himself states (1966, p. 285), learning is vital to the perception of affordances. The timescale for change here is radically different, but the process the same: regularity in the environment provides an opportunity for perceptual systems to develop which are sensitive to such regularity. Co-evolution may occur over the life-span of an individual through dynamic adaptation, or through processes of natural selection over many generations, but without underlying regularity in the environment it is hard to see how our perceptual systems could evolve so effectively. Hence, the perception of a semiotic affordance is just as direct as the perception of an affordance of any event or object, given that one accepts that cultural aspects of the environment provide us with affordances at all. If I point to cat, the gesture and the cat are directly perceivable, but so is the convention which links pointing to ostensive signification. This convention is perceived many times over the course of our perceptual development: just as with any other element of the environment we need to develop sensitivity to it. The convention is not purely abstract, it is an emergent property of real encounters with an environment within which we use pointing to refer to distant objects and events. The same applies to less ostensive signs: we become sensitive to the affordances of words and pictorial signs through our encounters with them, and our attempts to use them, and we refine this sensitivity through our perception of others' responses to such attempts.

In more extended terms, just as a weapon might afford defence against an intruder, making the utterance "freedom is an inalienable right" may afford the actions that make us pick up the weapon and use it. Although the utterance "freedom" may not seem as connected to the environment as the presence of an intruder, its affordance structure is most clearly specified by a particular cultural code, specific to English speakers, specific to a sub-culture that protects its territory with the use of force, specific to a culture in which, perhaps, artefacts are acted upon differentially depending upon ownership. Even ownership here is not an abstract concept. It may again be defined in functional terms: in a particular culture the exchange of certain tokens for an artefact entails certain patterns of action and not others.

Arguably, there is a conceptual distinction between perceiving an affordance furnished by the pick-up of visual information specifying an approaching rock, and the way in which someone shouting "look out" might afford a similar course of action. Both require the pick-up of presently available structured information, however, and both require us to have developed within a particular environment. For the former, we need to be adjusted to the lawful environment of earth gravity and physics through our experiences. For the latter we need to have adjusted to the lawful environment of English which specifies the meanings of different words. Moreover, the similarity is more subtle than this: just as the approaching rock itself does not *demand* evasive action (we might choose to catch it), neither does a shouted warning. Just as the sound of a breaking bottle affords different things for a bare-footed person and someone wearing stout boots, the utterance "this is mine" may afford different courses of action depending upon the social context: to a burglar possession is nine tenths of the law, whereas for the gun-toting housedweller the exchange of money for an artefact provides a less immediate, but no less real affordance. Language, or any other semiotic source of information, is mutually perceived and produced, in relation to the particular circumstances of an individual. Through an individual's perceptions and actions within a society that uses language, perception and action are constrained but not determined. We discover what an expression affords through our familiarity with the structure of the environment, an environment which is not only predictable on the basis of ecological physics, but also on the basis of the social and cultural relationships which we both perceive and create through our individual actions. If this were not the case, the social cooperation (and conflict) which characterises human behaviour would rely merely upon our direct contact with other human beings.

Language and other symbolic systems rely upon our perception of the structured information that is produced by other human beings, and which may be stored and transmitted between individuals who need not meet. Such information specifies affordances that otherwise would have to be individually discovered (see e.g. Reed, 1991). To say that a human's facial expression affords "amiability" (Gibson, 1979, p. 233), and to deny that the expression "I love you", does the same would be problematic. Although one source of information is visual, and the other acoustic, both are perceived in relation to the social and cultural context available, both can be perceived as affording 'kissing', and both might result in a slap in the face. The fact that the acoustic information is coded in an arbitrary form, may be a lie, and seems to rely upon cultural perceptions, cannot be used to portray the visual information as somehow better or more direct. A facial expression itself may be misleading, and may be indeed be coded through reference to others' use of such expressions.

# DEPICTION AND PERCEPTION

To extend the previous example, note that just as "I love you" could be used by a character in a film or a book, so could a description or film of a facial expression. This storage and translation of "real" information in a different form does not prevent the perception of affordances. How is this different from observing a couple in a real exchange? What is afforded for the observer? In one case the reader or film-goer cannot directly act upon the "characters", but otherwise there

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are similar affordances available. The line "I love you" (or more weakly "I like you") in combination with a particular facial expression affords continued looking or reading, averting one's gaze, stopping reading, discussion of what has been seen or read, arousal, disgust: these are all made possible by our familiarity with the information provided, our own context, and most of all by our perception of invariants that strongly specify the subsequent kiss (and possible slap). The coded information available from language and facial expressions specifies affordances that are multiple and socially constrained. Given that affordances are relational properties, and not uniquely specified by or identical to the events that give rise to them (Stoffregen, 2000a and b), the individual and contextual nature of affordances (this event affords *this* in *this* situation to *this* individual) should hold whether we are dealing with culture or nature, and whether or not the information is stored, reproduced and manipulated.

The depiction of a scene may of course alter the affordance structure, as in a case where we cannot intervene or where the information is radically transformed, but this does not mean that affordances are not perceived. A broken bottle may afford fighting, but so may a word, a sentence, a philosophy. Similarly, the sound of a broken bottle may be used in an attempt to convey "fighting" or be perceived in these terms. In the second case the sound is used or perceived relative to a set of cultural agreements, which may or may not be shared or applied by one or both parties. In differing contexts the affordances of this sound will differ: in a crowded bar the event might afford "evasive action"; in a radio play the "sound effect" specifies a change in the portrayed environment which would not afford any such direct action. However, this change in the virtual environment would afford a description of the scene as a fight in a bar, rather than anywhere else. Just as an event may orient us within a real environment, it may do so relative to a virtual environment. Rather than saying that an event in a radio play does not afford any bodily course of action, one might say that the context of a radio play affords "safety", "sitting still" and "the production of a critical linguistic response" to the sound, as opposed to taking evasive action (more complex aesthetic judgements are returned to at the end of this paper). The events themselves afford little unless related to the context provided by listener and environment, whether heard on the radio or in a real bar. Similarly, the sound of a linguistic utterance may or may not provide an affordance in itself, but only in combination with the diverse sources of information that accompany it, whether linguistic or not.

Moreover, one must question whether just how different it is to discriminate the multiple affordances that are provided by a cultural artefact as opposed to discriminating between the affordances provided by a natural event: both kinds of discrimination are made relative to the perceptual development of an organism, surrounded by cultural, social or natural occurrences which are structured and informative, and to the immediate context of that organism. Just as for a waterbug a fluid of particular density affords support, yet for a human immersion or swimming (Gibson, 1979, p. 127), human utterances, books, instruments and

actions afford things for humans that they do not for other organisms. Culture is perceived just as anything else is perceived, through the continuous exploration of our surroundings, and it constrains and facilitates human action through providing affordances specific to that environment. Human actions, and the changes in the environment wrought by them, are meaningful because they are embedded within an environment that is social. This does not mean that meaning is fixed, any more than the affordance of any event is fixed. Culture is acted upon as well as perceived, just as are our inanimate, vegetal, animal or human surroundings. Moreover, it is the active nature of this engagement with the cultural environment which allows for interpretation, interpretation being the active production of signs, not the passive receipt of meaning, as the next section will argue.

#### PERCEPTION AND INTERPRETATION

Within the perspective on society and culture presented above it becomes possible to reassess the notion of interpretation in a fundamental sense. The key here is to be found through providing a consistent level of description for the so-called natural and socio-cultural portions of the environment, and following Shaw and Turvey (1981) a return to pragmatic philosophy (in the figure of Charles Peirce) is warranted. Peirce (1991: 239-240, 180-187) notes that signs are not to be understood in terms of mere cause and effect. Through his concepts of "firstness", "secondness" and "thirdness" it become clear how signification (thirdness) can be distinguished from mere causation (secondness). Two firsts, for example a footprint and a foot, may be causally related through a relationship of secondness: one directly leads to another. However, for us to interpret the footprint as a sign of the foot it is necessary to introduce a third term. In order for the footprint to be regarded as "standing for" the foot, an interpretant must be added. The nature of this interpretant need not be a mental image (Eco, 1979, p. 68-71): it could be another "sign" (a word, a gesture, an action). In the case of the present example one might represent the relationship between "sign", "object" and "interpretant" as in Figure 1. If we take the sign to be the footprint, the object to be the foot and the interpretant to be the word "foot" it becomes clear that without "thirdness" nothing could be regarded as having been signified. The foot and footprint would retain a physical relationship, but no act of interpretation would have been made. Of course, this tells us nothing about the grounds upon which an interpretant may be chosen. However, it does point toward a more consistent conception of perception in that it integrates semiotic perception with a broader view of ecological perception, as I will go on to show below.

In a naively behaviourist interpretation perception is a relationship of secondness: a stimulus conditions a response. In an ecological approach, however, stimulus information is perceived relative to both the structure of the environment and the organism.

193



Figure 1. Peirce's triadic sign function between two firsts, forming a second, by virtue of a third.



*Figure 2.* Gibson's ecological version of perception represented in triadic terms. Note that any of the three terms can take on the status of an interpretant relating the other two terms: organism and environment are related through stimulus information, just as organism and stimulus information are related through the environment. The "meaning" is captured through the relationship of a third.

Hence, our first relationship of "thirdness" might look like Figure 2. Here, the relationship between information, organism and environment is clearly shown to be triadic. However, this does not quite capture the subtlety of the ecological approach: it is not the stimulus information itself that is perceived, but an affordance structure. The organism and environment are brought into a meaning-ful relationship by perceiving and acting upon affordances. However, affordances are a description of the relationship between organism and environment, not the means by which organism and environment become coupled.

Hence, it would be incorrect, for example, to replace "stimulus information" with "affordance" in Figure 2. Rather, one should describe this triadic relationship itself as representing an affordance. A similar triadic relationship neatly captures the relationship between action, perception and structure: structured information is perceived according to the effectivities of the organism, and similarly the actions of the organism are constrained by the information that is picked up.

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Consider the relationship between a sound and the actions of an organism: we hear, for example the sound of a breaking bottle and go to collect a broom. It is easy to mistake this for a causal relationship between two "firsts": a "second". The nature of this relationship is concealed, however, in this version of the situation. Only by relating both the sound and the action through the structure of the event, a "third", does the affordance become clear. The sound itself does not cause the action, it is "interpreted" by virtue of the structure of the event: without this "third" the collection of the broom is entirely mysterious, as it has no meaningful relationship with the sound itself but to the event specified. Similarly, one might consider the lawful relationship between sound and event as a "second", and hence suggest that this accounts for the affordance perceived. This too, however, collapses the true nature of the affordance: the action of the organism "interprets" this causal relationship to create the possibility of meaning through a "third". Stimulus information, events and actions are the necessary components for describing affordances, and no pair of these terms provides a sufficient explanation of perception.

Figures 1 and 2 suggest a strong isomorphism. It is clear that just as a sign requires an "interpretant", so does an affordance: the action of an organism is not in reaction to stimulation, but in the triadic relationship between organism, environment and stimulus information. Collapsing this "third" leaves one with a deterministic relationship between stimulus and response. The affordance that is perceived is the result of the permanence or change in stimulus information relative to both organism and environment. In the same sense, if one regards the structure of a code as part of the environment, then a similar triad emerges: there is no need to suggest that the associations between invariants and events are any more "psychological" for language than for natural events: just as Gibson proposed that in an ecological approach "learning by association becomes the learning of associations" (Gibson, 1966, p. 273) through acknowledging the lawfulness of the natural environment, one should extend this suggestion to cultural and social knowledge. We become sensitive to the associations between symbols and their directly perceivable consequences, we do not impose them upon culture.

Returning to the notion of interpretation, Peirce's trichotomy helps untangle a relationship between action, perception and stimulus information. This trichotomy reveals an ecological description of what it is to "interpret" a sign, and through this the relationship between culture, society and perception. The interpretant of a sign function is an active, not a passive phenomenon: the social and cultural nature of the human environment affords the production of interpretative actions; interpretations are made by human beings in order to supplement the information available from the environment.

If the consequences of "inadequate information" are that the perceptual system "hunts" for meaning (Gibson, 1966: 303–304), then the role of social and cultural information becomes clearer still:

More typical of life than absence of stimulation, however, is the presence of stimulation with inadequate information—in formation that is cinflicting, masked, equivocal, cut short, reduced, or even sometimes false. The effort of apprehension may then become strenuous. With conflicting or contradictory information the overall perceptual system alternates or compromises... ... but in lifelike situations a search for *additional* information begins, information that will reinforce one or the other alternative. When the information is masked or hidden in camouflage, a search is made over the whole array. If detection still fails, the system hunts more widely in space and longer in time. (Gibson, 1966: 303)

Crucially, although Gibson is not referring explicitly to the cultural environment here, he notes the extended nature of perception, and how such extension from the immediate is both spatial and temporal. Included in such supplementary information is that shared through social action: just as we may attempt to decide whether an opaque object is fillable by striking it, we might observe the actions of others (whether verbal or gestural) in response to an ambiguous event or object (such as an abstract artwork), in order to help perceive its affordances.

Moreover, the hunt for additional information might affford the production of symbolic artefacts which themselves provide affordances. In the absence of sufficient information to perceive a clear affordance is it not reasonable that as well as engaging in explorative action, we create signs which themselves act as clarifying information? The most obvious example of such behaviour is where an abstract artwork generates manifold discussions of "meaning". Here the sign affords creative linguistic (or gestural) actions, which when shared, themselves may afford activity and further exploration of the physical work. It is the very ambiguity of art which affords here, a lack of specificity.

In this paper it has been argued that culturally convened signs, and systems of such signs, can be understood within an ecological framework without having to maintain that there are two fundamentally different kinds of perception. Signs and codes are the result of human actions, and persist within the human environment. Moreover, they afford action, and may be perceptually explored. Such a bringing together of so-called direct and indirect modes of perception might be particularly important for the study of aesthetics, since art so often seeks to manipulate our perceptions through dislocating action and perception, and indeed is the focus of much of semiotic inquiry. Marcel Duchamp's "urinal as art" can only make sense in relation to its denial of conventional affordances. But this is not to say that once an object (the urinal) is framed by an aesthetic context (the gallery) it ceases to afford. The urinal both affords as a urinal and as an artwork (it affords discussion, observation ...), in relation to two very different real environments, and would lose its peculiar force if it did not. Although this is an extreme example, such dislocation between culture and the everyday has to be seen (and heard) for what it is: a manipulation of stimulus information such that one set of affordances is supplanted and contradicts another.

Indeed, it is in the field of aesthetics that a more complete theory of affordances might have considerable impact (for an example of how these ideas might apply

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to the perception of electroacoustic music see Windsor, 2000). Whereas many empirical studies of aesthetics concentrate upon the ability of art to convey, evoke or depict emotion (e.g. Gabrielsson and Juslin, 1996) it is less often that empirical attention is paid to the criteria upon which we attend to artworks as aesthetic, rather than everyday objects (see Dibben, 2001, for a rare example). Indeed, given the way in which much of the twentieth century's artistic endeavour has played with the relationship between everyday and artistic interpretations of events, determining the role of contextual information in constraining and affording our interpretative behaviour becomes a rather pressing concern for empirical aesthetics. It is only through admitting that our decisions to engage in aesthetic interpretation are constrained and afforded by manifold sources of information rather than merely evoked by an artwork that we can make significant progress along this route.

### CONCLUSIONS

The need to better deal with the cultural and social dimensions of perception within an ecological approach has been addressed to a certain extent by other authors, but this essay has contributed, it is hoped, a rather more coherent view of how signs should be viewed within this approach. Clearly, the view of affordances taken here might imply that all meaning can be expressed in terms of affordances. Whether this is the case is perhaps beyond the scope of this paper, but if we do seek an ecological view of perception, the concept of the affordance might need to be more fully tested against the "entire realm of potential action" (Sanders, 1997: 108), not just against a narrow range of phenomena, and the preceding approach is a small part of this project.

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#### REFERENCES

- BEN-ZEEV, A. (1984). The Kantian Revolution in Perception. *Journal for the Theory of Social Behaviour*, **14** (1), 69–84.
- CHEMERO, A. (2001). What We Perceive When We Perceive Affordances: Commentary on Michaels (2000) "Information, Perception and Action". *Ecological Psychology*, **13** (2), 111–116.
- CHOW, S.L. (1989). An Intentional Analysis of "Affordance" Revisited. *Journal for the Theory* of Social Behaviour, **19** (3), 357–365.
- Costall, A., & Still, A. (1989). Gibson's Theory of Direct Perception and the Problem of Cultural Relativism. *Journal for the Theory of Social Behaviour*, **19** (4), 433–441.
- COSTALL, A. (1989). A closer look at direct perception. In A. Gellatly, D. Rogers and J.A. Sloboda (Eds.) Cognition and Social Worlds. Oxford: Clarendon Press, 10–21.
- DAVIDSON, J.W. (1993). Visual Perception of Performance Manner in the Movements of Solo Musicians. Psychology of Music, 21 (2), 103–113.
- DIBBEN, N. (2001). What do we hear, when we hear music?: Music perception and musical material. *Musicae Scientiae*, **5** (2), 161–191.
- Eco, U. (1979). A Theory of Semiotics. Bloomington: Indiana University Press.
- GABRIELSSON, A., & JUSLIN, P. (1996). Emotional Expression in Music Performance: Between the Performer's Intention and Listener's Experience. *Psychology of Music*, **24** (1), 68–91.
- GAVER, W.W. (1996). Situating Action II: Affordances for Interaction: The Social is Material for Design. *Ecological Psychology*, **8** (2), 111–129.
- GIBSON, J.J. (1966). The Senses considered as Perceptual Systems. London: Unwin Bros.
- GIBSON, J.J. (1979). The Ecological Approach to Visual Perception. New Jersey: Lawrence Erlbaum.
- GINSBURG, G.P. (1990). The Ecological Perception Debate: An Affordance of the *Journal for* the Theory of Social Behaviour. Journal for the Theory of Social Behaviour, **20** (4), 347–364.
- HEFT, H. (1989). Affordances and the Body: An Intentional Analysis of Gibson's Ecological Approach to Visual Perception. *Journal for the Theory of Social Behaviour*, **19** (1), 1–30.
- HEFT, H. (1990). Perceiving Affordances in Context: A Reply to Chow. Journal for the Theory of Social Behaviour, 20 (3), 277–284.
- HEFT, H. (2001). Ecological Psychology in Context: James Gibson, Roger Barker and the Legacy of William James's Radical Empiricism. Mahwah, N. J.: Lawrence Erlbaum.
- INGOLD, T. (2000). The Perception of the Environment: Essays in livelihood, dwelling and skill. London: Routledge.
- JASZCZOLT, K.M. (1999). Default Semantics, Pragmatics, and Intentions. In K. Turner (Ed.), The Semantics/Pragmatics Interface from Different Points of View (pp. 199–232). Oxford: Elsevier Science.
- MCMAHON, A. (1994). Understanding Language Change. Cambridge: Cambridge University Press.
- MEAD, G.H. (1934). Mind, Self and Society. University of Chicago Press.
- MUFWENE, S.S. (2001). The Ecology of Language Evolution. Cambridge: Cambridge University Press.
- NEISSER, U. (1979). The control of information pickup in selective looking. In A.D. Pick (Ed.) *Perception and its Development*. Hillsdale, N. J.: Lawrence Erlbaum.
- NOBLE, W.G. (1981). Gibsonian Theory and the Pragmatist Perspective. *Journal of the Theory of Social Behaviour*, **11** (1), 65–85.
- NOBLE, W.G. (1991). Ecological realism and the fallacy of "objectification". In A. Still and A. Costall (Eds.) *Against Cognitivism: Alternative Foundations for a Cognitive Psychology*. London: Harvester Wheatsheaf.

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- PEIRCE, C.S. (1991). *Peirce on Signs* (Ed. J. Hoopes). Chapel Hill: University of North Carolina Press.
- REED, E. (1991). James Gibson's ecological approach to cognition. In A. Still and A. Costall (Eds.), *Against Cognitivism: Alternative Foundations for a Cognitive Psychology*. London: Harvester Wheatsheaf.
- REED, E. (1996a). *Encountering the World: Toward and Ecological Psychology*. Oxford: Oxford University Press.
- REED, E. (1996b). The Necessity of Experience. New Haven: Yale University Press.
- RUNESON, S., & FRYKHOLM, G. (1983). Kinematic Specification of Dynamics as an informational basis for person-and-action perception: Expectations, gender, recognition, and deceptive intention. *Journal of Experimental Psychology: General*, **112**, 585–615.
- SANDERS, J.T. (1997). An Ontology of Affordances. Ecological Psychology, 9 (1), 97-112.
- SAUSSURE, F. DE (1983). Course in General Linguistics (Trans. R. Harris). London: Duckworth.
- SHAW, R., & TURVEY, M.T. (1981). Coalitions as models for ecosystems: A realist perspective on perceptual organization. In Kubovy M. and Pomerantz J.R. (Eds.), *Perceptual Organisation*. Hillsdale N. J.: Erlbaum.
- SORCE, J.F., EMDE, R.N., CAMPOS, J., & KLINNERT, M.D. (1985). Maternal emotional signaling: Its effect on the visual cliff behavior of 1-year-olds. *Developmental Psychology*, 21 (1), 195–200.
- STOFFREGEN, T.A. (2000a). Affordances and Events. Ecological Psychology, 12 (1), 1-28.
- STOFFREGEN, T.A. (2000b). Affordances and Events: Theory and Research. *Ecological Psychology*, **12** (1), 93–107.
- WINDSOR, W.L. (2000). Through and around the acousmatic: the interpretation of electroacoustic sounds. In S. Emmerson (Ed.), *Music, Electronic Media and Culture*. London: Ashgate.

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