The Reflexive Theory of Perception

John Dilworth, draft only, 7/04

The *Reflexive Theory of Perception* (RTP) claims that perception of an object X by an organism Z consists in Z being caused by X to acquire some disposition D toward X itself. This novel, purely naturalistic perceptual theory explains perceptual intentionality, correct versus incorrect perception and externalist content in a plausible evolutionary framework. The theory also undermines cognitive and perceptual modularity assumptions, including informational or purely epistemic views of perception, in that, according to the RTP, any X-caused and X-directed dispositions are genuinely perceptual--including affective, attitudinal, and immediately activated purely action-directed behavioral dispositions.

The *Reflexive Theory of Perception* (RTP) claims that perception of an object X by an organism Z consists in Z being caused by X to acquire some disposition D toward X itself. It is perhaps surprising that this completely naturalistic, reflexive view seems to be novel, since it has an attractive simplicity--being definable with some initial clarity within a single sentence of modest length--while also being a natural outgrowth of a broadly causal (rather than computational)[1] functionalist approach to cognition, that seeks to explain perceptual or other cognitive activities in terms that integrally involve behavioral dispositions. But in any case, I shall defend the RTP here, in ways that emphasize also its integral connection with biological evolutionary theory.

As initial support for the reflexive theory of perception (RTP), arguably the primary evidence that some organism Z has perceived food item X is if Z attempts to do things such as to *directly causally interact* with X in some way, such as by eating the food X, or hiding it for later use, and so on--all of which behaviors are evidence for Z having acquired X-related dispositions as part of its perceptual contact with X. Also, 'negative'

X-related causal dispositions need to be considered too, for example a disposition to *refrain* from causal interaction with X when that interaction would otherwise occur, such as if Z is about to collide with object X, and its perception of X consists in its being caused by X to acquire a disposition, immediately activated, to avoid colliding with X. Thus overall, the best evidence that animal Z has perceived object X is if Z attempts to do something X-related, such as attempting to avoid X, or to interact with it. While at the same time, the best evidence that Z has *not* perceived X is if Z's behavior shows no manifestation of any X-related dispositions whatsoever.

To be sure, this purely dispositional view of perception, and of the evidence for its occurrence, might initially seem intuitively questionable, in that perception is widely regarded as being a process of information acquisition, with any associated behavioral dispositions, whether activated or not, being regarded as separable from, and subsequent to, the intake of such perceptual information.[2] However, though admittedly a radical view, the RTP can immediately reply with a counter-challenge to such informational views, as follows. If a pure informational view were correct, it would be possible for an organism to perceive all kinds of things without ever engaging in any subsequent appropriate behavior. But such an intellectualist, pure acquisition of information view would empirically be completely empty, in the absence of any concrete behavioral evidence that perception had actually occurred.[3]

Given that legitimate empirical perceptual theories must explain the role that behavioral evidence plays in establishing that perception has occurred, the simplest explanation of

perception itself is that it consists in *dispositions* to behave in the ways that have been observed. Hence a dispositional theory of perception such as the RTP is the simplest available legitimate empirical theory, whereas a pure informational view has no empirical credibility whatsoever.[4]

Another initial intuitive roadblock to acceptance of a dispositional theory such as the RTP is that the category of dispositions, even when specifically limited to X-caused and X-related dispositions, might seem too unconnected with the standard perceptual and semantic issue of correct versus incorrect, or veridical versus non-veridical, perception. In what sense can some perceptually acquired, X-related disposition be correct or incorrect with respect to X, since any actual behavior toward X that manifests the disposition is simply a behavioral event, having no intrinsic semantic properties?

Nevertheless, here too a supporter of the RTP can appeal to the common empirical currency of behavioral evidence, and argue that the only actual evidence we can have as to the correctness or incorrectness of some particular perceptual episode in organism Z's history is broadly behavioral evidence, so that the RTP cannot be any worse off with respect to evidence of semantic correctness than any other broadly empirical theory of perception. If at least some behavioral episodes do provide legitimate evidence of correct or incorrect perception--as they must for those concepts to have any empirical content--then they equally support the attribution of correctness or incorrectness to X-caused and X-related dispositions to thus behave, in conformity with the account of perception offered by the RTP.

As a simple example, the perceptually acquired disposition for a hungry person to eat some nutritious food placed in front of himself, while being disposed to refrain from eating some rocks similarly placed, would, when behaviorally manifested in either case under normal circumstances, provide adequate behavioral evidence of correct perception of the food and rocks on any theory of perception, including the RTP. Or a linguistic example: if, after gazing at a red object X, one says "that is red" while pointing at X, this would be clear behavioral evidence of correct perception of its color on any theory of perception. On the RTP, this case would involve X-caused, perceptually acquired correct dispositions with respect to the color of X, including a disposition to thus demonstratively utter the relevant sentence in appropriate circumstances.[5]

To sum up this Introduction, perhaps enough has already been said to show that the reflexive theory of perception has at least some initial viability in comparison with other perceptual theories. The following Sections will seek to further demonstrate its theoretical strengths.

1. The Evolutionary Foundations of the Reflexive Theory of Perception

The basic structure of, and rationale for, the reflexive theory of perception (RTP) will now be outlined. First, a completely naturalistic theory of perception must use no theoretical resources beyond those of countenanced by the non-purposive, purely causal

theoretical core of biological evolutionary theory, including physical causality itself, and causally based behavioral dispositions plus actual behavior toward worldly objects. Thus in particular, traditional epistemic views of perception as the sensory means of acquiring normatively correct information or knowledge about the world must be completely bypassed--if acceptable at all, such views must be re-established by a later reduction to their evolutionary fundamentals. These naturalistic restrictions do, however, also result in a significant theoretical advantage, namely that it becomes relatively straightforward and uncontroversial to demarcate what it is that perceptual theories are theories *of*, i.e., what perception itself must consist in, as will now be shown.

As a preliminary, two central concepts in evolutionary biological theory are those of natural selection and adaptive evolution.[6] A related causal concept is that of *adaptive behavior* for organisms,[7] in a broad sense of 'adaptive' that includes all three categories of successful, indifferent and unsuccessful behaviors, i.e., those behaviors of individuals that tend to promote survival of their species, those that on average make no difference to its survival, and those which are statistically inimical to its survival. In this broad sense all behavior is adaptive, in that each item of behavior has at least some minimal potential for changing the level of successful adaptation of its species to the relevant environment.

Now for theoretical purposes, each item of adaptive behavior can usefully be regarded as being caused by some underlying *behavioral disposition*, initially in circumstances in which the activation conditions for that disposition are immediately realized. Then more subtle and powerful forms of dispositional causality could evolve gradually, given the

evolutionary advantages of sometimes delaying a causal response until conditions are more optimal--such as when a predator, primed with a disposition to eat its prey, waits until the prey is most vulnerable. But in order to achieve a more substantive explanation of adaptive behavior, issues of causality must be pushed back one stage further, so that the primary issue regarding the causality of adaptive behavior is, what caused those relevant dispositions themselves? In general terms, it is some environmental factor X that causes such a disposition, whether the factor is an object external to an organism Z, or some internal part of Z itself.

Now a second meaning of the term 'adaptive' may be introduced, which is closer to the everyday meaning of the term 'adapt'. It involves some changes in disposition D, and hence behavior B, each of which results from some change in the environmental factor X. In this sense an organism Z 'adapts' to, or is responsive to, changes in its environment X via a causal mechanism in which the changes in X, i.e., each succeeding changed state of X, causes a corresponding change in Z's disposition D, and hence in its behavior B. Clearly this environmentally caused kind of responsive change in dispositions, and hence behavior, will often be required for successful adaptation, in the first sense, of the relevant kind of organism to an environment that is changing in significant ways.

But we still are missing one crucial element that is needed in order to achieve a theoretically useful concept of *perception* as such. So far we have nothing but causal chains and causal correspondences relating Z and its environment. In order for genuine perception to occur in organisms of type Z, they must be able to achieve some kinds of

adaptively beneficial *control* or *power* over the environmental factors X that cause changes in their dispositions D, in addition to merely being responsive to them. Without such a means of control, there could be environmental situations in which no amount of attempted evolutionary adaptation could ever be successful, simply because the responsive changes in behavior in organisms of evolving type Z were never *relevant,* i.e., causally effective, in diminishing environmentally caused threats, or enhancing potential environmental benefits.

But the only way in which this desired result of control over environmental factors can be achieved within the available naturalistic causal parameters is for the relevant X-caused dispositions D of organism Z to cause behavior that itself *causally acts upon*, or *causally interacts with*, those relevant environmental factors X. A typical controlling situation would be one in which an increasing value of X would have negative adaptive value for Z, but in which Z is caused by X to acquire a disposition D that, when activated, in turn leads to a reduction in the value of X--i.e., a 'negative feedback' causal loop, in which an organism achieves adaptive stability with its environment by directly modifying the threatening changes in X.[8] For example, much competitive behavior in animals can be explained thus: an increasing threat to animal Z's food supply from animal X will, if perception in Z's species has been adaptively successful, typically cause animal Z to fight off X's attempt to eat the food needed by Z.

The initial picture of perception that emerges from this account is of perception as one uniquely effective causal mechanism by which evolutionary adaptation can be achieved

by a species, in which organisms of type Z are caused by some environmental item of type X to acquire X-related dispositions which, when activated, may improve the adaptive success of type Z organisms with respect to their interactions with items of type X. But this view of perception is none other than the reflexive theory of perception (RTP) itself, as generalized to apply to adaptively relevant types of causal interactions between a species and its environment.

To be sure, perception as thus characterized is not the *only* adaptively relevant causal mechanism, as the above account makes clear, such as a case in which an item X might cause organism Z to acquire non-X-related dispositions, which nevertheless have adaptive value. For example, the scent of a certain plant X might lead to more reproductive behavior between members of the species Z, even though the scent-caused reproductive dispositions in such a case are not themselves scent-related or scent-directed.

However, the evolutionary centrality or primacy of perception, as a reflexively defined causal mechanism, comes from the fact that in order to be maximally effective in evolutionary terms, the formation of such non-reflexive dispositions must itself be maximized by the perceptual acquisition of *scent-related* dispositions by members of species Z, such as a scent-caused disposition to seek out similar sources of the scent properties in the future, so as to ensure more cases of additional reproductive behavior. Thus in such a manner specifically reflexive, genuinely perceptual dispositions play a

vital instrumental, facilitating or catalytic role in potential adaptive successes, even when other causal mechanisms also have a significant role.

To briefly summarize and explain the argument and broader context of this Section, an uncompromising naturalist approach to perception demands that traditional epistemic approaches to perception, viewed as the only sensory, broadly empirical means of acquiring normatively correct information or knowledge about the world, be completely bypassed. In their place, a pluralist view of adaptively relevant causal factors or mechanisms must be postulated. However, one of those mechanisms, namely the reflexive causal mechanism that defines the subject matter of the *reflexive theory of perception* (RTP), is both theoretically and causally primary or central, in that it is causally indispensable for some adaptive results, while also uniquely facilitative of adaptive success for the other available causal mechanisms.

Also, this reflexive causal mechanism is the closest analog in evolutionary theory for the perceptual processes or mechanisms postulated in other, more traditional theories of perception, whether biological, psychological or philosophical, and hence it deserves to be described specifically as a *perceptual* mechanism. For all such theories, as mentioned in the Introduction, must, if they are to have any substantive empirical content, accept the common currency of behavioral evidence that perception of an object X has indeed occurred, which evidence can only be provided by X-caused cognitive activity that results in X-related kinds of behavior. The RTP is a minimalist perceptual theory that adds only a single factor to those central items of behavioral evidence for the occurrence

of perception of X, namely that perception consists in the acquisition of X-caused *dispositions* to thus behave in an X-related way.

2. The Unrestricted Range of Perceptual Dispositions

This Section investigates an implication of the reflexive theory of perception (RTP), namely that, as long as a disposition of an organism Z is both X-caused and X-related, it counts as a genuinely perceptual disposition, even if the disposition seems to have no specifically informational or epistemic character.

It would generally be agreed these days that a theory of perception adequate to characterize and explain the whole range of biological perception must be built on broadly naturalistic causal and biological foundations. But some of the theoretical implications of this point have not yet been adequately reflected in, or absorbed into, competing perceptual theories. A central point is that the concept of perception must have the same full generality as the concept of *environmentally caused adaptive behavior* of organisms in specific response to those environmental causes themselves. For the proper study of perceptual phenomena in a broadly biological context is inevitably the full range of ways in which organisms acquire environmentally caused dispositions to react to those same environmental factors, in ways which may in fact make a difference to the survival of organisms of the relevant kind.

In particular, since some of these organisms may be low enough on the evolutionary ladder so that concepts of informational or conceptual acquisition, intentionality, belief, rationality, consciousness, decision, emotion and desire, and so on are inapplicable to them, an adequate general theory of perception should not put any limits on the kinds of environmentally caused dispositions to react to the environment that count as being genuinely perceptual. Our usual high-level classification of dispositions is roughly a tripartite one, as perception-related epistemic (rational belief or knowledge) dispositions, plus two kinds of non-perception-related dispositions, namely affective, emotive or attitudinal dispositions (e.g., as manifested in desires), versus purely action-oriented dispositions that have no specific cognitive or affective components. But this high level, tripartite classification has no clear or theoretically principled application to more rudimentary cognitive systems. Hence, even if it is true that conscious human perception predominantly relies on a tightly circumscribed range of rational and epistemically relevant dispositions, this fact must not be allowed to bias, in a species-chauvinistic way, the account given of the basic nature of perception in an adequate naturalistic general theory of perception.

Recall that the Reflexive Theory of Perception (RTP) claims that perception of an object X by an organism Z consists in Z being caused by X to acquire some, i.e., one or more, disposition D toward X itself. A characteristic feature of this view is that it does not limit in any way the dispositions D that might turn out to be thus acquired, and hence count as genuinely perceptually acquired dispositions toward X. Thus, for example, the RTP has theoretical room for the possibility that dispositions grounding some *desires*,

emotions or *attitudes* toward X, or pure dispositions to act in some X-directed manner, might be directly perceptually acquired, in addition to dispositions providing a basis for knowledge or belief. In this the RTP is unlike other views of perception, which typically regard perception as exclusively involving epistemically relevant items such as information or beliefs about the state of the world, even if perception itself is not regarded as automatically being a justified process of knowledge-acquisition.[9] However, it seems not to have been realized that this narrow epistemic assumption about the nature of perception, as found in standard perceptual theories, introduces a serious and unwarranted theoretical bias into the very foundations of perceptual and cognitive theories, not just for lower or more rudimentary organisms as discussed above, but also for higher mammalian, including human perception as well, as will now be shown.

The basic problem with such epistemic assumptions is that they foreclose on genuine empirical possibilities, as well as forcing a hopelessly outdated faculty psychology onto the investigations and findings of contemporary cognitive science. On such views, a cognitive system is assumed to be divided into more or less rigid compartments, with an encapsulated perceptual system whose sole output is information about the world. It is then assumed that there must be independent, higher level cognitive units that further process such purely factual information about the world, including emotive or attitudinal units that decide, on the basis of the perceptually acquired facts, what emotion, attitude or value the organism should adopt to, or place upon, those facts, plus decision-making units that decide what actions should be taken in light of the perceptually discovered facts. Thus on such views, all emotions, values or attitudes must involve higher level cognitive

interpretations or decisions about lower level perceptual facts. And similarly, any purely action-related dispositions are assumed to be exclusively the result of high level rational decisions as to what it is best to do, all things considered, given the basic perceptual facts that are the low level input to high level decision modules.

However, the obvious experiential fact about many of our emotions and attitudes is that they are completely unreflective and 'instinctive', such as when one takes an instant liking, or dislike, to someone when one first meets them, or immediately hates, or loves, a painting on first seeing it. My claim is that the X-caused acquiring of such emotional dispositions toward X can be just as much a legitimate part of a low level, purely perceptual episode as can the acquirings of any other kinds of more conventional epistemic perceptual dispositions toward X. And similarly, one can 'instinctively' or immediately react to something in an appropriate or inappropriate manner, which could equally be the manifestation of one's acquisition of a purely perceptual disposition to thus act. The assumption that all actions must be preceded by a high level decision to act on the basis of rationally evaluated facts, rather than sometimes being an immediate manifestation of a pure, perceptually acquired disposition, is just another distorting and unwarranted assumption implied by standard perceptual theories.

In the next Section an evolutionary argument will be given that offers empirical support for the claim that there is a wide incidence of such non-epistemic, but nevertheless genuinely perceptual, dispositions of such affective or purely action-oriented kinds.

3. An Evolutionary Argument for Unrestricted Perceptual Dispositions

In the previous Section it was argued that the 'unrestricted range' implication of the reflexive theory of perception (RTP) is legitimate--namely that, as long as a disposition of an organism Z is both X-caused and X-related, it counts as a genuinely perceptual disposition, even if the disposition seems to have no specifically informational or epistemic character. One of the strongest arguments for the actual wide prevalence of such non-epistemic dispositional cases is as follows. It is a broadly evolutionary argument, and it can be introduced as follows. As discussed in the previous Section, traditional views of perception, attitude-formation and action-oriented decision-making take them to always be distinct stages of cognitive processing. For example, if one sees an oncoming vehicle, and swerves to miss it, on the traditional model of rational action one first perceives the vehicle by receiving a mental representation of it, then one identifies the object thus represented, then one interprets the object as a danger to oneself on the basis of memories or information about vehicles and collisions, then one decides that the temporary inconvenience of swerving is better, all things considered, than not swerving and getting oneself killed, then one decides to swerve, then one executes an action of willing the swerve to happen, which finally results in the execution of one's decision to swerve. However, according to the RTP, the relevant or salient aspect of one's perception of the vehicle might be nothing more than the immediate acquisition of a

disposition to swerve so as to avoid it, which disposition is in turn immediately activated so that one actually does thus swerve.

One main, evolutionarily significant difference between these two different methods of reacting to the oncoming vehicle is very simple: the reflexive disposition procedure will typically be significantly faster than the rational action procedure, in that it involves much less cognitive processing. The difference in reaction time might seem like a relatively insignificant difference, but its evolutionary significance is profound.[10] This is because over the millenia, species that generally organized their short-term reactions to worldly objects and events via reflexive perceptual dispositions would have a significant survival advantage over those that did not. Indeed, because of the vital importance of the fastest possible reaction time to the sudden presence of dangerous predators, this factor alone is probably sufficient to virtually guarantee that any basic or habitual kinds of decision-making in organisms, that *could* be streamlined down into simple perceptual dispositions for immediate actions or reactions with respect to various worldly items and their properties, *would* actually be so streamlined. Hence, even if it is theoretically possible for perception to function in a purely epistemic modular way, as traditionally assumed, my claim is that evolutionary pressures alone would probably be sufficient to ensure the disappearance of such slower methods whenever the faster, more direct dispositional methods would be feasible.

This argument is more powerful and versatile than at first it might seem, because it potentially applies to *any* kind of disposition, not just to overtly survival-critical

dispositions of flight or avoidance of dangers. Given the related evolutionary advantages of an efficient and simple cognitive structure in organisms, the streamlining procedures that optimize survival chances in danger-avoidance are highly likely to work similarly on any other potential cognitive structures too. Any initial cognitive organization that functionally separated perception and recognition from various aspects of cognitive decision-making would be very likely to also be streamlined into a purely perceptual disposition-acquisition process whenever possible.

Thus for example, in perceiving an interesting new book in a bookstore, my claim would be that probably at least part of that perceptual event was the acquisition of a disposition to read that book. However, if asked about the event, one is likely, in the grip of the traditional view, to produce a kind of 'rational reconstruction' of the event, and claim in effect that one first saw or perceived the book, then realized that it had the intrinsic property of being interesting, then one decided on that basis that one should read it, then one deliberately formed an intention to read the book, that involved a disposition to read it. But in evolutionary terms, such convoluted cognitive processes would have no chance of survival in cases where the relevant simple and immediate perceptual disposition-acquisition was also possible.

At this point a possible line of criticism of the RTP handling of the distinction of purely perceptual versus higher level cognitive decision-making should be discussed. The criticism is that acceptable decision-making requires, in addition to a speedy decision in some cases, also at least a minimum amount of rational deliberation in all cases,

including even in time-critical cases such as a decision to swerve to avoid an oncoming vehicle. Hence, it would be argued, the rational perceiver has to decide, for every perceptual situation with which she is confronted, whether to immediately act a certain way with respect to it, or whether it would be better instead to engage in more prolonged deliberations (even if only for another second or so). But such decisions themselves involve a process of higher order cognitive deliberation based on prior, epistemically structured perceptual data. Hence there cannot be any cases of purely perceptual, immediately activated action-dispositions that are also acceptably rational.

There is a standard kind of evolutionary answer to such questions, which provides at least one kind of adequate response to them, as follows. The overall acceptability or practical rationality of a person's use of their perceptual mechanisms, including their differential use--sometimes in a purely perceptual way, and at other times in a more explicitly deliberative way--depends not on the details of their reasoning, but instead on the general evolutionary success of the surviving gene pool of the species *homo sapiens*, the members of which have in fact successfully used such differential techniques. From this purely factual perspective, normative standards of rational decision-making are simply causally irrelevant. Of course, though this process presumably would tend to eliminate genes from the gene pool that actively promote extreme or dangerously impulsive decision-making, there is little likelihood that it would produce de facto optimally rational behavior, as the highway death statistics in most countries illustrate.

To be sure, the overall discussion above raises the question of the role of perception in cognition when action decisions by an organism are not purely perceptual. This will be the topic of the next Section. But as a coda to this Section, it is important to note that the above evolutionary argument is sufficient by itself to refute traditional epistemic theories of perception, along with their assumption that attitude-formation and action-oriented decision-making are always distinct stages of cognitive processing. Thus, whether or not the RTP is itself acceptable as an adequate perceptual theory, standard purely modular cognitive architectures cannot be even approximately correct, because of the inevitable prevalence of evolutionarily effective short-cuts as discussed above.[11]

4. The Role of Reflexive Perception in Hierarchical Cognition Cases

This Section will briefly discuss the role of perception in cognition in cases when action decisions by an organism involve the mediation of higher order cognitive processes that are not purely perceptual, including inference and other forms of reasoning, deliberating, and so on. To begin, the reflexive theory of perception (RTP) as such has no inherent bias in favor of immediate action via purely perception-based action processes, even though the theory is consistent with the existence and evolutionary efficacy of some such perceptual processes. The RTP claims only that perception of an object X consists in the acquisition of X-caused and X-related dispositions.

Thus those dispositions may or may not be immediately activated, and of course, as with dispositions in general, some of them may never be activated. For example, one's perception of a new book in a bookstore might include the acquisition of a disposition to read the book. But this disposition need not result in one's actually reading it immediately, though it might; one might purchase it and then activate the disposition by reading it, or put it on a shelf and read it months later, or never read it at all.

Another point to be made is that the dispositional methods used in the RTP could simulate or model the cognitive structures, both perceptual and non-perceptual, postulated by traditional cognitive architectures, since any cognitive operations whatsoever can be causally or functionally expressed in terms of appropriate dispositions and their activation. Thus if there is, for example, convincing factual evidence that a certain kind of behavior only results as the final stage in a complex process of rational deliberation, it may be appropriate to postulate that, as one possible approach, an *executive* or *decision-making* perceptual disposition was acquired, which sets into motion an independent, non-perceptual deliberative cognitive process, that produces a final X-related disposition as a result of the process of deliberation.

The relevant dispositional structures will now be explained in more detail. To begin, pure perceptual cases followed by no X-related higher cognitive processes produce X-related dispositions D caused by X. However other dispositions D might be relatively indefinite, such as, informally described, a disposition to 'do something to react to X'. An organism Z with at least a minimally sophisticated cognitive structure might be able to

engage in a subsequent, non-perceptual deliberative process which terminates in a more specific X-related disposition EDt (a terminal executive disposition) to hide from X in a nearby bush.

The relevant dispositions D and EDt are related as follows. For any disposition, one must distinguish the disposition itself from the conditions under which it is activated. The executive cognitive process terminating in specific disposition EDt serves to specify or determine some subset of the activation conditions under which organism Z would actually realize disposition D. Thus the final, non-perceptual disposition EDt does not supersede or override perceptual disposition D, but instead it is the result of an executive process for selecting, out of all of the possible activation conditions for disposition D, those which would be most advantageous for Z.

Such a dispositional chaining situation is very common in everyday practical human reasoning. For example, one may acquire a disposition D to travel to city X, but actualizing that disposition may require several further dispositional stages in the decision-making process, such as a subsequent executive disposition ED2 to call an airline for flight reservations, a resulting executive disposition ED3 to choose the cheapest of the available flights, and so on--none of which stages have any tendency to show that one's initial disposition D was not, or does not remain, a fully legitimate disposition in its own right. Hence, in the perceptual case, the disposition D retains its integrity as a legitimate perceptual, X-caused and X-related disposition, in spite of its

indefiniteness and adaptive need of cognitive supplementation via an executive or decision-making cognitive process.

For theoretical tidyness, one other disposition should be postulated, namely a generic *initiating executive disposition* ED, that initiates the decision process terminating in disposition EDt, and which could be described as a disposition to determine an advantageous subset S of the activation conditions for disposition D, which subset S is the whole set of activation conditions for the more specific terminal disposition EDt. ED is needed as part of a purely causal explanation of how a perceptual process could be causally linked to a subsequent cognitive process. Arguably it itself is a perceptual disposition, in that it is both caused by X and X-related, but it is the only member of the decision-making chain ED, ED2,..EDt that is caused by X and hence perceptual, since all subsequent members, as a chain of reasoning steps in a decision-making process independent of perception and X itself, are not caused by X.

The adaptive advantages to organisms whose perceptual systems acquire the ability to causally link to such decision chains in non-emergency or non-time-sensitive situations are clear. Also, a rational reconstruction of the rationale for such chains in higher level kinds of reasoning shows the conditional necessity of such chains, as follows. Using the example again of a disposition to travel to city X, such a disposition by itself, if not followed by an executive chain of more specific dispositions, would leave the very dispositional status itself of that disposition in question, since without some such executive chain, it is unclear that there are any conditions under which the disposition

could become activated, i.e., in which the supposedly thus-disposed person could actually end up traveling to city X. Or, in epistemic terms, there would be no point in imputing an indefinite perceptual disposition to organism Z to do something X-related, unless there were some causal conditions, accessible to Z, with the aid of which Z might actually be able to behave in the relevant X-related way. Dispositional causal links to higher cognitive processes are sometimes needed, to provide such effective causal conditions for activation of a disposition that is nevertheless itself legitimately perceptual.

5. Representational and Intentional Aspects of Perception

In principle, there are several ways in which one might develop a reflexive, purely dispositional theory of perception. One possible approach would be a radically eliminative one, in which it would be denied that perception is in any significant sense a representational or intentional activity. Another approach would seek to reduce rather than eliminate such traditional concepts. The first, eliminative approach is initially tempting for an RTP supporter, for the following reasons.

To begin with representation, representational views of perception are naturally associated with views of perception as broadly an information-collecting activity, which information represents the relevant properties of object X when X is perceived. Or more traditionally, representational theories of perception postulated mentalistic intermediary entities, such as 'ideas' or sense data, for much the same purpose. But the vacuousness of

pure informational views of perception has already been pointed out, and traditional, behaviorally inert sense data or ideas would be equally empirically empty, so an RTP supporter has good reason to make no use of such representational concepts, and seemingly no immediate need to retain them for other reasons either.

As for intentionality or aboutness, here too it is tempting for an RTP supporter to see the concept as both theoretically suspect, and unnecessary besides. First, the concept might seem to be a major obstruction to a purely naturalistic theory of perception, if a naturalistic reduction of it cannot be provided.[12] Also, the concept might seem to be unnecessary on a reflexive theory, because the basic question as to what makes a given perceptual state of organism Z a perception that is *about* object X, or *directed torward* object X, has an easy answer for a reflexive theory, namely that the relevant X-caused dispositions are themselves *X-related* dispositions, so that there is no immediate further issue of intentional 'X-aboutness' that still needs to be addressed. Or in other words, since an at least minimally adequate dispositional substitute or equivalent for perceptual intentional aboutness can be had for free as part of the basic RTP theoretical package, simplicity considerations dictate that no independent, more traditional concept of intentionality should also be invoked.

Nevertheless, in spite of these very real eliminative temptations, my own programmatic approach, here and elsewhere, will instead be to mainly attempt reductions, rather than eliminations, of representational and intentional concepts within the conceptual framework provided by the RTP. Thus I shall acknowledge at least the heuristic and

folk-psychological value of some intentional and representational concepts, and seek to leave their referents in place, though as reconstructed on dispositional foundations.

In the case of intentionality, in practice this approach will not differ much from the eliminative view proposed above, since, in the case specifically of perceptual intentionality rather than intentional phenomena more generally, the reflexive view can directly explain in its own dispositional terms the standard logical features imputed to perceptual intentionality. Or in other words, perceptual intentionality as such turns out not to be a naturalistically problematic concept after all, so it is harmless to retain it via reduction, as will now be shown.

To begin, the fact that perception is *of*, or *about*, some particular distal, worldly object X is explained on the current reflexive view by the fact that the X-caused dispositions that constitute a perceptual state of perceiving X are *X-related* dispositions, that is, dispositions whose actualization-conditions include some concrete X-related causal factors, such as are involved in some actual interaction of the perceiving organism with X itself. In defense of this view of dispositions, U. T. Place has argued that the relevant kind of aboutness, with respect to some modal situation that would actualize the disposition, is an integral feature of any physical dispositional property, so that the relevant kind of aboutness is a purely physical feature of the relevant dispositions, and hence naturalistically unproblematic.[13]

The reflexive theory explains this representational aboutness in terms of the natural aboutness or object-directedness of X-caused and X-related dispositions. To be sure, some might be wary of Place's analysis, since it supports a view of the 'intentional objects' of dispositional properties as possibly being non-existent, since the possible objects or conditions with respect to which a dispositional property might be activated or manifested might themselves not exist.[14] However, in the perceptual case a weaker analysis of dispositional aboutness--i.e., one not requiring the possibility of non-existent intentional objects--will suffice, since the relevant object X of a perceptual state is guaranteed to exist because it has to cause the relevant perceptual state. Hence the present dispositional, naturalistic analysis of perceptual aboutness may be acceptable even to those who cannot stomach Place's much stronger, unrestricted modal analysis of dispositions in general.

Nevertheless, any dispositional analysis must recognize that a disposition D may not be actualized, so that there may not be an event E, such that E is the event of the actualization of disposition D. However, the relevant event E is here only described in a quantificational, Russellian-theory-of-descriptions way, rather than referred to as a particular but non-existent event, so this basic logical feature of all dispositions does not in itself give rise to strong modal problems of reference to possibly non-existent objects. As an illustration of the difference between weak (perceptual) and strong (modal) dispositional aboutness, contrast the innocuous perceptual disposition to hit an actual object X that is close to oneself--a case of weak aboutness--with a strong modal

disposition to seek the Fountain of Youth, a particular entity which almost certainly does not exist.

The second feature of perceptual intentionality to be discussed involves the issue of perceptual correctness versus incorrectness. The intuitive or traditional concept of perception involves a claim that that it is possible to perceive an object X as having a property F, even if X does not in fact have property F. Now on one ontological analysis of this claim, it entails that one can perceive possible but non-existent states of affairs, such as that of X instantiating the property F, even if in actuality X does not instantiate F. However, the dispositional analysis to be proposed will completely sidestep such an ontologically extravagant view, which would require there to be both non-existent entities, and perception of them. Nevertheless, such an analysis does show the connection of perceptual incorrectness issues with traditional intentionality issues about non-existent entities.

Other analyses of incorrect perception often invoke the concept of representation rather than that of intentionality. One might 'perceptually misrepresent' the object X as having property F, even if in fact it doesn't have F. However, for present purposes we do not wish to initially assume that all perception is representational, and in any case the problems involved in explaining the possibility of incorrect perception become no easier when re-expressed in representational rather than intentional terms.[15]

Fortunately, however, the dispositional analysis provided by the reflexive theory of perception (RTP) is able to support a completely straightforward account of incorrect perception, which makes it no more ontologically or semantically problematic than the corresponding concept of correct perception. The analysis to be given will also bypass altogether the issue of whether perceptual incorrectness is primarily intentional, primarily representational, indifferently both, or neither.

To begin, recall that the RTP analyzes a perceptual state as one or more X-caused and X-related dispositions. Now as briefly discussed in the Introduction, if the concepts of correct and incorrect perception have any genuine empirical content, then there will at least sometimes be behavioral evidence as to whether a given perception of an object X was correct or incorrect. For example, if someone looks at a rock X, and then tries to eat it, that behavior provides adequate evidence that the person has misperceived X as having the property of being edible. But the RTP can take that behavioral evidence as evidence of a perceptual state, consisting of a perceptually acquired disposition to attempt to eat X. So if the behavioral evidence is also evidence of incorrect perception, as it is, then the relevant perceptual state, i.e., the disposition to attempt to eat X, may itself be identified as an incorrect perceptual state, on the basis of the behavioral evidence for its incorrectness as a perceptual state. And a similar analysis could be given for correct perceptual states.

As will be clear from this discussion, no attempt is being made to provide a general analysis of what is involved in a perceptual state being correct or incorrect. Instead the

claim is simply that if indeed there are in fact both correct and incorrect perceptual states, then the analysis of them provided by the RTP must be at least minimally acceptable, even if it is not very informative. Indeed, arguably the RTP dispositional view provides a minimum common core of analysis for *any* adequate perceptual theory of the correct/incorrect distinction.

For example, a traditional representational theory might claim that incorrect perception of X involves the existence of a mental representation of X that has some features different from X itself, such as representing X as edible when X is not edible. But presumably any behavioral evidence for the existence of such a representational state, such as the attempted rock-eating behavior, would also count as evidence for the perceiver having had a corresponding *disposition* to attempt to eat the rock--it is just that the representational view would have, in addition, a further explanation of why the perceiver had that disposition, presumably as a result of action decisions based on the faulty information provided by her incorrect perceptual representation.

Nevertheless, a proponent of the RTP can argue that any apparently greater explanatory strength of such a representational view over the minimalist, 'plain vanilla' RTP view is spurious. For the representational view leaves it as a brute, unexplained fact that the relevant perceptual representation did not in fact correctly match the actual properties of object X. The equivalent RTP failing is that it is left as a brute, unexplained fact that X caused an incorrect X-related perceptual disposition to be acquired by the perceiver. Thus neither account genuinely explains why the perceiver perceived the rock

incorrectly. But the RTP account is much more theoretically economical in appealing only to dispositions, whereas the representational account appeals both to representations, with all of their problems,[16] and arguably covertly to dispositions as well.

Another important point about the RTP analysis of correct versus incorrect perception is as follows. The analysis given is conditional on there being genuine cases of correct and incorrect perception. However, here too, as with the concepts of representation and intentionality, it is tempting to adopt an eliminative analysis which would abandon those concepts altogether. For the Section 1 account of the biological nature of perception, and of its evolutionary utility in successful cognition, did not require any such distinction to be made. Thus, for instance, if it turned out that there was no way in which to provide an adequate naturalistic reduction of broadly semantic concepts such as those of correct versus incorrect perception, the RTP has the theoretical resources to provide a completely adequate account of successful cognition without making any use of such concepts.

Nevertheless, as with the concepts of representation and intentionality, the present approach will continue to seek adequate naturalistic reductions, rather than eliminations, of such semantic concepts, until either success is achieved, or clear evidence of their naturalistic irreducibility--or incoherence--becomes available, in which case an eliminative strategy could be pursued instead.

6. The Dispositional Structure of Conscious, Representational Perceptual States

A brief explanation will now be given of how the basic dispositional analysis of perception provided by the RTP is consistent with the existence of high level, conscious perceptual states, and of perceptual content. The analysis will also serve to show how a concept of representation, also of a high level perceptual kind, could be introduced that is both consistent with the RTP, and of some theoretical utility.

An initial issue concerning conscious perceptual states is that they seem to be episodic or event-like in nature, with a constant stream of perceptual activity going on as one consciously perceives an object X and its properties. However, if one were to regard a perceptual state as being constituted by the relevant acquired X-caused and X-related dispositions themselves, a categorial mismatch would result, since dispositions are not themselves events or processes, even though their behavioral actualizations or manifestations typically would be. So how is this categorial difference between dispositions and conscious, episodic states to be explained?

This query shows the need to clarify the status of perceptual states. To begin, recall that the basic definition of perception provided by the RTP is that perception of an object X by an organism Z consists in Z being caused by X to *acquire* some disposition D toward X itself. Thus on this basic definition, perception of X is not the acquired dispositions themselves, but rather the *acquiring* of those dispositions. We must distinguish that

process of *acquiring* X-caused dispositions from the *results* of that process, namely the dispositions themselves. Hence the basic definition of perception as provided by the RTP is already a definition of a perceptual state regarded as a process or event of acquiring dispositions, and so there is no mismatch with the usual view of conscious perceptual states as being episodic or event-like.[17]

But what, then, is the relation of those dispositions to episodes of acquiring them? The relevant dispositions may appropriately be described as being the *perceptual content* of the X-caused perceptual states of acquiring them. This characterization fits well with other views of content too, since on the RTP view it is the dispositions that provide the intentionality or aboutness, as well as the correctness or incorrectness, of any given perceptual state. Also, these contents constitute a form of wide or externalist X-related content, since their behavioral actualizations or manifestations would typically involve worldly events external to the organism whose perceptual states have those contents. Indeed, I would claim that this reflexive dispositional account of perceptual content is the first purely physicalist and naturalistic account to be able to simultaneously give a plausible explanation of all three critical content factors, namely intentionality, correctness versus incorrectness and the externalist definition of content.

Turning now to issues regarding conscious perception, it is desirable, in order to achieve a unified explanation of both conscious and non-conscious aspects of perceptual states, to attempt to explain the conscious aspects also in terms of acquisition of X-related dispositions and their manifestations. This is additionally desirable for evolutionary

reasons, so as to be able to explain the evolutionary emergence of conscious perception as a gradualist process of selection, that involved gradual functional modification of the same kinds of disposition-producing neurological mechanisms in organisms as underlie more basic kinds of perception.

As a basic conception of how this might work, we may postulate *second order* X-caused and X-related perceptual dispositions, whose activation or manifestation would involve some process that produces appropriate ordinary or first order X-related dispositions. (All references to dispositions will continue to be to first order dispositions, unless otherwise specified). Arguably such second order X-related dispositions would manifest conscious mental activities that should be understood as broad monitoring and control activities with respect to the events of production of the relevant first order X-related dispositions.[18] Thus the conscious aspects of perception involve the production of simulations, models or representations of aspects of objects, all of whose parts are closely functionally linked to appropriate first order X-related dispositions, so as to achieve improved control over the formation of those dispositions.

The theoretical point of regarding such second order, consciousness-related items as being dispositions, rather than just as occurrent processes, is that they may or may not be activated in a given perceptual state, depending on other considerations. Thus conscious attempts to visualize a given object might activate additional second order modeling or simulation dispositions that otherwise would remain dormant, while, on the more

minimalist side, in emergency or time-critical situations virtually all conscious aspects of perception might remain un-activated.

As a general possibility, the formation of the dispositions involved in perception of the shape of an object X might be consciously monitored by the cognitive construction of a *depictive representational model* of that shape, any inconsistencies or other problems with which would prompt some distinct but related perceptual contact with object X, such as by viewing it from a different angle, so as to initiate the formation of more desirable dispositions.[19] Thus on such a view, basic perception as such is not inherently representational, but nevertheless conscious monitoring and control of the formation of basic perceptual dispositions might involve the use of representational models.

Thus, in more detail, in the higher, conscious levels of perception, second order X-related dispositions would presumably normally be immediately activated so as to *model* X and its properties, with the model having a structure similar to that of X itself, and with each part of the model involving an appropriate group of X-related dispositions. Thus a modeling of the various differently shaped areas of a perceived object would involve similarly structured groups of dispositions to causally interact with each of those areas in distinctive ways, that depend on what each area of the shape is modeled as being. Nevertheless, such a model would still be *about* X, not because the model has the same structure as X (since many other objects would also have the same structure), but because each part of the model structure involves appropriate X-related dispositions. Thus the relevant activated modeling dispositions, as well as the resultant X-related dispositions

associated with each part of the thus-constructed model, would be an integral, controlling and monitoring part of the whole array of dispositions that constitutes organism Z's *complete* current perceptual content with respect to object X.

Now such models model how object X *seems* to be to organism Z, rather than how it actually is, because some of the modeled properties of X may not be its actual properties, but instead misrepresentations of those properties. Thus, as one might expect, the relevant model would misrepresent X in ways closely related to those more directly causal ways in which Z incorrectly perceives X. For example, a misrepresented shape in the model would involve dispositions to grasp or avoid X in ways that would also provide evidence of incorrect shape-related perceptual processing by Z, of a kind that would result in behavioral failures in activated attempts to actually grasp or avoid X.

To be sure, this view does not imply that *all* content properties, including cognitive, linguistic and consciousness-related properties generally, are purely physical. But at the same time, if aboutness and intentionality are thus reducible for all perceptual properties, including conscious ones, broader reductions may be feasible as well--particularly since Section 3, among others, provided strong arguments against the insulation of perception from other cognitive activities. Hence overall, I would claim that the theoretical structure provided by the RTP provides a substantial first step in such a broader naturalistic reductive program.

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Notes

[1] See Cummins 1989, Ch. 9 for a discussion of the distinction.

[2] See, e.g., Dretske 1981 and Fodor 1990.

[3] See also Millikan's point that informational views must consider 'consumer' as well as 'producer' aspects of information, e.g. in her 1989.

[4] See also my paper [Blind].

[5] For a useful discussion of related behavioral issues in Quine and Davidson see George 2004.

[6] A recent account of complexities in the concept of adaptive evolution is given by Walsh 2003.

[7] For a survey of relevant literature, see Downes 2001.

[8] Such negative feedback analyses can also be used to explain purposive concepts in naturalistic terms, on which see Falk 1995.

[9] For example, Armstrong's 1961 view of perception as belief acquisition does not require that all of the beliefs are true, but it does rule out any non-belief acquisitions, such as attitude or emotion-acquisition, as perceptual. Also, in spite of the evolutionary foundations of Millikan's theory of perception, she also views perception as primarily a matter of information acquisition--see, e.g., her 2004.

[10] See any general psychology text for discussion of factors influencing such reaction times.

[11] Thus the present view may be in conflict with some of Carruther's pro-modularity views, e.g. as in his 2003, as well as with Fodor's classic 1983 modularity of perception view.

[12] But one can be provided, see below.

[13] Place 1996 and Armstrong 1996. See also the similar view of Molnar 2003.

[14] E. g., see the chapters by Armstrong in Armstrong 1996.

[15] See Cummins 1996.

[16] Again see Cummins 1996.

[17] Armstrong 1961 pp. 121-122 makes a similar point with respect to his dispositional analysis of belief.

[18] For a recent account of the broad scope of consciousness-related control activities see Clark 2001.

[19] Thus the RTP has a natural affinity with enactive and sensorimotor views of perception, such as that of O'Regan and Noë 2001, which also emphasize perceptual interactions with the world.