

## **Dispositional Higher-Order Thought Theory versus Hierarchical Systems Theory of consciousness**

*ABSTRACT: Through the utilization of a descriptive illustration and detailed referencing of Carruthers (2000 – Phenomenal Consciousness), a comparison of Hierarchical Systems theory (2007 – On the Origins of Life, Consciousness, and Personal Identity) with Dispositional Higher-Order Thought theory identifies and reinforces their complementary status. However, this also determines some key distinctions, particularly with regard to the conclusions each make regarding the mentality of animals and the autistic, and regarding the moral consequences of these conclusions.*

Hierarchical Systems theory (HS theory) (Pharoah, 2007) and Dispositionalist Higher-Order Thought theory (DHOT theory) (Carruthers, 2000) are complementary models that purport to provide a reductive explanation of phenomenal experience. Following a brief review of these claims, this paper reconsiders the conclusions that Carruthers makes regarding phenomenal consciousness, particularly in relation to the mentality of animals and the autistic.

### ***On claims of reductive explanation***

According to Carruthers (2000), a successful explanation of phenomenal consciousness should explain:

(1) how phenomenally conscious states have a subjective dimension; how they have feel; why there is something which it is like to undergo them; (2) why the properties involved in phenomenal consciousness should seem to their subjects to be intrinsic and non-relationally individuated; (3) why the properties distinctive of phenomenal consciousness can seem to their subjects to be ineffable or indescribable; (4) why those properties can seem in some way private to their possessors; and (5) how it can seem to subjects that we have infallible (as opposed to merely privileged) knowledge of phenomenally conscious properties.

However, that a theory should explain points 1 to 5 does not mean that it satisfies the requirements of reductive explanation. This is evident from a more recent paper (Carruthers, 2004 – Reductive explanation and the ‘explanatory gap’) that revolves around the nature and demands of reductive explanation:

“A reductive explanation of phenomenal consciousness could be successful if it could explain all that needs explaining at the target level, leaving no significant question unanswered.” (2004, sec 4. para 9).

“A successful reductive explanation which focuses on the third-person characterizations can give us good reason to think that phenomenal consciousness per se has been reductively explained.” (2004, sec 5. para 6).

“a priori conditionals aren’t what are directly aimed at by those seeking reductive

explanations within the framework of a deductive-nomological account of explanation. What is actually aimed at, are the set of reducing facts together with bridge laws, identities, or constituting conditionals which can entail the target phenomenon.” (2004, sec 2.1. para 7).

“A reductive explanation of some property or process will be a description of the causal mechanism which generates that property–process”. (2004, sec 2.2. para 1).

A reductive explanation of phenomenal consciousness will “describe a way of linking together cognitive structures and contents... any instantiation of which is supposed to be metaphysically sufficient for phenomenal consciousness to occur.” (2000, p. 257).

“A successful reductive explanation shows how a particular instantiation... of a higher-level property is constituted by some lower-level property or process.” (2000, p.66).

Carruthers (2004) concludes, “there is no obstacle of principle, here, to the provision of a reductive explanation of phenomenal consciousness. Whether such an explanation can in fact be provided is, of course, a topic for another occasion.” (conclusion).

In her analysis, Dowell (2007b – A Priori Entailment and Conceptual Analysis) indicates that a reductive explanation simply requires linking uncontroversial physical facts to uncontroversial phenomenal conclusions. In this respect and following appraisal of several authors, Pharoah (2007) satisfies several criteria of reductive explanation. In contrast and in view of their analysis and Carruthers (2004), DHOT theory would seem but a plausible explanatory thesis that “takes the form of an inference to the best explanation” (Carruthers, 2000, p.xvii) – the only thing that distinguishes the DHOT theory from any other proposition is the degree to which it accounts for the features of 1-5 above and the accuracy with which it attributes or defines phenomenal characteristics. Irrespective of how thorough the account, the DHOT theory does not reduce to physical principles as it stands despite Carruthers’ claim, “that the problem of reductively explaining phenomenal consciousness into scientifically acceptable terms has been fully resolved within these pages.” (2000, p. 329). It remains to be seen whether there can be consensus as to how a theory should present itself in order to satisfy reductive explanation. Inevitably, without consensus, the nature and interpretations of phenomenal consciousness will diverge. It is in view of these difficulties that we now turn to a comparative analysis of HS and DHOT theories.

### ***Descriptive time sequence***

The descriptive time sequence to follow, will illustrate how evaluative comparison with Hierarchical Systems (HS) theory enhances Dispositional Higher-Order Thought (DHOT) theory:

Consider a scenario where an individual is walking along, feeling contented, and an object falls unexpectedly in front of him. This would startle him and he would elicit a purely innate reactionary exclamatory shriek. Call this time sequence, T1. The reaction is a hardwired pre-designated motor response

that requires no neural interactivity in that the individual has perceived an aspect of his environment but his neural mechanisms have determined nothing as to the nature of the stimulus other than that it was immediately shocking. (cf. Pharoah, 2007, category 1).

However, in T2 a neural evaluation determines that the object that fell from the sky has a distinctive shape. As the shape resembles a snake, an associative innate reactionary response dilates the pupils and makes hair stand on end. The dilating pupils and goose bumps are an indication of the presence of recognitional percepts because neural processing has identified certain features to evince the innate reaction. However, HS theory explains that at this T2 stage there is no feeling of the phenomenon of the experience to evince this reaction.

In T3, a series of perceptive evaluations lead to a continually altering understanding of the snake shape, with regard its size, colour, textures etc. that evokes the feel that the stabilizing neural understandings effect.

HS theory explains that this assessed reactionary response is the neural phenomenon of experience. In its isolation, the feel is purely a by-product of stabilizing neural understandings of the observed 'snake'. Whilst this feel be expressed through motor response, there are no recognitional properties regarding the experience itself with which one might ascribe phenomenal consciousness. Carruthers might define T3 as a "first-order perceptual state" (2000, pp. 128-9).

In their explanations of T1 to T3, there is little to separate the Hierarchical Systems (HS) and Dispositional Higher-Order Thought (DHOT) accounts.

T1 – translates in HS theory to category 1 passive perceptive processes, and in DHOT theory to the condition where organisms with a repertoire of behavioural reflexes are triggered by simple environmental features (p. 124, (a)).

T2 – translates in HS theory to category 1 active perceptive processes, and in DHOT theory to the condition where organisms have innate reflexes that are action-schemas guided by incoming quasi-perceptual information (p. 124, (b)).

T3 – translates in HS theory to category 2 passive phenomenal experience processes, and in DHOT theory to conditions where organisms possess a suite of learned action-schemas guided by quasi-perceptual information (p.124, (c)).

At T3, despite the pervasive and acute feel of the snake scenario, both HS and DHOT theories indicate that phenomenal consciousness and emotion are still absent.

### ***A detour from the descriptive time sequence***

At this juncture one can make an illustrative detour:

When describing a wall in the peripheral vision during T1 to T3, one might determine such things as its colour, shade and depth purely as forms of identity to which attention can be brought to bear should phenomenal experience (interacting understandings and their neural impact) require it to be so. As phenomenal experiences have, according to HS theory, an infinitely variable feel, so too must phenomenal experiences have an equivalent variable impact on attention. Beneath the realms of phenomenal consciousness, in our descriptive time sequence T1 to T3 above, the stable unchanging colour of a wall in the individual's peripheral vision is unlikely to instigate any conflicting perceptual content within the individual's neurological mechanisms. In its absence, there will not be much feel and consequently, a negligible phenomenal experience of the wall. However, if the identity and possible properties of the wall were to present themselves phenomenally such that the wall were to become relevant to the individual's experiential understanding, this status would change by degree. For example, if the snake were to disappear behind the wall, the individual's attention and consequential phenomenal experience and feel of the wall's features would heighten. Conversely, if all experiential understanding suddenly ceased to be relevant, or suppressed neurologically, attention would be entirely lost and the individual would become non-conscious (where non-conscious is not-attentive, as distinct from unconscious, which is a state incapable of being attentive) but phenomenally experiencing to a degree dependent on the depth of suppression. This account supports the distinction of phenomenal state-consciousness and forms of mental states or functional state-consciousness (Carruthers, 2000, pp. 13 – 18).

### ***Recommencing with the descriptive time sequence***

In the descriptive time sequence, the individual's neural mechanisms determine at T4 that the snake shape, oddly, has no eyes. Consequently, the neural understanding destabilizes as does the phenomenal experience. Further recognitional association between its understanding on the one hand, and its phenomenal experience on the other, creates the phenomenally conscious state of curiosity – 'a snake... with no eyes?' and a scenario where adaptive associative learning is taking place. However, were the 'snake... without eyes' to move, an innate reactionary response, perhaps in conflict with an understanding about the scenario, would attempt to reassert itself in order to determine an appropriate behaviour: Fear and dread with no understanding to convince the individual otherwise, would urge it to run until subsequent phenomenal experience and innate instinct persuades the phenomenally conscious individual that he has run far enough.

Both HS and DHOT theories may agree that the primary function of the neural mechanisms of T3 first-order representation (FOR) is to process indeterminate neural interpretations of the environment such that they create an integrated content. However, at T4 each account differs as to the nature of this integration, with regard to interpretations of the neural processes that lead to recognitional experiential associations

(Pharoah, 2007, active category 2; Carruthers, 2000, p. 125, cf. (c) and (d)). T4 – translates in HS theory to category 3 active phenomenal consciousness processes, whilst an interpretation of DHOT theory is that T4 is a state where an individual possesses ‘simple’ conceptual representations and reasoning capability generated by perception (p. 124, (d)).

### ***The Dispositional Higher-Order Thought (DHOT) account of T4***

Whilst the DHOT theory implies that a practical reasoning capability distinguishes recognitional association from conceptual thought (p.125, (d)), the theory allows both recognitional associations and conceptual representations to exist (p. 125, p. 303) at T4 without the presence of phenomenal consciousness.

Carruthers infers that the evolutionary process following learned action-schemas is conceptual thought, conceptual reasoning and conceptual representations (p.125). According to this view, for a creature to think about experience is to have concepts about experience but not to have phenomenal consciousness. Consequently, DHOT theory requires an extended thesis that explains why phenomenal consciousness occurs only at T5 when first-order conceptual reasoning systems, as well as a higher-order “mind-reading faculty” have a dual representational status (p. 246).

### ***The Hierarchical Systems (HS) account of T4***

In HS theory, recognitional associations form the identity of the individual’s phenomenal consciousness in T4:

HS theory suggests that there is no concept forming exercise during T4 for there are no realizations as to the significance of any given phenomenal experience, feel or emotion, over another. According to HS theory, phenomenal consciousness occurs merely when there are recognitional associations, which is why Gennaro’s (1996) resistance to the notion that phenomenal consciousness is exclusive to humans, is pertinent here.

HS theory indicates that all non-human animals are capable, at most, only of thoughts and feelings to which conceptual reasoning is absent. The nature of their thinking involves making learnt associations between phenomenal experiences and feelings, without the creature inferring and conceiving that those particular thoughts and feelings implicate anything other than that it is experiencing the phenomenon of being conscious.

The illustration of this T4 attentative consciousness (both transitive and intransitive, Carruthers, 2000, pp. 9-11) and high-order processes in HS theory do not identify and explain unique human characteristics. Consequently, HS theory requires an extended thesis that explains what humans possess and express in T5, above and beyond non-human animals.

### ***Diverging conclusions***

In contrast to DHOT theory, HS theory suggests that phenomenal consciousness is a state about which an individual need not have conceptual capability, which leads to a divergence of conclusions as to the characteristics of phenomenally conscious creatures:

Applying HS theory to reassess DHOT's phenomenal consciousness inference might allay Allen's (online – Evolving Phenomenal Consciousness) concerns regarding the “generality” of Carruthers' theory, which claims to explain the full range of perceptual representations for all the senses despite not qualifying the recognitional association and conceptual representation distinction. Lacking this distinction, Carruthers is forced to conclude, against intuitive reasoning, that non-human animals, infants, and the autistic, do not possess phenomenal consciousness. (c.f. T5 below). Furthermore, Carruthers argues “that what is bad about suffering is desire-frustration, not sensation” (p. 205) thereby placing all non-human life forms into a first-order non-phenomenally conscious category (p.206) without qualifying any distinct forms of behavioural characterization. The error lies in the assumption that the “conception of perceptual states” or “concept of experience” or “concept of seeming, or sensation” (p. 194/5) is the requisite of phenomenal consciousness and higher-order thought processes. Alternatively, according to HS theory, complex behavioural patterns emerge from associative experiential processes, without having to introduce the notion of conceptual thought or concluding that non-human animals, infants, and the autistic, do not possess phenomenal consciousness.

By way of example, if an individual non-human animal experiences a particular pain whilst simultaneously receiving conflicting pleasurable stimuli, the observed emotional response will evolve over time, from fear to suspicion, withdrawal, depression, tolerance, etc. Complex emotions and their communications are the evolved consequence of a dynamic association between phenomenal feelings and the evaluation of their stimuli. The nature of the complexity is due to the survival implications relating to the diverse range, degrees, and combinations of stimuli, and to the depth of innate knowledge and cognitive organization, capability, and capacity. Conceivably, there are many types of disorder in mental function that can have a disruptive effect on the composition of an individual's phenomenal consciousness (Courchesne et al., 2007 – Mapping early brain development in autism; Schmitz & Rezaie, 2008 – The neuropathology of autism: where do we stand?).

### ***Elucidating T5***

The behavioural consequences of the T4 HS dynamic may indicate, what Carruthers describes as a ‘weak’ variety of self-consciousness (p. 12). Consequently, T5 implicates the notion of a ‘strong’ variety of self-consciousness for which HS and DHOT have differing accounts.

### ***The Dispositional Higher-Order Thought (DHOT) account of T5***

With the DHOT view, “experiences are phenomenally conscious when they are held in a short-term memory store” (or stores p. 228) that acts functionally (not physically, p. 309), by creating recognitional concepts through the integration, via a “mind-reading faculty”, of belief-forming, reasoning, and “concept-wielding consumer” systems (p. 241). The function of this short term neural buffer, is to make perceptual contents available to cause higher-order thoughts about themselves should circumstances demand (p. 228), for example, in “dealing with the vital and complex exigencies of social intercourse” (p. 268). However, citations (p. 230) do not support, as claimed, the notion that a ‘mind-reading faculty’ as such has a genetic basis (c.f. Footnote 3), nor that apes demonstrate distinct (in so far as demonstrating recognitional conceptual thought) ‘non-animal like’ deceptive and co-operative behaviours indicative of the emergence of this mind-reading faculty, nor that the evolution of a mind-reading faculty developed in response to the need to interpret early hominid speech (p. 231).

Phenomenal consciousness only occurs, according to the DHOT theory, when a creature thinks about its states of experience, and consequently, when it possesses recognitional concepts (where a recognitional concept is one “whose application is grounded in awareness or experience of its object”, p. 232) (p. 215) (also described as self-conscious, p. 13, and higher-order awareness, p. 232). DHOT explains that recognitional concepts (p. 241) exist because of a mind-reading faculty that is capable of immediate introspective recognition (p. 255) thereby determining a distinction between first and second-order recognitional judgments of experience (p. 250).

### ***The Hierarchical Systems (HS) account of T5***

HS theory provides, arguably, a more convincing explanation concerning these issues. It does not require a distinction between simple and complex conceptual representations or need to indicate how they evolve, either physiologically or theoretically, into a short-term memory/ ‘mind-reading faculty’. Rather it describes an evolving hierarchical system dynamic. This dynamic involves passive processes that lead to increasing, but indeterminate, physiological complexities and active processes that lead to dramatic determinate evolutionary stages. The passive process equates to multiple streams of neurological processing or conditions of influence, whilst the active process equates to a structured and integrated content. Consequently, the HS theory can incorporate both the multiple drafts (Dennett, 1978) and dispositional higher-order thought models within the hierarchical systems model (Carruthers, 200, p. 297), whose distinctions Pharoah (2007) clarifies in terms both of functionality and physicality.

### ***How does HS theory account for T5 characteristics in the time sequence scenario?***

The individual has run away from the snake... or has he? By making an association between the functional properties of everyday objects and the emotional and learnt experiences of phenomenal consciousness, the individual can reconsider his reactionary and emotional response. In so doing, he can conceive of a scenario that could mitigate his fear, and flight or fight response. The key term is ‘conceive’:

In HS theory, conceptualization invokes the notion of a realization regarding purposeful intent, in contrast to the DHOT view that conceptualization is merely to possess thought. Consequently, to be aware of the conscious state is not only to make associations between experiences and to learn (as in phenomenal consciousness) but to recognize, or conceive, that objects have functionality. Sticks have various properties and functions. A human is capable of developing the realization that sticks have features which have potential uses in a variety of situations. He can conceive killing the snake with the stick given the requisite realizations or awareness through introspection (where awareness is not to be confused, as is frequently the case, with the notion of attention e.g. Carruthers, p. 200, footnote 9). This is very different to an ape using a stick as a response to a flight or fight reaction. At its core (Pharoah, 2007, category 3, passive awareness), an ape might possess a realization that this stick has function, however it has no recognitional concept of this fact. In a human, there is conceptual purpose and intent that examines the environment and the functions its contents possess in order to assist it in dealing with the reality of its environment and the relation of the environment to the individual's 'self' identity.

### ***T5 HS theory conclusions***

The absence of conceptual content in a human equates to being non-aware, as distinct from non-conscious described earlier. To be non-aware is to day-dream or to 'empty the mind', which is a uniquely human characteristic that entertains the notion that phenomenal awareness (rather than phenomenal consciousness) can be "concealed" or suppressed by human neural processes (cf. Carruthers, 2000, section – "non-conscious phenomenality?", p. 175, in reference to Tye 1995, 1999 – Ten Problems of Consciousness; Language, Thought and Consciousness)). However, it is difficult to isolate a human's phenomenal consciousness because phenomenal experiences and thoughts readily promote from phenomenal experience to awareness and conceptualizing inner-speech (cf. Hierarchical Systems Theory Figure). Conceivably, appropriate experiments might clarify their distinction. Alternatively, psychoanalysis clearly demonstrates a discipline that seeks to promote phenomenally conscious thoughts and its behaviours, to awareness and conceptual consideration. Obviously, cyclical conceptual thoughts can both reinforce or suppress phenomenal consciousness and awareness, as indicative of, for example, obsessive and superstitious disorders, and intellectual prejudice and indoctrination. Also of relevance to non-awareness is the notion that novel ideas stem from the ability to 'listen' to good phenomenal feelings about phenomenal consciousness i.e. to be open to one's intuitions (Carruthers, 2000, p. 19; Ghiselin, 1952 – The Creative Process), to which, by definition, there is no analytic access.

The HS theory explains that awareness of the conscious state is the first distinctive human evolutionary process, and that this state is the driving force behind social, cerebral and then language development, which is intuitively consistent with the evidence. This contrasts with the conclusions extrapolated from the DHOT theory that a mind-reading faculty evolved from the need to interpret early hominid attempts at speech or 'proto-language' (Bickerton, 1995 – Language and Human Behaviour) (Carruthers, 2000, p. 231). This view, that denies an underlying and distinctive psychological dynamic as the

impetus for language development, implies that there is no restriction on any animal to evolve language following appropriate environmental conditions. Were this to be the case there would be, conceivably, at least some, if not many varieties of proto-languages throughout the animal kingdom.

### **Conclusion**

Carruthers (2000) devotes five pages to “moral consequences?” (pp. 203-208), suggesting that our beliefs about the physical world should not become the objects of our sympathy, but constrained by our constructed moral ones. I interpret this to be an argument construed out of necessity to deflect our intuitions that DHOT is wrong in its conclusions regarding the absence of phenomenal consciousness in non-human animals and the autistic. This highlights the most challenging and potentially harmful consequence of all claims at reductive explanations of consciousness. Pharoah (2007, category 4) utilizes HS theory to extrapolate a thesis that explains the emergence and evolution of morality and the potential for a T6 state. His suggestion is that the phenomenon of perception, consciousness, awareness, and morality are by-products of a universal systems construct and are subject to physical dynamics laws. One inherent characteristic of these dynamics is that they are subject to fluctuations and despite any given moral construct, will inevitably have flaws for which the possessors of the moral construct will have no tolerance.

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