**Discursive Habits: A Representationalist Re-Reading of Teleosemiotics[[1]](#footnote-1)**

**Catherine Legg, Deakin University**

**ABSTRACT:**

Enactivism has influentially argued that the traditional intellectualist ‘act-content’ model of intentionality is insufficient both phenomenologically and naturalistically, and minds are built from world-involving bodily habits – thus, knowledge should be regarded as more of a skilled performance than an informational encoding. Radical enactivists have assumed that this insight must entail non-representationalism concerning at least basic minds. But what if it could be shown that representation is itself a form of skilled performance? I sketch the outline of such an account from the perspective of Peirce’s pragmatist semiotics, which theorises signs as habits of associating specific cues with appropriate acts and schemas of ensuing experience. Within this framework, I argue, a naturalistic account of propositional structure can be constructed which transcends the symbolic – and in some instances even the linguistic – sphere, and offers new insights regarding the Information Processing Challenge, and the Hard Problem of Content.

**1. Introduction**

The *radical enactivism* developed by Daniel Hutto and various co-authors (Segundo-Ortin and Hutto 2021; Hutto & Myin 2017; 2013, Hutto & Satne 2015, Hutto 2015; 2011a; 2011b) recommends shifting *teleosemantic* analyses of cognition to a *teleosemiotic* perspective, as a way of postulating that, at least for “basic minds”, knowing essentially consists in dynamic, real-time navigation of an environment – ‘knowing-how’ rather than ‘knowing-that’. But having gestured in this interesting new direction, these radical enactivists do not develop the specifically *semiotic* angle of their new view in much detail. I shall argue that Charles Peirce’s philosophy brings some useful tools to this table, as he founded his own independent and highly systematic branch of semiotics, whilst his pragmatism promises fruitful engagement with enactivism through its analysis of belief as habit. This engagement with Peirce is important for enactivism more generally, I shall argue, since although many enactivists freely acknowledge influence from pragmatism, they have tended to look for inspiration to John Dewey (Gallagher 2017; Hutto 2011; Gallagher & Miyahara 2012). Dewey explicitly eschewed the semiotic direction of Peirce’s later thought, and I shall urge that by considering what Peirce has to offer by contrast, pragmatist-inclined enactivists can gain important new resources for reconstructing rather than rejecting the notion of representation, whilst staying true to many of radical enactivism’s key ideals. To this end, this paper will sketch a preliminary outline of a naturalistic Peircean semiotics of propositional structure.

**2. Radical Enactivism and The Information Processing Challenge**

This section explores some of the reasons that radical enactivists have embraced anti-representationalism, and key challenges that this choice has raised for them. Philosophers have traditionally distinguished *knowing that*, conceived as knowledge which can be shared in propositional form (e.g. “Snow is white”), from *knowing how*, conceived as bodily skills (e.g. riding a bicycle). The former was traditionally privileged in epistemology and philosophy of mind, to the latter’s almost total neglect. I will follow many authors in calling this broad approach “intellectualism”. Intellectualism has been a powerful actor in modern philosophy from the time of Descartes’ influential distinction of a “mental act” from its (somehow encapsulated and commodified[[2]](#footnote-2)) “content”.

 However, since Gilbert Ryle (1949; 1946), intellectualist assumptions have been increasingly foregrounded and challenged in mainstream philosophy.[[3]](#footnote-3) A particularly widespread critique has been launched by a rapidly-growing philosophical movement advocating *embodied*, *embedded*, *extended* and *enactive* (so-called “4E”) cognition. This movement rejects Descartes’ traditional cleavages between mind and body, and mind and world, and the corresponding ‘mentalization of knowledge’. Instead, theorists of *embodied* cognition view knowledge as located in both mind and body, and theorists of *embedded* and *extended* cognition view knowledge as located in both mind and world. These movements may be understood as ‘querying the pure subjectivity of the knowing subject’. This naturally generates a correlative process of ‘querying the pure objectivity of the known object’ – which leads to the arguably most controversial arm of 4E cognition – ‘the fourth e’ – *enactivism.* Enactivism holdsthat the world is not antecedently given but ‘enacted’, through natural organisms’ capacities for lived meaning-making.Thus, a key enactivist theme has been a so-called *Life-Mind Continuity Thesis* (Godfrey-Smith 1996; Wheeler 1997), which holds that the basic structures which create life are the basic structures which create mind.[[4]](#footnote-4)

 Since enactivism holds that minds fundamentally interact with rather than represent the world, it denies the discrete or independent existence of so-called ‘*content*’. This is a somewhat notorious philosophical term of art, whose exact definition crucially shapes debates which arise from it. Hutto defines content as any representation for which there are “specified conditions of satisfaction” (Hutto & Myin 2013, x), or truth-conditions.[[5]](#footnote-5) As a ‘radical’ enactivist he suggests that philosophy of mind needs to do without this notion and embrace *anti-representationalism*,[[6]](#footnote-6) at least for “basic” levels of mindedness. Thus, enactivists have lately shown significant interest in exploring skilled performance[[7]](#footnote-7) as a form of intelligence (Gallagher & Aguda 2020; Hutto & Robertson 2020; Miyahara 2011).

 Basic minds are envisaged by radical enactivists to correspond to an organism’s skills in navigating its immediate environment. In other words: “[c]ompetence is prior to content” (Hutto 2011a, 48). A major issue for radical enactivism then becomes how to explain the *appearance* of an encapsulated and commodified content which has led philosophers to invest so heavily in Cartesian approaches to cognition across the past four centuries or so. The human mind *appears* to freely share information in abstract propositional form – for instance when we speak to one other, and read and write in English. How can a theory of cognition that is framed most fundamentally in terms of individual concrete environmental interactions account for this? This concern constitutes enactivism’s *Information Processing Challenge*. It asks how with no notion of mental content whatsoever (at least for basic minds), one might account for cognitively sophisticated capacities such as memory, imagination (Gallagher 2017; Clark 2016; Hutto 2015), and planning (Bruineberg et al 2019; Wheeler 2005; Wilson 2002).

 Hutto has expressed the challenge as “the complaint…that any version of enactivism that relies entirely on dynamical systems theory under-appreciates thefundamental role played by information-processing mechanisms in making mental activity so much as possible” (Hutto 2011a, 49). He notes that in order to resolve the challenge, we need to ask, “does basic cognition or mentality require information processing?” (Hutto 2011a, 56). Hutto and Myin discuss the challenge in detail in their 2013 book, where they choose to place it within the broader question of how any philosopher might develop a naturalistic account of information – examining gradually more complex attempts to provide such an account, and rejecting each in turn. We shall now review some of this discussion.

 Firstly, Hutto and Myin note that one might attempt to develop a naturalistic account of information from the way in which information is apparently contained in certain ‘natural objects’ – as when the number of a tree’s rings registers its age. However, they claim, all that such a relatively naive approach can provide is *information-as-covariance*: the claim that two distinct properties (i.e. tree-ring count and tree age) change together in predictable ways. They then argue that such covariance is insufficient to account for the “special properties” possessed by full-fledged content, such as truth, reference and implication (Hutto & Myin 2013, 67). Just because a tree’s rings vary predictably with its age, does not mean that the rings should be said to *represent* the age:

…the number of a tree’s rings can covary with the age of the tree; however this doesn’t entail that the first state of affairs says or conveys anything true about the second – or vice versa. (Hutto & Myin 2013, 67).

What more do Hutto and Myin envisage is needed, exactly, to supply fully-fledged truth, reference and implication? In the 2013 book, they essentially fall back on claiming that to hold that content is reducible to covariance conflicts with physicalism (Hutto & Myin 2013, 69), because content is not the sort of thing that can be physically instantiated. Why not? Because fully-fledged concepts instantiate *intensionality* – the ability to present the same information under different ‘guises’ (Hutto & Myin 2013, 79-80, 184n2). The matter is addressed in more detail in (Hutto 2011a, 56), which claims, following Godfrey-Smith, that mere covariance constitutes a *weak* notion of information, which should not be confused with a *strong* notion of information which is ‘semantic’ or ‘intentional’.But Hutto still stops short of defining the semantic / intentional in any definitive way, which raises the question whether this invocation of weak and strong information constitutes a circular argument. He does, however, let slip a description of the semantic / intentional as manifesting“linguistically mediated states of mind” (Hutto 2011a, 55). We will take this as our guide, and analyse the radical enactivist’s problem with understanding the tree rings to convey ‘natural information’ about a tree’s age as a complaint that there is no *concept* – or any other meaningful symbol – present in the tree and capable of in any sense representing the general concept of ‘age’, only the specific rings themselves.

 Next Hutto and Myin turn to the work of Fred Dretske to consider another possible candidate for a naturalistic account of (strong) information – *indication relations*. Unlike information-as-covariance, which is a mere isomorphism between two distinct properties, they note that indication proper comprises a three-place relation between: i) an indicator, ii) an indicated state of affairs, iii) an interpreter who interprets that indicator as indicating that state of affairs. Now it seems that we can say that it is an interpreter’s understanding of a set of tree-rings *as* covarying with a tree’s age which determines that the rings *indicate* the age, and this interpreter’s contribution creates the “special properties” which constitute content proper. But Hutto and Myin are not satisfied by this either. They claim that it’s not clear how even these more complex relationships may be understood to “form inner representations” in the interpreter (Hutto & Myin 2013, 70), and they say little more about them. From a Peircean perspective, this swift disengagement is a pity, as the account’s triadic structure has potential – this will be discussed further below.

 Hutto and Myin dub all of these problems taken together *The Hard Problem of Content*, which they suggest is as confounding for philosophers of mind as the notorious Hard Problem of Consciousness. In many places they urge that it is this problem’s insuperability that requires enactivists to ‘go radical’. However, further possible strategies await their survey of attempts to naturalize content. The natural next step, they suggest, is to use certain biological properties of the interpreters of natural information to resolve the Hard Problem of Content, by invoking evolutionary histories and purposes. Hutto and Myin consider stickleback fish, who note a certain red colour on a fellow fish’s underside as indicating maleness. A ‘teleofunctionalist’, they claim:

…would hold that certain internal states of the fish represent because they have the function to say how things stand with the world. Such states, which are thought to possess semantic content, are consumed by mechanisms within the fish that use them to guide the behaviour of the fish in specified ways (Hutto & Myin 2013, 72).

This approach will not work, they claim, because the “special properties” which constitute content proper are still missing from it: “adding informationally sensitive users or consumers of information to the story leaves covariance relations unaltered…They are not converted into naturally occurring contentful relations by the addition of users that exploit them for certain purposes...” Why not? Because “[l]ogic dictates that if there is no informational content in the world, then there is no informational content in the world *to be acquired by minds*” (Hutto & Myin 2013, 72-3). We will return below to the crucial question of whether this conclusion follows.

 Hutto and Myin then turn to the full-blown teleosemantics of Ruth Millikan. This view adds to teleofunctionalism an even richer role for biological properties of the interpreter in creating meaning. Here an organism’s evolutionary history is thought to determine the information that it should take from particular natural objects, through the *proper functions* of its cognitive faculties (Hutto & Myin 2013, 74). The invocation of *proper* (rather than actual) function gives the account an extra normative bite, and teleosemanticists imagine that this renders the account semantic rather than merely causal: “…content is fixed by what organisms are supposed to do in their interpretative activity rather than what they are merely disposed to do” (Hutto & Myin 2013, 76).[[8]](#footnote-8)

 In reply, Hutto and Myin seek to trap Millikan’s approach in a dilemma with respect to whether it is committed to content which “pre-exists” (Hutto & Myin 2013, 76) the evolutionary development of proper cognitive functioning that it posits. If teleosemanticists answer yes – holding that our cognitive faculties have evolved in order to *interpret* that extant content – then it seems that a complete naturalistic explication of content has not been provided. So, Hutto and Myin argue, Millikan’s teleosemantic systems perforce end up being content-*creating*. But, they note, this is precisely the radical enactivist position, which holds that basic minds do not ‘contain’ content, but merely engage in public language-games for certain purposes, in certain socially mediated contexts.On this basis, then, they conclude that all naturalistic accounts of content fail.

 How do Hutto and Myin envisage that in the absence of content we are able to navigate the world intelligently? They attribute to us “non-contentful but world-directed attitudes – intentional attitudes” (Hutto 2011a, 62). Such attitudes pertain to the *whole* organism – not merely its ‘mind part’ – and “are to be contrasted with properly contentful, sententially-mediated propositional attitudes, such as truth-conditional beliefs and desires” (Hutto 2011a, 62). To sum up, then, Hutto and Myin believe that basic minds display “informational sensitivity and response” – often quite sophisticated – whilst not “processing informational content” (Hutto & Myin 2013, 82). There is clearly a fine line between these two options. The next section will examine further how radical enactivists plan to walk it.

**3. Radical Enactive Teleosemiotics: Teleosemantics without the Semantics**

As a replacement for the failed representationalism, Hutto and Myin introduce their favored position of *teleosemiotics.* This is a fairly new terminological arrival and, although it is generally regarded as having some broader purview than teleosemantics, what is its most appropriate or useful definition is an interesting question. I will begin by summarising Hutto and Myin’s understanding, in this section, then explain how I think it can be enriched and improved by a Peircean perspective. Hutto and Myin define teleosemiotics as “(basically) teleosemantics without the semantic ambitions” (Hutto & Myin 2013, 78). By this they mean a content-free account of “the determinate kinds of intentional directedness that organisms exhibit towards aspects of their environments” (Hutto & Myin 2013, 78)[[9]](#footnote-9). The account accepts covariance accounts of information (Hutto & Myin 2013, 81), whilst rejecting the idea that the mind contains any structures which represent or refer to objects in the world, or which process those representations inferentially (Hutto & Myin 2013, 82).

A more recent paper with Glenda Satne (Hutto & Satne 2015) provides further detail. Here teleosemiotics is explicated in the context of a plan for developing a naturalistic account of linguistic norms, which seeks to irenically embrace insights from all three “baseball teams” in John Haugeland’s influential division of contemporary philosophy of cognition into *neo-Cartesians*, *neo-behaviourists* and *neo-pragmatists*. Hutto and Satne reconstruct Haugeland’s three-way distinction into three progressive stages in developing their own theory. Here a first, neo-Cartesian, moment is said to show their theory’s need for some kind of proto-representation (but nothing more):

[B]iology provides adequate tools for making sense of something more modest than content – it provides what is needed to understand and explain responses exhibiting a kind of Ur-intentionality that results from the targeted directedness of past organisms (Hutto & Satne 2015, 531).

For instance, the frog snaps its mouth at flies because it has evolved to eat them, but it also snaps at beebees because they trick the frog’s fly-detecting mechanism, which has evolved in a beebee-free environment. Thus, the snapping frog cannot be said to truly represent “This is a fly”. Next, the neo-behaviorist moment is said to justify a distinction between the merely passive intentional behaviour exemplified by the frog, and a more active intentional behaviour that is exemplified by ourselves insofar as we *ascribe* intentional states to others (Hutto & Satne 2015, 532).

 Finally, neo-pragmatism is said to supply an account of how the frog’s Ur-intentionality may be transformed into content proper, through social practices such as mutual training. These practices are described as in themselves pre-contentful, as they “do not require individuals to purposefully comply with rules from the get go” (Hutto & Satne 2015, 532). Rather, they build on mechanisms for social conformity that *homo sapiens* has previously evolved to enable fitness. Despite their being pre-contentful, Hutto and Satne claim, these social training practices enable organisms to build a practice of assertion-making which has its own special kind of sophistication (Hutto & Satne 2015, 533). Although this is a strong and suggestive schematic account, it must be admitted that the authors say little about the actual mechanisms involved at each stage, noting that their paper is merely a prolegomena to scientific work (Hutto & Satne 2015, 534).

 I believe that the radical enactivists’ arguments against finding content in a naturalistic framework are not insuperable, and the real problem lies not with the concept of representation itself, but with an impoverished understanding of it. Therefore, the rest of this paper will explore ways in which Peirce’s semiotics-inflected pragmatism can arguably do better.I will begin by examining how pragmatism sought to systematically reconceive traditional Cartesian ‘idea-based’ epistemology around the more naturalistically respectable notion of ‘habit’, thereby radically reconceiving content. This will be a first step towards reclaiming the behavioural *as* the semantic, rather than defining the two against one another as we have just seen radical enactivists do. After that, I will show more explicitly how these behaviours might themselves be attributed *logical structure*.

**4. From Pragmatism to Enactivism**

We have seen that Descartes established an influential understanding of ‘mental content’ as encapsulated and commodified representations, which led many philosophers to (effectively) treat all knowing as knowing-that. As Peirce’s initial scoping-out of pragmatism arose from his explicit disavowal of certain Cartesian tenets, some explanation of this background will help to establish how he can be a significant enactivist ally. I will first discuss how Peirce developed an account of meaning beyond Descartes’ understanding of ‘clear and distinct ideas’, looking instead to expectations regarding agency in a lived context.

 In his famous paper “How to Make our Ideas Clear”, Peirce distinguished three grades of clarity that we can attain with respect to the meaning of our concepts. At the first grade, we can identify instances of a concept, without necessarily being able to say how. For instance, the judge at the notorious “Obscenity Trial” of the novel *Lady Chatterley’s Lover* famouslyremarked that although he could not *define* obscenity, “he knew it when he saw it…”. At the second grade, we can give a verbal (or ‘nominal’) definition of a concept – and also, sometimes – necessary and sufficient conditions for its application. Most philosophers cease their investigations into meaning here; the third grade of meaning-clarity is Peirce’s proffered innovation. Here he recommends that we apply the Pragmatic Maxim: “Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object.” (Peirce CP 5.402, 1878)[[10]](#footnote-10). This leads us away from mere verbal definitions of our concepts, towards the specific experiences we can expect if we apply them appropriately. It also teaches us that if a concept is attended by no such expectations, it has no meaning.

 All this has been thoroughly explored in the Peircean scholarly literature.[[11]](#footnote-11) What has been less discussed – particularly in light of enactivism[[12]](#footnote-12) – is how the third grade of meaning-analysis effectively transforms every concept into a series of *hypothetical conditionals*, pertaining to a concept-user’s own agency and resulting experience. Peirce gives a particularly detailed example regarding the meaning of *lithium* – outlining how a person may perform a series of specific actions giving rise to a series of specific experiences, which ultimately produces an actual lithium specimen:

If you look into a textbook of chemistry for a definition of lithium, you may be told that it is that element whose atomic weight is 7…But if the author has a more logical mind he will tell you that if you search among minerals that are vitreous, translucent, grey or white, very hard, brittle, and insoluble, for one which imparts a crimson tinge to an unluminous flame, this mineral being triturated with lime or witherite rats-bane, and then fused, can be partly dissolved in muriatic acid; and if this solution be evaporated, and the residue be extracted with sulphuric acid, and duly purified, it can be converted by ordinary methods into a chloride, which being obtained in the solid state, fused, and electrolyzed with half a dozen powerful cells, will yield a globule of a pinkish silvery metal that will float on gasolene; and the material of that is a specimen of lithium (Peirce CP 2.330, 1902).

Peirce notes the “peculiarity” of this definition, as follows:

…it tells you what the word lithium denotes by prescribing what you are to do in order to gain a perceptual acquaintance with the object of the word (Peirce CP 2.330, 1902).

I will consider these Peircean hypothetical conditionals (following Sandra Rosenthal 1994; 1982) as essentially connecting three things: i) a cue, ii) an act, iii) some schema of anticipated experience. In short: *When given a certain cue, an agent expects that if she performs a certain act, then a certain kind of experience will follow.* We can see these three stages acted out more than once in our definition of lithium. The initial cue corresponds to the process’ starting point – some mineral that is vitreous, translucent, grey or white, very hard, brittle, and insoluble. A series of acts on this substance is then described, each accompanied by a characteristic anticipated experience. It is the *reliability* of this whole process, in delivering expected results from recommended actions, that renders lithium a meaningful concept in chemistry. If at any point the anticipated experience does not appear, this triggers the agent to engage in *learning*. Such learning involves testing and adjusting one’s expectations – usually by means of further acts, such as experimental testing – until one’s set of hypothetical conditionals (i.e. concepts) reaches a new equilibrium of success in relevant expectations. Such processes are known amongst pragmatist philosophers as the ‘cycle of inquiry’. This points to an important difference between Peirce’s semiotics and the teleosemantics of Millikan and others examined earlier. Although both explicate signs teleologically, on Millikan’s approach successful signs merely *self-replicate*, whilst on Peirce’s approach they *develop*, as Winfried Nöth nicely explains:

Signs are not only self-replications in the infinite process of semiosis, they also develop in a process of semiotic growth: “The purpose of signs” says Peirce (CP 2.444, fn, c.1893), “– which is the purpose of thought – is to bring truth to expression” (Nöth 2014, 188).

We have established that pragmatism holds that meaning consists in certain hypothetical conditionals, which connect proposed acts with anticipated experiences, following certain salient cues. *These intelligible structures* *in the lives of organisms* *constitute habits*. Habits form a superior building block for epistemology than the Cartesian ideas that have problematically congealed into today’s notion of ‘content’, for a number of reasons. Firstly, habits ontologically bridge body-mind dualism, insofar as they are simultaneously embodied and intelligible. Relatedly, unlike ideas, habits also ontologically bridge the public-private distinction, insofar as they are simultaneously observable and introspectable. Finally, unlike ideas, habits are teleological: not necessarily in the sense that they have *goals* or *ends*, assometimes a habit is a just a repetitive behavior. But habits are teleological in the sense that they ‘lead us into the future’. They “take effect in external actions, unless a particular inhibition has been laid upon them.” (Peirce MS 318: 46, 1907). Early pragmatism was famously built from identifying belief with habit. Thus Peirce writes:

Intellectual power is nothing but facility in taking habits and in following them in cases essentially analogous to, but in non-essentials widely remote from, the normal cases of connections of feelings under which those habits were formed (Peirce CP 6.20, 1891).

But so far we do not yet depart decisively from radical enactivism. Here Peirce could be merely describing whole-organism responses to environmental cues. Can we excavate from his thought any account of a *logical articulation* of these habits? I think we can, but in order to achieve this, we require a preliminary exploration of Peirce’s semiotics.

**5. Prolegomena to a Peircean Teleosemiotics**

Peirce developed his concept of a sign as an essentially *triadic* relation, thereby seeking an evolutionary, post-mechanistic account of thought and meaning (Alborn 1989, 4). By ‘evolution’, he notes at one point, he simply means “nothing but growth in the widest sense of that word” (Peirce CP 1.174, 1893). In this way, Peirce may be argued to already hold a Life-Mind Continuity Thesis. On the other hand, we shall see that Peirce did not have the two-stage approach of explaining linguistic norms – first as content-free Ur-intentionality, then as intentionality proper – that we just saw in (Hutto & Satne 2015). For Peirce, fully-fledged, logically analyzable meaning – operationalized in a hypothetical conditional structure – may be identified in all our habit-taking.

Across much of his career,Peirce analyses all signs as analyzable into the following three components: i) a *representation* (the “representamen”), ii) an *object*, iii) an *interpretation* (the “interpretant”).[[13]](#footnote-13) An elegant feature of this account is that the sign’s interpretation simply consists in continued use of the same representation to refer to the same object. As Peirce puts it, a sign is “anything which, being determined by an object, determines an interpretation to determination, through it, by the same object” (Peirce CP 4.531, 1906). So, to take a simple example, the word “rabbit” constitutes a genuine sign by virtue of its continued use to denote members of the species *Oryctolagus cuniculus*. If at any point the word ceases to be so used, the sign will literally ‘die’. This need for continued interpretation in order for a sign to function as such (by linking present to past denotations of the same object) demonstrates an important way in which Peirce’s sign relation is irreducibly triadic, that is: “…its three members are bound together by it in a way that does not consist in any complexus of dyadic relations” (Peirce 1998, 273).It is worth noting how this avoids objections we earlier saw Hutto and Myin prosecuting against Dretske and Millikan – that in their account of natural information, the interpretation seemed an inessential add-on.

 As well as his analysis of the essentially triadic structure of every sign, Peirce famously claimed that the three different ways in which a sign can pick out its object determine three different *kinds* of sign. An *iconic sign* picks out its object by itself resembling it in some way, for instance by possessing some of the same properties. A good example is a map. As what an iconic sign signifies depends on its own intrinsic properties, its signification relation is essentially monadic. By contrast, an *indexical sign* picks out its object by means of some existential connection. Examples include pointing, and a name conferred by baptism. As such, the index’s signification relation is essentially dyadic. Meanwhile, a *symbolic sign* picks out its object *via* some kind of arbitrary convention or rule which mediates the relationship between sign and object (as is the case with all English words, which must be learned), and as such, the symbol’s signification relation is essentially triadic.[[14]](#footnote-14)

 Many radical enactivist arguments against content seem to assume that content is largely or wholly *symbolic*. This was evident in Hutto and Myin’s dismissal of the tree rings as obviously not the sort of things that content could *be*. In fact, insofar as a tree ring is directly caused by the passage of the seasons of one year, within Peirce’s semiotics it provides a serviceable *index* of that year. Indeed, Peirce claimed that icons and indices play essential semantic functions which are irreducible to symbolic functioning. The key function of iconic signs is to represent schematic structure, by embodying it nondiscursively: ‘showing’ not ‘saying’. Only iconic signs can represent structure nondiscursively, because only they signify by means of their own intrinsic properties (Peirce CP 2.276, 1902).Crucially, this schematic structure includes *logical form* (Legg 2012; 2008), which means that iconicity lies at the very heart of rationality. On the other hand, the key function of indexical signs is to determine what in the world a concept or proposition *is about,* through establishing an existential connection that is unmediated by general concepts. Peirce commented that a key role of the index is precisely to focus the sign-user’s attention on something salient. (“Anything which focusses the attention is an index” Peirce CP 2.285, 1895). Meanwhile, symbols’ key function is to represent generalizations, such as “white” or “metal”, which become more useful in our thinking the more deeply they are entrenched. Thus, symbols constitute *habits*. Now that we have distinguished icons, indices and symbols, we may align this trichotomy of sign-types with our earlier pragmatic account of meaning, that *when given a certain cue, an agent expects that if she performs a certain act, then a certain kind of experience will follow.* We do this by observing that the posited experience schema may be understood as an iconic sign, the cue may be understood as an index and the habit of associating that act with that experience schema in the context of that cue may be understood as a symbol.

 In order to appreciate the originality and potential fruitfulness of this Peircean approach, it is helpful to say more about the exact role of iconicity in it. Importantly, Peircean icons have a meaning that is in *some* sense general, but not in the same way as the arbitrary, linguistically mediated, symbols such as ‘age’ or ‘white’ which radical enactivists scoff at finding in the natural world. Rather, Peircean iconicity embodies a kind of specifically *structural* *and* *non-linguistic* generality, which Peirce frequently explicated through the metaphor of a *composite photograph* – a 19th century technology whereby the same photographic plate was multiply exposed in order to ascertain a kind of ‘pictorial average’ of, for example, the typical scientist, or criminal.[[15]](#footnote-15) Crucially, the meaning of a composite photograph is not established by linguistic convention, but by the nature of the structures that it superimposes, and thereby summarises. This alternative understanding of generalization opens up the possibility of arguing that the real solution to the Hard Problem of Content lies not in abandoning the notion of representation altogether (at least for “basic minds”), but in *broadening our understanding of it beyond the linguistic*. Peirce’s semiotics enables us to argue that habits themselvesmanifest an iconic generality, insofar as they embody *schematic logical structure*.[[16]](#footnote-16)This structure gives rise to both the array of different-yet-saliently-similar acts that constitute our habits, and the schemas of experience that we anticipate, test, then use to correct and further refine our habits.

 Rosenthal has written insightfully on this. She notes that Peirce, “takes from Kant the fundamental insight that concepts are empirically meaningful only if they contain schematic possibilities for their application to sensible experience” (Rosenthal 1994, 26). But she also notes that Peirce rejects Kant’s relegation of schemata to the productive imagination, as opposed to the faculty of judgment. Rather, she claims, both faculties combine to produce and mobilise schemata, in “…a creative functioning of habit as providing a lived or vital intentionality between knower and known” (Rosenthal 1994, 26). Thus, lived experience “reflects a semiotic structure operative at its most fundamental level”, since “human behaviour is meaningful behaviour” (Rosenthal 1994, 26).[[17]](#footnote-17) It is crucial to emphasise that this account of schemata does not constitute a ‘copy theory’ of content, which is hostage to empirical fortune with respect to ‘finding the copy’ inside the knowing organism. The schema is not an ‘idea’ that dictates a habit. *It* *is the habit itself*. In this way, our Peircean teleosemiotics arguably promises a form of enactivism just as radical as Hutto’s, although it reconstructs rather than rejects the notion of representation.

 We have now reviewed the Peircean sign’s triadic structure, and its division into icons, indices and symbols. The next section will explain how these three sign-types combine into an original account of propositional structure, and thus, content.

**6. A Teleosemiotic Account of Propositional Structure**

Important work towards providing a Peircean teleosemiotic account of propositional structure has been done by Frederik Stjernfelt(2016; 2015; 2014). Stjernfelt explores how later in life Peirce placed linguistic propositions, such as “Snow is white”, within a broader theory of *dicisigns* which extends beyond language to embrace picture, gesture, and even biological features such as the spot on a butterfly’s wing which in some sense ‘states’ (falsely) that an eye lies there. What is essential to a dicisign, Stjernfelt notes, is that it is a sign which *says something about something*. As Peirce himself puts it: “[a] proposition is a sign which separately, or independently indicates its object.” (Peirce 1998, 307). This structural feature is what enables propositional signification to rise beyond the level of terms considered merely as labels denoting objects or concepts, in order to *convey information*. More specifically, a dicisign is characterised by a “particular double structure”, which consists in *an index and an icon fused together so that something is both picked out and described at the same time*. As Peirce puts it:

…every proposition is a compound of two signs, of which one functions significantly, the other denotatively. The former is intended to create something like a picture in the mind of the interpreter, the latter to point to what he is to think of that picture as being a picture of (Peirce MS 284 1905, cited in Stjernfelt 2014, 58).

Take, for instance, “Snow is white”. On the Peircean analysis, this proposition’s indexical part picks out a specific substance from all other objects that exist, while its iconic part ascribes to that substance a general colour.

 We can place dicisign theory within an enactivist frame as part of a Peircean teleosemiotics if we can show how a pragmatist account of cognition – consisting, as we have seen, in habits of connecting proposed acts with anticipated experiences, following certain salient cues – instantiates the formal propositional structure just outlined. Building on insights in the last section, we may *now identify the dicisign’s indexical part with the particular stimulus which cues any given habit, identify the dicisign’s iconic part with the ensuing act and anticipated experience (schematically understood), and understand the dicisign as a whole as a symbol which connects that icon with that index*. Let us explore an example. A woman is waiting at a Melbourne tram-stop. She is well-practiced in riding public transport, which includes a general habit of boarding a tram she wishes to catch as soon as it stops. Now imagine that she perceives a tram stopping beside her. This cues her habit to move her legs and arms in a particular way, which results in her having an experience of successful boarding. This action is clearly a kind of skilled behavioural performance, yet it may simultaneously be understood as embodying dicisign structure as follows:

 [**SYMBOL:** *general habit of behaviour*]

 ↑

 ← →

[[**INDEX:** this →] *particular event*] should be responded to by [**ICON:** *schema of bodily movement + anticipated experience*]

Of course this proposition is relatively inarticulate, and vague. Our tram enthusiast has ridden trams of a variety of sizes and shapes, which she has boarded from many different directions, with or without other passengers simultaneously boarding and alighting. Yet she can recognise sufficient similarity between all these events to develop a relatively stable *habit of tram-boarding*. (This is just to emphasise again that the concepts involved in this dicisign are importantly schematic, in the sense explored earlier of a composite photograph.)

 What many philosophers refer to as the *conceptual* may plausibly be alignedwith what Peirce refers to as the *symbolic*, because Peirce’s symbol is defined by the arbitrariness of its generalization. If we do align these two notions, we can see how propositional content can be not necessarily conceptual or fully conceptual – as radical enactivists have assumed that it must be – due to the essential involvement of icons and indices. Stjernfelt explains this well:

The Dicisign doctrine…[claims] there are quasi-propositions already in perception and that perception, consequently, involves “propositional stances”. The same goes for externalized Dicisigns in books, pictures, computers and elsewhere which may display parts which are not exhaustible by concepts – such as gestures, images, diagrams etc. Thus, it is a source of error to assume propositions are conceptual through and through – they may involve both conceptual and non-conceptual representational contents (Stjernfelt 2014, 116).

What *is* essential to content, though, it now appears, is the subject-predicate (S-P) form, which is represented in our Peircean teleosemiotics by the index-icon fusion. What Peircean semiotics shows us is that – perhaps surprisingly – this structure outruns the linguistic sphere. Stjernfelt conjectures that a S-P form of information processing is very ancient in living organisms, drawing on the work of neuro-linguist James Hurford, who seeks to align it with the brain’s ventral-dorsal split, such that the dorsal stream “assign[s] indices to a small number of tracked objects” and the ventral stream categorizes those tracked objects (Hurford 2007, 103, cited in Stjernfelt 2014, 124).[[18]](#footnote-18). Such researches constitute fascinating fodder for developing a specifically Peircean Life-Mind Continuity Thesis. They also promise new ways to mediate the debate currently raging between proponents of ‘automatic’ vs ‘cognitive control’ accounts of skilled action (Christensen 2019), insofar as an intelligent habit may be understood as *both* automatic and cognitive.

**7. Peircean Resonances in Current Cognitive Science**

Let us now explore the possibility that the real solution to the Hard Problem of Content lies not in abandoning the notion of content altogether (at least for “basic minds”), but in broadening our concept of logic and information beyond the linguistic. In fact, this possibility is beginning to be highlighted and explored by cognitive scientists. I will briefly review a recent rich survey piece, which also seeks to highlight that iconic signification differs crucially and importantly from symbolic signification, although Peirce himself is not referenced.[[19]](#footnote-19) Daniel Williams and Lincoln Collinghaveargued that cognitive neuroscience’s embrace of new multi-level, mechanistic explanations constitutes a revolutionary break from traditional cognitive science, which has been crucially enabled by “a dramatic shift away from thinking of cognitive representations as arbitrary symbols towards thinking of them as icons that replicate structural characteristics of their targets” (Williams & Colling 2018, 1942). As the brain is thereby understood to itself instantiate dynamical models, the relevant cognitive mechanisms must be viewed as fully-fledged representations (no mere “indicator semantics”), in order to provide adequate scientific explanations of cognition:

Anti-representationalism is profoundly revisionary…[and] this radicalism has not borne fruit when it comes to explaining even moderately sophisticated instances of intelligence and adaptive success, such as a rat’s ability to navigate a maze (Williams & Colling 2018, 1948).

We have seen how Peirce’s semiotics describes the icon as the only sign-type that signifies *by means of its own intrinsic properties*. Williams and Colling note how precisely this feature enables iconic accounts of mental representation to solve longstanding problems of explanation in cognitive science, by showing *how* an organism is able to display what Hutto and Myin termed “informational sensitivity and response”:

a genuinely representational explanation of some phenomenon must satisfy the following condition: the properties by which internal representations represent must be responsible for their systemic role within the broader mechanism of which they are a part....With iconic representations...the property responsible for their representation of a given domain—namely, resemblance—doubles up as the property by which they perform their systemic role (Williams & Colling 2018, 1953).[[20]](#footnote-20)

Again, this explanatory power does not hold of indicator accounts, insofar as they constitute merely indexical – rather than iconic – signification. As Williams and Colling put it, iconic representations go beyond mere *detection*. Precisely through their defining feature – the intelligible structure that exists in the sign itself – icons enable planning and the entertaining of counterfactuals. For this reason, Williams and Collings call iconic cognitive systems “emulators”, and it is interesting to reflect here on the link with the pragmatist, hypothetical-conditional-based, agentive model of meaning we have explored above.

 Indeed, Williams and Colling posit that in order for any cognitive structure to have a regulatory function (as it must in order to manage a body, for instance) it must be iconic in order to be optimal according to the so-called “good regulator theorem advanced by Conant and Ashby”, which holds that:

…any system whose function is to regulate another system must—insofar as it is optimal—exploit a stand-in or model of that system that is isomorphic (i.e. structurally similar) to it. (Williams & Colling 2018, 1962-3).

One might worry here that Williams and Colling are here drawing a little too close to the ‘copy theory’ of cognition, that we were earlier at pains to reject in favour of locating representative function in habits themselves. We can note some further differences with our Peircean framework, insofar as Williams and Colling award icons the lion’s share of representing work in their theory of cognition. Here Peirce arguably points the way to locating the key challenges for Williams and Colling’s account, through his triadic semiotics whereby icons, indices and symbols all have distinct and clearly defined functions. By slighting indexicality (or, as we have interpreted it here, ‘cues’), they risk not being able to account for the *salience* of particular iconic representations in particular contexts. By slighting symbolicity (which we have here interpreted as habits), they risk not being able to account for our ability to *arbitrarily* *generalize*, which makes possible the higher-order cognition that has led to such distinctive human achievements.

**8. Final Reflections**

In this paper I have argued that the Hard Problem of Content is not as hard as Hutto and his co-authors imagine. I have done this by presenting a pragmatic analysis of meaning in terms of *discursive habits*, by fashioning Peirce’s distinctive triadic analysis of signs into a representationalist re-reading of teleosemiotics*.* This account does not invoke content understood as an informational commodity that is ‘stored’ (for instance in the mind). Yet it doesunderstand knowledge as comprised of articulable propositions, rather than merely as whole-organism world-directed intentions. In so doing, the account salvages representation in at least some recognisable form, whilst at the same time identifying it as a kind of skilled performance.

 Peircean telesemiotics arguably still constitutes a *radical* enactivism in certain senses dear to Hutto and his co-authors. For instance, it holds that cognition is *essentially extensive*, not merely contingently extended (Hutto & Myin 2013, 135-9). For on this account, there is no separate ‘mental sphere’, or any other self-contained representation of the logical and informational relationships which structure cognition. But *that does not mean that intentionality has no logical structure*. A crucial and damaging elision has taken place here. Hutto’s radical enactivism fails to see that logical and semantic relations may fail to be encapsulated and commodified, and yet may still be present. This is because such relations may be *implicit in an agent’s own habits*, with all of the rich, schematic, counterfactual structure that they embody, which is much too complex to ever be made fully explicit. In that sense, this account – and pragmatism in general – may be understood as a form of modal realism which builds modality into semantics at the ‘ground level’ (and, to be frank, how else is one to account for modality naturalistically?) In short: Hutto and Myin are quite correct that content does not lie in the world as an entity independent of knowing subjects, waiting to be acquired by them. But this does not mean that content is not *enacted* by knowing subjects, through their ongoing intelligent interactions with that world. And isn’t this what one would expect an enactivist to say?

**REFERENCES**

Alborn, Timothy. 1989. “Peirce’s Evolutionary Logic: Continuity, Indeterminacy, and the Natural Order.” *Transactions of the Charles S. Peirce Society* 25(1), 1–28.

Bruineberg, J., Chemero, A. & Rietveld, E. 2019. “General Ecological Information Supports Engagement with Affordances for ‘Higher’ Cognition.” *Synthese* 196(12), 5231–5251.

Christensen, W. 2019. “Skilled Action.” *Philosophy Compass* 14(11), e12631.

Clark, A. 2016. *Surfing Uncertainty: Prediction, Action, and the Embodied Mind*. Oxford.

Clark, A., 2015. “Predicting Peace: The End of the Representation Wars.” In T. Metzinger & J.M. Windt (eds.) *Open MIND* 7:R. Frankfurt: MIND Group.

Fanaya, Patrícia Fonseca. “Autopoietic Enactivism: Action and Representation Re-examined under Peirce’s Light.” *Synthese* *(forthcoming)*.

Gallagher, Shaun. 2017. *Enactivist Interventions: Rethinking the Mind*. Oxford.

Gallagher, Shaun and Aguda, Baltazar. 2020. “Anchoring Know-how: Action, Affordance and Anticipation.” *Journal of Consciousness Studies* (forthcoming).

Gallagher, Shaun and Miyahara, Katsunori. 2012. “Neo-Pragmatism and Enactive Intentionality.” In *Action, Perception and the Brain* (pp. 117–146). Palgrave Macmillan, London.

Gładziejewski, Paweł and Miłkowski, Marcin. 2017. “Structural Representations: Causally Relevant and Different from Detectors.” *Biology and Philosophy* 32(3), 337–355.

Godfrey-Smith, Peter. 1996. “Spencer and Dewey on Life and Mind.” In M. Boden (ed.) *The Philosophy of Artificial Life*. Oxford, 314–331.

Hookway, Christopher. 2012. *The Pragmatic Maxim: Essays on Peirce and Pragmatism*. Oxford.

Hookway, Christopher. 2002. “‘... A Sort of Composite Photograph’: Pragmatism, Ideas, and Schematism.” *Transactions of the Charles S. Peirce Society* 38(1/2), 29–45.

Hookway, Christopher. 1985. *Peirce*. Routledge.

Hurford, James. 2007. *The Origin of Meaning*. Oxford.

Hutto, Daniel. 2015. “Overly Enactive Imagination? Radically Re‐Imagining Imagining.” *The Southern Journal of Philosophy* 53, 68–89.

Hutto, Daniel. 2011a. “Philosophy of Mind’s New Lease on Life: Autopoietic Enactivism Meets Teleosemiotics.” *Journal of Consciousness Studies*, 18(5-6), 44–64.

Hutto, Daniel. 2011b. “Enactivism: Why Be Radical?” *Sehen und Handeln* 1, 21–44.

Hutto, Daniel and Myin, Erik. 2017. *Evolving Enactivism: Basic Minds meet Content.* MIT Press.

Hutto, Daniel and Myin, Erik. 2013. *Radicalizing Enactivism. Basic Minds without Content*. MIT Press.

Hutto, Daniel and Satne, Glenda. 2015. “The Natural Origins of Content.” *Philosophia* 43(3), 521–536.

Hutto, Daniel and Robertson, Ian. 2020. “Clarifying the Character of Habits: Understanding what and how they explain.” in Caruna, F and Testa, I (eds), *Habit: Pragmatist Approaches from Cognitive Neurosciences to Social Sciences*. Cambridge University Press.

Legg, Catherine. 2012. “The Hardness of the Iconic Must: Can Peirce's Existential Graphs Assist Modal Epistemology?” *Philosophia Mathematica* 20(1), 1–24.

Legg, Catherine. 2008. “The Problem of the Essential Icon.” *American Philosophical Quarterly*, 45(3), 207–232.

Legg, Catherine and Black, Joshua. 2020. “What is Intelligence For? A Peircean Pragmatist Response to the Knowing-How, Knowing-That Debate.” *Erkenntnis* *(forthcoming)*.

Liszka, James Jakób. 1996. *A General Introduction to the Semiotic of Charles Sanders Peirce*. Indiana University Press.

Miyahara, Katsunori. 2011. “Neo-pragmatic Intentionality and Enactive Perception: A Compromise between Extended and Enactive Minds.” *Phenomenology and the Cognitive Sciences* 10(4), 499–519.

Noë, Alva. 2004. *Action in Perception*. MIT Press.

Nöth, Winfried. 2014. “The Growth of Signs.” *Σημειωτκή-Sign Systems Studies* 42(2-3), 172–192.

Nöth, Winfried. 2011. “From Representation to Thirdness and Representamen to Medium: Evolution of Peircean Key Terms and Topics.” *Transactions of the Charles S. Peirce Society*, 47(4), 445–481.

O’Brien, Gerard and Opie, Jonathan. 2015. “Intentionality Lite or Analog Content?” *Philosophia* 43(3), 723–729.

Peirce, Charles S. 1992. *Essential Peirce, vol. 1: Selected Philosophical Writings (1867-1893)*, ed. N. Houser and C. Kloesel. Indiana University Press.

Peirce, Charles S. 1998. *Essential Peirce, vol. 2: Selected Philosophical Writings (1893-1913)*, ed. N. Houser and C. Kloesel. Indiana University Press.

Peirce, Charles S. 1931-1958. *Collected Papers*, ed.s C. Hartshorne, P. Weiss and A. Burks, 8 vol.s. Harvard.

Rosenthal, Sandra. 1994. *Charles Peirce's Pragmatic Pluralism*. SUNY Press.

Rosenthal, Sandra. 1982. “Meaning as Habit: Some Systematic Implications of Peirce’s Pragmatism”, *The Monist* 65(2), 230–245.

Ryle, Gilbert. 1949. *The Concept of Mind*. University of Chicago Press.

Ryle, Gilbert. 1946. “Knowing How and Knowing That.” *Proceedings of the Aristotelian Society* 46, 1–16.

Segundo-Ortin, Miguel and Hutto, Daniel. 2021. “Similarity-Based Cognition: Radical Enactivism meets Cognitive Neuroscience.” *Synthese* 198(Suppl 1), S5–S32.

Shea, Nicholas. 2014. “Exploitable Isomorphism and Structural Representation.” *Proceedings of the Aristotelian Society* 114(2ii), 123–144.

Stanley, Jason and Williamson, Timothy. 2017. “Skill.” *Noûs* 51(4), 713–726.

Stjernfelt, Frederik. 2016. “Dicisigns and Habits: Implicit Propositions and Habit-taking in Peirce’s Pragmatism.” In D. West & M. Anderson (eds.) *Consensus on Peirce’s Concept of Habit: Before and Beyond Consciousness*. Springer, 241–262.

Stjernfelt, Frederik. 2015. “Dicisigns.” *Synthese* 192(4), 1019–1054.

Stjernfelt, Frederik. 2014. *Natural Propositions: The Actuality of Peirce's Doctrine of Dicisigns*. Docent Press.

Wheeler, Michael. 2005. *Reconstructing the Cognitive World: The Next Step*. MIT Press.

Wheeler, Michael. 1997. “Cognition’s Coming Home: The Reunion of Life and Mind.” In P. Husbands and I. Harvey (eds.) *Proceedings of the 4th European Conference on Artificial Life*. MIT Press, 10–19.

Williams, Daniel & Colling, Lincoln. 2018. “From Symbols to Icons: The Return of Resemblance in the Cognitive Neuroscience Revolution.” *Synthese* 195(5), 1941–1967.

Wilson, Margaret. 2002. “Six Views of Embodied Cognition.” *Psychonomic Bulletin & Review* 9(4), 625–636.

1. In formulating the ideas of this paper, I’m indebted to workshops and discussions with Katsunori Miyahara, Glenda Satne, Ian Robertson, Daniel Hutto, Shaun Gallagher, Jack Reynolds, Marilyn Stendera and Ross Pain. [↑](#footnote-ref-1)
2. ‘Commodified’ is of course an economic metaphor. But it is arguably not out of place – and has previously been explicitly mobilised – in these philosophical debates. For example: “…information is a prime commodity, and when it is used in biological theorizing it is granted a kind of atomistic autonomy as it moves from place to place, is gathered, stored, imprinted, and translated…” (Oyama 2000, 1, cited in Hutto 2011a, 50). [↑](#footnote-ref-2)
3. They were being challenged even earlier in the pragmatist tradition, which it appears that Ryle may have covertly drawn on (Legg and Black 2020). [↑](#footnote-ref-3)
4. See (Thompson 2007, 128-9) for a useful overview. [↑](#footnote-ref-4)
5. It should be noted that a somewhat more complex definitional picture of content is offered in (Hutto 2011a, 54), where he appears to sketch more of a family resemblance account: “Content, it seems, is a bit like Christmas: it can come without truth conditions, without concepts, without intensionality (with an ‘s’), without semantics, without mentality….” [↑](#footnote-ref-5)
6. It’s worth emphasising that not all enactivists are anti-representationalist. Others hold that representation survives in modified form, but must be understood as fundamentally ‘action-oriented’ (Clark 2016; 2015; 2013; Wheeler 2005). This fundamental disagreement has led to a series of “representation wars” (Clark 2015). My focus here, however, is on the anti-representationalist position of radical enactivism. [↑](#footnote-ref-6)
7. The qualifier ‘skilled’ is important here, because otherwise the concept of ‘performance’ might seem too mechanical, basic or repetitive to constitute a form of intelligence. I am grateful to an anonymous referee for this point. [↑](#footnote-ref-7)
8. There is an interesting lineage in the background here – not irrelevant to this paper – insofar as Millikan was a student of Charles Morris, an early interpreter of Peirce’s semiotics for mainstream philosophy. Nöth argues, however, that both the scope of her semantics and her understanding of its teleology, were considerably narrower than Peirce’s (Nöth 2014, 186-8). This will be discussed further below in sections 5 and 6. [↑](#footnote-ref-8)
9. See also (Hutto 2011a, 59). [↑](#footnote-ref-9)
10. References to Peirce’s *Collected Papers* are formatted as ‘CP’ followed by the book and remark number, as per convention in Peirce scholarship. I have added the date of Peirce’s authorship where possible. [↑](#footnote-ref-10)
11. A particularly comprehensive and clear early account is (Hookway 1985). [↑](#footnote-ref-11)
12. An honourable exception here is (Fanaya 2020). Although Fanaya does fine work connecting Peirce’s pragmatic account of meaning with enactivism, through emphasising their mutual “embodied dynamicism”, and resulting mind-body continuity, she does not explicitly analyse a hypothetical conditional structure as I do here. She does also push back against anti-representationalist tendencies in enactivism, although her target is autopoietic enactivism, rather than the radical enactivism discussed here. [↑](#footnote-ref-12)
13. Peirce’s terminology for this most basic distinction in his semiotics underwent significant evolution across his lifetime – from early days where he used ‘representation’ to mean ‘sign’ (as above) and ‘sign’ to mean ‘index’, to 1902 where he used ‘sign’ to designate specifically human semiosis, to 1905-6 where he used ‘representation’ to mean ‘any sign *not* an index’. His understanding of representation also increasingly expanded into a broader metaphysical account of ‘mediation’ (Nöth 2011). But despite these terminological shifts, Peirce’s claim that signification is an irreducibly triadic relation, and his distinction between iconic, indexical and symbolic *functioning* are remarkably stable throughout his career. [↑](#footnote-ref-13)
14. For a systematic overview of this fundamental triad in Peirce’s sign theory, see (Lizska 1996). [↑](#footnote-ref-14)
15. For insightful commentary on Peirce’s deployment of this metaphor in his philosophical system, see (Hookway 2012; 2002). [↑](#footnote-ref-15)
16. For a discussion of the implications of this claim within formal logic, see (Legg 2012). [↑](#footnote-ref-16)
17. Again, these ideas are discussed further in (Legg and Black 2020). [↑](#footnote-ref-17)
18. It’s worth noting that Stjernfelt goes on to criticise some of Hurford’s work as psychologistic in the hard-fought sense of Frege and Peirce – for instance where Hurford states that the “…logico-linguistic enterprise is essentially psychological” (Hurford 2007, 124, cited in Stjernfelt 2014, 127). [↑](#footnote-ref-18)
19. Other relevant sources include (Gładziejewski and Miłkowski 2017; O’Brien and Opie 2015; Shea 2014). [↑](#footnote-ref-19)
20. I believe this quote puts to rest the two major objections which Segundo-Ortin and Hutto present as an explicit counter-argument to Williams and Colling’s piece – that icons do not *inherently* represent what they are taken to represent, and that they do not play *a casual role in cognition* in virtue of their content (Segundo-Ortin & Hutto 2021, S9-10). [↑](#footnote-ref-20)