DISCUSSION

Some notes on internal and external relations and representation*

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Internal relations

Internal relations are those relations that are intrinsic to the nature of one or more of the relata. They are a kind of essential relation, rather than an essential property. For example, an arc of a circle is internally related to the center of that circle in the sense that it could not be that arc of that circle without having that relation to that center of the circle. A classic example is that of part to whole: this X could not be a part of Y unless it had an appropriate "part of" relationship to Y. (I like my "arc of circle" example better.)

The Idealists of the 19th century made massive use of internal relations. The universe was supposed to be a whole united by internal relations among everything. Russell reacted strongly against internal relations (although some of his reasons were based more on the fact that the Idealists Green and Bradley supposed all internal relations to be symmetric than on internal relations per se), but was unable to do away with all of them (Hylton, 1990). E.g., the relations among his logical types are internal.

Quine has ushered in a period in which all things intensional or modal or normative are under grave suspicion, and to be rejected if at all possible. Internal relations have mostly disappeared from the scene because of their 'essentialism'. All relations are assumed to be external, except that most people, including most philosophers, today don't know what an internal relation is, and, therefore, don't know what an external relation is either.

Representation

The relation of an encoding to its content is external. The "..." of Morse code would be exactly the same set of dots even if it were not paired with the character

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"S". Because the relationship of an encoding to its content is external, that content must be specified *explicitly* in order for the encoding to *have* any content, and, therefore, for the encoding to be a representation at all. It must be specified explicitly because there is no other way in which any content is determined.

Having representational content be *internally* related to a representation is necessary in order to be able to avoid the problem of an infinite regress of interpreters. If the relation between the representation and its content is external, then there is nothing in the representation per se that determines or constitutes its content, and whatever content there is must be assigned or understood by some interpreter. Internally related content, then, is a necessary desideratum of representation, in spite of the contemporary anti-essentialism that banishes internal relations, and, thus, renders all models of representation as some version of encodingism.

The interactive model of representation

There is an internal relation between an organism and its environment in virtue of the organism being a far from thermodynamic equilibrium system. Such systems are necessarily in interaction with their environment in order to maintain their far-from-equilibrium condition. This is a physical necessity: that is the way the thermodynamics works. If there is no such interaction, the system goes to equilibrium and ceases to exist.

This internal relation is not itself sufficient for representation, but it does frame or ground a model of representation called Interactivism. Further considerations that are required include that some far-from-equilibrium systems, such as a candle flame, make contributions to the maintenance of their own far-from-equilibrium conditions. In the case of candle flame, the flame maintains above combustion threshold temperature, induces convection which brings in oxygen and removes waste, and vaporizes wax into fuel. These are self-maintaining systems. Still more complex are systems that can alter their activities in accordance with environmental conditions so that they continue to be self-maintaining in the face of environmental changes. A bacterium, for example, might swim if swimming up a sugar gradient, but tumble if swimming down a sugar gradient. These are recursively self-maintaining systems (Bickhard, 1993, 2002, in press). More broadly, they are autonomous systems (Christensen & Hooker, 1998; Christensen & Bickhard, 2002). This is autonomy

in very much the Aristotelian sense — for Aristotle "Autonomous entities rely on themselves both for the realization of their capacities and for their persistence." pg. 213 (Gill, 1989).[1]

It is in recursively self-maintaining systems that we find the emergence of primitive representation. The switching to an activity in an environment involves a dynamic presupposition, a dynamic anticipation, that that activity, such as swimming, is in fact appropriate for that environment, that it will in fact be self-maintaining. The presupposition, then, is that the environment has those properties, whatever they may be, that support that activity being self-maintaining.

Those presuppositions are the *contents* of the shifts of organism activity, and they constitute those shifts as representations. Such contents, such anticipatory presuppositions, can be *false*: the environment might not support the appropriateness of the activity. The bacterium will swim up a saccharin gradient as well as a sugar gradient, and, in such a case, the dynamic presupposition of the swimming is false.[2]

An interactive representation is internally related to its content. Interactive content is constituted in the environmental properties that would support the flow of interaction to be consistent with the system-anticipations about that flow. That is, interactive content is constituted in the presuppositions involved in functionally having those anticipations at all. This is internal in the sense that those anticipations (however realized in actual system dynamic organization, whether pointers or microgenetic set-up anticipations, etc., Bickhard, 2000) could not be the interactive anticipations that they are without making those presuppositions about the success conditions for those anticipations.

This is a normative internal relation. The anticipations are normative (derivative from the normative *function* of interaction selection that they serve, which, in turn, is dependent on their involvement in the overall self-maintenant autonomy of the system). That is, anticipations can fail (anticipatory failure is a normative property derived from the normativity of functional failure) and it is the presuppositions of, the conditions for, their *not* failing that constitute the content, an internally related content.

Two and three part models of representation

An internal relation between a representation and *that which it represents* was characteristic of the models of the Idealists Green and Bradley, and was part of

what Russell reacted so violently against. Given their additional assumption that internal relations were symmetric, this had as one bizarre consequence that if your representation of something changed, then so did that which was being represented. Russell rejected the internal relation aspect of this model, but kept the assumption that representation is a two part relation. He never accepted, and, in fact, argued against, Frege's notion that representation involved three parts: representation, content (sense), and represented.

The Interactive model is a three part model. Interactive anticipations are internally related to the presuppositions that they involve regarding the appropriateness of the environment for the success of those anticipated (or indicated) interactions. Those presuppositions, in turn, are presuppositions about the environment. So, there are three parts: the anticipated/indicated interactions, their internally related presuppositions, and the environment which those presuppositions are about.

The relation between anticipated interactions and their presuppositions is internal; the relation between those presuppositions and the environment is not internal. Thus, nothing like the Idealists' problems can emerge.

Implicit and explicit content

Interactive content is internally related; it is also implicit. Just what are the environmental conditions of success for an interactive anticipation? Science can not tell us in full what those are. Five hundred years ago we could be even less clear about what they are. Certainly a toddler or a cat or a snake has no explicit 'knowledge' of its implicit contents. Interactive representational content can be implicit precisely because it is internal: it is specified as "whatever the conditions are for the success of the anticipations of interactive flow" and that specification is implicit and internal. It is only because of its internality that there is content at all, since it is not explicitly, independently, specified. If not for the internality, it would have to be explicitly specified, as for encodings.

What about explicit representation in the interactive model? The dynamic presuppositions are implicit, not explicit. There is no fundamental explicit rendering of what the conditions for successful interaction are. Later theorizing and elaborated understand, however, may provide [partial] explicitization of those presuppositions: "It can be explicit that an interaction of a particular kind, arriving at a designated outcome, indicates that one or more further interactions would be possible, but what supports those indications, what is presupposed about the

environment by those indications, is not explicit." (Bickhard, in press; see also various discussions of the explicit apperceptive image, object representations, plan and image, etc., e.g., in Bickhard & Terveen, 1995)

External relations between representation and its content, then, require interpreters, both to assign the content and to interpretively understand it. That is fine for some purposes, but not for non-derivative representations: they cannot require interpreters on pain of infinite regress. The only way to avoid such an interpretive regress is if the content is internally related. In such a case, given the representation, you are already given the content, internally (even if implicit, and, arguably, necessarily implicit, since primitive representation [infants, cats, snakes, etc.] is *only* of organizations of interactive possibilities, and cannot be given any further characterization by the system itself, and primitive representation could not be otherwise without some other source of content specification).

Content and Wittgenstein

Wittgenstein, in his later work, thought that all representation was inherently externally related to its content (though this was not his way of putting the matter).[3] His recourse was to "grammar". Grammar involved the internally related rules of use for words and language more generally. By being internally related, as a matter of the normativity of language, they do not require interpreters, and, thereby, avoid the problematic regress of interpreters. Wittgenstein is partially correct here, but his notion of grammar is itself already normative, and Wittgenstein has no way to make good on that normativity. So, setting aside other problems with his characterizations, he has not succeeded in accounting for normativity (and, therefore, not for the normative internal relations of grammar). Another problem is that he is so focused on language as the locus of his problems that he fails to sufficiently recognize that normativity (of representation, for example) is already involved in the relationships between individual persons and their world, including their world of other persons and of language. Wittgenstein tried to avoid or sidestep epistemology (until his last work, and that was still caught in a language frame), but that does not work, and the failure is manifested, among other ways, in his "hanging" or "brute" normativity of grammar.

Some classic issues avoided

Mental objects and non-existents

Brentano argued that mental activity involves an object. Mental activity involves dynamic presuppositions, but that is safely renderable as "an object" only in certain circumstances. If representation is construed as some sort of encoding, however, then there must be some "object" that is the other end of the representational relationship, and this requirement yields multiple *aporia.*

One that greatly exercised Russell and others around a century ago was how to account for the representation of non-existents. If there is a representation of a unicorn, or of a square circle, what is the object on the other end of the representational relationship? Part of what makes such problems so vexing is that encodingism motivates two part models of representation, and, for a two part model, there is no possible source of determination of what is being represented other than the object of representation, but if there is no such object, the whole framework threatens to fall apart. In practice, it often yielded the postulation of odd metaphysical realms of "objects" for such representations in which the "objects" were not real in any ordinary sense (Dummett, 1994; Hylton, 1990).

Conversely, the representation of non-existents is not a problem so long as the content is not itself being determined by or constituted by the represented. For a two part model, that seems to be the only possibility, and these problems are profound. If content is determined by the representation itself, however, *independent* of the represented, as it is by interaction anticipations, then there is no problem with the representation of non-existents. That is, the content is internally determined by the representational anticipations, and there is no need that anything exists to satisfy the presuppositions involved in order for those presupposed conditions to be presupposed.

Error and system detectable error

A second problem for encoding models is that, if the content is determined/constituted by the represented, then we have problems with the possibility of representation being false: how can the representation-constituting *relation* exist, and, therefore, the *representation* exist, if the representation is false, that is, if the represented doesn't exist — or if it isn't what is (supposed to be) being represented? This problem of accounting for the possibility of representational

error has generated a minor industry in the last decades, but it cannot be solved (for non-derivative representation) within an encoding framework. Again, there is no such problem for interactive representation: the anticipations, thus the representation, can exist or not, and, if the anticipations exist, then their dynamic presuppositions are thereby presupposed, and they might be true or they might be false.

Let me increase the stakes involved here. Accounting for the possibility of representational error has been a perplexing problem. But an even more difficult problem is to account for the possibility of representational error that is detectable by the system or organism itself. Without such detection, error guided behavior and learning are not possible. We know that error guided behavior and learning occur, therefore any model that makes such detection impossible is refuted. No major model in the literature even addresses this problem, and it is not possible for any of them other than the interactive model (Bickhard, 1999, in press). The fundamental problem is that 1) content in such models is constituted in some way that is functionally inaccessible to the organism (e.g., in its evolutionary or learning history, or its asymmetric dependencies between classes of counterfactual possible conditions or histories of the world — more deeply, the content is externally related, and, so can only be understood by some observer/interpreter of the organism-in-its-environment, not by the organism itself) so there can be no comparison of that content with what is in fact being represented to determine if it is being falsely represented, and 2) such comparison would not only require access to one's own representational content, it also requires epistemic access to what is in fact currently being represented, but that is the representation problem all over again. This is one of the radical skeptical arguments — any determination of the truth of one's representations is circular because it involves checking a representation against itself — and it has withstood some centuries of attempts to defeat it. Yet it cannot be a sound argument, because error guided behavior and learning do in fact occur. An interactive representation transcends it, because the anticipations involved, if false, can be falsified in the course of further interactions on the part of the organism, and can be detected to be false by the functional failures of those anticipations.

Representational particulars

Within standard frameworks, it seems to make sense to ask, for example, if both X and Y are wanting a dagger, is it the same dagger that they are wanting?

Context may help: if X and Y are characters in two different plays, then likely it is not, or if X and Y are bidding for a dagger at an auction, then the answer seems to be that it is the same dagger.

More deeply, however, questions such as whether or not the two daggers are the same assume that there need be some fact of the matter about the answer. This, in turn, assumes that representation is of particulars, which have identities, so the question is: is the particular in the first case the same as the particular in the second case. Basing representation on particulars is the obvious, perhaps the only, possibility if you are working within a two part object based model of representation.

But the Interactive model is not such a model. Interactive representation is constituted in terms of indications among differentiations of the world: if this differentiation has that outcome, then this other differentiation will have that other outcome. There are no particulars here at all, except as occasional accomplishment-claims about objects, such as "there is only one object of this kind" or "this object is the same as that object" (identities) (claims such as can be involved, for example, in uses of "the"). Such claims are pragmatic and fallible, in all cases. And there need not be *any* such particularity or co-referentiality claims. Note the contrasts, for example, between the first sentence and the other five (the issues in these examples are complicated by the involvement of language, but I will not address those complexities here):

> John lost *a black pen* yesterday and Bill found *it* today.
>
> *My home* was once in Maryland, but now *it's* in Los Angeles.
>
> John thinks *my home* is in Maryland, but Bill thinks *it's* in Los Angeles.
>
> We need *a secretary* and we need *her* soon.
>
> John couldn't catch *a fish* if *it* jumped into his lap.
>
> The man who gave *his paycheck* to his wife was wiser than the man who gave *it* to his mistress. (Bickhard & Campbell, 1992, from Partee, 1972)

The Interactive model yields a differentiation or partition epistemology, not an object epistemology (see Bickhard and Campbell, 1992). It is based on relations among possible interactive partitions *of* the environment, not on relations to particulars *in* those environments. Representing (claimed or assumed) particulars in an environment is a developmental accomplishment that requires some years for human infants, and is never reached by most organisms of most species.

Conclusion

There are multiple desiderata for models of representation, but one is that content must be normative and it must be internally related to representation. Among other consequences, this forces a three part model. No major model currently in the literature, or, in general, no encoding model of representation, satisfies this desideratum.[4] Yet without such internally related normative content, the models face fatal problems, such as accounting for the possibility of system detectable representational error.

The Interactive model is a model of internally related normative content. It solves or dissolves these and many additional problems for standard approaches (Bickhard, 1993, 1999, 2002, in press; Bickhard & Terveen, 1995). It offers a way beyond the perplexities.

Notes

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1. See also "An organism's activity is much more than an expression of what it is; it is also the means by which the organism preserves itself from deterioration." pg. 219 "Self-maintenance is the preservation that results from an organism's self-directed behavior." pg. 227 "Living organisms are ... autonomous self-preserving systems." pg 241 (Gill, 1989).

2. This does not address at all more complex kinds of representations, such as of objects or of abstractions such as numbers. For such further elaborations of the basic representational model, see (Bickhard, 2002).

3. See, for example, "Wittgenstein's point is that there is no such thing as an object which has intrinsic meaning" Skorupski, 1997, pg. 82.

4. See Bickhard (1993, 1999, in press) for critiques of Millikan (1984, 1993), Dretske (1988), Fodor (1987, 1990, 1990b, 1991, 1998), and Cummins (1996).

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