

Constructivisms and Relativisms: A Shopper's Guide

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ABSTRACT: Diverse forms of constructivism can be found in the literature today. They exhibit a commonality regarding certain classical positions that they oppose – a unity in their negative identities – but a sometimes wild multiplicity and incompatibility regarding the positive proposals that they put forward. In particular, some constructivisms propose an epistemological idealism, with a concomitant relativism, while others are explicitly opposed to such positions, and move in multifarious different directions. This is a potentially confusing situation, and has resulted in some critics branding *all* constructivisms with the charge of relativism, and throwing out the baby with the bath water. In addition, since the epistemological foundations of even non-relativist constructivisms are not as familiar as the classical positions, there is a risk of mis-interpretation of constructivisms and their consequences, even by some who endorse them, not to mention those who criticize. Because I urge that some version of constructivism is an epistemological necessity, this situation strikes me as seriously unfortunate for philosophy, and potentially dangerous for the practice of education.

Key words: realism, idealism, empiricism, innatism, constructivism, relativism, representation, epistemology, scaffolding

Diverse forms of constructivism can be found in the literature today. They exhibit a commonality regarding certain classical positions that they oppose – a unity in their negative identities – but a sometimes wild multiplicity and incompatibility regarding the positive proposals that they put forward. In particular, some constructivisms propose an epistemological idealism, with a concomitant relativism, while others are explicitly opposed to such positions, and move in multifarious different directions. This is a potentially confusing situation, and has resulted in some critics branding *all* constructivisms with the charge of relativism, and throwing out the baby with the bath water (Bickhard, 1993b). In addition, since the epistemological foundations of even non-relativist constructivisms are not as familiar as the classical positions, there is a risk of mis-interpretation of constructivisms and their consequences, even by some who endorse them, not to mention those who criticize.

Because I urge that a constructivism is an epistemological necessity, this situation strikes me as seriously unfortunate for philosophy, and potentially dangerous for the practice of education (Bickhard 1995). The issues that frame epistemological constructivisms and their alternatives are of fundamental importance, but they are not simple and cannot be safely accepted, dismissed, or criticized in an all-or-nothing fashion.

My primary aim, then, is to outline what I take to be some of the most important issues framing this debate, with a secondary focus on a few particular versions of constructivism. I strongly endorse a rejection of idealism and relativism, but will argue that rejecting constructivisms *in toto* on these grounds has the ironic result of committing to the problems that yield idealisms and relativisms in the first place. Rejecting constructivism, then, is precisely the wrong 'solution'.

A FRAMEWORK OF ISSUES

Realism and idealism

To begin an exploration of some of the framing issues, consider the classical opposition between realism and idealism. Realism in its classical forms begins with an assumption of a basic split between the knowing agent and the world. Both sides of this metaphysical division are taken for granted, and epistemological questions generally focus on how the epistemic agent – the knower – can know about the world. All classical attempts to answer this question about representation assume that representation consists of mental elements or events that are in some sort of representational correspondence with whatever they represent in the world. Those elements or events are taken to encode corresponding objects and properties in the world (Bickhard 1993; Bickhard & Terveen 1995).

Skepticism

A very large maze of venerable issues arise at this point (Bickhard 1993; Bickhard & Terveen 1995). One troublesome question that can be asked is how the knower can ever know whether or not his or her representations are correct. If I wish to check my representation that there is a desk in front of me, my only recourse would seem to be to again invoke my representation that there is a desk in front of me. Any such check seems to be unavoidably circular, and, therefore, no check at all. This is one of the core arguments of skepticism (Rescher 1980). It has not received adequate answers over the course of several millennia.

But, if there is no way to determine whether or not representations of the world are in error, then in what sense does it make sense to posit such a world at all? Perhaps all we *really* have is our representations, and there is no 'other end' of the presumed representational correspondences. Such a response to the apparent unanswerability of the skeptical arguments is a standard move into an idealism: the stance that our representations, be they individual or social, are all the reality there is.

Such an idealism, in turn, yields the apparently easy conclusion that 'anything goes'. If the only reality there is is constituted in our representations, and there are no rational criteria by which we can determine that

some are correct and others incorrect, or even that some are better than others, then we arrive at a relativism. Relativisms are poisonous with respect to issues of morality and ethics, and can be psychotic with respect to issues of science and mathematics. If *'anything goes'* with respect to whether or not there is a desk in front of me, or whether or not there is a truck bearing down on me, then I have fallen into a potentially fatal psycho- or philosophico-pathology.

The argument that drives this move is the skeptical challenge to being able to check our representations. That challenge, in turn, depends on the standard conceptions of representations as being constituted as encoding correspondences. It is a challenge, one of many, to the presumed representational correspondences being able to work in the manner that they are supposed to work. It is frequently assumed that the source of the problems is the original division between knower and known, and that such a dualism must be transcended (e.g., Gergen 1995). I do not disagree with that position with respect to the standard way in which the dualism is understood, but I will argue that the shared assumption about representation is the more fundamental source of the dilemma and its disastrous consequences. Let us now turn to a classic division of assumptions about *how* those representational correspondences are supposed to work.

Empiricism and rationalism

Another of the many questions that can be raised about presumed encoding representations is how the epistemic agent is supposed to know what is even *supposed* to be on the other end of the correspondence – what is it that is supposed to be represented – prior to the skeptical issue of how it can be determined whether or not that representation is correct. Many representations are presumed to be constructed out of more basic representations – e.g., a desk representation might be some composite of representations of color, rectangle, legs, and so on. For such composite representations, issues of how we could know what is supposed to be represented devolve on the component representations – how do we know what *they* represent. Such decomposition of complex representations cannot proceed indefinitely, however, so there must be some level of non-decomposable atomic representations. The basic question of how we know what is supposed to be represented, then, has its ultimate focus on such presumed atomic representations.

There are two classes of classic answers to this question: 1) Knowledge of what is supposed to be represented by the foundational atomic representations enters into the mind along with the causal process – e.g., visual transduction in the retina – that generates the correspondences in the first place, or 2) Knowledge of what is supposed to be represented by the foundational atomic representations is already present in the mind. That is, the answers tend to fall into the classic empiricist or rationalist camps, or some mixture of them. There are, in turn, two versions of rationalism:

1) Basic representational knowledge is inherent in the nature of mind, or
 2) It is resident in the genes. Contemporary versions of rationalism tend to advocate the innateness version – it's all in the genes (Bickhard 1991; Fodor 1981).

Note, however, that empiricism and rationalism share the assumption that representation is constituted as correspondence, and share the assumption that knowledge of what foundational representations represent – what's on the other end of foundational correspondences – *must come from somewhere*. Such knowledge (such *content* of the representations) must come from outside (empiricism) or inside (rationalism).

Emergence

This assumption, however, cannot be correct. If representation can exist only if it comes *from* somewhere, then representation could never have come into existence. Since representation presumably did not exist at the Big Bang, representation has to have come into existence at some point or points since then. Neither empiricism nor rationalism, and, therefore, classical realism, can account for such an emergence of representation. They render the existence of representation impossible.

A model of some phenomenon X must be consistent with X coming into being, with the emergence of X. If it is not, then that model *cannot* be a correct model of X. The skeptical arguments already demonstrate that there must be something wrong with standard models of representation. This impossibility for standard models of representation to account for the emergence of representation is another such demonstration. It points to a need for models of representation that could account for representational emergence. A model of representation that could account for emergence might also succeed in avoiding the pernicious dichotomy between classical realism, with all of its skeptical impossibilities, and idealism, with its nihilistic relativism. I will develop a model that I claim does precisely that.

Representation, action, and constructivism

The mind and mental phenomena have for millennia been studied within the assumption that consciousness is the proper locus of analysis, and with passive conceptions of vision as the metaphors for consciousness. This view yields a conception of knowledge that is sometimes characterized as 'knowing that' something is or is not the case – a propositional model of knowledge and representation. A century ago Charles Saunders Peirce introduced a shift to action as the proper locus for the study of mind and mental phenomena (Joas 1993; Rosenthal 1983). This is characterizable as a focus on 'knowing how', how to do something. The move from knowing that to knowing how, from correspondence-propositional models to pragmatic interactional models, I suggest, is the critical move for tran-

scending the maze of dilemmas and paradoxes that were adumbrated above.

I do not wish to suggest that Peirce got it all right, nor those influenced by him (such as, for example, Heidegger (Joas, 1993) and Piaget). There are many details in a successful pragmatist model of representation, and many problems specific to such an approach that need to be addressed. But a pragmatist approach, assuming it is successful in these other respects, does offer a relatively easy avoidance of the classical impossibilities of the correspondence-encoding approaches. So, I will leave the details to elsewhere (Bickhard 1993; Bickhard & Terveen 1995). For current purposes, it suffices to indicate how problems of representational emergence might be solved or dissolved.

Classical models assume that representation is constituted as some sort of correspondence. That has not worked. Pragmatist approaches assume that representation is somehow emergent in systems of action and interaction. How could that be?

Evolutionary continuity. Note first of all that a locus of analysis in action and interaction honors a continuity in the animal kingdom, from the simplest to the most complex. Darwin highlighted this continuity – and opened up the consideration for Peirce. Without such a continuity, we are faced with an inexplicable saltation from animals that do not have propositional ‘knowing that’ consciousness to those that do (Churchland 1989).

Constructivism. If we construe representation as constituted by correspondences, we are tempted to assume that those correspondences are impressed into a passive mind, like forms into wax, or light transduced in the retina. If we assume that representation is an emergent of interactive systems, there is no such temptation to assume that the environment could impress the proper organizations of system into a system. Interactively successful system organization cannot be impressed into a system from its environment. System organization must be constructed by the system itself. *A pragmatic approach to knowledge and representation logically forces a constructivism.*

There is no temptation, for example, to assume that knowledge of skills must pre-exist somewhere and come into the organism acquiring those skills, nor that knowledge of how to survive as a frog must come into the frog genome from the environment or from pre-frog evolutionary sources. In both cases, the relevant knowledge is emergently constructed, either by the organism or over the course of evolution or both.

This relationship between interaction models and constructivisms, of course, is the proximal reason for my advocacy of constructivism, but the strength of that advocacy depends on the success of the underlying pragmatic framework in accounting for knowledge and representation. So, again, how could that be?

Interactive representation. Interactions sometimes succeed and sometimes do not. Whether or not they succeed depends in part on appropriate

conditions holding in the environment with which the interactions are taking place. Engaging in a particular interaction, or indicating that a particular interaction would succeed if it were undertaken, presupposes that those appropriate conditions hold. They might not. If they do not, the interaction will fail, and that failure of the interaction falsifies that indication of presupposed conditions.

An indication of the appropriateness of an interaction, thus, has a truth value, and a truth value potentially (though fallibly) detectable by the system itself (Bickhard 1993; Bickhard & Terveen 1995). It captures the minimal characteristic of representation, of knowing that – it can be true or false. This, I argue, is the core sense in which a pragmatic approach can model representation.

Note that issues of emergence are trivial in this view: *any* appropriate organization of the system process will constitute representation. Therefore, the new construction of any such system organization will constitute *emergent* representation. Representation can be emergently constructed, constructed out of material that is not itself already representational.

This is the barest gesture toward a pragmatist or interactivist model of representation. There are at least three major classes of questions that need to be addressed: 1) How can such notions as ‘indication’, ‘interaction type’, and ‘detection of success or failure’ be modeled, without circularly invoking some other representational notions? 2) How can this minimal model of representation account for more familiar sorts of representations, such as of objects, and of abstractions, such as numbers? and 3) How can this model account for language? I will not address any of these sets of issues here (see Bickhard 1992b, 1993, 1995b; Bickhard & Terveen 1995). It suffices that there is some plausibility that a pragmatic approach is necessary to avoid classical aporias, and that a pragmatic approach forces a constructivism. We can now turn to looking at some of the varieties of constructivism, not all of which succeed in solving or dissolving these issues, and, therefore, not all of which are supported by these considerations.

SOME VARIETIES OF CONSTRUCTIVISM

Linguistic idealism

Kant argued against the empiricism of Hume that the mind provided its own organizing and framing principles for our representations. This constitutes a contributory function of the mind, but still leaves the mind essentially passive with respect to the world. Unlike pragmatist models, the notion of an intelligent plant – with no actions at all – is not an internal contradiction in Kantian terms.

Kant’s own proposals concerning what the mind contributes to our cognitions have been largely abandoned. The discovery of non-Euclidean

geometry, for example, made it clear that the mind does not impose Euclidean intuitions on our representations of space. Nevertheless, the idea that our understanding of the world is framed by prior conceptions has remained. One important descendent version holds that it is language that provides the framing conceptions (Gier 1981).

Construing language as the source of our representations of the world has at times been taken to the point of a linguistic idealism, in which our world is constituted by our language. Consider, for example, the hermeneutics of the later Heidegger and Gadamer: 'That which can be understood is language.' (Gadamer 1975, p. 432) 'Man's relation to the world is absolutely and fundamentally linguistic in nature.' (Gadamer 1975, p. 432) '... we start from the linguistic nature of understanding ...' (Gadamer 1975, p. 433) 'All thinking is confined to language, as a limit as well as a possibility.' (Gadamer 1976, p. 127). The details, of course, are complex and deserve much more attention, and, in fact, Gadamer wishes to deny the idealist stance that he seems to have committed himself too (Gadamer 1975, p. 496). Nevertheless, this historical development is 'just' a modern version of the move from naive realism to idealism, and has produced powerful contemporary versions of idealisms and positions committed to idealisms in spite of their own author's intentions (Gergen 1995; Rorty 1979). The nihilism and relativism that follow have even been acknowledged (Rorty 1987).

Note that such a linguistic idealism *is* a constructivism. Society constructs our representations, and, thus, our world, in the course of the evolution of language. What makes this position an idealism is that the notion of constraints on those constructions – of a world outside or independent of the constructions that nevertheless constrains the constructions – has been lost. Indeed, arguments for these positions generally proceed by recounting the historical failures to make good on correspondence notions of representation, failures to counter the skeptical arguments, and then shift to a social idealistic constructivism as if that is the only alternative (Gergen 1995; Rorty 1979, 1987). Such oscillations between realism and idealism are ancient, but they do not succeed in escaping the trap of the correspondence notions of representation that force the dichotomy in the first place. The nihilisms and relativisms that follow from such positions, however, are due to the constructions being unconstrained, not to the proposal that representations are constructed. That is, the nihilisms and relativisms are due to the idealism, not the constructivism.

Empiricist or rationalist 'constructivism'

There is, of course, a kind of constructivism that can be proposed, and has been proposed, even within an empiricism – or rationalism. This is the construction of composite representations out of the presumed atomic representations. For a time, there was even a kind of growth industry

in Cognitive Science and Developmental Psychology in exploring such molecular constructions (Fodor, Bever, & Garrett 1974).

Such an endeavor, however, does nothing to solve the basic problem of the representational atoms themselves, and is inherently powerless to do so. Constructing representations out of atoms that are already themselves representations cannot address the origins of the atoms per se. Careful pursuit of such approaches has yielded bizarre *reductio ad absurdums* such as the implication that virtually all concepts that human beings are capable of having are already in the genes. After all, they could not have been created by any method known to contemporary cognitive science (Bickhard 1991; Fodor 1981).

It is clear that these versions of constructivism do not fall into the idealism error, but they avoid that error simply by remaining in the camp of some mixture of empiricism and innatist rationalism. They do not escape the fundamental problems.

Jean Piaget

Influenced by both Kant and Peirce, Piaget proposed a powerful version of constructivism based on pragmatic action, and coordinations among potential actions. Piaget was well aware of the classic battles between empiricism and rationalism, and felt that there had to be a 'third way', a way that avoided the problems of both. In particular, he focused on logical and mathematical necessity as a form of knowledge that could not be explained empirically: no matter how many times two pebbles plus two pebbles is observed to yield four pebbles, that does nothing to show that two plus two *necessarily* equals four. The number of planets is nine, but not necessarily so, while three times three is also nine, but, in this case, it is necessarily so.

Piaget's proposal for the origin of necessity was ingenious. As the mind constructs greater and greater ability to coordinate actions in some space of possible coordinations, it will eventually exhaust any bounded such space. At that point, the coordinations of which the mind is capable, at least in many cases, will form a mathematical group, or some other mathematical structure. In the emergence of such groups is the emergence of the necessity of all of those mathematical properties that groups (and other structures) necessarily have. Here is the *emergence* of mathematical necessity – it does not come in from the environment nor up from the genes.

Piaget's model is of a kind of inherent tendency in development. Any sufficiently powerful construction process will tend to exhaust bounded spaces of possible constructions, and fundamental new properties can come into being when such a space is subsumed in those constructions. Piaget looked to embryology for an analogy to such development – the tendency is inherent in the nature of construction – but it was quite explicitly no more than an analogy. The tendency for the emergence of

necessary properties did not rest on anything in the genes beyond a sufficiently powerful construction process per se, nor on anything from the environment beyond sufficient stimulation to continue to 'feed' the processes of construction. Construing Piaget as a maturationist, or empiricist, or rationalist, then, is a serious misunderstanding (Kuhn 1992; Lour-enço & Machado 1995).

I argue that Piaget did not ultimately succeed in his aims (Bickhard 1988; Campbell & Bickhard 1986). Nevertheless, he demonstrated the plausibility of constructing our familiar world of objects in space and time, related by causality, and amenable to mathematical analysis, within a framework of organizations of action and interaction. He demonstrated the plausibility of a pragmatist constructivism not only for frogs, for which a 'restriction' to 'knowing how' might be superficially plausible, but for the 'knowing that' world of human beings as well.

Popper and Campbell

Whether at the cultural and institutional level of science, or at the level of individual organisms, there can be no *a priori* guarantee that epistemic constructions about the world will be correct. Any such assurance constitutes prior knowledge, which begs the question of the ultimate origins of knowledge and representation. Epistemic constructions, then, must be trials that may or may not succeed – variations that may or may not be selected out. Pragmatic constructivism about the world must be a quasi-evolutionary process. Pragmatic constructivism forces an evolutionary epistemology (Campbell 1974).

Clearly we are not, in most circumstances, bereft of prior knowledge. Most of our problem solving trials are heuristically guided. The existence of such prior heuristic knowledge is of critical importance, and, in fact, imposes its own powerful constraints on the architecture of any epistemic system capable of such heuristics (Bickhard & Campbell, in press), but heuristic knowledge is itself knowledge, and its origins too must be accounted for. No model of the emergence of knowledge and representation can logically *require* prior knowledge or representation on pain of infinite regress, and the impossibility of emergence.

Of crucial importance to the current discussion is the point that no evolutionary epistemology can consistently be an idealism. In a consistent idealism, there can be no source of selections, no surprises. If there is nothing independent of the constructions, then there is nothing to select against, to resist, to surprise, those constructions. An evolutionary epistemology offers the possibility of accounting for the constructive emergence of representation without the 'free' unconstrained constructions of idealisms, and the consequent nihilisms and relativisms. This offer, of course, involves massive promissory notes concerning the specifics of representational and other normative emergences to be able to account for normative errors ranging from functional error to representational error to error

of rationality to moral and ethical error. But a variation and selection constructivism does avoid the aporetic problems of not being able to account for any such emergence at all, in principle (Bickhard 1993, in preparation; Bickhard & Terveen 1995).

Von Glasersfeld

Von Glasersfeld's radical constructivism is a version of a pragmatic constructivism. It emphasizes the impossibility of obtaining correspondence knowledge about the world, and the ubiquity of considerations of pragmatic success. Under the rubric of 'viability', von Glasersfeld proposes a construction model subject to pragmatic selections. He emphasizes the ubiquity and necessity of feedback, the necessity of constructions in the light of such feedback, and the underdetermination – relative to fixed one-to-one correspondence models – that viability selections provide for constructions that survive those selections (von Glasersfeld 1979, 1981, 1995).

Such underdetermination could be read as 'no constraints', yielding an interpretation of radical constructivism as an idealism and consequent relativism. Clearly, this badly misses the point. Or, in an even worse interpretation, the focus on consequences could be construed as a verificationism, and radical constructivism could be read as a positivist empiricism. (A frequent mis-interpretive fate for pragmatism in this century.) Clearly, this egregiously misses the point. Radical constructivism may have its faults, but idealism and empiricism are not among them.

On the other hand, radical constructivism has not addressed the issue of the emergence of representation – more carefully, of precisely what viability feedback, especially error feedback, is and how it occurs. Von Glasersfeld has discussed notions of both representation and re-representation, but the problem of how error, or 'non-viability', of representation is supposed to work, is not developed (von Glasersfeld, 1995). Radical constructivism thereby leaves this critical problem of representational error open, and, by default, potentially open to the same correspondence problems that radical constructivism seeks to avoid. Constructivism cannot ultimately simply avoid problems of representation, but if correspondence encodings are the temptation when representational issues are considered, then the classic framework of problems resurfaces. This lacuna in radical constructivism, I suggest, leaves it vulnerable to idealist and empiricist misinterpretations.

Constructivisms and relativisms

The varieties of constructivism are manifold. Some are idealist, some are even empiricist, but constructivism is not committed to either position. Constructivism is not committed, in fact, to any of the framework of classical problems generated by correspondence notions of representation. It offers a potentiality of avoiding the entire framework of realism-ideal-

ism, empiricism-rationalism, and all of its consequent aporias. In particular, it offers the possibility of accounting for representational emergence and for the possibility of organism detectable representational error.

Note that an evolutionary epistemological constructivism does postulate a 'realism'. It is not, however, a realism construed as the other end of representational correspondences – that is the view that generates the classical labyrinth of dead ends. Instead, it is a 'realism' construed as selections on constructions that are independent of those constructions ('ontic' constraints, von Glasersfeld, 1995, 52). The automatic interpretation of 'realism' in the correspondence sense is one of the myriad conceptual traps in this domain.

An evolutionary epistemological version of constructivism is required in order to account for obvious realities, such as the existence of representation and representational error. It is necessary, therefore, as a background set of assumptions, for exploration of any epistemological phenomena or endeavor. In particular, it is necessary for the understanding and planning of education.

FUNCTIONAL SCAFFOLDING AND SELF SCAFFOLDING

Functional scaffolding

I will illustrate some of the fecundity of a variation and selection evolutionary epistemology with a model that follows readily from it: a functional notion of scaffolding. This is related to scaffolding as commonly understood in contemporary literature, but constitutes a generalization of it (Bickhard 1992).

Constructions are retained only if they succeed – are 'viable'. This, of course, is relative to what selection pressures are actually being encountered by the organism – perhaps a child. If a particular task requires too complex a construction before such a construction will work, then the child is not likely to hit upon that complex construction, and is, therefore, not likely to master the task at all.

On the other hand, if some of the selection pressures normally involved in the task are 'artificially' blocked or removed, then some less complex constructions might succeed and be retained. If there is a trajectory of these protected – scaffolded – less complex constructions that results ultimately in the full successful construction, then provision of such scaffolding by a parent or teacher could make possible development or learning that would not otherwise be possible. Bruner's classic example is the great effort that parents put into the interpretations of communication attempts from infants that would otherwise not succeed in communicating (Bruner 1975).

Bruner's notion of scaffolding (derived from Vygotsky's model of the zone of proximal development) turns on the provision of knowledge that

the developing child does not otherwise have. Supplemented in this way, the child can succeed in tasks not otherwise possible, and can learn – internalize – the supplemental knowledge him- or herself, thus becoming competent to the task without the scaffolding.

Providing supplemental knowledge is one way in which selection pressures that would otherwise require that knowledge can be mitigated. But it is not the only way. Selection pressures can often be blocked without any knowledge of what would satisfy those selection pressures being provided, or being present at all. It is this broader functional view of scaffolding that the variation and selection model generates.

Functional scaffolding can be provided, for example, 'simply' by limiting the problems to which the child is exposed to simpler versions, at least at first. Protected environments, and curricular design are generally based on this intuition, but without the guide of a scaffolding model.

Self-scaffolding

Of greater importance, however, is that functional scaffolding, without the supplemental provision of otherwise absent knowledge, is something that the individual can do for him- or herself – and can *learn* to do for him- or herself – and can be *taught* to do for him- or herself. Such self-scaffolding is not a coherent notion within the standard view: a person cannot provide to himself supplemental knowledge that he does not have. Yet self-scaffolding, and the development of self-scaffolding skills, is arguably among the most important aspects of development and education alike (Bickhard 1992). Certainly it is an aspect that is not understandable without an evolutionary epistemology.

Examples of self-scaffolding would be: breaking a problem down into subproblems; moving to simpler ideal or analogous cases; looking for and learning to use resources that might not be necessary when the task is mastered; temporarily suspending constraints; and so on. It is obvious that these are important, even essential, skills and that they must be learned. Self-scaffolding offers a coherent model for such phenomena, an explanation for the importance of learning such skills, and a guide for the educational scaffolding of the learning of such self-scaffolding skills.

There is much more to be addressed concerning scaffolding and self-scaffolding (Bickhard 1992), but the intent here is more simply to illustrate the power of an evolutionary epistemological perspective. Functional and self-scaffolding are two examples among many of that modeling power (Bickhard 1992b). They show that an evolutionary epistemology, thus a constructivism, is not only necessary to avoid the traps of naive encodingist realism-idealism, but that it also offers useful new perspectives of its own. Note, in this regard, that the notion of functional scaffolding can not be formulated within an idealism. With idealism, there is nothing to impose selection pressures, and, therefore, there are no selection pressures to block or mitigate.

CONCLUSION

Constructivisms abound. Most of them are united in a recognition of the failure of classical correspondence-encoding models of representation. The positive proposals that they offer, however, vary wildly. In particular, idealist constructivisms, whether a solipsistic individual idealism, or a social-linguistic idealism, simply recapitulate the classic shift from realism to idealism, and thereby remain trapped in the correspondence-encoding framework. They do not transcend any of the aporia of that framework that they seek to escape. Instead, they create the additional serious threat of a nihilism and relativism.

Problems are created by the assumption that representations are a type of correspondence. Only when that view is rejected in favor of a pragmatic view, an account of the emergence of representation out of interaction, can these classic deadends be avoided. Such a pragmatic model of representation, in turn, *forces* an evolutionary epistemological constructivism. Such a constructivism is fundamentally different from an idealist constructivism (or an empiricist constructivism), and we mangle the issues if we confuse or misinterpret them.

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