

Footprints in the Sand: Radical Constructivism and the Mystery of the Other

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> Context • Few professional philosophers have addressed in any detail radical constructivism, but have focused instead on the related assumptions and limitations of postmodern epistemology, various anti-realisms, and subjective relativism. **> Problem** • In an attempt to supply a philosophical answer to the guest editors' question, "Why isn't everyone a radical constructivist?" I address the realist (hence non-radical) implications of the theory's invocation of "others" as an invariable, observer-independent, "external" constraint. **> Results** • I argue that constructivists cannot consistently defend a radically subjectivist theory of knowing while remaining entirely agnostic about the nature and existence of the larger world (including independent others). That is, any non-solipsistic account of human experience must explicitly acknowledge its extra-subjective, ontological dimension. **> Implications** • It follows that no pedagogical, social, philosophical, or commonsensical insight associated with so-called "trivial" or "social" constructivism survives or receives any support from the move to radical constructivism. **> Key words** • Ernst von Glasersfeld, solipsism, fictional posits, ontological agnosticism, others, subjects, observer-independence.

Introduction

The Editors of this special issue of *Constructivist Foundations* are seeking responses to the following question: *Why isn't everyone a radical constructivist* (hereafter, RC)? In my view, the straightforwardly social, hence non-radical, presuppositions of this public forum and the very question itself are sufficient to explain the theory's constitutive failure to account for those very presuppositions.¹

To those familiar with the contours of this debate, I am invoking the persistent and vexatious *problem of the other* (Glasersfeld 1989a: 126). The problem has its source in von Glasersfeld's dual insistence on the indi-

vidual knower's unqualified "cognitive isolation from reality" and the undeniably social, consensual, and constrained nature of that isolation:

"No individual can afford not to establish a relative fit with the consensual domain of the social environment." (Glasersfeld 1989b: 121).

In proposing these particular constraints on radically subjective experience, von Glasersfeld seems to want his epistemological cake in isolation and share it, too. Like the rest of us, whenever he reflects on the contents of his "experiential world," von Glasersfeld correctly notes that his constructions are not "wholly free," – an ineliminable component of common sense and any plausible account of the knowing process – in part because of the "constraints" and "guidance" he receives from others (Glasersfeld 1989b: 126). But to populate the world with constraining, guiding others is immediately to contravene his purported "cognitive isolation from reality." The essential argument seems to be this:

- 1 | My constructions are constrained by others,
- 2 | so others pre-exist (constrain, etc.) my constructions.

- 3 | But I can only know that which I have constructed,

- 4 | so others cannot pre-exist (constrain, etc.) my constructions.²

This is an obvious enough contradiction in thought; an impossible attempt to marry commonsensical assumptions about the world beyond the isolated knower (1–2) to radical skepticism about our very access to that world (3–4). And so the "mystery of the other" is born.

Despite decades of attempts to accommodate, dismiss, or ignore these obvious and necessary social (hence realist³ and

2 | Von Glasersfeld might claim to construct constraining others at each moment of construction in an effort to avoid saying that these others pre-exist his construction of them. This solves the problem of 1–4, leaving us with the further (worse?) problem of explaining, as Silliman (1984: 2) writes, "my perverse and systematic undermining of my own constructive intentions."

3 | For the purposes of this essay, and in the first-person, subjectivist language familiar to radical constructivists, I define realism as follows: the ontological-epistemic thesis that (ontologically speaking) much of the world exists and has a determinate nature independent of anything I might think, say, or do; and, furthermore, that (episte-

1 | I identify the "argument from the social nature of experience" as one of five interrelated areas of critical concern about the conceptual viability of RC in Johnson (1996). Countless others have raised similar concerns. See, for example, Kikpatrick (1987), Goldin (1989), Suchting (1992), McCarty and Schwandt (2000), and Martinez-Delgado (2002). I would like to thank Kathleen Johnson, Matt Silliman, Paul Nnodim, the editors of this special issue, and two anonymous reviewers for their helpful comments and suggestions.

non-radical) underpinnings of any generalized theory of knowledge, the mystery continues to haunt RC.⁴ And it continues for good reason: von Glasersfeld's ubiquitous and explicit disavowals notwithstanding, RC must assume the subject-independent reality of other subjects before it can make any appeal – political, epistemic, or explanatory – to those others. This, I imagine, is the common intuition of everyone ever puzzled by von Glasersfeld's explanation of his current inability to walk through a desk⁵ or, relatedly, Humberto Maturana's hypnotically poetic account of his own mother (along with the rest of the world) as reducible without remainder to a set of subjectively agreeable operations or distinctions (Maturana 1988: 27–30).

However, my negative assessment of RC's viability, which will no doubt strike many readers as all-too-quick, must also consider the prominent notion of constraining "other" that every radical constructivist readily accepts. These are the "others" (often quoted, I suspect, to under-

mologically speaking) my speculative, inferential, experiential (perceptual and conceptual) access to that overarching, sustaining world (myself and those things at all dependent on me for their nature or existence now included) serves as the best (most viable, useful, intuitively plausible, or rational) explanation of all that I think, say, and do.

4| Even were von Glasersfeld to express a surprising (some might legitimately say *paradoxical*) lack of interest in the theory's generalizability, "rightness," or very status as a *theory* (as indeed he occasionally has), RC-as-personal-monologue clearly cannot be the working assumption of those moderating and contributing to the current discussion of RC's prospects for "going mainstream."

5| Von Glasersfeld writes: "That the desk constitutes an obstacle to my physical movement is due to the particular distinctions my sensory system enables me to make and to the particular way in which I have come to coordinate them. Indeed, if I now could walk through the desk, it would no longer fit the abstraction I have made in prior experience. This, I think, is simple enough. What is not so simple is the realization that the fact that I am able to make the particular distinctions and coordinations *and establish their permanence in my experiential world*, does not tell me anything other than the fact that it is one of the things my *experiential reality* allows me to do" (Glasersfeld 1991: 6–7).

score the constructivist's rejection of ontological or metaphysical commitment⁶) von Glasersfeld variously describes as "very special" constructions, fictional posits, or "hypothetical (as-if)" denizens of one's "experiential world." So perhaps constructivists and realists are simply using different terms to describe the same kind of experiences: "are posits not constructs" after all (Glasersfeld 1993: 58)? Why not see these posited "others" as something akin to the "heuristic fictions" (Glasersfeld 1996: 19)⁷ of Kantian metaphysics?

1. On fiction and reality

Posits (imputations, fictions, as-if hypotheses, etc.) are surely constructs. But what matters here, especially in the context of a discussion of RC's general acceptance, is the *intended content and ontological status* of the posit itself. Since fiction derives its meaning from being distinguishable from the real (its *unreality*), the two are logical contradictories (everything must be either real or fictional, but not both; and if it is one, it is not the other).⁸ Therefore, the depths and insights of Kantian metaphysics aside, it is at best a misleading metaphor to label explanations of powerful, seemingly invariant experiential constraints "fictions" (heuristic though they may certainly be). When I posit ghosts in an effort to frighten gullible children or superstitious adults, I am invoking a set of unsavory fictional entities in order to produce a desired effect. When I posit micro-particles to round out

6| I will use the terms ontology and metaphysics interchangeably to denote the theory of being or existence, of "what (we or I *think or assume* – necessary qualifications that ought never to discourage any theorist) there is."

7| It should become clear presently, if it is not immediately self-evident, that "heuristic fictions" ought never to be confused with speculative, ontological assertions or "working (nonfictional) hypotheses." Ignoring or denying such all-important distinctions (like the basic one between our theories of the world and the world itself) is a hallmark of antirealist literature.

8| The genre of children's literature called "realistic fiction" is simply a proper subset of fiction.

a physical theory, or posit other persons to explain my own birth, acquisition of language, or receipt of an email from the editors of *Constructivist Foundations*, I am invoking (perhaps directly or contingently unobservable) entities that, I presume, exist and have a nature capable of assisting me in understanding other (more direct) observations. Expressing ontological commitment in this way is not peculiar to realists; it is what we all invariably do.

Of course, I could be mistaken in each instance (about the nature or very existence of ghosts, micro-particles, or other persons). Hypotheses (posits, constructs) of all kinds are inherently speculative and fallible. Here, from the vantage point of the thoroughgoing skeptic (a frequent player in von Glasersfeld's longstanding rejection of realism), theory is daring. Indeed, the skeptic is entitled to see every perceptual experience and empirical claim as daring (that is, as inductively or abductively exceeding the data). But the possibility of error does not erase genuine (honestly reported) ontological commitment. That is, if I posit others to explain my experience of an invariant, seemingly external force or constraint, I *really do believe* that those others exist and have something like the nature I ascribe to them. If I do not take these others to be real, but merely fictional, I would either be lying or implicitly numbering myself among the gullible or superstitious, who alone might construe fictional others as invariant internal, rather than external, constraints.⁹

Perhaps I have overlooked this other permutation: might I construe these fictional posits as real (or real posits as fictional)? Neither is a conceptual possibility. Since fiction and reality are logical contradictories (no real entity is at the same time entirely fictional or unreal), the principle of noncontradiction clearly blocks any skeptical move to equate the two, or to suggest that any given posit is both (purely) fictional and real at the same time. The most any of us (skeptics included) can say with

9| Of course, I might posit scary *thoughts of (fictional) ghosts* in the minds of others (whom I am then positing as real). But positing *ideas of ghosts* is not an instance of positing *ghosts* (however much the apparent viability of RC might depend on confusing the two).

respect to any given posit is that we may be wrong in our judgments of its fictionality or reality.

Moreover, the fallibility of all human perception has no bearing on the basic difference between what I intend as a fictional posit and what I intend as a real posit. When I posit “others” as autonomous beings like myself in order to explain a seemingly invariant obstacle to constructing the world in any way I please, I am expressing my (fallible) ontological commitment to a set of beings that actually exist and have a nature (perhaps very much like my own), and decidedly not (as in the case of ghosts) simply invoking imaginative, purportedly nonexistent, purely subjective, or fictional entities in order to satisfy some personal desire or inclination. Likewise, the radical constructivist who expresses his or her honest belief that other cognizers are, or may possibly be, an invariant source of constraint on our conceptual constructs, is expressing precisely the same kind of ontological commitment to those others.

The careful reader should now be able to supply the next, constructivist round in this imagined dialectic: “But are these ontological commitments not *commitments*?” Indeed they are. Here, as before, the debate between realism and radical constructivism threatens to evaporate, as fallible, ontological commitment to the existence of independent, constraining, nonfictional entities (such as others) implied by our honest, well-informed assertions is all that anyone could ever ask for! Indeed, at the moment of its invocation of *independent others*, radical constructivism loses its qualifying adjective and collapses into realism. And the reason for that should be obvious: the nature of constraint is always temporal and ontological. Constraining others must not only exist (in some form or other), but pre-exist any particular construction of them and, therefore, not be reducible without remainder to any prior acts of similarly constrained construction.

In fact, these conditions mark the very distinction between *constraint* and *construction*. If, as von Glasersfeld frequently maintains, (known) “others” are simply constructed others, then all of his (rational) utterances about others (and the observer-independent world generally) amounts to

the claim, “My constructions appear to be constrained by other constructions of mine.” This is an interesting (psychological, epistemological) claim for sure, but one that momentarily forgets and thus fails to explain von Glasersfeld’s other, equally ubiquitous, characterization of those posits or imputations as both *necessary and seemingly independent*: in other words, that his experience is such that it invariably seems “as if” he is not alone, a larger world containing and constraining his experience.

Hopefully, the previous two paragraphs will have stolen some of the persuasive power of the expected reply: “But, you forget, mine is a theory of knowing, not a speculative account of being. As an ontological agnostic, I neither deny nor affirm this so-called ‘independent world,’ since that is something about which I cannot rationally speak, whether positing ‘realities’ or ‘fictions.’ The burden, therefore, falls to you to show me how I could know any such thing.”¹⁰ There

10| In line with my expectations (and despite my hopes), this appears to be the view of one anonymous reviewer who suggests that I have succeeded only in hurling a barrage of convoluted arguments at the wrong target; arguments that would perhaps have been more appropriately directed toward something von Glasersfeld explicitly rejects (solipsism) or labors to avoid (theories sporting an ontological or metaphysical dimension). On the assumption that I have failed to notice von Glasersfeld’s ontological neutrality (or nonmetaphysical epistemology), I am counseled to heed von Glasersfeld’s actual words, namely: “I have never said (nor would I ever say) that there is no ontic world, but I keep saying that we cannot know it (Glaserfeld 1989c: 17). Although I do understand the radical’s desire to embrace an “epistemology without metaphysics” (von Glasersfeld’s phrase), I simply judge the effort to be self-reflexively inconsistent (and, therefore, logically and fatally flawed). In my view, making fallible reference to at least some determinate features of the observer-independent world (and not just agnostically refusing to deny its existence) is a condition of the very intelligibility of any theory of knowing, RC included. I claim, in short, that extra-experiential elements of the “ontic” world von Glasersfeld claims he “cannot rationally know” and should remain silent about he must and certainly does know and indeed constantly invokes in his account of the mental operations and conditions facing himself and knowers everywhere,

are several problems with this response. First, as I have argued above, von Glasersfeld joins the rest of humanity in constantly and unavoidably expressing his ontological *commitment* to an extra-experiential world in his every nonfictional posit, “as if” metaphysical assertion, or hypothesis concerning the apparent independence of that world. So much he sometimes seems willing to admit (although more frequently denies).

Second, and what von Glasersfeld repeatedly fails to notice, is that (absolutist caricatures of realism aside) this kind of honest expression of ontological commitment to independent, constraining entities (such as necessary others) within a theory of the world *more than satisfies* the realist’s demand that our theories make reference – however fallibly or tentatively – to that world. Third, constructivists are prone to confuse two very different notions of independence denoted by the phrase “independent world.” When a knower posits something as a nonfictional, independent constraint, he or she is not (mystically, poetically, or in some God-like fashion) suggesting that he or she divines the object as existing in some impossibly transcendent, absolute realm of pure being. Rather, the knower posits an (nonfictional) independent constraint each time it appears as if the world is greater than his or her experience of it. So, the only legitimate source of any constructivist enthusiasm for Ludwik Fleck’s aphoristic dismissal of “independence” is his unfortunate characterization of reality (or, what I think he means to say,¹¹ of our knowledge of reality) as “absolute”:

“Of what should absolute reality be independent? If you want it independent of humans, you should consider that it would then be useless for humans.” (Quoted in Glasersfeld 1989a: 435)

the pragmatic success and failure (viability) of his and our constructions, and, especially important in this instance, the related notions of necessary constraint and sociality.

11| I’m not sure what to make of the notion of absolute reality. It certainly plays no role in my realism. It seems undeniable that things are self-identical (for all A, A=A). With that in mind, I suppose someone might be inclined to say, with respect to whatever there is, that it is *absolutely* whatever it is.

All talk of “*absolute* reality” (and similarly qualified knowledge, proof, truth, etc.) is simply a distraction designed to represent the everyday, speculative ontological posits of the realist as quasi-religious, inherently dogmatic, or, at best, naïve but ultimately useless references to some ugly neologism like “the World-as-it-is-in-itself-with-a-capital-W.” But the simple (non-absolute, small-t) truth is this: given von Glasersfeld’s speculative invocations of experience-independent obstacles such as “others,” he is no more an agnostic about that constraining independent world than are his realist critics. (I offer more thoughts on “ontological agnosticism” in section 6 below.)

Finally, von Glasersfeld’s notion of “rational knowing” embodies a selectively applied bias against induction (reasoning from evidence to only probabilistic conclusions), which sees that mode of thought, like the notion of “absolute reality,” as forever irrational, mystical, or naïve. The central tenets of realism are no doubt arrived at inductively (or abductively, reasoning from the perceived effects to their likely causes). There is a long and rich debate in the history of philosophy about the (ir)rationality of induction. Fortunately, I needn’t take up the details of that fascinating debate here, since von Glasersfeld’s insistence on the necessity of certain constructs (nonfictional others, a posited “real” world, etc.), together with the fallible ontological commitments they prefigure, places him squarely in the same (rational or irrational, however the debate over induction may turn out) camp as the realist. Therefore, we can dismiss as false the persistent charge that realists differ from radical constructivists as the former attempt, irrationally and in the language of the mystics or poets, to speak the unspeakable or think the unthinkable. At any rate, it is no more or less “irrational” to predict the path of the second hand on my watch than to talk of features of the world informing or shaping, but not fully present to or constructed by, my experience.

As I first argued in 1993, von Glasersfeld’s troublesome account of others (and the world generally) is an instance of RC’s characteristic lapse into a contradictory anti-metaphysical metaphysics, one that self-inconsistently permits reference to observer-independent, extra-experiential sources

of constraint – including other cognizing subjects – on the activity of the otherwise “isolated” subject (Johnson 1993). About the apparently universal need to recognize these constraining others, von Glasersfeld writes:

“Every individual’s abstraction of experiential items is constrained (and thus guided) by social interaction and the need of collaboration and communication with other members of the group in which he or she grows up. No individual can afford not to establish a relative fit with the consensual domain of the social environment.” (Glasersfeld 1991: 8)

At the same time, however, RC’s isolationist (radical) pole insists that each of us is the sole author of our “social environment”:

“...the subject creates not only objects... but also others.” (Glasersfeld 1989a: 447)

“...not even language enables a cognizing subject to get beyond the boundaries of subjectively constructed experiential reality.” (ibid: 14)

Clearly, von Glasersfeld’s fallible ontological commitment to these others, entailed by his assertion that we must each face similar constraints, places him as far “beyond” the boundaries of his experience (a truly unfortunate phrase, implying as it does the conceptually absurd “unexperienced experience”) as anyone should ever hope to go. (If I have been at all convincing, the reader should no longer find entirely distracting typical disclaimers such as “my thoughts of these ‘others’ are simply *my thoughts* after all.”) But the point is this: positing or hypothesizing real others to explain our *conception* of “others” exceeds the immediately available evidence by employing the same sort of inductive, speculative reasoning that leads us to suppose that others are the source or best explanation of audible laughter or knocks on the door (or that my second hand will again point to twelve in what will seem to me like a minute’s time). Making a mystery of such familiar inductive inferences confounds the debate, not only for radical anti-metaphysicians, but for any would-be *social* constructivists,¹² for whom

12| A note on “social constructivism”: though often uncritically antirealist with respect to the nonsocial world, social constructivists by

the existence of autonomously existing *others* is an obvious precondition. In von Glasersfeld’s own words:

“... introducing the notion of others raises a problem for constructivists. If what a cognizing subject knows cannot be anything by what that subject has constructed, it is clear that... the *others* with whom the subject may interact socially cannot be posited as an ontological given.” (Glasersfeld 1989b: 126)

And as I have labored to show (and will qualify and extend below), positing others as ontological givens and thereby (inferentially) “getting beyond” subjectively constructed “experiential reality” is precisely what von Glasersfeld does and must do.

2. On misunderstanding radical constructivism

As always, I appreciate this opportunity to speak directly to those seeking a radical alternative to realism. But, having assessed RC along these lines for the better part of two decades, I have little reason to believe that this short essay will have much influence on those constructivists determined to see any form of realism as errantly absolutist, naïve, mysterious, or intolerant. So, let me pause momentarily to consider directly the recurrent charge that I (and other like-minded theorists) have failed to understand the basic thrust of von Glasersfeld’s view; that I have, perhaps, overlooked the true nature of its ontological innocence or ag-

definition invoke, presuppose, or imply the irreducible, ontological plurality of knowing subjects (“we jointly construct the knowable world”), in contrast to the Cartesian (subjective, radically skeptical) ontology of the isolated knower and his/her individual constructions (“the knowable world is my construction”). The main point of the preceding analysis has been to show that sociality (and the extra-subjective world generally) is not available to the radical. As defenders of RC turn to “the social” or other “seemingly independent obstacles” to avoid solipsism or assuage recurrent critiques of its subjectivist ontology of self-and-its-constructions, they court contradiction. That is, the implied hybrid theory of *radical-social-constructivism* is self-reflexively inconsistent.

nosticism, its “untruthed,” autobiographical, or merely rhetorical status, its willingness, in the spirit of selfless cooperation, to embrace the realist’s claims about the world as good poetry, mysticism, or an odd but tolerable nod in the direction of the ineffable, etc.

Realists and anti-realist constructivists alike frequently deliver surprisingly impassioned defenses of their views. Many, including von Glasersfeld, will continue to object that my account of human knowledge misguidedly or with ill-intent smuggles realist metaphysics or other irrelevant, intolerant, or mysterious monstrosities (the threat of solipsism, objectivity, “truth-with-a-capital-T,” the “really” real, etc.) into what would otherwise be a pure epistemological analysis (free, moreover, of any pretensions to truth or “Truth,” “objectivity,” universality, etc.); and, as a consequence, that I have radically misunderstood the radicalism of his view. Paradoxical though it may be to find fault with (let alone recognize) critical *others* on any of these grounds, I suspect that several other responses to the editors’ query will take precisely this form. But, even were the present account to suffer from these or related defects, it remains true that the many honest efforts to comment on, render consistent, unearth the tacit metaphysical foundations or ontological presuppositions of RC will not, in every instance, signal a misunderstanding or ill-informed rejection of the theory.¹³ Indeed, the persistent injunction to judge RC only by its own “internal” suppositions is doubly wrong. First, as I see it, RC is in many respects – and not simply by virtue of its would-be social status – self-reflexively inconsistent; that is, rather like the radical internal critique of neo-classical economic theory, no “outside” considerations are required to illuminate its structural defects. Most centrally, and as the irreducibly plural nature of sociality and the foregoing account of ordinary ontological commitment confirms, the principal contention that RC

13| Though, of course, misunderstanding commonly occurs (on both sides). For example, while frequently compelling, both Saalman’s (2007) meandering “critical realist” take on RC and Dykstra’s (2007) heroic efforts to demolish a strawperson characterization of realism-in-the-classroom suffer from just this sort of unfamiliarity with the details of the debate.

provides an epistemological description of subjective experience free of all metaphysical or ontological suppositions is false.

I recognize, of course, that von Glasersfeld explicitly claims never to be denying the “real” or experiencer-independent world, preferring instead to be “agnostic” about its every feature or very existence. As laudably unpretentious or uncluttered as this might initially sound, his brand of “ontological agnosticism” does not and could not succeed (for the reasons adduced above and augmented below) in articulating a consistent theory of “knowing without metaphysics” (Glasersfeld 1989c). Furthermore, and as I explain in the penultimate section of this essay, such a view – were it even conceivable – would offer no protection from the threat of (equally inconceivable) subjective idealism or solipsism (views von Glasersfeld repeatedly, and wisely, rejects or describes as irrelevant to his project). Ironically, and as a consequence of these internal difficulties, a faulty epistemological theory – especially one plagued by a crippling and axial mystery such as RC’s supposedly agnostic account of a purely subjective yet necessary concept of an “other”¹⁴ – may require (real) “outside” help. To believe otherwise, to reject on principle any deviation from the foundational aspirations or features of a theory, is to court pure, anti-intellectual dogma. In this way, realism’s fallibilistic, abductive inferences to experiencer-independent objects, relations, and persons are meant to inform or reform along relatively non-skeptical, non-

14| I assume a necessary condition of being an “other” is to exist and have a nature that is not fully reducible to von Glasersfeld’s constructions, notions, ideas, concepts, experience, etc. of that “other.” That, of course, is simply what other means (it is, in this context, shorthand for “a person other than me”). More substantively, only independently existing others can fulfill the explanatory role required of a necessary experiential constraint. And when the constructivist falls back on the predictable “but all I want to say is that it appears *as if* positing these others along with the so-called ‘real’ world is necessary to explain my experience,” I happily reply, “That’s wonderful! It appears as if we finally agree: realism is the only viable explanation of our common experience of the world.”

solipsistic and commonsensical lines – not to bludgeon, talk past, or pervert – RC.

I have now outlined my case against RC in the context of the “problem of the other.” However, in an effort to dispel any lingering suspicions that these criticisms are irrelevant to von Glasersfeld’s actual concerns, I wish now to trace the foregoing conclusions to the very foundational assumptions of RC.

3. On radical constructivism principle #1

We can trace the “mystery of the other” directly to von Glasersfeld’s oft-quoted “two principles of RC,” the first of which is perfectly compatible with non-radical epistemological realism. My preferred reconstruction of RC would have us reverse the acronym and embrace *constructivist realism* (hereafter, CR).¹⁵ Indeed, CR emerges partly in recognition of von Glasersfeld’s proper emphasis on the active and inherently subjective nature of the knowing process. The first, “trivial” principle of constructivism

RC Principle #1: “Knowledge is not passively received but built up by the cognizing subject.” (Glasersfeld 1995: 18)

could just as easily double as the first principle of an ontologically robust CR. It’s important to note, in light of von Glasersfeld’s unfortunate characterization of Principle #1, that there is nothing at all trivial about our interest in so-called “trivial” constructivism.¹⁶ RC Principle #1 rightly dismisses

15| My recent book (Johnson & Silliman 2009) defends and articulates in dialogue form the constructivist realist (CR) alternative to RC first proposed in Johnson (1996).

16| Are obvious-sounding claims such as “everything said is said by someone” (Maturana 1987: 26) equally nontrivial bases on which to reject realism? Every view of the world is a view of someone, about something, and from some spatio-temporal location. Nevertheless, from these prosaic claims alone nothing of (especially antirealist) interest logically follows about what can or cannot be known. In particular, it does not follow that we cannot know, talk about, or refer to the world as it is independent of our experience.

as naïve or errantly collectivist accounts of knowledge formation that are entirely passive – where the world magically stamps its nature on our minds and bodies; or, in Richard Rorty’s famous phrase, where mind simply and accurately mirrors the natural world (Rorty 1979).¹⁷ Concept formation, and making rational sense of experience generally, is an active process (set of “constructions,” “operations,” or distinctions) of each observer or knower.

At this early stage of its development, constructivism is silent on the question of the ontological status of the objects of experience: however much it is *my* product, what is my experience *experience of*? Ought I to believe that I am (as the greater part of philosophy, science, and common sense would have it) experiencing something that exists and has a determinate (perhaps evolving) nature independent of myself (in particular, some aspect of the objective, or extra-subjective, world)? Does Principle #1

What does follow is the related, second-order and skeptical worry that we might not know, and therefore should in all fairness remain agnostic about, whether in any particular case we have been able to say or think anything about the world as it is independent of our subjective experience. (I discuss selective and global agnosticism as two very different responses to the skeptic below.) But this kind of limited skepticism is no threat to realism for two reasons. First, realism supplies the very condition of intelligibility for all varieties of skepticism – if there were no world, there would be nothing to be skeptical about. And second, many of our speculative, referential claims about the world receive experiential confirmation as we infer abductively from successful or unsuccessful action to the external conditions for the truth of these representations. In general, we cannot derive any substantive conclusions from mere tautologies. For example, “I can only know what I know,” does not entail (or even suggest) “I cannot know independent objects,” any more than “I can only see what I see” entails “I cannot see the tree.” For a detailed analysis of this surprisingly pervasive fallacy, see Stove (1991).

17| But Rorty equally famously fails to identify the real problem with all such metaphors – the conceit that knowing is a kind of passive or infallible reflection of the way things are, in contrast to the necessarily speculative and active nature of our attempts to know something of the external world and our place there.

apply to me and my experience alone, or do I have reason to think that this is the situation facing all knowers? Are there any other knowers? The apparent subjectivism and individualism of Principle #1, in the context of our discussion of sociality, demands that we address these questions. But first, we note also that Principle #1 is silent on the ontological status of the “experienter” or knower:

“RC has never made any bones about the problem of the subject that generates percepts, concepts, and the structure of the experiential world. It is that mysterious spot where awareness arises and experience begins. From my point of view it lies at the interface of the rational and the domain of the mystical to which reason has no access.” (Glaserfeld 2007: 7).

Before we accede to von Glaserfeld’s poetic turn, we should ask: what is the source of the “mystery” of the subject? The answer anticipates a second basic principle of RC – that the only world one can know and talk about is but a construct of the lone subject. A simple (yet fatal) reflexive turn in constructivism would see the subject, too, as a construct of the subject, but this entails the markedly anti-constructivist (that is, realist) assumption of a pre-existing subject able to construct the subject who constructs the world of experience. And who constructs the subject-constructor, and so on *ad infinitum*? The only alternative seems to be for a fully constructed subject to appear *ex nihilo* – a magical cure surely worse than the infinitely regressive disease.

Now, for any given epistemology (or theory of knowing), what holds for the one knower surely holds for all knowers; that is, *the “mystery of the subject” is equally a problem for all subjects*. Indeed, though it is an undeniable consequence of constructivism’s radical turn, it is rarely acknowledged that the “problem” (mystery) of the other is equally the problem of all subjects (all others), the problem of any and all objects or relations that exist (or ever have existed) and have a nature independent of the one knower, and perhaps even the problem of the nature and existence of every conceptual structure not currently present or accessible to the one knower’s mind.

4. On radical constructivism principle #2

CR sees this enigmatic exercise as a consequence of the assiduously radical rejection of experience-independent real (nonfictional) things and relations, or what is sometimes misleadingly dubbed MIR (metaphysical, independent reality),¹⁸ contained within von Glaserfeld’s famous follow-up assumption:

18| I have argued previously on another forum (Herbert Muller’s Karl Jaspers Forum) against the continued use of MIR and in favor of SIR (subject-independent reality) and HIR (human-independent reality). What realists affirm and radical constructivists purport to deny is SIR and HIR; not MIR, an old-fashioned, ambiguous notion best ignored. Furthermore, the only issue that divides CR from RC is SIR, subject-independency (which CR affirms and RC denies), since HIR, human-independency, presupposes, contrary to radical constructivist scruples, the autonomous existence of others. That is, realists, who support (talk of) the autonomous existence of others (and the world), are entitled to assert HIR (as well as SIR); radical constructivists, by their own lights, are barred from such claims. However, as I noted above, “mind-independence” in the sense applicable to the present debate, as von Glaserfeld and others so often fail to notice, is not “independence” *sans* phrase “MIR”, but *subject-independence*, and so applies to any possible object of thought, even those dependent on *us* for some aspect of their natures (that is, human-dependent reality). So, far from invoking any kind of ineffable “beyond,” I suppose only that any object, including mind and its many products, can exist and have a determinate nature independent of any particular subject; that is, all of these Johnson-independent objects are the proper denizens of SIR. In other words, it is not “independence of us” that is at issue in the debate between realists and radical constructivists (HIR), since “us,” just like the very notion of HIR, denoting as it does the independent existence of at least one other person, is a notion available only to the realist (or realists masquerading as “social constructivists”). Though this all sounds (at least to me) rather unexceptional, it is important to recall that radical constructivism – when it is not tacitly assuming the (realist) position it hopes to replace, rejects it all, including MIR (which, perhaps, it should), HIR, and SIR. See Johnson (2005a).

RC Principle #2: The function of this process of learning is adaptive, and serves the knower's organization of her own experiential world, not the discovery of an objectively existing ontological reality.

Though not at all opposed to seeing all processes of learning as essentially adaptive (as another evolutionary, biological process), CR encourages us to suppose, in concert with the greater part of science and common sense, that the constructing subject (along with its many objects – including other subjects) is not itself merely a construction. Rather, it is a being that first exists as a precursor to its many later constructions (a developing human, for example, who begins not as a “construct” but a fertilized product of two other subjects) and subsequently as the active generator of those constructions (including percepts, concepts, and all the ideational furniture of that human's “experiential world”).

If this naturalistic, familiar account of the cognizing subject is on the right track, then, and contrary to von Glasersfeld's words, it is never the “subject *that* constructs...” but always the subject *who* constructs his or her experiential world. Most simply:

Realist Principle of Subject Independence (RPSI): The subject and others (hereafter, simply and interchangeably “subjects” or “others”) exist independent of (many of) the subject's constructions.¹⁹

In other words, all subjects are part of the objectively existing, not fictional, “ontological reality” dismissed as unknowable in RC Principle #2. Ontologically speaking, objective simply means extra-subjectively existent or extra-subjectively real – the supposed ontological status of those posits we commit ourselves to as we describe them as “real.” (Of course, many things are only subjectively real, hence non-ob-

19| And not, as prevailing misrepresentations of the realist project would have it, that (a) the subject exists independently of the subject; or (b) that the subject's constructions exist (entirely) independently of the subject; or finally (c) that no aspect of the subject is the subject's own construction.

jective.) “Reality” and “truth” – two terms often condemned as inherently intolerant, old-fashioned, or mysterious – are neither eliminable nor unfortunate holdovers of a discredited philosophical tradition. After all, even radical constructivists must understand its two foundational principles as truthful (rather than false) accounts of experientially *real* (rather than purely fictional) aspects of its theory.²⁰

Others are the conscious conceivers and perceivers of our world; most usually (in these and other species-specific discussions), they are sentient, conative, human animals. While mysteries remain about the fine structure of these subjects, their thoughts, and their world, the basic notion of a subject is hardly mysterious. We not only know what subjects are, thanks in large part to the various human and natural sciences, but that the world currently contains about 6.5 billion of them.

20| The radical (who has not yet given up on my analysis) may very well reply: “but, unlike your mysterious access to some ‘beyond,’ at least these ‘experiential realities,’ as you call them, don't pretend to exceed the limits of the mind that thinks them!” This is a common misconception, for which the history of absolutist or naïve claims for realism bears at least partial responsibility. Realism, as I understand and employ the theory, is not absolutist, impossibly transcendent, or mystical. Ontological claims (including realist claims, of course) are, or ought to be, speculative and testable (in terms of the observable differences that would result if they were true). But notice: very few things outside of logic and other formal systems can be known absolutely (infallibly, perfectly) or with certainty (the psychological state of being unable to doubt), including many, if not all, of our internal states. So, if certainty were the standard of all legitimate knowledge, realism and constructivism (in fact, all epistemological views, including, for example, Merleau-Ponty's enigmatic phenomenalist reduction of material objects to qualifications of possible or actual experience) would suffer alike. Often glossing this latter point, the tendency in antirealist circles is selectively to condemn realism for a constitutive limitation of all empirical inquiry.

5. On the “mystery of the (other) subject”

Admittedly, the language of RPSI is ambiguous. For the realist to say that subjects exist independently of their constructions is to locate those subjects along with all other independently existing objects or relations in SIR (see note 19), or subject-independent reality. Now, what exactly does it mean to talk of the “subject-independent existence of subjects”? Certainly not that the subject exists independently of itself. Independence, if it is to mean anything at all in this context, could only mean *existing independently from (much of²¹) our experience*. So, von Glasersfeld's mystery of subject (along with the entire universe of extra-subjective things and relations – human-independent reality, or HIR) is actually the mystery of the experience-independent existence of the subject. I will, therefore, parse von Glasersfeld's mystery of the subject (MOS) in the following way:

MOS₁: The (mostly) experience-independent existence of subjects is a mystery.

The concept of “experience-independent existence” requires further clarification. Since it can mean either existing independently of my experience or existing independently of all experience, we now have two further, less ambiguous candidates for our critical attention:

MOS₂: Whether subjects can exist (mostly) independently of my experience is a mystery.

And

MOS₃: Whether subjects can exist (mostly) independently of our experience is a mystery.

21| I employ the qualifications “much of” and “mostly” to reflect the logical truth that no (experiencing) subject exists entirely independent of all experience (in particular, his or her own). However, in a non-solipsistic universe each of us exists as essentially (not necessarily in every detail) independent of every other subject's experience.

Now, despite the familiarity of utterances akin to MOS_3 and notwithstanding all of von Glasersfeld's seemingly extra-subjective ontological commitments noted above, the truly radical constructivist, in order to avoid contradiction, ought never to accept the robustly realist assumption of a plurality of subjects contained in MOS_3 . For to do so would be to commit oneself to the existence of several experiencers (or subjects). Most importantly, barring the assumption of a collective mind or grand experiencer that creates and sustains parts only conceptually (not ontologically) distinguishable as individual "subjects," the phrase "our experience" entails the *independent* existence of separable subjects. That is to say, of course, that MOS_3 is self-reflexively inconsistent: the clearest imaginable answer to the purported "mystery of the (other) subject" is contained within the sentence itself!²² That is, on simple reflection, no rational person – neither constructivist nor realist – ought to make such claims.

Only MOS_2 remains. Quite apart from any logical concerns with MOS_2 , von Glasersfeld's preference for ontological agnosticism – however problematic or erratically applied – no doubt inclines his view to the more Spartan ontology of MOS_2 with its singular-sounding subject. So, for any number of reasons, MOS_2 emerges as the best option for the radical constructivist.

But clearly MOS_2 has its own set of problems. First, the problematic object of knowledge in this case ("subjects") has at least the appearance of an assumed plurality, and so threatens to undermine the subjective ontological innocence implied jointly by RC principles #1 and #2. Second, asking whether these subjects can exist independently of my experience when, for all I know, I am the only subject, sounds very much like asking whether some aspect of my experience can exist independently of my experience, an obvious enough contradiction in thought. Now a lot rests on the phrase in the previous sentence "for all I know," and von Glasersfeld and his followers will not hesitate to point out that I have failed (yet again!)

22 | MOS_3 is a clear example, first mentioned in note 19, of contradictory use of HIR ("our ideas") in calling into question SIR ("anything independent of me").

to consider the possibility that the question might be posed by one who succeeds in remaining consistently agnostic about the number of real or existent subjects: "Perhaps I am alone; perhaps I am not. I care not to say; for I have no metaphysical ambitions at all."

6. On solipsism and ontological agnosticism

This leads us to a third (and the gravest) problem for MOS_3 ; one that involves the specter of solipsism – a persistent (if ultimately misplaced) thorn in RC's side. Von Glasersfeld's position on solipsism is equivocal, since he variously suggests that RC "refutes" (on the basis of "daily experience"²³) or (as a theory of knowing, not being) "has nothing to do with" this homely outlook (Glasersfeld 1989c). Most frequently, however, he offers a variation on the second strategy, and moves to dismiss the recurrent charge of solipsism, not by invoking or inferring anything determinately extra-von Glasersfeldian in his experience (which I obviously think he should and, in the end, does do), but by claiming to remain "neutral" with respect to the existence and nature of anything beyond his experience. That is, realism's rejection of solipsism is a direct consequence of its ubiquitous inferences from individual experience to likely features of a larger, constraining, extra-experiential world. Obviously, and in keeping with his radicalism, von Glasersfeld must limit all of his (knowledge) claims to claims about his own experience. Note also, that in order to serve as an alternative to realism's principle of subject independence (RPSI, above), ontological neutrality must be exhaustive or global, extending over all objects and relations purportedly existing and having a nature independent of any one subject's experience. This kind of global ontological agnosticism (GOA) differs greatly from its more modest and perfectly agreeable cousin – selective ontological agnosticism (SOA),

23 | "[Solipsism] seems easily refuted by the simple consideration that our world is hardly ever quite what we would like it to be and, what is more, the 'real' world has some rather nasty ways of treading on our toes" (Glasersfeld 1989a: 437).

where a subject, embracing a modestly skeptical outlook, might choose to remain neutral on the experiencer-independent existence of any particular object or relation.

SOA, like the cognate concept of selectively applied skepticism noted above, is nothing other than the fallibilistic imperative ingredient in rather ordinary, commonsense realism. But the radical in von Glasersfeld must see SOA as naïve or irrational (once again, because of its supposedly mystical access to a world of things and relations beyond the lone subject-as-constructor). Just as he labors to make a mystery of others existing apart from his constructions, he favors GOA's more expansive capitulation to the skeptics, refusing to admit, finally, as real anything at all that might escape his mind's capacity for immediate inspection, construction, and verification. The challenge now facing von Glasersfeld is to find in such bare-bones metaphysics even the slimmest basis for rejecting solipsism.

Von Glasersfeld will no doubt counter that I have deliberately, or by virtue of the exercise of some naïve realist blind spot, failed to notice some more fitting version of neutrality or agnosticism; one that sports an exclusively "epistemological" character and is capable of rebuffing solipsism, free of any metaphysical referents. In response to my suggestion that GOA is either a cognate or simple expression of solipsism, von Glasersfeld writes:

"I submit that the rejection of all claims to *know* experiencer-independent objects or relations has nothing to do with solipsism, because solipsism designates a belief about *being* whereas the agnostic's rejection concerns *knowing*." (Glasersfeld 2005: 1).

There are several problems with this response. Solipsism, as a "designator of beliefs," is the epistemological-ontological thesis that limits both what there is (and, therefore, what I can possibly know) to the lone subject. *There can be no purely ontological form of solipsism or any other view, since it would be, after all, a view of someone.* As von Glasersfeld recognizes, global ontological agnosticism (GOA) neither affirms nor denies the existence of all things external to the (lone) subject and his or her constructions. However, since GOA shares with Des-

cartes the reasonable (I think unavoidable) assumption that the subject-who-constructs exists at each moment of construction (at the very least), GOA has this minimal ontology. I can repeat a central conclusion of my take on RC here: *there can be no purely epistemic view of anything, since it is, after all, someone's view of something.*

While I'm convinced that von Glasersfeld's "necessary others" and related invariant experiential posits place him squarely in the constructivist realist camp (and so he is no solipsist or true defender of GOA24), his frequent flirtation with GOA does help to explain RC's continued vulnerability to that charge. After all, no one could deny that solipsism's hermetic world does share a striking family resemblance to GOA's minimal positive ontology of the self-and-its-constructions.

Conclusion

So, to the editors' question, "Can RC become a mainstream endeavor?" I must reply: not in our world, and not in its current form. No one could deny the obvious truth that many (myself included) take great pleasure in and find very useful the arguments of the skeptics (von Glasersfeld included). But the only viable explanation of RC's purported or projected popularity is that all self-described radicals are in fact committed only to what von Glasersfeld misleadingly calls "trivial" constructivism (and, therefore, following the requisite amendments, to a constructivist version of realism) while the antirealist excesses simply go unnoticed. It is possible that still others enjoy the sense of novelty and freedom that often accompanies the wholesale, yet flawed, rejection of tradition (in this case, traditional realist epistemology and metaphysics, only some aspects of which we rightly abjure). Of course, trivial constructivist claims, together with the constructivist realism that substantiates and extends those claims, are entirely compatible with the progressive focus, in educational theory, philosophy, and social life generally, on diverse perspectives, versions, and ideas of the world.

24| I express concerns about the very conceivability of solipsism in Johnson (2004) and GOA in Johnson (2005b).

Von Glasersfeld is prone to eschew the philosophical terminology and arguments I employ in favor of a defense of RC underscoring its "usefulness" or "viability" (as opposed to truthfulness) or hypothetical, "as-if" character (as opposed to the mythical "absolutes" or certainties of realism). He might say: "It simply provides an added degree of conceptual viability to the various elements of my experiential world to populate it with heuristic fictions called 'others.'" But just as no one's hunger was ever satisfied by thinking about food or taking a bite of a working hypothesis, no "conceptual 'other'" ever rescued a theory from the subjectivist isolation. "Other" is essentially a linguistic or conceptual item, a name for some object, a sign, or notion. Others – like you and me – are not.

Like Robinson Crusoe surveying footprints in the sand, we have a choice: risk the sort of potential error that naturally attends speculative inquiry and join the realists (and the greater part of humanity) in inferring abductively to the subject-independent existence of others and the world generally; or risk absurdity or contradiction and join the skeptics in constructing radically subjectivist accounts of these impressions without assuming anything about the world that an isolated, inspecting observer cannot immediately confirm as his or her own product.

Constructivist realism, not global agnosticism or RC, is the only viable alternative to this lonely epistemic route. I believe von Glasersfeld is at least tacitly aware of this. It is, therefore, in the final analysis hardly surprising to see von Glasersfeld invoking the specter of subject- or experience-independent constraints at nearly every turn, either in the guise of "independent, ontological obstacles," appeals to the "necessity" of social consensus, "fitness" (a fallibilistic cognate of correspondence), or myriad other references to the way the "real world steps on our toes." In fact, and in the fashion of Berkeleyan or Kantian or Cartesian idealism, RC temporarily avoids quick refutation by exceeding its own preferred restrictions on the scope of sensible utterances. Luckily for RC, solipsism and the "incredulous stares" (Devitt 1991: 287) that often accompany such philosophical curiosities, are averted by the simple mention of a possible, mind-independent external constraint, in the fashion of (and I paraphrase) "my experiential

world appears to contain others, and perhaps, though I can't say for sure, those subjects exist independently of me."

Unluckily for RC, such claims, given their attendant, undeniable ontological commitments, run directly counter to von Glasersfeld's radicalism. Why is he, and like-minded theorists, forever defending opposing positions? Because, as I have argued for the past two decades, RC in its current form rests on a set of contradictory assumptions. He wants both to resist all positive references to a world beyond the lone knower and at the same time to embrace commonsensical, non-solipsistic reflections grounded in the recognition of a plurality of subjects and (at least the possibility of) an independent, extra-experiential world that contains and constrains those subjects. The sort of metaphysical innocence or purity von Glasersfeld periodically covets is indeed for the solipsist alone. The selectively agnostic and consistent von Glasersfeld, in rejecting solipsism and declaring his fallible ontological commitments to that world, is a metaphysical realist. Mystery solved.

References

- Devitt M. (1991) Realism and truth. Basil Blackwell, Cambridge.
- Dykstra D. (2007) Against realist instruction: superficial success masking catastrophic failure and an alternative. *Constructivist Foundations* 1(1): 49–60. Available at <http://www.univie.ac.at/constructivism/journal/abstracts/1/1/049.dykstra>
- Glasersfeld E. von (1989a) Facts and the self from a constructivist point of view. *Poetics* 18: 435–448. Available at <http://www.vonglasersfeld.com/122>
- Glasersfeld E. von (1989b) Cognition, construction of knowledge, and teaching. *Synthese* 80: 121–140. Available at <http://www.vonglasersfeld.com/118>
- Glasersfeld E. von (1989c) Knowing without metaphysics: Aspects of the radical constructivist position. Educational Resources Information Center ED304344. Reprinted as: Glasersfeld E. von (1991) Knowing without metaphysics: Aspects of the radical constructivist position. In: Steier F. (ed.) *Research and reflexivity*. Sage, London: 12–29. Available at <http://www.vonglasersfeld.com/132>



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- Glaserfeld E. von (1991)** An exposition of radical constructivism: Why some like it radical. In: Davis R. B., Maher C. A. & Noddings, N. (eds.) *Constructivist views on the teaching and learning of mathematics*. Journal for Research in Mathematics Education Monographs, Reston VA: 19–29. Available at <http://www.vonglasersfeld.com/127>
- Glaserfeld E. von (1993)** Questions rather than answers. *Cybernetics and Human Knowing* 1(4): 57–59.
- Glaserfeld E. von (1995)** *Radical constructivism: A way of knowing and learning*. Routledge-Falmer, New York.
- Glaserfeld E. von (1996)** The view from here. *Cybernetics and Human Knowing* 3(4): 18–19.
- Glaserfeld E. von (2005)** Semantricks. Karl Jaspers Forum. Retrieved from <http://www.kjf.ca/78-C30GL.htm> on 27 October 2010.
- Glaserfeld E. von (2007)** Some rash conclusions. *Constructivist Foundations* 3(1): 7–8. Available at <http://www.univie.ac.at/constructivism/journal/3/1/007.glasersfeld>
- Goldin G. (1989)** Constructivist epistemology and discovery learning in mathematics. *Proceedings of the Psychology of Mathematics Education* 13(2): 15–22.
- Johnson D. K. (1993)** The metaphysics of constructivism. *Cybernetics and Human Knowing* 1(4): 27–41.
- Johnson D. K. (1996)** The view from somewhere: A philosophical critique of radical constructivism. *Cybernetics and Human Knowing* 3(4): 3–17.
- Johnson D. K. (2004)** Subject-object fusion and idealist metaphysics. *Karl Jaspers Forum*. Retrieved from: <http://www.kjf.ca/75-R1MUL.htm> on 27 October 2010.
- Johnson D. K. (2005a)** Between MIR, HIR, and SIR: Constructivism's pronoun problem. *Karl Jaspers Forum*. Retrieved from: <http://www.kjf.ca/75-R4MUL.htm> on 27 October 2010.
- Johnson D. K. (2005b)** Constructivism de-radicalized. *Karl Jaspers Forum*. Retrieved from: <http://www.kjf.ca/78-C31JO.htm> on 27 October 2010.
- Johnson D. K. & Silliman M. (2009)** *Bridges to the world: A dialogue on the construction of knowledge, education, and truth*. Sense Publishers, Rotterdam.
- Kilpatrick J. (1987)** What constructivism might be in mathematics education. *Proceedings of the Psychology of Mathematics Education* 11(1): 3–27.
- Martinez-Delgado A. (2002)** Radical constructivism: Between realism and solipsism. *Science Education* 86: 840–855.
- Maturana, H. R. (1988)** Reality: The search for objectivity or the quest for a compelling argument? *Irish Journal of Psychology* 9(1): 25–82.
- McCarty L. P. & Schwandt T. A. (2000)** Seductive illusions: Von Glaserfeld and Gergen on epistemology and education. In: Phillips D. C. (ed.) *Constructivism in education: opinions and second opinions on controversial issues*. The University of Chicago Press, Chicago: 41–86.
- Rorty R. (1979)** *Philosophy and the mirror of Nature*. Princeton University Press, Macon, GA.
- Saalmann G. (2007)** Arguments opposing the radicalism of radical constructivism. *Constructivist Foundations* 3(1): 1–6. Available at <http://www.univie.ac.at/constructivism/journal/3/1/001.saalmann>
- Silliman M. (1994)** A separate reality: Response to von Glaserfeld. *Thesis XII: A Philosophical Newsletter* 2(1): 2.
- Stove D. C. (1991)** *The Plato cult*. Basil Blackwell, Oxford.
- Suchting W. A. (1992)** Constructivism deconstructed. *Science & Education* 1(3): 223–254.

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