

reality?" The realists' own initial assumption appears to mask the challenge of the Skeptics from them.

6 In §1, Saalmann has translated a passage of von Glasersfeld's that was originally in German as: "Instead of an iconic relation of conformance or reflectance we can apply the relation of matching." There is no example in any article in English by von Glasersfeld in which he uses the word "matching" in such a context. Von Glasersfeld goes out of his way to point out that he uses the word "fit" quite pointedly and words such as matching are not consistent with the idea he intends.² Is it possible that Saalmann made this error because he translated the original passage as a realist and not from an understanding of RC?

7 Later in the same paragraph, Saalmann suggests that while MIR and constructed truth may have different specific properties, the two are nonetheless covariate with each other. This is but a restatement of the realist *assumption*. One need only point out from the history of explanations that features of accepted explanations are covariate with sets of specific experiences with the phenomena. But when these sets of experiences have expanded, our explanations are no longer covariate with them. This disequilibrium between explanation and experience has moved us to construct new explanations. We must ask: "How would we know when there are no more expansions of the set of experiences to be explained?"

8 Still, the challenge of the Skeptics looms. How do we know that covariance with experiences also means covariance with an MIR, itself? In life we never get to see Nüse's (1995) fuel tank, how much is in it, or indeed that it is a fuel tank. We *only* get to see the gauge. This is the point of the Skeptics' challenge. Laboring under the hegemony of realism Saalmann *assumes* the fuel tank can be known. He appears to understand neither the nature of the Skeptics' challenge nor RC.

9 In §8, Saalmann refers to "perception deceptions." Such a characterization also exists nowhere in the English writings of von Glasersfeld. The possibility of a perception deception depends on the capacity to know a MIR itself. The capacity to detect a perception deception is implied by initial assumptions of realism. Such a capacity is specifically not possible from the initial assumptions in RC. Hence, the concept of perception decep-

tion is not one that makes any sense in RC. Here again, we have evidence of Saalmann working from initial assumptions of realism to formulate his critique rather than the initial assumptions of RC. By abduction, not understanding the distinction between these sets of assumptions means not understanding RC.

10 RC is accused of ambiguity (§9) and arbitrariness (§15). One notices in §11, that Saalmann concludes that a consequence of RC is that "a seemingly real complete world would be simulated for everyone" and that "this...would in turn imply that knowledge of" these worlds "would be completely *useless*" (emphasis in the original). Add these three items together and it is not hard at all to imagine that Saalmann's notion is that "knowledge" for a radical constructivist is some kind of "laissez-faire" entity. It need have no limits or constraints and still be acceptable for the radical constructivist. This is in spite of the explanation given in radical constructivist literature that our thinking is about constructing explanations of our experience. Our explanations are constrained by the fact that they have to fit our experiences.

11 Obviously, this all depends on what might be meant by the word "useless." As Saalmann himself points out several times in his piece, radical constructivists hold that they construct knowledge to fit experience, to be viable, and that, in the terms of Maturana and Varela, this constructed knowledge enables the maintenance of autopoiesis. But apparently this does not rise to the standard of usefulness for Saalmann, although it does for radical constructivists. One is left to imagine Saalmann's standard for usefulness is the achievement of a true picture of a MIR or the known approach to such. Nothing else is good enough because it does not meet realist criteria. Alas, this should come as no surprise since it is clear he is operating from the initial assumptions of realism and not those of RC.

Conclusions

12 I have pointed out that since no conclusion is logically valid outside of the initial assumptions on which it is based, we learn nothing new when realists criticize RC from realist initial assumptions. Also, given the evidence, Saalmann apparently does not fully grasp the essence of RC.

13 All of this is not to say that neither realism nor RC can be criticized. But the only net effect of a critique of RC by one who is still laboring under the hegemony of realism is to display some of the many ways RC is not commensurate with realism and not understood by the author of such a critique. To use another term from current slang in use in the U.S., *duh!*

Notes

1. From a monologue by Henry V in the play of the same name by William Shakespeare. "Once more unto the breach, dear friends, once more..."
2. Indeed, the passage should be translated as "Instead of the iconic relation of a perfect match or mirror image we may posit the relation of fit." (von Glasersfeld, personal communication).

Observations on an Observer's Attachment to the Idea of Reality

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1 As Maturana (e.g., 1987) has often reminded us, everything said is said by an observer. What I say here I say as an observer and reflects who I am, what I can perceive and what sense I am prepared to make of that. Similarly, what Gernot Saalmann says in his article is said by an observer and reflects who he is, what he can perceive and what sense he is prepared to make of that. I describe myself as an English speaking mathematics educator with a family background in neuroscience. Saalmann does not describe himself in his article but appears to be (to me as an observer) a German speaking sociologist. Given that we are different observers it is no surprise that we make different observations about radical constructivism.

2 One observation we agree on is made in §3. The authors he quotes would not all agree to be described as radical constructivist (or constructivists at all), there are important differences between them (for example in what is being constructed), and there are some significant reinterpretations of key ideas (for example, operational closure, autopoiesis,

information). I do not have space here to address all of these issues. Instead I will focus on the key point of whether an understanding of cognition can be based on the idea of “reality.”

3 I would like to focus first on the difference of language. The authors Saalmann considers radical constructivists (von Glasersfeld, Maturana, Varela, von Foerster, Luhmann) write in English, German, Spanish, Italian, and French (at least). I have read their work in English and Saalmann has read their work in German. This means that we have access to different subsets of the literature, and that some of what we read passes through translation. It is entirely possible that radical constructivism, as described in German texts, has the flaws Saalmann sees in it, while in the English texts these flaws do not exist. But I doubt it.

4 A more plausible theory to me is that Saalmann's readings of the texts he reads are strongly influenced by his emotional attachment to the idea of reality. That his attachment is emotional rather than rational has been clearly argued by Maturana (1988). And I see some evidence that it influences Saalmann's reading. In §9 Saalmann quotes a passage from Maturana and Varela (1987) which he has translated himself from German to English. Interestingly, he translates the German word “Einheiten” as “entities.” Now this is a possible translation, but a revealing one. In the original Spanish (Maturana & Varela 1984) the word is “unidades,” which the revised English edition (Maturana & Varela 1992) translates as “unities.” In the words “unidad,” “unity” and “Einheit” there is an emphasis on oneness. In Saalmann's translation “entity” the emphasis has shifted to existence. Maturana and Varela are careful writers and so I suspect that if they chose words (and their translators chose words) that suggest oneness rather than existence, they meant to do so.

5 Looking carefully at what Maturana and Varela mean by “unity” reveals some possible reasons for their choice of words. “A unity (entity, object) is brought forth by an act of distinction” (Maturana & Varela 1992 p. 40). A unity is something perceived by an observer to be one thing. That they include “entity” as synonym should not be taken to mean that “unity” for them means what “entity” does in a standard dictionary (“something that has a

real existence”). Instead, Maturana and Varela are taking the opportunity to redefine “entity” in a way that removes any reference to reality.

6 That Saalmann translates “Einheit” as “entity” tells us something about Saalmann as an observer. While Maturana and Varela begin, as cyberneticists do, with an observer making a distinction, Saalmann begins with reality. So for him “Einheit” translates as “entity,” because for him in order for something to be perceived as a unit it must be real. As with all observers, he does not do this out of malice or foolishness, but simply because his structure, constructed over the history of humanity and himself, determines that he must perceive things in that way. As his history progresses he might learn to perceive things differently.

7 I believe that this belief in reality is a legacy of the history of humanity and so common to the structures of many people. It was perhaps my history as a mathematician, exploring worlds I know to be inventions but that seem as real to me as any, that left my structure open to perceiving all unities as not necessarily real.

8 Before I dismiss Saalmann's observations on radical constructivism as constructed primarily on the basis of his attachment to the idea of reality, let me consider one point he makes where he almost, but not quite, touches on what I consider a key strength of the work of Maturana and Varela. In §27 Saalmann notes that we are all observers, even when we are observing the observations of others. This is the insight that forces a radical constructivist position on us (even if we do not call it that). If we begin to operate as scientists, systematically observing what we assume to be the real world in a reproducible way, we find ourselves observing the operational closure of the cognitive systems we observe. For example, Evan Thompson (1995) provides a useful summary of research related to colour vision and operational closure. Having observed operational closure to be a general feature of cognitive systems, we are forced to accept that it applies also to ourselves. This amounts to a proof by contradiction that observing reality is impossible. This was what brought Maturana and Varela to their position (Maturana & Poerksen 2004).

9 Finally, let me try to sum up Saalmann's observations in a few sentences. He notes (§§11, 12, 22) that the radical constructivist position does not in fact deny the existence of

something outside of the cognition of all individuals (call it “reality”). He acknowledges that it is impossible to know how appropriate human cognition actually is to that reality (§15, 28), a fact that is central to a radical constructivism position. Where he parts company from radical constructivists is in how he responds to this necessary uncertainty. A radical constructivist would suggest that instead of studying cognition with reference to an unobservable external world, it would be a better use of our energies to try to learn about observers and how they construct the worlds they observe. In this the radical constructivism position echoes Wittgenstein's (1922) “*Wovon man nicht sprechen kann, darüber muß man schweigen*. [Whereof one cannot speak, thereof one must be silent.]” Saalmann's position seems to be instead: Upon which one can know nothing, one must establish a theory of cognition. And his basis for this, as noted above, seems to be an emotional attachment to the idea of reality, against which one cannot argue rationally.

Knowledge as Experiential Reality

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Lack of systemic wisdom is always punished
Gregory Bateson (1972)

1 I appreciate Saalmann's recognition that “there are considerable differences amongst the authors” and that these “have changed their opinions in the course of time” (§3); but given this, what are the consequences for an outline of the theses of radical constructivism (RC)? Which approach is best for outlining a theory of knowing under these hindering conditions? My suggestion would be to use a method specifically developed for this kind of situation and to present it explicitly, or, if it does not yet exist, to develop one.

2 In §5, Saalmann writes about sensory stimuli as a basic assumption of RC. To support this claim he refers to a few concepts of the skeptics as well as to the biological systems theory of Maturana, Varela, and von Foerster. However, approaching RC with such a spe-