veyed – would indicate which of the various options I have listed he finds closer to his work. If any at all, that is. It is perfectly possible that I have completely misunderstood him, and our (failed) interaction would perhaps provide implicit support for one of my alternatives.

Received: 2 September 2011
Accepted: 11 September 2011

Stefano Franchi is Research Associate Professor in the Department of Hispanic Studies, Texas A&M University. He works on Twentieth century European philosophy and the history of Artificial Intelligence and cognitive science. He is the editor (with Güven Güzeldere) of *Mechanical Bodies, Computational Minds* (MIT Press 2005) and (with Francesco Bianchini) of *The Search for a Theory of Cognition.* (Rodopi 2011). He is completing a monograph on contemporary alternatives to Hegel's theory of historical development, provisionally titled *Play and Passivity.*

Moving Forward from Radical or Social Constructivism to a Higher Level Synthesis

Hugh Gash
St Patrick's College, Dublin, Ireland
hugh.gash/at/spd.dcu.ie

> Upshot • Siegfried J. Schmidt's timely article offers a fresh look at radical constructivism with an emphasis on contextually and culturally located action as an expression of knowing. Perhaps it remains cautious in making connections with neighbouring philosophical approaches. Two areas that are largely unmentioned are the issue of viability and the conceptual analysis, which remained largely on the sidelines in von Glasersfeld's later work.

« 1 » Radical constructivism, as presented by Ernst von Glasersfeld (1996), emphasised two principles: that knowledge is actively built by the individual, and that the function of knowledge is adaptive and serves the organization of the experiential world rather than the discovery of ontological reality. Von Glasersfeld applied his understanding of constructivist ideas as a philosophical clarification to work in cognitive psychology, linguistics, and education. This philosophical emphasis underplays the psychological and cognitive side of constructivism that originated in Ceccato's operational analysis (1961) of meaning with its cybernetic approach to process, though there were some papers that emphasised this type of analysis (see Gash & Riegler 2011).

« 2 » A similar conceptual model with an emphasis on action is brought out and highlighted in Siegfried J. Schmidt's proposal to rewrite radical constructivism as action in social contexts (§59–62). However, my reading of Schmidt's proposal is that the action proposed is primarily at the level of interpersonal action rather than the intrapersonal actions or operations outlined, for example, in von Glasersfeld's analysis of concepts of cause (1974a). In what follows, I comment on the helpfulness of this fresh approach to constructivism in relation to the points made above and suggest it remains cautious in its move to include other thinkers.

« 3 » Constructivism's emphasis on the organisation of the experiential rather than the ontological world has generated much discussion and when it is first met often remains a difficult idea to appreciate. Reality and truth remain vitally important to many people, and the epistemological problems associated with knowing a fully structured world that is independent of any experiencing and knowing subject remain ignored. As a result, arguments that attempt to trivialise constructivism are not infrequent in the educational sphere (Kirschner, Sweller & Clark 2006; Tobias & Duffy 2009; Larochelle & Désautels 2011) and in the humanities (Zimmerman 2006). These criticisms seem to have ignored the concept of viability, which seems to be an effective way to counter charges of relativism. In addition, Alexander Riegler (2007) suggests that order arises from internal considerations, based on work on formal networks. Given the varieties of interpretation surrounding reality and radical constructivism, it is not surprising that Schmidt raises this issue in the introduction to his paper.

« 4 » Schmidt suggests that reality may remain crucial in philosophy today (§2) because of the varieties of realities (§3) in media-culture societies. An alternative is that living systems are hard-wired to find solutions to mismatches between what is expected and what is experienced. Another suggestion is that reality is a useful heuristic or cognitive shortcut people use to make sense of experience (Shweder 1977). One way to evaluate Siegfried Schmidt's article is to see how the constructivist procedures he outlines may contribute to discussions of difference between individuals or groups. In the case of reality, for example, Humberto Maturana (1988) has previously emphasised the importance of process in distinguishing between reality and "reality in parenthesis." In the latter case, the observer's cognitive processes were taken as part of the "reality" construed; in the former, these processes were ignored. Siegfried Schmidt's proposal to rewrite radical constructivism by moving from objects to processes follows this tradition. His work is timely, coming in the year following the celebration in this journal of von Glasersfeld's life and work. And Schmidt's approach differs in providing more helpful details to consider when there are differences in opinion. Disagreements arise between individuals or groups when the assumptions made differ (§23). The emphasis on process entails that reality is replaced by what we do to make something real (§16). These are helpful details for structuring discussions about differences in understanding between individuals or groups. Further, cultural issues are clearly involved in that the actions are part of the processes that occur in communities with cultural conditions (§35).

« 5 » A recurring difficulty in talking about systemic approaches to knowing is that the speaker describing process is caught up in the process in the act of communicating. Consequently, listeners with different points of view – that is, with different positings (choices) and presuppositions (§22) in Schmidt's article – have inevitably conserved and prioritised some other part of the system. Schmidt's discussion (§22–30) on ways of describing an individual's point of view in terms of presuppositions and choices allows a mechanism for the specification of the observer's point of view. One interesting measure of the success of this approach to resolving differences in perspective will depend on its viability. A function of art is to present ideas in new ways that capture the

imagination and I find that Schmidt's article achieves this aim. His proposal to "dissolve reality" by emphasising the role of cognitive process is, to my mind, an exciting metaphor. I hope that Schmidt's fresh approach will allow these debates to move to a higher level through its re-emphasis on process as that which constitutes objects (§31).

« 6 » One of Schmidt's aims is to link radical constructivism with recent developments in philosophy. Von Glasersfeld's (1974b) criticisms of philosophy were of classical philosophy and its unwillingness to deal with the dualism implied by matching experience with objects. In Ernst's last paper, written with Edith Ackermann (2011), he returns to the themes of his early papers in relation to the importance of cognitive activity in knowing and the importance of the knowing subject in organising experience. Yet, from the time of Theodore Mischel's (1971) book on genetic epistemology, philosophers were beginning to see connections between philosophy of science and epistemology (Kitchener 1987). A major stumbling block to integrating cognitive development with epistemology was the so-called "genetic fallacy," according to which development was irrelevant to the study of the roots of and the validity of knowledge. Hamlyn (1978) was one who championed this position. However, this view took knowledge to mean completed knowledge, and when one takes a long-term view of knowledge, as in the history of science, knowledge development becomes important to epistemology. So questions were raised about the different types of genetic progressions and sequences in knowing, and if "genetic" means a sequence of stages that are related to one another conceptually and rationally then this would constitute important epistemological information (Kitchener 1987). Perhaps with the broader platform offered by Schmidt for radical constructivism it will be possible to make further links with recent trends in philosophy and epistemology.

« 7 » I want to add a final point to Schmidt's discussion of action and its relation to knowing. This emphasis on socially and culturally embedded action is welcome and seems to link with the activity theory that developed from work by Vygotsky and Leont'ev. However, I have been struck by the work Ernst and others have done on operational analysis as an unexploited tool for modelling emerging thoughts. This model goes unmentioned by Schmidt and may form a useful tool for future work in radical constructivism.

Received: 18 August 2011
Accepted: 11 September 2011

Hugh Gash has worked with constructivist theory in educational settings throughout his career. This work has included teaching, engaging with stereotypes and prejudice towards different others and with young peoples' ideas about heroes. Recent work was on teachers' and pupils' representations of teaching. Homepage: http://staff.spd.dcu.ie/gashh/

Life as a Process of Bringing Forth a World

John Stewart
Univ. de Technologie de Compiègne
js4a271/at/gmail.com

> Upshot • My suggestion is that the shift from objects to processes can be seen as grounded in the processes of self-generation common to all living organisms. Specifically human cognition is a subsequent evolutionary emergence.

« 1 » Siegfried J. Schmidt makes the point that as constructivists we should focus on *processes* rather than *objects*. I quite agree with this; but my comment is that whereas Schmidt's discussion is focussed almost exclusively on human knowledge and actions, it can be interesting to enlarge the discussion to the realm of the "lived worlds" enacted by all living organisms. What fits well here is that living organisms are *par excellence* processes and not "things." It is failure to properly appreciate this that has led contemporary mainstream biology to declare that "life does not exist."[17] Living organisms, then, are processes; but processes of a very particular kind, since they have the key property of *producing themselves*; this is the meaning of the term "autopoiesis" coined by Humberto Maturana and Francesco Varela (1980).

« 2 » In this approach, Maturana and Varela propose to consider that "cognition" is not the exclusive privilege of human beings, but is grounded in the biological facts of life. What is it that all living organisms – even the lowliest bacteria – "know"? Well, it is not so much a question of "knowing *that*," but rather of "knowing *how*" – knowing how to act in a given situation, on the basis of sensory input, in such a way as to remain viable.

« 3 » This approach is beautifully illustrated by the classical work of Jakob von Uexküll (1909), who describes and analyses the "world of the tick." The tick is a tiny animal that feeds exclusively on the blood of mammals. The tick is blind, deaf, and able not to fly but only to crawl slowly; how can such an animal catch a mammal immensely bigger than itself? The answer is the following. First, the tick climbs to the end of the branch of a bush and …. waits, for days, weeks, months if necessary, until it smells a whiff of butyric acid in which case it lets itself fall. (This makes sense when we know that butyric acid is emitted by the sweat-glands of mammals, and in this context only by them). If the tick falls onto a furry surface, it crawls until it comes upon a smooth surface (in context, this will be the bare skin of the mammal); whereupon it sticks its proboscis through the surface, and if it finds a liquid underneath at 37°C, it sucks up this liquid to satiety (in context, this liquid will indeed be the blood of the mammal). In this example, it is quite clear that the basic "knowledge" possessed by all living organisms is not a question of mental representations, nor of "knowing that…" in the form of propositional statements; the knowledge in question is literally *embodied*, in the form of the repertoire of actions (in the case of the tick, crawling, falling, crawling again, piercing a surface, and sucking a liquid); the repertoire of sensory inputs (olfaction that is specifically sensitive to bu-

17| Quoting the biologist Szent-Gyorgyi, Henri Atlan proclaims: "Life as such does not exist, no-one has ever seen it… The noun 'life' has no meaning, for such a thing does not exist" (Atlan & Bousquet 1994, my translation). The point, of course, is that "life" is not "a thing," but a pure process.