

rector getting out of the way of the players for a while as they – well – *play* with and in the text. Further, we cannot imagine a practitioner who would not welcome the idea of “applied epistemology” (footnote 1) – the idea that we know via embodied doing – nor any who would refuse the idea of gently and generously taking care not to mistake “the word ‘science’ for ‘objective ontological truth’ rather than continuing to view it as a powerful and useful description that continues to work only until it does not” (§52). The concept of something “working” (unless it does not) is so common a shorthand in theatre that it might deserve a separate analysis of its own.

« 9 » By drawing out von Foerster’s concept of eigenvalues (a topic explored at some length in Glanville 1982) as expounded in Søren Brier’s discourse of cyber semiotics and, above all, in numerous variations by Louis Kauffman (1987, 2005, 2015), however, Scholte does demonstrate the potential of second-order cybernetics to deconstruct cognitivist truth-claims regarding “phenomenologically unmediated embodied forms of knowing” (§43). In short, whereas the postmodern critique on the one hand lacks an account of systemic operationality and the cognitivist critique on the other hand lacks an account of recursive sociality, a robustly eclectic deployment of second-order cybernetics loops individual body-minds and their semiotic mediations into recursive social circuits in a manner that can account for their creative success if not predict the spontaneous content of their operations. Thus we find Scholte’s approach to be an effective reminder of the breadth of second-order cybernetic conceptuality as it has developed since the 1970s and an apt demonstration that this vocabulary provides an analytical repertoire adequate in this instance to the complexity and manifold stages of the theatrical phenomena being described, from the construction in rehearsal to the delivery in performance of the play.

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“Truthful” Acting Emerges Through Forward Model Development

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> **Upshot** • My aim is to show that “truthful” acting that emerges through improvisation is equivalent to the development of mutual forward models in the actors. If these models match those of the audience members, this is perceived as “truthful.”

« 1 » One of the aims of Tom Scholte’s target article is to re-introduce the stigmatized word “truth” back into the discourse of theatrical practise and also constructivism. This has been (from my point of view) successfully achieved by using the rehearsal process as devised by Constantin Stanislavsky as a constructive example. Central to this approach is improvisation, where the actors base their actions on the internal goals of their characters and start to interact. If successful, the director, the audience and, thus, observers, as a result report the behaviour of the actors to be “truthful.” The article bravely goes beyond the postmodernist notion that “truth” needs to be avoided at all costs and successfully removes its stigma.

« 2 » While the article succeeds in making “truth” credible again, it could have also benefited from being ambitious on the front of open vs. closed loop. This could have easily been taken into account as well because

from the cybernetic point of view, the target article is not just about closed loops but also about open loops. However, as with the word “truth,” “open loop” is also often frowned upon in constructivism, which traditionally demands that descriptions are based on closed loops, recursions and the observation of loops by other loops. In this commentary I remind the audience of the concept of the *forward model*, which is a well-established construct in second-order cybernetics and control theory (Palm 2000). This concept is implicitly woven into the main text and my aim is to make it explicit in this commentary.

« 3 » First of all, we need to define “forward model.” An ideal forward model is an open loop controller that no longer needs feedback to arrive at a desired outcome (Palm 2000). If we refer back to the well-trodden territory of the thermostat, then a thermostat action using a forward model will not require its feedback path because it knows the exact temperature change in advance when switching on/off the heating. It would notice a change from the desired state and then would switch on/off the heating without making any comparison of the achieved result with the desired result. Another example is a chef who knows exactly how much salt needs to be added to a soup without tasting it afterwards. The chef is able to achieve the perfect taste because he/she has operated in closed loop mode many times before but no longer needs to do it because he/she has a forward model.

« 4 » One might argue that we will not need forward models. It is of course possible to live without developing any forward models in our lives but this is a risky strategy. A purely reactive feedback system is always at the mercy of the environment, hoping that its requisite variety will always be sufficient when reacting against disturbances. The rabbit hopes to be fast enough all its life to escape all attackers. However, animals – and in particular humans – develop a multitude of forward models to pre-empt what is going to happen. This can only be achieved through learning, which step-by-step develops forward models through experience on top of feedback loops (Porr & Wörgötter 2002, 2005). Even if these forward models fail from time to time and the feedback loops need to kick in overall, the agent has developed mod-

els of its environment. This does not mean that the agent knows everything about its environment, but it has understood its own closed loops. With that knowledge, the agent knows how to avoid unexpected surprises. In the worst case, these might kill the agent. However, they could be just a situation where the agent enters a cocktail party with a room full of strangers. This leads us to the special case of human–human interaction, where two or more people try to develop forward models of each other.

« 5 » What happens if agents develop forward models of each other by interacting with each other? This is what Niklas Luhmann calls “double contingency” (Luhmann 1984). It is mastered by creating mutual forward models to achieve a high degree of certainty. For example, bakers often talk about recipes or theatre practitioners about the rehearsal process and not baking recipes. Here, learning develops forward models of the other person because the other person (alter) disturbs the closed loop processes of the first person (ego) and vice versa. It is important that both persons start off from their personal closed loops and that if they do not learn they just see each other as mutual disturbances (think again of the cocktail party with a room full of strangers). Only because they develop forward models do they actually create a closed loop system that spans through both of them (Porr & Di Prodi 2014). This is an important step and is often overseen because the people themselves become open loops (!) because they no longer need their own personal feedback loops. For example, when talking about the weather, the response of the other person is highly predictable. The person has developed a forward model of the other person in terms of the topic of weather. This can be termed as a theory of the other person’s mind.

« 6 » Now we can go one step further and observe a conversation of two people, for example in a pub. It is important that the observer has developed her own forward models of conversations in the past as described above. The observer can observe and perhaps join into the conversation because of her forward models. This will work more or less seamlessly, depending on the topic and shared experiences, but it will be just part of the everyday operations in our environment.

« 7 » Now, observing acting is a special case in contrast to observing people interacting in everyday situations. The main text is spot on that the actors and the director need to find out what goals (or in control theory, desired states) the different characters want to achieve and that then, through the technique of improvisation, this will be tried, tested and evolved. Again, this can be understood in terms of forward models: at the start of the improvisation, the actors have a very limited or perhaps no forward model of the other actors’ goals or closed loop behaviour. However, the two actors then learn to predict what the other actor is going to achieve so that their mutual uncertainty is reduced, in the sense of Luhmann’s reduction of double contingency. If the improvisation has been successful (very similar to the everyday conversations), the actors will mainly act in open loop using their forward models by knowing what the other actor is trying to achieve. This is in stark contrast to reading out lines, which require very little predictive power and, thus, no forward model. An observer who watches the improvisation (or the director) should then be able to compare their forward models to that of the two or more actors on stage. If there is a reasonable match, then this is perceived as being “truthful” in the sense that there are similarities of forward models developed by both the actors and the audience.

« 8 » Scholte’s article also has wider implications because improvisation imitates everyday double contingency reduction and acts as a convincing demonstrator/simulator of how everyday communication emerges. The actors face a similar challenge to somebody entering the aforementioned cocktail party with a room full of strangers. Again, here, forward models need to be developed to engage in meaningful conversations.

« 9 » As a final remark, I would like to draw attention to film, where certain directors use improvisation not just to shape the acting but as a tool for developing the story as such (as done by Mike Leigh for example). Another example is the recent film “Victoria,” which indeed feels very “real.” This has been achieved by just prescribing inner goals for the protagonists in the form of a treatment that they then use to improvise the action. Even in more traditional environments, film is usually developed as

a two-stage process where first, a treatment is written, which often describes the characters’ goals, and then a script based on the treatment is evolved.

« 10 » Be it film or theatre, improvisation should be at the heart not only of the rehearsal process but ideally also of the story development itself.

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Naturalism in Improvisation and Embodiment

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> **Upshot** • This commentary adds historical perspective to the use of improvisation and conversation as models for the promotion of naturalism in acting. It wants to denaturalize naturalism and the concept of embodiment in support of Scholte’s reconceptualization of the naturalist theatre, and concludes with a reflection on the societal function of art and theatre today.

The introduction of the chorus was the decisive step with which war was declared openly and honourably against any naturalism in art.
(Nietzsche 2008: 28)

« 1 » The “essentially cybernetic vision” (§14) Tom Scholte locates at the core of the Stanislavski system of acting (or Method acting) is most apparent in Constantin Stanislavski’s use of improvisation. Improvisation demands a particular mindset, the attentiveness to one’s surroundings and the willing-