

# On the nature of creative processes: performativity as a missing algorithm

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## The creative role of performativity

In our project the performance is a product of performativity. Performativity is the cognitive ability to produce physical or mental actions. Studying performance and studying performativity sets different scientific activities. Studying how to enhance performance belongs to the behavioral science. On the contrary, studying performativity belongs to a general cognitive procedure that must not be confused with the description of behaviors, requiring instead a specific theorization in the cognitive sciences. The aim of this research project is to focus on the hypothesis that performativity is not a property confined to certain specific human skills, or to certain specific acts of language. Instead, the executive and motor component of cognitive behavior should be considered an intrinsic part of the physiological functioning of the mind and as endowed with self-generative power (Pennisi A., 2019; Pennisi A.-Falzone, 2016).

We believe that performativity has evolved alongside with those natural selection processes which have led the human species to develop articulated language and the embodied simulation (Pennisi A.-Falzone, 2016; Falzone 2018). In such framework, cognition is a form of mediated action rather than the link between inner thought and overt behavior. According to our model, thus, action is not the mere externalization of a mental process, but is the process itself (Pennisi A., 2018 and 2019; Pennisi A.-Falzone, 2019; Gallese, 2019). Since such process is carried out through the body, we think that the species-specificity of the bodies occurring in nature paves the way for every individual's knowledge of reality.

Performativity as a physiological tool of cognitive creativity has precise neural correlates and procedural properties.

From the point of view of procedures, performativity is a cognitive property that arises from the absence of an algorithm designed to carry out a given performance. Acting in a non-planned way, learning by trial and error, applying familiar behavioral patterns to new situations: these are just a

few examples of what is performativity and of how it works. Thus, performativity is intrinsically creative because its nature is to face situations that cannot be solved by the application of already known algorithms. In a nutshell, performative creativity is a procedural system that is somewhere between what Chomsky called "rule governed creativity" and "rule-changing creativity". Performativity however bears a peculiar kind of creativity, which is different from the one generated by the competence but still shares some features with the latter: in fact, it is a fully embodied and free-from-rules process that is carried out through trial and error, that is to say it depends on the bodily practice (locomotion, language, perception, etc.) made in everyday experience (Pennisi A., 2019; Pennisi A.-Falzone, 2016; Gallese 2018; Matteucci, 2018; Montani 2018). In functional terms, hence, the brain is a powerful biological instrument which permits continuous reorganization of the activity of organisms. An incessant activity of biological agents that move and act, that perceive and explore the world around them through a network of sensors and nerves, whose complexity of articulation is directly dependent on the species-specific structure. This activity relentlessly stimulates the rewiring of sensorimotor networks and remodeling of cognitive interactions. Our mind is the result of this close cooperation between the performative competence triggered by sensory-motor systems and the readjustment of the computational procedures of our deep brain to allow the survival and growth in the fitness of individuals and the entire species within environmental variation.

## Insights from neurolinguistics

A large amount of literature has been devoted to the aforementioned mapping process, carried out through both brain imaging (Monchi et al. 2001, 2006; Nagano-Saito et al. 2008) and the study of the biochemical reactions involved in the plasticity of synaptic processes (Thivierge et al. 2007; Ko et al. 2013; Tamburrini-Prevete, 2018). Such researches have demonstrated "that the caudate nucleus and the putamen are particularly important, respectively, in the planning and the

execution of a self-generated novel action, whereas the subthalamic nucleus may be required when a new motor program is solicited independently of the choice of strategy” (Monchi et al. 2006, 257). Examining the biolinguistic aspects of these discoveries in depth, Lieberman and his team have shown that the neural circuits connecting different brain parts during human speech exploit the putamen for neuromotor control, changing “on the run” - that is, during verbal action performance - “the direction of our thought processes based on new stimuli such as the understanding of meaning conveyed by the syntax of language” (Lieberman & McCarthy 2007, 16).

Furthermore, a similar activation of brain motor components is registered when language data are processed in the absence of grammatically well-tested algorithms, such as when a second language is learned (Klein et al. 1994), or when a subject switches from listening to informal speech to a more formal one (Abutalebi et al. 2007).

In short, the management of neurocerebral performative strategies seems to be responsible for the most dynamic processes of linguistic behavior. This kind of behavior needs an attempt, or an active effort, that cannot be accomplished only through the mechanical application of already known and stabilized rules because it requires “the execution of a self-generated action among competitive alternatives” (Lieberman 2013, 80): an activity that is prolonged virtually forever, after the first acquisition step of ontogenetic speech, moving from mechanical physiology to the physiology of thought.

This overall framework also explains why the paths of speech often follow the hesitational phenomena of breaking up, recomposition, reunion, syncretism, propositional chiselling, semantic and lexical refinement: that is, all that is stigmatized by Chomsky’s idea of performance as the deposit of cognitive junk produced by externalization devices (to repeat his words: “numerous false starts, deviations from rules, changes of plan in mid course, and so on”, 1960, 530). On the contrary, the most advanced neurolinguistic research reveals the close interconnection between motor performativity and the continuous reorganization of propositional and abstract thinking: “the cortico-striatal regions that regulate language comprehension also regulate many aspects of behavior such as motor control and abstract reasoning” (Simard, Monchi et al. 2010, 1092). Evolutionarily, in fact, the performative motricity of thought could have been decisive for understanding the subsequent development of human language, “because it indicates that our modern brains may actually have been shaped by an enhanced capacity for speech motor control that evolved in our ancestors” (Lieberman & McCarthy 2007, 16).

### **Schizophrenia as the realm of anti-performativity**

Another field of research which supports our idea of performativity is phenomenological psychopathology. Authors like Sass (1992), Stanghellini (2004) and Fuchs (2005), in fact, claim that one of the core symptoms of schizophrenia is a sort of “disembodiment”, the onset of a

problematic relationship between the patient and his own body in which the parts of the latter become heavy, distorted and even “stranger”. This peculiar kind of corporeity is reflected in a total lack of fluidity in any patient’s performance: “patients frequently experience a disintegration of habits or automatic performances, a «disautomation». Instead of simply dressing, driving, walking, etc., they have to prepare and produce each single action deliberately, in a way that could be called a «Cartesian» action of the mind on the body” (Fuchs & Röhrich 2017).

Such schizophrenic tendencies might be described as the attempt to apply procedural rules - algorithms - to the everyday and well-mastered situations that make up our “being in the world”, as the following words by a schizophrenic patient show: “If I do something like going for a drink of water, I’ve to go over each detail – find cup, walk over, turn tap, fill cup, turn tap off, drink it” (Chapman 1966, 239). As we have already claimed (Pennisi G. 2018), schizophrenia might be read as the disruption of the mechanisms that make a performance efficient, namely the selective target control, the softly conscious monitoring of one’s bodily configurations and the implicit sense of body-as-subject (Gallagher 2018).

Instead of having this tacit, self-transparent and immediate relationship with their own bodies, patients often exercise a thematic control on the latter that goes from repetitively touching their own body parts – as if they try to verify if their body still «belongs» to them – to the fragmentation of every goal-related movement in many sub-movements, like in the previous example. Schizophrenics’ inability to get in the flow of the action is what makes such illness “the realm of anti-performativity” (Pennisi G. 2018): this is why we think that the study of the role of performativity on human cognition cannot be separated from the phenomenological analysis of psychopathologies.

### **Conclusion**

In the light of the above, we will define performativity as a constituent component of the cognitive processes. The actions that we perform in the environment, in fact, allow us to know both the surrounding world and our physical possibilities. In such model, the body is not only the means by which the individual explores and acts on the environment, but the precondition for the development of any cognitive ability.

Our intention is to validate our ideas on the role of the body and on performativity by applying the interdisciplinary methods of Cognitive Science. The issues we have raised, in fact, not only are the subject of a debate between the embodied/extended mind models and the mentalist hypotheses carried out by cognitive psychology and computationalism, but can only be clarified by providing an overview of the scientific literature on psychopathology and on cognitive neuropsychology.

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