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Ancient *choreia* in neurocognitive context

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Abstract: This paper addresses the problem of difficulties in the detailed reflection of the ancient aesthetic terms, in this case *choreia* - triune of dance, music and singing. The paper hypothesis is that an important contribution to understanding of *choreia* can be brought from contemporary cognitive sciences and neurosciences. Firstly, an outline of the key historical and anthropological research on the ancient term is presented, attained from classical sources as well as the recent analysis. The issues that need clarification are then listed. In the context of *choreia* it is primarily the type or level of experience, in which the unity of music, singing and dancing would emerge. Analysis of the neural correlates of predominantly motion, but also music and language perception entails to recognize in them the potential basis for a unity of artistic elements particularly in the cognitive experience of both the performer and spectator. Further analysis within the cognitive theories regarding movement control and the origins of the language contrives to see *choreia* as a specific cognitive quality. The conclusions from these considerations are then applied to the analysis of the performances of CHOREA Theatre Association, which refers to ancient patterns. It leads to a further refinement of the *choreia's* analysis and indicate possible directions for further research.

Keywords: ancient dances, dance reconstruction, cognitive aesthetics, neuroaesthetics, sensorimotor aesthetics, joint action

Introduction

Ancient *choreia*, despite years of scientist's studying and artist's experimenting its heritage, remains mostly a blur fantastic wish or romantic dream of both of these groups. The first, approach the problem from different perspectives at the end having them, as Graham Ley state, paradoxically

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obscuring their view on the case[2]. The second, on the other hand, rely on their intuition, which tends to be strongly affected by their modern craftsmanship and current trends. This last assessment can be easily assigned to anybody trying to work with Greek tragedy, as it always means dealing with foundations of Western culture, therefore also using history to express our own needs and desires. Nevertheless, there are some apparent facts to which we can refer to. Attempting to keep to those mostly approved, I will try to show in the current study if modern cognitivism and neurosciences can shed light on our understanding of the experience of *choreia,* as well as its indisputable importance for the theatre.

To pursue the methodological endeavor of this article I begin by gathering the findings of historical research on the essence of the ancient *choreia*. Thus, the term is defined in a broad manner and put in the right theoretical and historical context. This indicates the directions in which *choreia* can be possibly recontextualized using theoretical and conceptual apparatus of modern cognitive science and neuroscience. In particular, the research on the neural correlates of motion control and perception, as well as proposals for binding them to the processing of music and language are at stake. The conclusions of this section are further correlated with the contemporary theatrical practice, which attempts to performatively reconstruct the cognitive and aesthetic quality of the ancient *choreia*.

Choreia – the unity of three

"*Choreia*, of course, is dance and song taken as a whole" (Laws, II, 654b)[3], says Plato in the *Laws,* in a passage that directs my reflection. Although the philosopher is not mentioning here "words" or "action", it is clear that they were also a part of it, which makes *choreia* a total form of art[4]. If turning around this statement we may also say after Ley, that most probably there was no poetry without music[5].

2. Graham Ley, *The Theatricality of Greek Tragedy: Playing Space and Chorus* (Chicago: Chicago University Press, 2007).
3. Interestingly, the same passage form Laws is also translated "Choir-training, as a whole, embraces of course both dancing and song" Plato, Laws, ed. and trans. R.G. Burry, Loeb Classical Library. Cambridge, MA: Harvard University Press, 1990, p. 93.
4. A.P. David, *The Dance of the Muses. Choral Theory and Ancient Greek Poetics* (Oxford: Oxford University Press, 2006), 35.
5. Ley, *The Theatricality of Greek Tragedy: Playing Space and Chorus*, 133.

David is fulfilling this picture arguing that the very base of Greek poetry – the metre – is by all means a residue of the movement:

> …it is far more likely that what is called a metre in ancient Greek was always, to begin with, a dance measure (even if modified by the epithet 'iambic'). The elements of metre are feet! […] Plato is explicit that metres measure bodily motion, not speech…[6]

In another fragment, David becomes even more straightforward:

> Metres, we are likely to be told, are abstract systems of formal constraints. But think about the nature of a foot: there is nothing either abstract or formal about it; it is, in fact, the most pedestrian thing there is. A poetic foot in Greece was a dance step […] If a dance began […], on the right foot for luck, and ended on the right foot as well in the final antistrophe or epode, we have a hypothesis for reconstructing the steps of an ode. One need only remember, as a general maxim, to put one foot after another; or to put it another way, the left foot must come between successive steps of the right. If my reader can walk, or has seen people walk, he will quickly grasp the real constraints inherent in Greek metre.[7]

Thus, David closes the circle of dance – poetry – music – dance – etc. with the very dance at the beginning as an extra-linguistic origin of metre in Greek poetry[8]. Therefore, dance marked the musicality of poetry or even ancient Greek language in general:

> Ancient Greek is already musical, measured as it is purely by the short or long of the syllable, and not subject to variable or discretional stress (which he terms accent) as in modern meters. The rhythm is inherent in the words: "The syllables themselves are the rhythmic matter from which a rhythm originates.[9]

6. David, *The Dance of the Muses. Choral Theory and Ancient Greek Poetics*, 27.
7. David, 37.
8. David, 30.
9. Thrasybulos Georgos Georgiades, *Greek Music, Verse, and Dance* (Cambridge, MA: Da Capo Press, 1973), 55.

This takes us back to dance or wider – movement as an original source. It is actually misleading to even consider this relation as a circle of dependence as presented above, as for the ancient Greeks dance, music and poetry most probably existed almost as one entity. This is valid at least until the development of tragedy, which disunited them. An important moment of this process is the exclusion of the actor from chorus, which led chorus to become representational.

> What had been a composer's orchestra was obliged to become a dramatist's vehicle, costumed and perhaps even masked: a chorus of old men, or libation-bearing women, or Furies. Unlike music and dance, which need not be imitative, the phenomenon of the dramatic personation and representation of myth could be linked directly to depictions in the visual and the plastic arts, and imitation became the central concern of philosophical approaches to poetry and poetics.[10]

This process seems to be irreversible. Music, dance and poetry separated and evolved alone, making it if not impossible for contemporary artist to perform them together, then mostly recognised only as virtuosity. Classical music is to be listened by a static spectator, dancing to it often rather disturbs the experience then strengthens it. Moreover, ironically, the same audience usually does not understand the words sung if not following libretto, which also underscores the distance between once joint qualities of *choreia*.

What is gone from the cultural point of view (even though many artists attempt to challenge themselves with creating performances somehow actualizing ancient *chorus*) paradoxically seems to never have happened for the human mind. I will argue below, that *choreia* is the ever-actual modality of perception.

Neurocognitive perspective

The breakthrough discovery that allows such speculations and fertilizes many other fields of humanities is the existence of so called "mirror neurons" in human brain. By the end of the 20th century Italian neurobiologists found neural networks that activate both when one performs a certain task, e.g. opening the door at the time of observing the same action. For the first time

10. David, *The Dance of the Muses. Choral Theory and Ancient Greek Poetics*, 25.

this mechanism has been observed in macaque monkeys, when examining the reactions of selected areas of the monkey's brain whilst performing specific tasks (in this case grabbing of a fruit). Electrodes placed in the macaque's brain were signalling the stimulation of selected areas of the central nervous system. To scientists' surprise, at the moment when a monkey was idle, and one of the researchers caught the fruit, the electrodes received a strong signal. Neurons responded the same way as when the macaque was catching the legume itself. Scientists have poetically called discovered cells "the mirror neurons"[11] – name as appealing as misleading. These cells are in fact only a part of a complex structure – as called by Emily S. Cross – *Action Observation Network*[12]. It includes, in anatomical terms: cells that encode only movement, canonical neurons coupling movement with objects, simulation/mirror cells and other supplementary circuits. AON plays a crucial role of solving almost all the calculations needed to perceive and perform physical actions. All determined by an inherent economy of human brain – the less effort the better. The economy or optimization rule serves its purpose on every level of the process. Therefore, it is easier to relay on the same mechanism of the action processing and apply it whenever needed than create each time a precise picture of it. Likewise, it is more efficient to use the same circuits for both performing and observing similar actions done by others, than double the information in the memory for each modality of its usage. Considering a wide discussion on the importance of such neuronal multimodality for social interaction, it can be also seen as a premise for a joint action and synchronisation of ancient chorus[13].

The very same economy leads to the coupling of sounds and actions. As proved in later research of the Italian scientists, the macaque's mirror neurons reacted also when it only heard the sound of the action[14]. Speech and sounds

11. Vittorio Gallese, "Embodied Simulation: From Neurons to Phenomenal Experience," *Phenomenology and the Cognitive Sciences* 4, no. 1 (March 2005): 32, https://doi.org/10.1007/s11097-005-4737-z; Vittorio Gallese et al., "Action Recognition in the Premotor Cortex," *Brain* 119 (1996): 593–609; G Rizzolatti et al., "Premotor Cortex and the Recognition of Motor Actions.," *Brain Research. Cognitive Brain Research* 3, no. 2 (March 1996): 131–41, http://www.ncbi.nlm.nih.gov/pubmed/8713554.
12. Emily S. Cross, "Building a Dance in the Human Brain: Insights from Expert and Novice Dancers," in *The Neurocognition of Dance. Mind, Movement and Motor Skills*, ed. Bettina Bläsing, Martin Puttke-Voss, and Thomas Schack (Hove - New York: Psychology Press, 2010), 210.
13. Yuval Hart et al., "Individuality and Togetherness in Joint Improvised Motion," *Plos One* 9, no. 2 (2014).
14. Marc Jeannerod, *Motor Cognition: What Actions Tell the Self* (Oxford: Oxford University Press, 2006), 111.

in general are most probably encoded audiomotorically, once again partly by the circuits involved in action processing[15]. However, this relation is not only anatomical. Cognitivists propose that action programs operated by AON when memorizing the movement are based on *Basic Action Concepts*[16]. These can be described audibly, verbally and visually. For example, a fundamental for classical ballet *plié* (bending of the knees) can be considered as such an action concept, which can be repeated with a "fitting it" resonant name. That does not mean, however, that *BACs* necessarily relay on representation. It is worth noting particularly when considering the not-obvious relation between the sound and movement, for example in karate, which tends to be rather a dynamic coherence and not a relation of representation[17]. These two issues link us back to David's insistence on keeping the metre underfoot. Brain is apparently inherently linking sound and dancing step, both on a hardware level of anatomical region used during dancing, and software level of dynamically joint performance of voice and foot. When recognized, such a synchronized activity might be rewarded by the pleasure mechanism in the brain, as a sign of subject's or potential partner's health, but also stimulate the search for meaningful symmetries in the environment - for example a symmetrical body of a dangerous predator[18]. Therefore, symmetry in space and time (synchronization) can be considered – as Ramachandran proposes – as a neurophysiological aesthetic law. Tragic *choreia* must have been a great example of fulfilment of such a rule, with the pursuit of the artists to achieve perfect harmony within the chorus' performance. Oppositely, if this is correct, it supports the hypothesis, that *choreia* was not only an aesthetic artefact, but also a certain cognitive competence.

The discovery of the mirror neurons provoked a large discussion on the spectators' experience in the theatre, which I present and discuss in detail elsewhere[19]. Also, Greek audience must have made large use of simulating

15. Ivar Hagendoorn, "Some Speculative Hypotheses about the Nature and Perception of Dance and Choreography," *Journal of Consciousness Studies* 11, no. 3–4 (2004): 96–97.
16. Bettina Bläsing, "The Dancer's Memory: Expertise and Cognitive Structures in Dance," in *The Neurocognition of Dance. Mind, Movement and Motor Skills*, ed. Bettina Bläsing, Martin Puttke, and Thomas Schack (New-York: Taylor & Francis, 2010), 84.
17. Tim van Gelder, "What Might Cognition Be, If Not Computation?," *Journal of Philosophy*, no. 91 (1995): 345–81.
18. Vilayanur Subramanian Ramachandran, *The Tell-Tale Brain: A Neuroscientist's Quest for What Makes Us Human* (New York: W. W. Norton & Company, 2011), 234.
19. Tomasz Ciesielski, *Taneczny Umysł. Teatr Ruchu I Tańca W Perspektywie Neurokognitywistycznej* (Łódź: Wydawnictwo Uniwersytetu Łódzkiego, 2014).

neurons, as they themselves were in all likelihood very familiar with the dances and songs of the *choreia* and thus enjoyed the embodied recognition of the performance[20]. This is true at least for the early tradition of dancing in the circle[21]. Regardless of how interesting it would be to discuss this problem further, it does not advance us in the search for neurocognitive *choreia*. Until now, only the connection between dance and music was indicated, not including the poetry or even simply the words. Answers might be provided by canonical neurons mentioned above. In the frontal areas and in the parietal association cortex areas (considered to be responsible for analysing the stimulus) a number of motor neurons of specific properties were discovered. Some of them are active both during the execution of the action, and the passive observation of possible objects of this action[22]. The study proved their visuomotor character, which develops probably not right away, but gradually with growing up. In addition to the basic function, they have the ability to represent activities related to the item's specified class. In other words, the canonical neurons represent objects in terms of possible actions to take against them: a small nut will release the program of a precise grip, while a big apple – an action requiring use of the whole hand, followed by a broad opening of the mouth[23]. The same simulation mechanism probably allows one to understand names of given objects[24]. Numerous experiments have demonstrated the existence of an equivalent area of canonical neurons in humans[25]. Interestingly enough, this particular area of a monkey's brain is phylogenetically equivalent to the place, which in human anatomy is known as the Broca's area; its involvement in the use of language has been repeatedly clinically documented. Of course, enacting through human canonical neurons such advanced features as recognition and naming of objects is possible thanks to a much greater complexity of these structures than in monkeys. In fact, the parietal areas are

20. Corinne Jola et al., "Motor Simulation without Motor Expertise: Enhanced Corticospinal Excitability in Visually Experienced Dance Spectators," *Plos One* 7, no. 3 (2012).
21. David, *The Dance of the Muses. Choral Theory and Ancient Greek Poetics*, 41–42.
22. Leonardo Fogassi and Vittorio Gallese, "The Neural Correlates of Action Understanding in Non-Human Primate," in *Mirror Neurons and the Evolution of Brain and Language*, ed. Maxim I. Stamenov and Vittorio Gallese (Amsterdam–Philadelphia: John Benjamins Publishing Co, 2002), 15.
23. Fogassi and Gallese, 28.
24. Jeannerod, *Motor Cognition: What Actions Tell the Self*, 162.
25. J Grèzes et al., "Activations Related To 'mirror' and 'canonical' neurones in the Human Brain: An fMRI Study.," *NeuroImage* 18, no. 4 (April 2003): 928–37, http://www.ncbi.nlm.nih.gov/pubmed/12725768.

one of the most developed in the course of evolution of the human in relation to other primates. Psychologists provide additional evidence for the hypothesis of performative perception. Among others, the early research by Jean Piaget and Ulric Neisser confirmed that preliminary knowledge of infants is being developed thanks to built-in motor skills, unconscious knowledge of basic laws of physics and regularities of temporal and causal relationships[26]. Mediated in this data are the ability to interact with the environment and the mirroring capabilities of the same brain networks; it is the key to the knowledge and understanding of the world. In cognitive studies such idea can be simply defined as "the embodied mind"[27].

To better present the consequences of such a concept, I shall recall the George Lakoff's concept of the metaphor, considered not as a language-based poetic tool, but the fundamental structure of human interaction with the world:

> Metaphor is for most people a device of the poetic imagination and the rhetorical flourish—a matter of extraordinary rather than ordinary language. Moreover, metaphor is typically viewed as characteristic of language alone, a matter of words rather than thought or action. For this reason, most people think they can get along perfectly well without metaphor. We have found, on the contrary, that metaphor is pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature[28].

Metaphor, as Lakoff describes it, exists between what we can experience through the senses, and the terms on which this knowledge is mapped. In other words, the understanding of concepts is embodied – structured by the constant relationship and interaction with the world through the body, including the brain. Thus, Lakoff's proposal, lately developed and reshaped

26. Jeannerod, *Motor Cognition: What Actions Tell the Self*, 169.
27. Francisco J. Varela, Evan Thompson, and Eleanor Rosch, *The Embodied Mind: Cognitive Science and Human Experience* (Cambridge MA: MIT Press, 1991); George Lakoff and Mark Johnson, *Philosophy in the Flesh: The Embodied Mind & Its Challenge to Western Thought* (New York: Basic Books, 1999).
28. George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago Press, 1980), 4.

together with Vittorio Gallese, can be defined as the interactive theory of meaning[29]. According to it, there is no separated brain module dedicated to linguistic and abstract reasoning, since those are based on the same multimodal sensorimotor systems of the brain as other aspects of human consciousness. This is also consistent with the principle of optimization – if it were otherwise, the data would have to be doubled in the mind and constantly "translated" from one language of processing to the other. A prerequisite for relying all mental processes on the same neural structures is their multimodality. This feature constitutes sensorimotor neural networks – AON – that are responsible for simulation and processing of action. They respond to visual, auditory and proprioceptive stimuli, and so they are a part of neurological base for the embodied mind. It needs to be noted here, that "multimodality" is radically different from "supramodality" - that is combining various modalities of experiencing by the higher associative areas, which can be understood as rational thinking. That is not necessary for the processes of constructing metaphors, because combining data is performed on the lower levels of processing[30].

However, only now, with the development of modern neurosciences and subordinate technologies, these hypotheses can benefit from more empiric evidences. The way our consciousness functions in the brain circuits, although still very unclear, is presenting itself as extremely complex, multimodal and most of all non-hierarchical. Lower processes can strongly affect high reasoning as well as oppositely, the need of organizing our experiences in a "reasonable" way often changes the initial stimulus (top-down and bottom-up connections). All of these are happening not as a computation, but rather as feedback negotiations of the "sense" with our body and environment and, as I expect, can be successfully correlated with the latest proposals on non-representative intelligence models[31]. In such a context, dancing, demanding extensive use of the crucial motor brain networks, appears to be an external representation of a deep reflection[32]. Joined by song and poetic words that

29. Vittorio Gallese and George Lakoff, "The Brain's Concepts: The Role of the Sensory-Motor System in Conceptual Knowledge," *Cognitive Neuropsychology* 22, no. 3–4 (2005): 456.
30. Gallese and Lakoff, 459.
31. In particular, swarm intelligence models can be an example here. See Tim van Gelder, "What Might Cognition Be, If Not Computation?," *Journal of Philosophy*, no. 91 (1995).
32. Corinne Jola, "Research and Choreography: Merging Dance and Cognitive Neuroscience," in *The Neurocognition of Dance. Mind, Movement and Motor Skills*, ed. Bettina Bläsing, Martin Puttke-Voss, and Thomas Schack (Hove - New York: Psychology Press, 2010), 210.

can originate from the same bodily source, a dance performed by the ancient chorus – *choreia* – is a staged metonymy of the processes presented above. Oppositely, *choreia* can be seen as a performative model of the embodied acting or even cognition.

Artistic endeavour for cognitive *choreia*

Unfortunately, when applied to the history of theatre, the embodied mind seems only a hypothetical statement; it might be proven, however, to a certain extent, by modern practices of reconstructing Greek theatre. The theatre association from Łódź (Poland), appropriately called CHOREA[33], could be a perfect example. Created from the two research groups: The Antique Orchestra and The Dances of the Labyrinth, it was fully devoted for several years to researching the qualities of ancient *choreia*. Importantly, only limited part of that research was devoted to a *strict* reconstruction. The group was mostly trying to create modern *choreia,* which recall the core qualities of ancient, ritualistic performance, but not its aesthetics and context. The artists created, on the base of both scientific and artistic inquiries, a unique method of developing a "multidimensional actor".

Actor's training in CHOREA is multimodal, but based on physical training, or perhaps more accurately dance and acrobatics. This includes both bodily techniques derived from Eastern traditions, as well as original material developed by members of CHOREA. Also further aspects of the performer's training are built on the movement. Only after appropriate preparation of the body during a warm up, the development of vocal material may begin. It is not yet then treated in a musical way, but, so to speak, physiological – attention centres to bodily aspects of creating sound. Musicality is introduced also through dance exercises, joint with characteristic for ancient Greek music complex and odd rhythms. Generally, at this stage, actor is opened for interaction with a partner or even with a group. It is the building of the support in partnering and common rhythm that turns out to be crucial for the later work with the voice. This is achieved by simple tasks focused on linking motion with the sound, and subsequently harmonizing it with the group. Alternatively, the basis for the introduction of musicality is the observation of the dialogue between different rhythms based on the same beat, minted in motion by other performers.

33. http://www.chorea.com.pl/pl/o-nas/idea/ [10.04.2015]

In the same way word and text are introduced. They arise in connection with the music, or directly through working with the body. A common task at this stage is to create one's own movement alphabet through improvisation. Giving the inspiration of images representing non-Latin alphabets often supports the creative process. In effect, each performer creates his limited, primary alphabet, based on which he improvises with a partner. On the one hand, it is therefore the task of creating a performative language (*parole*), and on the other, bonding activities and intentions with the visual stimuli. Only after such introduction the actual speech begins to appear, which would never break away from its bodily basis during the performance.

Clearly, the above-described evolution of the workshop is in practice rarely present, and the training of CHOREA's actors includes all these elements in an order matching current production. Nevertheless, the process is always based on physical training, which through work with voice is the output for music and word. Most of the exercises can therefore be considered as tools improving cognitive abilities and the search of organic connections between the elements of *choreia* – learning embodiment. As surveys show, the performers of the Theatre CHOREA are obtaining in this way also a unique presence on stage. In addition to the synergistic use of multiple artistic media, it is considered by spectators to be the greatest value of the theatre's performances[34].

Extremely important for theatre performances of CHOREA is also the emphasis on group work and the search for common rhythms, which can be read as a reversal of the process of separation of the protagonist from the ancient chorus. Moreover, in the cognitive context, CHOREA's practice can be recognised as an attempt to reconstruct a truly embodied and profound social relationship, into which the audience is also drawn. Viewers are invited to be a participating witness of the events on the stage, not the distant observer. Given such audience, performer becomes truly vulnerable.

A significant final example of the creative process in CHOREA might be here the production *Grotowski. An Attempt to Retreat*. Six performers under the supervision of (participating in the stage action) director – Tomasz Rodowicz – try to reference their practice to the activities of Jerzy Grotowski. This appeal seems to be in the context of my reflection an added value. Grotowski, at the early stage of his career, postulated "art as vehicle" – a term created by Peter

34. The research was made for the *TAKE OVER: Seeing theatre through young audiences eyes* project ran by CHOREA Theatre Association as a partner of British Council.

Brook[35] – that allows the performer transcend the average reality of his or her life[36]. Not coincidentally, he also referred to the ritualistic origins of the theatre, where *choreia* certainly should be placed. Therefore, the led discourse can be hypothetically opened to social neurosciences, which opens a possible new research area.

The performers in the show are acting almost purely as a joint choir – everyone always remain active on the stage. Between the moments of common singing combined with the movement there are also solo fragments. However, as in ancient processions performer separates only for a moment from the choir, to express the concerns of the society. Even if he or she relay strongly on his or her own creative process, they are always in a rhythmic, musical or simply physical way accompanied by other actors. Importantly, all the (para)solo performance pieces also are prepared through teamwork, so that, from the beginning, they emerge in relation to a common organic rhythm of the group. In the same time, this builds the expected presence of the performers, which does not depend here only on their individual commitment and competence.

The musical and rhythm structure of the performance is evident. In a symbolic way, water drops falling from the I.V.bag measure time and set the rhythm. More important, however, it is the music composed by Tomasz Krzyżanowski. It organizes a performance, but not a narrative, which itself breaks down in a seemingly loose associations and correlations. They remain, however, "sensible" thanks to the multimodality of the experience of both artists and audience – it does not make sense narratively, but produces meaning in an experiential and perceptual way. In particular, this is visible in the scene of peculiar procession, which transforms into a living sculpture created out of the actors' bodies. The process is accompanied on the one hand by the monologue of the actress, and on the other by the emerging from the performers' movement common singing. None of these elements fit to the other.

Analysis of the CHOREA's performances proves to be ineffective, if based on the classical methods of cultural studies, even taking into account their postmodern proposals. Their semiotics and narrative entangle, not following

35. Peter Brook, "Grotowski, Art as Vehicle," in *The Grotowski Source Book*, ed. Richard Schechner and Lisa Wolford (London and New York: Routledge, 2006), 381–84.

36. Carla Pollastrelli, "'Art as Vehicle': Grotowski in Pontedera," *New Theatre Quarterly* 25, no. 4 (November 18, 2009): 333, https://doi.org/10.1017/S0266464X09000621.

any rational logic. Without a doubt, however, the production forms a coherent whole, felt and understood by the viewer. It seems that it is precisely this type of performances in a specific way closer to achieving quality similar to the ancient *choireia*. Obviously, they also suggest that not only intersubjective unity of art was the essential element of the antique performance, but also a common experience of the members of the choir[37].

Conclusions

The arguments quoted at the beginning of the paper undoubtedly indicate that ancient chorea was some form of the unity of music, movement and speech. In cognitive sciences, it can be described as a special symmetry and synergy of the cognitive control of movement, perception of rhythm and music, and the usage of abstract concepts - poetic language. But there is no certainty what, in fact, would be this unity in terms of its structure and mechanisms.

As proposed here, it seems it was not limited to the aesthetic coexistence of different artistic elements on the stage. This is not apparent either from the descriptions of ancient chroniclers, or preserved treaties (especially Aristotle's), or ethnographic and anthropological researches. Thousands of years of the evolution of theatre blurred the ancient quality and developed a dominancy of the forms focusing separately on the word, music and dance. Hope to reconstruct the meaning of the ancient *choreia* seems to be given by contemporary cognitive science, which through the embodied mind concept allows us to see the coexistence of these forms of human activity as an inherent feature of the mind. If we agree to accept such hypothesis, it is worth paying attention to contemporary artistic activities that attempt to restore *choreia* to life by the artistic tools.

CHOREA's actors seek in their work the "unity of three", mastering the skills of using them on the stage. Through demanding training and hours spent in the studio, they attempt to overcome inner boundaries and awaken organic qualities of an actor's performance to achieve intense stage presence. The intensity of the spectacles of CHOREA is extraordinary and in a very specific way stimulates the audience, as I argue, the *choreia* should do. At the

37. Mariusz Bartosiak, "Chorea – Próba Odwrotu Czy… Powrót?," *Kultura I Spoleczenstwo* 56, no. 2 (January 1, 2012), https://doi.org/10.2478/v10276-012-0016-2.

same time, in the practice of the CHOREA's actors all distinct elements of which it is composed are clearly present. Perhaps, then, watching artistic strategies they use could be fruitful not only for understanding the embodied acting but embodied mind in general. Particularly important here seems to be the question of rhythm, as an element connecting movement, music and language and the various stages of linking them into the performance.

Modern neuroscience is often accused of bringing humanistic, philosophical problems to physics and chemistry governing the functioning of human brain[38]. Even though cells and neurotransmitters are indeed its field of interest, the conclusions that can be derived from their studies are much more far-reaching. They do not question the authenticity of aesthetic experience, but consequently prove its existence and even deepen its possible outcomes. These can be even deepened by broadening the terms that are crucial for understanding of performing arts, and ancient *choreia* is one of them – a term that could be revised thanks to contemporary science. In return, such research might be inspiring for the cognitive studies, by revealing the aspects of the embodiment that are still in question.

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38. Bruce McConachie and F. Elizabeth Hart, "Preface," in *Performance and Cognition. Theatre Studies and the Cognitive Turn* (London and New York: Routledge, 2006), 2006.

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