

Theoretical Analyses

Aristotle's Concept of Mental Imagery in Sports

Stavroula Roumbou*^a

[a] South-West University "Neofit Rilski", Blagoevgrad, Bulgaria.

Abstract

Throughout the past decade, there has been an accelerated expansion of heightening consciousness in athletic performance's mental facets, which is reflected in the aggrandizement of research concern in cognitive sports psychology. Research on mental imagery has been considerably influenced by cognitive concepts whereby Aristotle, the Stageirite philosopher, delivers the primary systematic account of the significant role of mental imagery in cognition. In Aristotelian psychological theory, mental images perform much the same function that the rather broader concept of mental portrayal plays in contemporary cognitive science. With the assumption that cognition refers to any mental activity associated with acquiring, storing or using knowledge (including competent behaviour), the present paper, endeavors to forge an alliance between Aristotle's notion of mental imagery, which draws attentions to some form of fundamental mental portrayal of athletic Knowledge, along with the contemporary notion of mental imagery in sports performers.

Keywords: mental imagery, Aristotle, Athletes, Phantasia, optimal performance

Psychological Thought, 2017, Vol. 10(1), 49–59, doi:10.5964/psycht.v10i1.200

Received: 2016-08-09. Accepted: 2016-11-29. Published (VoR): 2017-04-28.

Handling Editors: Irina Roncaglia, The National Autistic Society (NAS) - Sybil Elgar, London, United Kingdom; Stanislava Stoyanova, South-West University "Neofit Rilski", Blagoevgrad, Bulgaria

*Corresponding author at: 66, Ivan Mihailov Street, 2700 Blagoevgrad, Bulgaria. E-mail: svroubou@gmail.com



This is an open access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Mental Imagery

Mental imagery is delineated as *"a symbolic sensory experience that may occur in any sensory mode"* (Hardy, Jones, & Gould, 1996, p. 28). As outlined by Kosslyn (1994), mental imagery is an important form of cognition, which performs a significant task in several human tasks including recollection and innovative thinking. Driskell et al. (1994) suggest that mental imagery as the Knowledge of phenomenal mental images entails the cognitive rehearsal of an activity without the presence of overt corporeal movement. Undoubtedly, some of its essential key functions are either in mental practice or in the methodical utilization of mental imagery with the intention to perform competencies covertly, without implementing the required movements.

Having evaluated the efficiency of mental practice in laboratory adjustments, imagery scientists have progressively ventured into physical exertion (Thøgersen-Ntoumani, Shephard, Ntoumanis, Wagenmakers, & Shaw, 2016) as well as in sport context (MacIntyre, Moran, Collet, & Guillot, 2013).

Ergo, in sports' context, mental imagery involves the athletes' imagery themselves in a selected ambiance or executing a specified process. Diverse utilizations of imagery in sports, encompass the experienced exercise of

the competent sensory-motor practical knowledge actually executed in perception, the mental rehearse of distinct performance competencies with the intention to enhance confidence, to manage arousal and anxiety as well as to prepare for optimal performance (Plessinger, 2009). Considering the fact that scientific studies regarding the technique of mental imagery obtain on optimistic perspective (Fisher, 1986; Gammage, Hall, & Rodgers, 2000), further research is required regarding the ways through which imagery impacts on human behavior. From the perspective supplied by scientific studies in sport psychology's domain (Hall, 2001; Perry & Morris, 1995; Porter, 2003), imagery is an element of specific psychological competencies for sports activity or an instrument for mental training that may assist sportsmen to achieve success and can prolong physical performance, mainly during competitiveness.

Even though certain skepticism diffused on Carpenter's (1894) psycho-neuromuscular theory exists as outlined by Feltz and Landers (1983), it is probably the most apparent and immediate foundation for comprehending the association between mental imagery and prosperous athletic performance implementation. Psycho-neuromuscular theory (Carpenter, 1894) postulates that when a movement is vibrantly as well as intensely imagined, sequential micro-firings of the neural pathways equivalent to that movement occur and are stored on a mental compendium assisting athletes to perform that specific activity easier to execute in the foreseeable future (Ziegler, 1987).

Another interpretation of the mental imagery's effects is outlined in the spirit of Mackay's cognitive concept (1980), wherein corporeal practice contributes to the formation of physical nodes; their improvement consequently, induces counterpart mental nodes. As soon as a mental node is developed, its activation by means of mental rehearse contains the improvement of its counterpart physical node. The most apparent characteristic associated with MacKay's (1980) cognitive approach, is the supposition that mental nodes develop from physical nodes. Hence, it can be predicted that in the absence of previous task-relevant corporeal behavior, there would be no mental nodes; so attempts at mental practice with the intention to develop beneficial changes in physical performance would be ineffective. Consequently, imprecise physical practice or practice of inefficient actions would yield fractional or incomplete mental nodes and it will lead to the formation of imperfect physical nodes or to the development of duplicated mental-nodes.

It seems apparent, according to Hale's (1982) as well as Slade's (2002a, 2002b) research findings that by supporting an athlete obstruct disrupting thoughts, as well as concentrate on task-relevant stimuli, mental imagery is providing athletes control, which may consequently cultivate feelings of enhanced personal efficiency and increased self confidence in the skills' performance arena.

Paivio (1985) additionally declares that the motivational as well as the cognitive elements of mental imagery are divided into two levels: a specified as well as a general level. To be more specific, the cognitive area of mental imagery is divided into the cognitive-general as well as the cognitive-specific area. Cognitive-specific mental imagery entails the rehearsal of task specific competencies such as the precise shooting abilities that are required for a basketball player. Cognitive-general mental imagery includes the rehearsal of activity specific competencies, for instance when a basketball player runs mentally through his overall athletic performance.

In accordance with Paivio's (1985) suggestions, the motivational area of imagery is divided into the motivational-specific and motivational-general area. Motivational-specific mental imagery, entails imagining the required actions in an effort to attain specific objectives. As an illustration, a marathon runner may imagine what is required in order to accomplish a desired time in a season period. Consequently, motivational-general

imagery contains two sub-categories: the motivational-general-mastery imagery, associated with being self-confident and mentally tough, as well as the motivational-general-arousal imagery associated with arousal and anxiety. [Munroe et al. \(2000\)](#) indicate that once analyzing mental imagery it is recommended to harmonize the applied imagery with the expected result. To depict [Munroe et al.'s \(2000\)](#) recommendation, [Vadocz et al. \(1997\)](#) examined the connection between mental imagery appliance, competitive anxiousness, and self-confidence. Research results revealed that participant involvement in motivational-general-arousal imagery was a substantial predictor of participant cognitive anxiety, supporting the concept that this form of imagery is correlated with arousal. [Vadocz et al. \(1997\)](#) additionally concluded that sportsmen associated with motivational-general-mastery imagery experienced substantially higher levels of self-assurance, whilst the cognitive imagery was discovered to have no influence on individual self-assurance levels.

Imagery Use by Athletes

A plethora of studies exist to support that mental imagery practice is a veritable instrument in enhancing sport performance. According to [Murphy \(2005\)](#), the effectiveness of imagery in cultivating sport performance, is maximized only through a controlled systematic practice. [Ziegler \(1987\)](#) investigated the way different imagery styles affected participants' effectiveness on a basketball free throw shooting process. Results of the study provided further support to mental imagery rehearse as an effective means of enhancing performance efficacy. In addition, [Hall and Erffmeyer \(1983\)](#) implemented visuo-motor behavior rehearsal, a technique that synthesizes mental imagery, relaxation, and behavioral modeling. The study results revealed substantial improvement in free-throw shooting performance.

[Munroe et al. \(2000\)](#) in their qualitative assessment of imagery use - where, when, why, and what - supplemented enlightening details about imagery utilization by sportsmen. With reference to 'where', sportsmen documented using imagery extensively in both training and contest, and they described doing so before, throughout and after each, the 'when'. With regard to 'what' they imaged and described a variety of features such as the frequency with which they use imagery. It is utilized mostly just before competition and throughout practice. It is essential to note that a few scientific researchers assume that sportsmen should physically practice a new skill first, before endeavoring to practice it using imagery ([Richardson, 1967](#); [Smith, 1987](#)). This is to ensure that they comprehend the adequate strategies required and obtain an interior sense of how they are expected to perform that skill. Without this comprehension, sportsmen may visualize incorrect techniques, causing them to physically perform that skill using the inaccurate techniques, which would have minimal impact on enhancing their performance.

Supplementary research has found that athletes may also reap the benefits of the usage of mental imagery immediately after a prosperous performance, enabling them to re-experience the positive aspects of their performance, enhancing their feelings of self-confidence and competence for their next performance ([Hodges, Huys, & Starkes, 2007](#); [MacIntyre & Moran, 2007](#)).

There are numerous prerequisites in attaining mental imagery's desired effect; however, the primary ones are the teaching and learning processes of the specific mental imagery techniques. The visuo-spatial and temporal elements form mental imagery's procedural knowledge, whilst conceptual as well as symbolical elements form mental imagery's declarative knowledge ([Annett, 1988](#)). According to [Paris and Cunningham \(1996\)](#),

Procedural knowledge represents the knowledge of knowing how to do mental imagery, based upon performance outcomes such as the effective achievements in mentally forming the proper image in the mind. Declarative knowledge differs, since it is the knowledge of knowing that, or the concept behind the mental imagery process in order to obtain a comprehension of the mental imagery process, and intervening conceptually, or symbolically to facilitate understanding (Paris & Cunningham, 1996). Both of these constructions of knowledge are crucial if the individual is to learn the necessary strategies to perform mental imagery adequately (Paris, Lipson, & Wixson, 1983). The reason for this is that imagining the skill, and actually performing the skill, needs to be as closely implemented as possible for effectual transfer and reinforcement to neural structures (Currie & Ravenscroft, 1997; Goss, Hall, Buckolz, & Fihburne, 1986). Thus, mental imagery competency necessitates a degree of attention and psychological effort to elicit the ideal, desired effect. Once *declarative* knowledge has been assimilated and comprehended, the conscious attention to details during mental imagery forms a reinforcing feedback loop that optimizes neural structures, then *procedural* knowledge commences. There are numerous guidelines to enrich the imagery process, and most, if not all, fit within the spectrum of strategies in mental imagery training (Martens, 1987; Moran, 1996; Rushall, 2008).

Aristotle's Phantasia

Aristotle described the Greek word *phantasia* as synonymous to imagery, used for referring to an extensive range of activities linked to thoughts, dreams, as well as memories.

Aristotle (1976) in *De Anima* (Περὶ Ψυχῆς) additionally posits a mental function referred to as *phantasia* and appeals to *phantasia* with the intention to enlighten behavior of all Kinds, specifically to clarify the directed by reason behavior. Furthermore, he appeals to *phantasia* to clarify the human mind's capacity to transition seamlessly between perception and thought. In such a capacity, *phantasia* is necessary for thought to be activated. Elucidating the sources of *phantasia*, Aristotle declares: "As sight is the most highly developed sense, the name *phantasia* (imagination) has been formed from *phaos* (light) because it is not possible to see without light" (Aristotle, 1941, 1, p. 589). Aristotle's *Phantasia*, according to his psychological writings (*De Anima*, 1976; *Parva Naturalia*, 1936; *Politica*, 1957; *The Metaphysics*, 1961; *Ethica Nicomachea*, 1962) functions as a connector between perception, sensation, as well as mentality, or exterior and interior climate, is a psychic procedure, an act of perception and, thereupon, it is not an autonomous process. This procedure is nevertheless crucial to human thought process. *Phantasia's* function is to sustain the acquaintanceship with mental imagery, whose virtual quality brings the imagination close to the function of memory whilst simultaneously distinguishing it from perception. Moreover, Aristotle remarks, that *phantasia* (φαντασία) differ from *sensation* (αἴσθησις) and *thought* (διάνοια) (Aristotle, 1976, *De Anima*, pp. 427b14-21:

"Because *phantasia* is different from sensation and thought; this [namely *phantasia*] cannot exist apart from sensation and supposition. It is manifest that [*phantasia*] is not the same kind of thinking as supposal. For this affection is in our own power whenever we wish (for it is possible to represent an object before our eyes, as do those who set things out in mnemonic systems and form [mental] images of them), but believing/forming opinions is not in our own power; For it is necessary to be either false or true."

In other words, *phantasia* for Aristotle is not a combination of sensation and judgement, ("σύμμιξις αἰσθήσεως καὶ δόξης" (Plato, 1993, pp. 264b1-2), as Plato in the *Sophist* assumed.

The Stageirite philosopher furthermore asserts, that *phantasia* (φαντασία) is a kind of motion (κίνησις) in the soul, that cannot exist apart from sensation (αἴσθησις) - the result of sensation's activity - and supposition (ὑπόληψις), which contains knowledge, right thinking, practical wisdom and judgment (Aristotle, 1976, De Anima, pp. 428a.1-429a.9:

“ἡ δὲ φαντασία κίνησις τις δοκεῖ εἶναι καὶ οὐκ ἄνευ αἰσθήσεως γίνεσθαι ἀλλ’ αἰσθανομένοις καὶ ὧν αἴσθησις ἐστίν, ἔστι δὲ γίνεσθαι κίνησιν ὑπὸ τῆς ἐνεργείας τῆς αἰσθήσεως, καὶ ταύτην ὁμοίαν ἀνάγκη εἶναι τῇ αἰσθήσει, εἴη ἂν αὕτη ἡ κίνησις οὔτε ἄνευ αἰσθήσεως ἐνδεχομένη οὔτε μὴ αἰσθανομένοις ὑπάρχειν, καὶ πολλὰ κατ’ αὐτὴν καὶ ποιεῖν καὶ πάσχειν τὸ ἔχον, καὶ εἶναι καὶ ἀληθῆ καὶ ψευδῆ.”
 [imagination seems to be a kind of movement and not to occur without sensation, but belong to things that perceive and has to do with things of which there is perception, and since the activity of perception may provoke movement, and that movement is necessarily identical with the perception, it could be possible for that movement neither to occur without sensation nor to belong to those that cannot perceive, and what possesses it to act and be acted upon many things in accordance with it, and such as to be both true and false. (Kotsalis, 2016)]

Aristotle's View of Phantasia in Sports

For Aristotle, sports may be a means of philosophical cognition as well as a way to obtain genuine self-fulfillment (Aristotle, 1962, *Ethica Nicomachea*). He accounts that the main function of mental imagery, as a cognitive simulation procedure, is to encourage individuals attain eudaimonia (Aristotle, 1962, *Ethica Nicomachea*) which means personal excellence. Personalized Excellency, consequently, may intricately be affiliated with getting involved in interpersonal activities such as sports activities, which may supply the resources for testing one's personal competencies via collaborating team activities, against worthy contenders, with the encouragement of a community to stimulate one to attain one's best. Thus, we could assume that whilst sport activities and cognition are in accordance with the superlative fulfillment (reason), the true contentment of the reasonable being can be obtained. Through the use of the mind (thought process), sport expands over the physical world and reaches the eternal and changeless world of forms. Additionally, the realm of forms is for Aristotle the area, wherein the truthfulness is being unveiled (in Barnes, 1979). Through this, sport intrinsically intervenes in the sphere of philosophical cognition – the field of exploring and cultivating the cognition of wisdom and knowledge; cognition of the self and self-borders.

As emphasized by Aristotle's notion, individuals develop a mental map an *"image"* (1984, p. 680) of the future from connections drawn from constant-ongoing sensory Knowledge. The mind then computes and deliberates by viewing or by constructing mental images of what is to come with reference to whatever is present, via imagination and memory, in accordance with Aristotle's prominent Laws of Association (in Warren, 1921, p. 30). This internal map, ascertains the way an individual will perceive a scenario. Since it is derived from the body's neurological system, imagery may also affect the human body in numerous ways. Frequently, images of objectives and consequences develop a focal point or attractor, around which attitude becomes self-organized. Individuals regularly utilize mental illustrations of upcoming consequences as the foundation for mobilizing or selecting specific behaviors in the present. In hypnotic process, imagery through symbols and metaphors is used as a method to comprehend and steer unacquainted action and produce trance states, mostly throughout the technique of guided fantasy (Kelly, 1972). Imagery may also affect the functionality of the autonomic

neurological system. Mental images, for instance, have been used to invigorate autoimmune system functioning along with other healing procedures (Jemmott & Locke, 1984).

According to McMahon (1973), Aristotle determined the image in the soul as the superlative prompting power in the human action. He claimed that whenever an image/ perception of something to be pursued or even averted as contained in imagination's construct, the soul is moved in the same way as if the desired objects were actually present. Kosslyn et al. (2002) ensure the supposition that human beings react to mental images in a similar way to visual ones. Numerous neuroimaging studies demonstrate that mental imagery and perception stimulate about the two thirds of the equivalent brain areas (Kosslyn et al., 2002). These outcomes form the neuropsychological basis for Markus and Ruvolo's (1989) declaration that: "*imaging one's own actions through the construction of elaborated possible selves achieving the desired goal may thus directly facilitate the translation of goals into intentions and instrumented actions*" (p. 213).

Sport psychologists have endeavored to comprehend the precise procedure that induces mental imagery to function, which is briefly illustrated below:

The brain areas responsible for motor performance (in particular the prefrontal cortex and its connections to the basal ganglia) appear to be responsible for imagery procedures under conscious thought without evoking intended movements (Jeannerod, 1994, 1997). The neural operations associated with motor coordination execution, also play a substantial role in mentally representing those actions in conscious thought, via imagery, without generating the actual movement. If the mental imagery technique is conducted inadequately, without sufficient attention on appropriate execution, motor performance will be ineffective (Behncke, 2004).

Aristotle, undoubtedly, lived centuries before the study of the mind crystallized into a specialized science. With his envisioned psychology concepts, it is compelling to wonder how adequately Aristotle's mind concept complements with contemporary mind concepts. Notwithstanding, there is a plethora of mind concepts presented and suggested by psychology professionals throughout the years. The Filter Theory of Attention by Donald Broadbent (1958) is the basis of the majority of the recommended concepts (Bundesen & Habekost, 2005). Examining Broadbent's (1958) approach in conjunction with Aristotle's mind approach we may conclude that both theories emphasize the stream of external data being conscientiously processed by sense organs and consequently as being individualized and altered to the mental process arena. Doubtlessly, either concepts highlight the effective adjustment of external information into internal models. This specific focus, maintained throughout the millennia between Aristotle and Broadbent's cognitive approach, reveals that what we sense (beneficial information processing) is the most fundamental necessity of the mind. For Broadbent and modern neuropsychological concepts, this effectual system of information exchange is the electrochemical interactions among neurons, whilst in Aristotle's concept, this effectual system of information exchange is the exploitation of *phantasmata* that are captured in the notion of *phantasia*. This is not to state that *phantasmata* are the Aristotelian analogous of a neuron. Preferably, a *phantasma* may be a form of internal portrayal equivalent to the informational signals shared between neurons. Whichever the precise parallelism may be, it is unquestionably stimulating to consider that Aristotle with the utilization of *phantasia* constructed and developed a mind theory that is determined by formations yet upheld in contemporary neuropsychology.

Conclusions and Recommendations

Aristotle's remarks, suggestive and persuasive though they are, are scattered widely among the surviving texts, and the only extended discussion of *phantasia*'s concept is particularly difficult to interpret. Not merely due to the fact that the texts that have come down to us seem to be more than usually corrupted but also because of the richness and density of its justifications and its peculiarly oblique approaches to the ostensible subject matter (Nussbaum, 1978, 1992).

This article endeavored to support the view that the argumentation of *phantasia* in Aristotle's dialectic is continuous and utterly unified. Aristotle's psychology approach of *phantasia* acknowledges the multi-domain and multi-factorial nature of this specific mental process. Thus, it may be used as a meta-theory, supplying a theoretical structure that can integrate empirical findings from psychology as well as sports psychology into an emergent unified conceptualization of psychology.

Aristotle appeals to *phantasia* to explain a plethora of cognitive functions, for with the contemporary notion of imagination (sensory or propositional) would not be invoked to clarify (as cited in Matlin, 2009, p. 4). Thus, the power of Aristotle's *phantasia* offers the primary assets of exhibiting and shaping images in the soul, therefore it can be traced in an extensively wide range of psychological scenarios, implying that it is linked to additional psychological procedures, such as reminiscence, thought process, as well as inspiration, giving rise to action. Thence, when the notion of *phantasia* is equated to the contemporary concept of 'imagination' we may conclude that is closely related, yet having a wider meaning.

The breadth of Aristotle's conception of *phantasia* (mental imagery) is outstanding and sets the stage for the discussion of mental imagery in subsequent literature. Regardless the obscurities encircling the notion of Aristotle's concept of *phantasia*, the influence on latter thinkers of Aristotle's account of cognition and imagery, was substantial and expanded far beyond those who were avowed Aristotelians. Though Aristotle's mind concept may not be acceptable by several scholars; possibly due to the fact that Aristotle associates *phantasia* to a considerable amount of different psychological processes, Aristotle admirably may be characterized as the prime thinker in philosophy's history to critically accept *phantasia* as a philosophical idea, developing its ontological presence. Hereupon, he deservedly has been accredited with the discovery of the concept of *mental imagery* (Schofield, 1978; Scruton 1974), and certainly, it seems fair to say that the origins of most subsequent discussions of the mental imagery concept may be traced back to his work (Thomas, 1997; Tye, 1984; Watson, 1988a, 1988b).

Funding

The author has no funding to report.

Competing Interests

The author has declared that no competing interests exist.

Acknowledgments

The author has no support to report.

References

- Annett, J. (1988). Motor learning and retention. In M. M. Gruneborg, P. E. Morris, & R. N. Sykes (Eds.), *Practical aspects of memory: Current research and issues* (Vol. 2, pp. 434-440). Chichester, United Kingdom: John Wiley & Sons.
- Aristotle. (1936). *On the soul; Parva naturalia; On breath* (W. S. Hett, Trans.). London, United Kingdom: Loeb Classical Library.
- Aristotle. (1941). *The basic works of Aristotle* (R. McKeon, Trans.). New York, NY, USA: Random House.
- Aristotle. (1957). *Aristotelis politica* (W. D. Ross, Ed.). Oxford, United Kingdom: Oxford University Press.
- Aristotle. (1962). *Ethica nicomachea* (I. Bywater, Ed.). Oxford, United Kingdom: Clarendon Press.
- Aristotle. (1961). *The metaphysics. Books I-IX* (H. Tredennick, Trans.). London, United Kingdom: Heinemann.
- Aristotle. (1976). *De anima* (Robert D. Hicks, Trans., introduction and notes). New York, NY, USA: Arno Press.
- Aristotle. (1984). *The complete works of Aristotle* (Jonathan Barnes, Ed.; revised Oxford Translation). Princeton, NJ, USA: Princeton University Press.
- Barnes, J. (1979). Aristotle's concept of mind. In J. Barnes, M. Schofield, & R. Sorabji (Eds.), *Articles on Aristotle: Vol. 4. Psychology and aesthetics* (pp. 32-41). London, United Kingdom: Duckworth. (Originally published in *Proceedings of the Aristotelian Society*, 1971-2).
- Behncke, L. (2004). Mental skills training for sports: A brief review. *Athletic Insight: The Online Journal of Sport Psychology*, 6(1), 1-19.
- Broadbent, D. (1958). *Perception and communication*. London, United Kingdom: Pergamon Press.
- Bundesen, C., & Habekost, T. (2005). Attention. In K. Lamberts & R. Goldstone (Eds.), *Handbook of cognition* (pp. 105-129). London, United Kingdom: Sage.
- Carpenter, W. B. (1894). *Principles of mental physiology*. New York, NY, USA: Appleton.
- Currie, G., & Ravenscroft, I. (1997). Mental simulation and motor imagery. *Philosophy of Science*, 64, 161-180. doi:10.1086/392541
- Driskell, J. E., Copper, C., & Moran, A. (1994). Does mental practice enhance performance? *The Journal of Applied Psychology*, 79, 481-492. doi:10.1037/0021-9010.79.4.481
- Feltz, D. L., & Landers, D. M. (1983). The effects of mental practice on motor skills, learning and performance: A meta-analysis. *Journal of Sport Psychology*, 5, 25-57. doi:10.1123/jsp.5.1.25
- Fisher, A. C. (1986). *Imagery from a sport psychology perspective*. Paper presented at the meeting of the American Alliance for Health, Physical Education, Recreation and Dance, Cincinnati, Ohio, USA.
- Gammage, K. L., Hall, C. R., & Rodgers, W. M. (2000). More about exercise imagery. *The Sport Psychologist*, 14, 348-359. doi:10.1123/tsp.14.4.348

- Goss, S., Hall, C., Buckolz, E., & Fihburne, G. (1986). Imagery ability and the acquisition and retention of movements. *Memory & Cognition*, *14*, 469-477. doi:10.3758/BF03202518
- Hale, B. D. (1982). The effects of internal and external imagery on muscular and ocular concomitants. *Journal of Sport Psychology*, *4*, 379-387. doi:10.1123/jsp.4.4.379
- Hall, C. R. (2001). Imagery in sport and exercise. In R. N. Singer, H. A. Hausenblas, & C. M. Janelle (Eds.), *Handbook of sport psychology* (pp. 529-549). New York, NY, USA: Wiley.
- Hall, E. G., & Erffmeyer, E. S. (1983). The effect of visuo-motor behavior rehearsal with videotaped modeling on free throw accuracy of intercollegiate female basketball players. *Journal of Sport Psychology*, *5*, 343-346. doi:10.1123/jsp.5.3.343
- Hardy, L., Jones, G., & Gould, D. (1996). *Understanding psychological preparation for sport: Theory and practice of elite performers*. Chichester, United Kingdom: Wiley.
- Hodges, N. J., Huys, R., & Starkes, J. L. (2007). Methodological review and evaluation of research in expert performance in sport. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of sport psychology* (3rd ed., pp. 161-183). New York, NY, USA: John Wiley.
- Jeannerod, M. (1994). The representing brain: Neural correlates of motor intention and imagery. *Behavioral and Brain Sciences*, *17*, 187-245. doi:10.1017/S0140525X00034026
- Jeannerod, M. (1997). *The cognitive neuroscience of action*. Oxford, United Kingdom: Blackwell.
- Jemmott, J. B., III, & Locke, S. E. (1984). Psychosocial factors, immunologic mediation, and human susceptibility to infectious diseases: How much do we know? *Psychological Bulletin*, *95*, 78-108. doi:10.1037/0033-2909.95.1.78
- Kelly, G. F. (1972). Guided fantasy as a counseling technique with youth. *Journal of Counseling Psychology*, *19*, 355-361. doi:10.1037/h0033221
- Kosslyn, S. M. (1994). *Image and brain: The resolution of the imagery debate*. Cambridge, MA, USA: MIT Press.
- Kosslyn, S. M., Cacioppo, J. T., Davidson, R. J., Hugdahl, K., Lovallo, W. R., Spiegel, D., & Rose, R. (2002). Bridging psychology and biology: The analysis of individuals in groups. *The American Psychologist*, *57*(5), 341-351. doi:10.1037/0003-066X.57.5.341
- Kotsalis, G. A. (2016, March 27). *What imagination is*. Retrieved from <http://www.aristotelianphilosophy.com/what-imagination-is/>
- MacIntyre, T. E., & Moran, A. P. (2007). A qualitative investigation of imagery use and meta-imagery processes among elite canoe-slalom competitors. *Journal of Imagery Research in Sport and Physical Activity*, *2*(1), Article 3. doi:10.2202/1932-0191.1009
- MacIntyre, T. E., Moran, A. P., Collet, C., & Guillot, A. (2013). An emerging paradigm: A strength-based approach to exploring mental imagery. *Frontiers in Human Neuroscience*, *7*, Article 104. doi:10.3389/fnhum.2013.00104
- MacKay, D. G. (1980). Language, thought and social attitudes. In H. Giles (Ed.), *Language: Social psychological perspectives* (pp. 89-96). New York, NY, USA: Pergamon Press.

- Markus, H. R., & Ruvolo, A. (1989). Possible selves: Personalized representations of goals. In L. A. Pervin (Ed.), *Goal concepts in personality and social psychology* (pp. 213-214). Hillsdale, NJ, USA: Lawrence Erlbaum.
- Martens, R. (1987). *Coaches guide to sport psychology*. Champaign, IL, USA: Human Kinetics.
- Matlin, M. (2009). *Cognition*. Hoboken, NJ, USA: John Wiley & Sons.
- McMahon, C. E. (1973). Images as motives and motivators: A historical perspective. *The American Journal of Psychology*, 86(3), 465-490. doi:10.2307/1421935
- Moran, A. P. (1996). *The psychology of concentration in sport performance*. Hove, United Kingdom: Psychology Press.
- Munroe, K. J., Giacobbi, P. R., Hall, C. R., & Weinberg, R. S. (2000). The four Ws of imagery use: Where, when, why and what. *The Sport Psychologist*, 14, 119-137. doi:10.1123/tsp.14.2.119
- Murphy, S. (2005). Model of imagery in sport psychology: A review. *Journal of Mental Imagery*, 14, 153-172.
- Nussbaum, M. C. (1978). The role of phantasia in Aristotle's explanation of action. In M. G. Nussbaum (Ed.), *Aristotle's De motu animalium* (pp. 221-269). Princeton, NJ, USA: Princeton University Press.
- Nussbaum, M. C. (1992). Human functioning and social justice: In defense of Aristotelian essentialism. *Political Theory*, 20(2), 202-246. doi:10.1177/0090591792020002002
- Paivio, A. (1985). Cognitive and motivational functions of imagery in human performance. *Canadian Journal of Applied Sport Sciences*, 10, 22S-28S.
- Paris, S. G., & Cunningham, A. E. (1996). Children becoming students. In D. Berliner & R. Calfee (Eds.), *Handbook of educational psychology* (pp. 117-146). New York, NY, USA: Macmillan.
- Paris, S. G., Lipson, M. Y., & Wixson, K. K. (1983). Becoming a strategic reader. *Contemporary Educational Psychology*, 8, 293-316. doi:10.1016/0361-476X(83)90018-8
- Perry, C., & Morris, T. (1995). Mental imagery in sport. In T. Morris & J. Summers (Eds.), *Sport psychology: Theory, applications and issues* (pp. 339-385). Brisbane, Australia: John Wiley.
- Plato. (1993). *Sophist* (N. P. White, Trans., introduction and notes). Indianapolis, IN, USA: Hackett.
- Plessinger, A. (2009). The effects of mental imagery on athletic performance (Research paper at 2027 Washington D.C. The World Bank). Retrieved from <https://www.hypnosisalliance.com/articles/The%20Effects%20Of%20Mental%20Imagery%20On%20Athletic%20Performance%20-%20Annie%20Plessinger.pdf>
- Porter, K. (2003). *The mental athlete*. Champaign, IL, USA: Human Kinetics.
- Richardson, A. (1967). Mental practice: A review and discussion. Part II. *Research Quarterly*, 38, 263-273.
- Rushall, B. S. (2008). *Mental skills training for sports: A manual for athletes, coaches, and sport psychologists* (4th ed.). Spring Valley, CA, USA: Sports Science Associates.

- Schofield, M. (1978). Aristotle on the imagination. In G. E. R. Lloyd & G. E. L. Owen (Eds.), *Aristotle on mind and the senses: Proceedings of the Seventh Symposium Aristotelicum* (pp. 99-141). Cambridge, United Kingdom: Cambridge University Press.
- Scruton, R. (1974). *Art and imagination: A study in the philosophy of mind*. London, United Kingdom: Methuen.
- Slade, M. (2002a). Routine outcome assessment in mental health services. *Psychological Medicine*, 32, 1339-1343. doi:10.1017/S0033291701004974
- Slade, M. (2002b). What outcomes to measure in routine mental health services, and how to assess them – A systematic review. *The Australian and New Zealand Journal of Psychiatry*, 36, 743-753. doi:10.1046/j.1440-1614.2002.01099.x
- Smith, D. (1987). Conditions that facilitate the development of sport imagery training. *The Sport Psychologist*, 1, 237-247. doi:10.1123/tsp.1.3.237
- Thøgersen-Ntoumani, C., Shephard, S. O., Ntoumanis, N., Wagenmakers, A. J. M., & Shaw, C. S. (2016). Intrinsic motivation in two exercise interventions: Associations with fitness and body composition. *Health Psychology*, 35(2), 195-198. doi:10.1037/hea0000260
- Thomas, N. J. T. (1997). Imagery and the coherence of imagination: A critique of White. *Journal of Philosophical Research*, 22, 95-127. doi:10.5840/jpr_1997_20
- Tye, M. (1984). The debate about mental imagery. *The Journal of Philosophy*, 81, 678-691. doi:10.2307/2026175
- Vadocz, E. A., Hall, C. R., & Moritz, S. E. (1997). The relationship between competitive anxiety and imagery use. *Journal of Applied Sport Psychology*, 9, 241-253. doi:10.1080/10413209708406485
- Warren, H. C. (1921). *A history of the association of psychology*. New York, NY, USA: Scribners.
- Watson, G. (1988a). Discovering the imagination: Platonists and Stoics on phantasia. In J. Dillon & A. A. Long (Eds.), *The question of eclecticism: Studies in Later Greek philosophy* (pp. 208-233). Berkeley, CA, USA: University of California Press.
- Watson, G. (1988b). *Phantasia in classical thought*. Galway, Ireland: Galway University Press.
- Ziegler, S. G. (1987). Comparison of imagery styles and past experience in skills performance. *Perceptual and Motor Skills*, 64, 579-586. doi:10.2466/pms.1987.64.2.579

About the Author

Stavroula Roubou received her BSc in Physical Education & Sport Sciences from National & Kapodistrian University of Athens (Greece, 1993), her MSc in Science Education – Educational Management from University of Nicosia, Cyprus (Cyprus, 2014) and currently is a PhD student at Department of Psychology, South-West University "Neofit Rilski", Blagoevgrad, Bulgaria. Her research involves issues within the sport psychology domain and in particular cognitive processes, self-talk and team roles. She received her PGCert in Special Education (National University of Athens, 2016) – and her PGCert in Educational Management (HAROKOPIO UNIVERSITY –Athens, 2015). Stavroula is the former executive manager of Spa Center IRAYYA in Argyroupoli, Athens, and current Manager at the Department of Physical Education in Argolida's Regional Secondary Education Directorate (since 2011).