

# **Sound Body, Sound Mind, and Successful Performance: Exploring Movement and Artistic Expression in Gymnastics, Dance, Martial Arts, Music, and Beyond from an Embodied Cognition Perspective**

## **Abstract**

Embodied cognition is a more recent approach to understanding how human beings think, in which the relationships between cognition and action are emphasized. A key assumption of embodied cognition concerns that our physical/bodily interactions with the environment allow us to more advantageously perceive, remember, contemplate, and act on complex information that is presented to us. This paper specifically explores embodied cognition in the context of athletic preparation for competition and achievement during competition. Athletic activities such as gymnastics, dance, and the martial arts (for example, Aikido) will be investigated, and similar performative characteristics and influences in music will also be explored. The historical underpinnings and evolutionary elements of embodied cognition, the fundamental attributes to embodiment, comparisons between more traditional cognitivist and computational approaches to cognition, and the application of embodied cognition to athletic performance will be discussed. Further, coping skills utilized by athletes in preparation for competition and the potential applications of embodied cognition to therapies and treatments for a variety of psychopathological conditions will be explored.

## **Introduction**

The embodied cognition approach to understanding human thought is characterized by an agent's firsthand recognition of and interaction with an environment that is somewhat familiar to the agent. This recognition and the subsequent information that the agent takes away from the engagement with the environment is considered to occur without cognitive or advanced perceptual processing, in which acquired heuristics, propositional contents, and encoded algorithms that have been stored in the mind are not utilized (Cappuccio, 2015, p. 214). This approach contrasts with the more traditional cognitive perspectives, which assume that, in order for intelligent operations to be carried out, logical processing must occur in some form, particularly via various forms of rudimentary symbolic manipulation that extract amodal information from the external environment without contextual influence (Cappuccio, 2015, p. 214). A variety of theorists have supported the embodied cognition perspective, relating it to numerous contexts that describe how the mind works. For instance, Paul M. Fitts and Michael I. Posner's

cognitive-computational approach (1967) emphasizes how more than just “intellectual” skills that exist via internal mental processes are required in order for the body to effectively perceive, remember, think, and act; such activity is only fully made possible with the body’s interaction with the external environment (Cappuccio, 2015, p. 214). Further, James Gibson’s cognitive-ecological approach (1979) describes how the body aids in much of the information-processing phenomena that many have associated with internal activity of the mind in classical approaches to understanding cognition (Cappuccio, 2015, p. 214). Gibson also developed a theory of affordances, in which he defines affordances as “the offers, consistent in opportunities of interaction, that the objects present in the environment possess in relation to the sensorimotor capacities of different animals: ‘The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill’ ([*The Ecological Approach to Visual Perception*,] p. 127)” (Garbarini & Adenzato, 2004, p. 100). As such, objects that are present in the external environment provide a variety of affordances for human beings and other animals, depending on their current needs, although these affordances are an intrinsic feature of the object, and not formulated by the needs or intentions of the viewer (Garbarini & Adenzato, 2004, p. 100).

This paper seeks to explore embodied cognition as it relates to preparation prior to competition and achievement during competition in the contexts of athletics, such as artistic gymnastics, dance, and the martial arts (specifically, Aikido) and in music. The history of the development of embodied cognition as an approach to understanding human cognitive abilities (Garbarini & Adenzato, 2004; Illundáin-Agurruza, 2013; Raab & Araújo, 2019; Robinson, 2007; Spatz, 2017) and its evolutionary support will be investigated (Wilson, 2008), comparisons between more traditional cognitivist and computational approaches to cognition, and the application of embodied cognition to athletic (Barrero González, 2019; Bradshaw, 2010; Kimmel & Rogler, 2018; Snowber, 2012) and musical (Schiavio, Gesbert, Reybrouck, Hauw, & Parncutt, 2019) performance will be discussed. Finally, coping skills utilized by athletes in preparation for competition and the potential applications of embodied cognition to therapies and treatments for a variety of psychopathological conditions will be examined.

### **Embodied Cognition from an Evolutionary Perspective**

Evolutionary aspects in the development of embodied cognition as an area of investigation (Wilson, 2008)

### **Embodied Cognition: Background, History, and Conflicting Views**

Its development as an approach to understanding human cognition: (Aizawa, 2015; Allen-Collinson, 2009; Garbarini & Adenzato, 2004; Illundáin-Agurruza, 2013; Raab & Araújo, 2019; Robinson, 2007; Spatz, 2017)

Rosch’s principles of categorization (Garbarini & Adenzato, 2004, p. 104)

Powers (1978)- goal-directed action and its influence on an agent’s perceptions of the fluidity of the external environment (Cappuccio, 2015, p. 217).

Maurice Merleau-Ponty (1945)- “tacit knowledge” and “knowledge in the hands” as influenced by context and experience (Cappuccio, 2015, p. 213-214).

### **Emotion, Physiology, and Embodiment**

Emotional expression during performance, physiological manifestations associated with emotion (Robinson, 2007)

### **Embodiment in Music**

Background of embodied cognition in music learning and performance (Robinson, 2007; Chirazi, 2021; Cox, 2016; Schiavio et al., 2019)

### **Embodiment in Athletics: An Overview**

Background of embodied cognition in an athletic context (Cappuccio, 2015; Chirazi, 2021; Illundáin-Agurruza, 2013; Raab & Araújo, 2019; Schiavio et al., 2019).

Thomas Carr and Sian Beilock- contributions to the field of embodied cognition as it relates to athletics (skill development and performance) through experimental investigation (Cappuccio, 2015, p. 214-215).

### **Embodiment in Dance**

Background of embodied cognition, artistic expression in dance (Barrero González, 2019; Chirazi, 2021; Snowber, 2012)

### **Embodiment in the Martial Arts**

Background of embodied cognition, artistic expression in the martial arts (main focus- Aikido) (Kimmel & Rogler, 2018)

### **Embodiment in Gymnastics: Nerves and Athletic Performance**

Background of embodied cognition, artistic expression in gymnastics (Bradshaw, 2010; Chirazi, 2021; Daroglou, 2011; Gautier et al., 2008; Luis del Campo & Espada Gracia, 2018; Marsh et al., 2006; Pizzera, 2012)

How nervousness can impact athletic performance if effective coping strategies are not employed: “choking under pressure” (Cappuccio, 2015, p. 215, p. 217, etc.)

### **Coping Mechanisms and Performance in Gymnastics Competitions**

Coping mechanisms with gymnastics performance during competition (Daroglou, 2011; Luis del Campo & Espada Gracia, 2018; Pizzera, 2012)

### **Self-Belief, Self-Concept, and Performance in Gymnastics Competitions**

Self-belief and physical self-concept and their influence on gymnastics performance during competition  
(Marsh et al., 2006)

### **Treatments and Therapies Utilizing Embodied Cognition**

Utilizing embodied cognition in general: (De Fano et al., 2019)

Specific applications to dance: (Barrero González, 2019)

### **Conclusion**

Restate thesis, key terms used. Review historical elements, relationships between athletic activities, music, and the arts. Therapies, benefits to coping mechanisms and a healthy self-concept.

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