



The Evolution of Motor Behavior: Lessons from Past Research and Future Prospects

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1. Round 1

1.1 Reviewer 1

Reviewer:

The literature search strategy is comprehensive but lacks detail on the databases used. Include specifics on the inclusion criteria for “key academic databases” and why certain databases (e.g., IEEE Xplore for AI-related studies) were excluded.

The introduction states that motor behavior research has “practical applications in sports performance, rehabilitation, and education,” but the specific mechanisms linking motor behavior to these areas are not outlined. Consider adding examples or references to studies that demonstrate these applications more concretely.

The mention of “functional magnetic resonance imaging (fMRI)” and “motion capture systems” is crucial, but the practical challenges of using these technologies (e.g., the limitations of fMRI in natural movement studies) should be addressed to provide a balanced view.

The concept of “neural efficiency” in expert performers is introduced but is not backed with empirical data in this section. Including specific study results or figures from key papers (e.g., Guo et al., 2017) would add credibility to this claim.

When discussing motor skill development, include examples from longitudinal studies that highlight the progression of motor competence across different life stages. This would provide more context for readers.

The section on rehabilitation references movement sonification, but the practical implications of this technology in clinical settings are not clearly outlined. Consider expanding on how sonification has been used in actual rehabilitation programs.

Authors revised the manuscript and uploaded the updated document.

1.2 Reviewer 2

Reviewer:

The sentence "Advances in neuroimaging techniques allowed for the examination of brain activity during motor tasks" needs elaboration. Specify which neuroimaging techniques (e.g., fMRI, EEG) have been most impactful and how these techniques have evolved over time.

When discussing the integration of artificial intelligence in motor behavior, it would be helpful to elaborate on specific models or AI algorithms (e.g., machine learning models) that are currently used. This would enhance the reader's understanding of how AI has influenced the field.

The transition from developmental stages to motor control research is an important progression, but the connection between these two areas is not fully explored. Explain how foundational motor development studies directly influenced modern motor control theories.

The discussion on motor learning theories introduces "motor programs" but lacks depth on the debate between motor programs and dynamical systems theory. Consider adding a brief comparison of these two perspectives to clarify their implications on motor learning.

The term "sensorimotor performance" is introduced without adequate definition. Clarify what is meant by this term and how it differs from general motor behavior to avoid confusion among readers.

The section on AI and machine learning is promising, but lacks discussion on the limitations of these technologies, such as the challenges of generalizing AI models to diverse populations. Addressing these limitations would strengthen the section.

Authors revised the manuscript and uploaded the updated document.

2. Revised

Editor's decision after revisions: Accepted.

Editor in Chief's decision: Accepted.