# Review of: "Occupation from a perspective of complementarity - Part 1 - Background to the development of a concept"

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Potential competing interests: No potential competing interests to declare.

Thanking the attempt made by the authors, for a standard structural pattern of research articles Swales (1999) proposed a popular model called CARS which is followed by most researchers. So, it is recommended that the authors follow the model.

**Abstract**

The article introduces the concept of complementarity in occupational science and its potential applications in other disciplines. The authors draw inspiration from physicist Niels Bohr's ideas and philosopher Edmund Husserl's concept of intersubjectivity to offer a fresh perspective on how we understand occupation. The abstract also touches on the cultural dimension of complementarity, referencing ancient Chinese philosophy. However, the abstract lacks specific details about methodology, results, and conclusions, as well as a conceptual model to support the claims made. Nonetheless, the abstract presents a thought-provoking perspective and invites further exploration.

**An overview of a dispute in physics**

This section presents a detailed account of the historical controversy in physics concerning the nature of phenomena and the concept of complementarity. The author effectively explains the traditional scientific approach, where the researcher and the phenomenon were separated. The advent of quantum mechanics in the 1920s challenged this approach and led to different interpretations by leading physicists, including Einstein, Heisenberg, and Bohr. The article discusses Bohr's proposition of complementarity in 1927, which argued that Heisenberg and Schrödinger's accounts were complementary and offered distinct but valid perspectives on the phenomena. The discussion also includes Bohr's 1948 conceptual breakthrough, which recognized the experimenter's involvement in the production of phenomena. The article's language is easy to understand, but more information is needed to describe the evidence and mathematical descriptions supporting Heisenberg and Schrödinger's viewpoints and Heisenberg's subjectivist interpretation. Overall, the article provides a comprehensive overview of the dispute and introduces Bohr's complementary perspective as a way to overcome the subject-object separation.

**Parallels with occupational science**

This section discusses the historical controversy in physics and its relevance to the issue of defining phenomenon in occupational science. The traditional assumption in physics was that there was a clear separation between the knower

and the known, which also influenced the definition of occupation in occupational science. However, both fields have faced challenges in defining their respective phenomena, and the author argues that adopting Bohr's concept of complementarity could provide a way to approach this issue in occupational science. By broadening the concept of complementarity and revising the definition of phenomenon, occupational science could adopt a more nuanced approach to understanding the complexity of occupation. While the section presents an interesting parallel between physics and occupational science, further elaboration and examples would enhance the reader's understanding. Additionally, a deeper analysis of the implications of adopting a more nuanced approach to defining phenomenon in occupational science would strengthen the argument.

**Complementarity, intersubjectivity, and ancient Chinese philosophy**

In this section, the concept of complementarity in science is discussed, particularly in relation to humanistic interpretations. The author argues that understanding complementarity involves interpreting how science describes various phenomena, which has humanistic implications. To interpret complementarity in humanistic terms, the author introduces the term "intersubjectivity" from phenomenology. The section explores how science produces phenomena beyond the basic understanding of them as simply the behavior of objects, and how interpretation and construction are intertwined in this production. The author also discusses the application of complementarity to quantum physics, challenging the assumption of a subject-object duality in the dominant Western philosophical worldview. Overall, the section provides an interesting analysis of complementarity, but further elaboration and clarification on certain points would strengthen the argument.

**Complementarity involving activity and receptivity**

The section delves into the concept of complementarity proposed by Bohr in quantum physics and its relevance to other disciplines, like occupational science. Bohr's idea of complementarity centers around the mutual and reciprocal relationship between opposites, as represented by the Yin-Yang symbol. Yang contains receptivity, and Yin contains activity, and this mutual containment forms the basis for complementarity. The section also critiques Lee's interpretation of complementarity as applying to objects without considering phenomena and assuming subject-object duality.

However, to strengthen the section, the author could provide more elaboration and context on complementarity, holism, and their implications for occupational science. Examples and references to relevant literature could enhance the reader's understanding, and addressing limitations and criticisms of Bohr's concept could provide a more balanced perspective. Nonetheless, the section serves as an interesting introduction to the topic and sets the stage for further exploration in subsequent sections.

**Disciplinarity and interdisciplinarity**

The section explores the concept of complementarity in occupational science and highlights the importance of interdisciplinary perspectives. The authors emphasize that different disciplines may require different rules for interpreting complementarity. They also express concerns about disciplinary insularity in occupational science and its failure to live up

to its self-proclaimed mandate of being holistic. The authors argue that a hermeneutical bridge is needed to connect Bohr's complementarity in physics with occupational science. The section provides a critical review of the literature and raises important questions about disciplinary boundaries, holism, and the need for interdisciplinary perspectives. It sets the stage for further exploration of complementarity in occupational science and its potential application.

**The emergence of a complementarity perspective in physics**

In this section, the author gives an overview of how Bohr developed the concept of complementarity in his interpretation of quantum mechanics. The author discusses how Bohr's early views on complementarity were influenced by Wittgenstein's theory of language in science and Heisenberg's interpretation of quantum mechanics, which challenged the notion of objectivity in science.

Initially, Bohr viewed complementarity as the existence of "complementary pictures of the phenomena" derived from different types of measurements, which challenged the idea of objectivity in science. Heisenberg's interpretation of complementarity introduced subjectivity in the choice of experimental conditions and interpretation of results, which Bohr was not entirely satisfied with.

This dissatisfaction led to Bohr's reformulation of the meaning of the term "phenomena" in 1948, advocating for a limitation of the term to refer exclusively to observations contained under specified circumstances. The author also notes that complementarity in Bohr's later account includes both what is observed and what cannot be observed due to limitations of observation, and that a quasi-objective account is provided that is "not susceptible to picturable interpretation."

Overall, the author effectively explains complex concepts and provides relevant quotes from Bohr and other philosophers to support the arguments. The writing is clear and concise, making it accessible to readers with some background knowledge of quantum mechanics and philosophy.

**Conclusion**

The section discusses Bohr's development of the concept of complementarity in quantum mechanics and its broader applications. It highlights how complementarity can provide a fresh perspective on occupation and occupational science, going beyond a simple definition of human activities. The section draws parallels between Bohr's initial views on subject-object split and the behavior of research subjects in occupational science. Additionally, it explores Bohr's reformulation of the meaning of "phenomena," which created room for a new understanding of occupation from the perspective of complementarity. The section effectively sets up the groundwork for further discussions on complementarity in occupational science. However, it is less appropriate to write a new even related idea and reference in the conclusion.

**In Sum,**

The idea of complementarity is a philosophical concept that has ancient roots and has been integrated into modern philosophy, bringing it closer to science. It suggests that two seemingly contradictory aspects can both be necessary for a full understanding of a phenomenon. Niels Bohr, a renowned physicist, introduced this concept and attempted to apply it beyond physics in fields like psychology, biology, and anthropology, but with limited success during his lifetime. In this

research article, the authors explore the trajectory of the concept of complementarity from physics to occupational science. They argue that Bohr's perspective on complementarity can be applied to re-conceptualize the notion of occupation from a complementarity perspective by aligning with Bohr's redefinition of the term "phenomenon." This perspective of complementarity can be applied to various fields of study, including occupational science, as it is a description of two mutually exclusive yet necessary aspects for a comprehensive understanding of the phenomenon.

The article discusses Bohr's attempt to apply the concept of complementarity in areas beyond physics, such as psychology, biology, and anthropology. Despite Bohr's belief in the versatility of complementarity, he was not very successful in applying it to these fields during his lifetime. The authors propose a new way of understanding occupation from a complementarity perspective, which aligns with Bohr's philosophical concept. This approach suggests that seemingly contradictory aspects of occupation can both be necessary for a complete understanding of the phenomenon. The article emphasizes the potential of complementarity in various fields of study, but the authors should avoid using personal pronouns such as ‘we’ and ‘us’ in their writing.

In their article titled "Occupation from a Perspective of Complementarity - Part 1 - Background to the Development of a Concept," authors David Turnbull and Ross Barnard explore the idea of complementarity in relation to occupational science. They argue that adopting a complementary perspective is essential for the advancement of occupational science as a field of study. The authors draw inspiration from physicist Niels Bohr and his concept of complementarity, which he initially introduced in the context of physics but believed could be applied to other disciplines as well.

The article provides a historical account of the development of the idea of complementarity in physics, specifically concerning the debate surrounding the behavior of electrons in atomic physics in the 1920s. The authors highlight the competing viewpoints of physicists such as Heisenberg, who suggested a particle-based explanation, and Schrödinger, who proposed a wave-based explanation. Bohr's solution to this controversy was to suggest that both perspectives were complementary and that each provided a valid way of understanding the phenomenon in question.

In "Occupation from a Perspective of Complementarity - Part 1 - Background to the Development of a Concept," Turnbull and Barnard argue that the concept of complementarity in occupational science requires an intersubjective understanding of phenomena. They suggest that this shared interpretation is essential to the very notion of complementarity, which has a universal application across different disciplines. The article provides an interdisciplinary approach to the study of occupation, drawing on insights from physics, philosophy, and social sciences. The authors emphasize the importance of a complementary perspective for a comprehensive understanding of occupation as a phenomenon. Part 2 of their series of articles will delve deeper into the concept of complementarity in occupational science. The article is well-written, informative, and thought-provoking.

In terms of limitations, the article does not provide an in-depth analysis of specific examples or applications of complementarity in occupational science, as this is reserved for Part 2 of the series. Additionally, the article does not address potential criticisms or limitations of the concept of complementarity itself, which could be a subject of further discussion in future research.

To summarize, Turnbull and Barnard's article "Occupation from a Perspective of Complementarity - Part 1 - Background to the Development of a Concept" introduces the concept of complementarity in occupational science and its interdisciplinary nature. It lays out the historical and philosophical context of the concept and emphasizes the need for a shared interpretation of phenomena. However, the article does not delve into specific examples or potential criticisms of complementarity, which are reserved for Part 2. Nonetheless, the article provides a valuable contribution to the literature on occupational science and sets the stage for further research and discussion.

In conclusion, "Occupation from a Perspective of Complementarity - Part 1 - Background to the Development of a Concept" by Turnbull and Barnard is a thought-provoking article that provides a conceptual overview of complementarity as it applies to occupational science. It presents a historical context for the development of the concept in physics, introduces parallels in Chinese philosophy, and emphasizes the interdisciplinary nature of the approach. The article sets the stage for further discussion and analysis in Part 2 of the series, and overall, contributes to the literature on occupational science and the understanding of occupation as a phenomenon from a complementary perspective.