# Three Puzzles about Bohr's Correspondence Principle

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## Abstract

Niels Bohr's "correspondence principle" is typically believed to be the requirement that in the limit of large quantum numbers ($n \to \infty$) there is a statistical agreement between the quantum and classical frequencies. A closer reading of Bohr's writings on the correspondence principle, however, reveals that this interpretation is mistaken. Specifically, Bohr makes the following three puzzling claims: First, he claims that the correspondence principle applies to small quantum numbers as well as large (while the statistical agreement of frequencies is only for large n); second, he claims that the correspondence principle is a law of quantum theory; and third, Bohr argues that formal apparatus of matrix mechanics (the new quantum theory) can be thought of as a precise formulation of the correspondence principle. With further textual evidence, I offer an alternative interpretation of the correspondence principle in terms of what I call Bohr's selection rule. I conclude by showing how this new interpretation of the correspondence principle readily makes sense of Bohr's three puzzling claims.

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