No extension of quantum theory can have improved predictive power

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http://www.nature.com/ncomms/journal/v2/n8/full/ncomms1416.html [2]

According to quantum theory, measurements generate random outcomes, in stark contrast with classical mechanics. This raises the question of whether there could exist an extension of the theory that removes this indeterminism, as suspected by Einstein, Podolsky and Rosen. Although this has been shown to be impossible, existing results do not imply that the current theory is maximally informative. Here we ask the more general question of whether any improved predictions can be achieved by any extension of quantum theory. Under the assumption that measurements can be chosen freely, we answer this question in the negative: no extension of quantum theory can give more information about the outcomes of future measurements than quantum theory itself. Our result has significance for the foundations of quantum mechanics, as well as applications to tasks that exploit the inherent randomness in quantum theory, such as quantum cryptography.

- QIPC [3]
- Highlight [4]
- Quantum Information Theory [5]

Links:
[1] http://qurope.eu/users/ltheussl
[2] http://www.nature.com/ncomms/journal/v2/n8/full/ncomms1416.html
[3] http://qurope.eu/category/qipc/qipc
[4] http://qurope.eu/category/attribute/highlight
[5] http://qurope.eu/category/virtual-institute/quantum-information-theory