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A quantum-probabilistic paradigm: Non-consequential reasoning and state dependence in investment choice

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1 A quantum-probabilistic paradigm:  
2 non-consequential reasoning and state  
3 dependence in investment choice

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7 **Abstract**

8 Seminal findings involving payoffs (Shafir and Tversky, 1992; Tver-  
9 sky and Shafir, 1992; Shafir, 1994) showed that individuals exhibit  
10 state-dependent behaviour in different informational contexts. In par-  
11 ticular, in the condition of ambiguity as well as risk, individuals tend  
12 to exhibit ambiguity aversion. The core principle of rational (conse-  
13 quential) behaviour conceived by Savage (1954), that is the ‘Savage  
14 Sure Thing’ principle, has been shown to be violated. In mathematical  
15 language, this violation is equivalent to the violation of the “Law of  
16 total probability”, (Kolmogorov, 1933). Given the importance of orig-  
17 inal findings in the call for a generalization of classical expected utility,  
18 we perform in this paper a set of experiments related to expressing  
19 investment preferences: i) under objective risk, ii) after a preceding  
20 gain, or loss. In accordance with previous findings we detected state  
21 dependence in human judgement (previous gain or loss changed the  
22 preference state of the participants) as well as violation of consequen-  
23 tial reasoning under risk. We propose a quantum probabilistic model  
24 of agents’ preferences, where non-consequentialism and state depen-  
25 dence can be well explained via interference of complex probability  
26 amplitudes. A geometric depiction of the experimental findings with  
a *state reconstruction* procedure from statistical data via the inverse

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