

عنوان مقاله:

A Kantian Solution for the Freedom of Choice Loophole in Bell Experiments

محل انتشار:

فصلنامه پژوهش های فلسفی، دوره 18، شماره 47 (سال: 1403)

تعداد صفحات اصل مقاله: 14

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خلاصه مقاله:

Bell's theorem is based on the assumptions of local causality and measurement independence. The last assumption is identified by many authors as linked to the freedom of choice hypothesis. In this sense the human free will ultimately can ensure the measurement independence assumption. The incomplete experimental conditions for supporting this assumption are known in the literature as "freedom-of-choice loophole" (FOCL). Although there is no consensus among the scientists that the measurement independence is linked to human choices, in a recent paper, published in a prestigious journal, signed by more than a hundred authors, this assumption was seriously taken for the first time in an experiment known as Big Bell Test (Abellán et al. ۲۰۱۸). Using photons, single atoms, atomic ensembles and superconducting devices, this experiment was performed in five continents, and involved twelve laboratories, adopting human choices to close the FOCL. Nevertheless, the possibility of human freedom of choice has been a matter of philosophical debate for more than ۲۰۰۰ years, and there is no consensus among philosophers on this topic. If human choice is not free, this solution would not be sufficient to close FOCL. Therefore, in order to support the basic assumption of this experiment, it is necessary to argue that human choice is indeed free. In this paper, we present a Kantian position on this topic and defend the view that this philosophical position is the best way to ensure that Big Bell Test can in fact close the loophole

کلمات کلیدی:

Bell's inequality, Big Bell test, free will, Kant, Agency

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