Under which conditions do humans cooperate with machines? This study explores human and algorithmic cooperation in the infinitely repeated Prisoner's Dilemma, focusing on a critical threshold for cooperation. Using online experiments, we assess how replacing human opponents with learning algorithms – either human-mimicking or profit-maximizing – affects cooperation rates. Our results show that human cooperation is influenced by opponent type and strategy, with a higher predictive power of the theoretical threshold when interacting with AI maximizing profits.