Previous research suggests that violent video games are a cause of aggressive behavior. However, this research has a number of weaknesses: violent and nonviolent games may have other confounding differences, outcomes may be chosen post-hoc, and the literature appears to be influenced by publication bias. In this study, we address these weaknesses by using violent and nonviolent games that are closely matched, collecting a large sample, and using a single preregistered outcome. 446 male undergraduates were randomly assigned to play a violent or nonviolent, difficult or easy first-person shooter game. They were then provoked by a confederate and given an opportunity to aggress by assigning their partner to soak his hand in ice-cold water. Neither game violence nor game difficulty predicted aggressive behavior. Incidentally, we found that 2D:4D ratio, thought to index prenatal testosterone exposure, did not predict aggressive behavior. Results cast doubt on violent video games and low 2D:4D as causes of aggressive behavior.