

# Effects of Prior Investment and Personal Responsibility in a Simple Network Game

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## Abstract

The present study has twofold purpose. First, we wish to test the descriptive power of the Nash equilibrium solution in a traffic network game with a new population of participants and a different experimental procedure. Second, we wish to determine whether the effects of prior investment and personal responsibility, that may lead people to commit to a failing project, may be generalized from individual to interactive decision tasks.

For these two purposes, we implement a computer-controlled traffic network game in which the addition of a cost-free line segment to the network may, in equilibrium, increase the travel cost of all the network users. This setting is formally called the Braess paradox. In this experiment, participants first played the basic game, which involved two routes from the origin (O) to the destination (D): routes (O,A,D) and (O,B,D). Participants were then played the augmented game, which involved the cost-free line, and thus three routes to the destination: (O,A,D), (O,B,D) and (O,A,B,D). The present study confirmed the Braess paradox. Every participant's travel cost in fact increased by the cost-free line in the network. In addition, we tested the effects of personal responsibility and prior investment on commitment to a failing course of action.

To this end, before playing the augmented game, we asked participants to express their preference for the two games. Some participants were led to believe that they were collectively responsible for their playing the augmented game in the second phase (i.e., personal responsibility manipulation). Some participants paid some cost in order to play the augmented game (i.e., prior investment manipulation). After playing the augmented game, participants were asked their preference for the two games for the third phase. Although all participants were worse off in the augmented game and were aware that the augmented game was associated with the less beneficial equilibrium, some of the participants in conditions involving prior investment endorsed the less beneficial, augmented game. The personal responsibility manipulation did not facilitate the commitment.