

THINKING OUTSIDE THE BOX: VIDEO GAME PLAY AS WARM UP FOR CREATIVE THINKING

Video game play as warm up for creative thinking

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In an experiment, we examined the effect of game play on improving participant's problem-solving ability, perspective shifting (using the Remote Association task), and change detection ability. These are common cognitive elements in video game play that relate to creative problem solving and have the potential to transfer to problems outside of video games (Gee, 2003; McDonigal, 2011; Veinott et al., 2013). Classic insight problems are difficult to solve. When one solves one of them, it is not likely that they will solve another (Gentner, 1980).

Sixty-two participants were randomly assigned to a Game or Control condition. Participants either played Atari's Roller Coaster Tycoon or were in the control condition (filler task for 30 min). In the game condition, players built and maintained a park. To be successful, this required the players to manage resources and look at the situation from multiple different levels. After this manipulation, participants completed 3 tasks: a pre/post insight problem task, a remote association task (10 trials), and a change detection task (100 trials). For all the tasks, including perspective taking and creativity, we used a standard remote association task in which participants must find a relationship among three words.

Participants in both conditions tried to solve one insight problem at time 1, then either filled out a series of questionnaires (Control condition) or played Roller Coaster Tycoon (Game Condition) for 30 minutes, then tried to solve a new similar insight problem at time 2 (Dunker, 1942). Problem order was counterbalanced across participants within conditions. Data were analyzed using a 2 (Game, Control) x 2 Problem Time (Pre/Post) analysis of variance. Two different problems were used and their order was counterbalanced. Our results indicate that while there was no difference in problem solving abilities at time 1 as expected, participants in the game condition increased their problem solving ability at time 2 by 27% compared to the control condition which improved by 3% on average.

Unlike problem solving, the results for the other two tasks were not statistically significant. A repeated measure ANOVAs was not statistical significant for the other two tasks. Participants in the game condition did not do better on a remote association task, $F(1, 528) = 1.257$, $p = .263$, or complete it faster, $F(1, 528) = 0.067$, $p = .796$, than those in the non-game condition. Participants in the game condition did not do better on change detection accuracy, $F(1, 532) = 1.70$, $p = .193$, or speed, $F(1, 532) = .207$, $p = .849$, than those in the non-game condition. These data indicate that game play did not warm-up participants for either of these tasks, but did for the problem solving task. The problem

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The problem solving result provides initial support for the idea that video games that practice for certain cognitive strategies can serve as a potential warm-up or transfer for problem solving activities outside of the game. If warm up was universal, we might have expected improvement on all three tasks, but we only found it on one. Future research will seek to replicate the problem solving result, and include measures that are more directly tied to the specific game play (e.g., in this case resource management in roller coaster tycoon). This will allow us to tease apart whether this is transfer of specific skills or warm up of more general skills (e.g., perspective taking). In general, transfer of cognitive learning is not found as often as one would hope. While we discuss the potential of games for transfer of learning, the measure of this type of transfer is rare. The idea that games could serve as a warm up we think is intriguing, but more research is needed.