

“Hunger for games”: Video game influences on understanding of cancer

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INTRODUCTION

A frustration among cancer patients occurs when physicians attempt to explain physiological mechanisms of the disease and potential treatments. The common community tends to not have a medical background that enables them to understand relevant but complex terminology. Due to this disconnect, technology-based strategies have been developed to better familiarize individuals with the science behind cancer technology. For instance, Kato, Cole, Bradlyn, and Pollack (2008) showed that the creation of video game interventions improved both motivation and self-understanding in cancer patients. Moreover, Cole, Yoo, & Knutson (2012) have correlated cancer-based interactive video games (IVGs) with increased activation of brain areas that have been previously associated with positive rewards and emotionally-guided motivation. HopeLab industries (see Tate, Haritatos, & Cole, 2009) explored the possibility of using a publicly accessible video game (i.e., *Re-Mission 1*) to educate and prepare cancer patients for future treatment of their conditions. Tate and colleagues (2009) found promising results from such a game, and they have since developed *Re-Mission 2*, a set of six short, interactive games that show the nature and progression of the different cancer types (e.g., bone, brain, etc.). This suggests that video game products may have a positive impact on education of cancer and the accompanying mechanisms. Our lab previously demonstrated that video game usage enhanced memory of how cancer spreads and can be treated (Bacharz, Howard, & Smith, 2017); however, long term retention of the respective content was not analyzed.

PURPOSE

1. Explore whether the *Re-Mission 2* product may be effective in characterizing cancer progression and therapy
2. Assess the long-term memory effects of the content

HYPOTHESES

1. Both conditions (text- and game-based) will effectively lead to improved memory of cancer progression and treatment
2. The game-based condition will demonstrate a greater memory benefit, when compared to text-based materials

REFERENCES

- Bacharz, K. C., Howard, J. R., & Smith, P. L. (2017, March). *Game on! The influence of computer simulations on understanding of cancer-based therapies*. Poster presented at the annual meeting of the Southeastern Psychological Association, Atlanta, GA.
- Kato, P.M., Cole, S.W., Bradlyn, A.S., & Pollock, B.H. (2015). A video game improves behavioral outcomes in adolescents and young adults with cancer: A randomized trial. *Pediatrics*, 122(2), e305-e317.
- Tate, R., Haritatos, J., & Cole, S. (2009). Hopelab approach to *Re-Mission*. *International Journal of Learning and Media*, 1(1), 29-35.

METHODS

Participants:

$n = 41$, Female = 32, Male = 9
Ages 18-37 ($M = 19.76$, $SD = 3.49$)

Design:

- 2 x 3 Mixed-Subjects Factorial Design:
 - Stimulus Format (Game-based, Text-based)
 - Test Session (pre-test, post-test, long-term test)
- Dependent Variables:
 - Recognition Scores (measured in multiple choice answers)
 - Cued Recall (measured in open-ended responses to prompted questions)

Text-Based Condition

Pre-test for prior understanding of cancer and treatments

Read the text passage

Post-test for understanding of cancer and treatments

Two Weeks

Long-Term test for understanding of cancer and treatments

Game-Based Condition

Pre-test for prior understanding of cancer and treatments

Read the game instructions about the characters

Play 5 levels of *Re-Mission 2*

Post-test for understanding of cancer and treatments

Two Weeks

Long-Term test for understanding of cancer and treatments



RESULTS

Figure 1. Average Percent Recognition of Multiple Choice Answers as a Function of Presented Stimulus Format

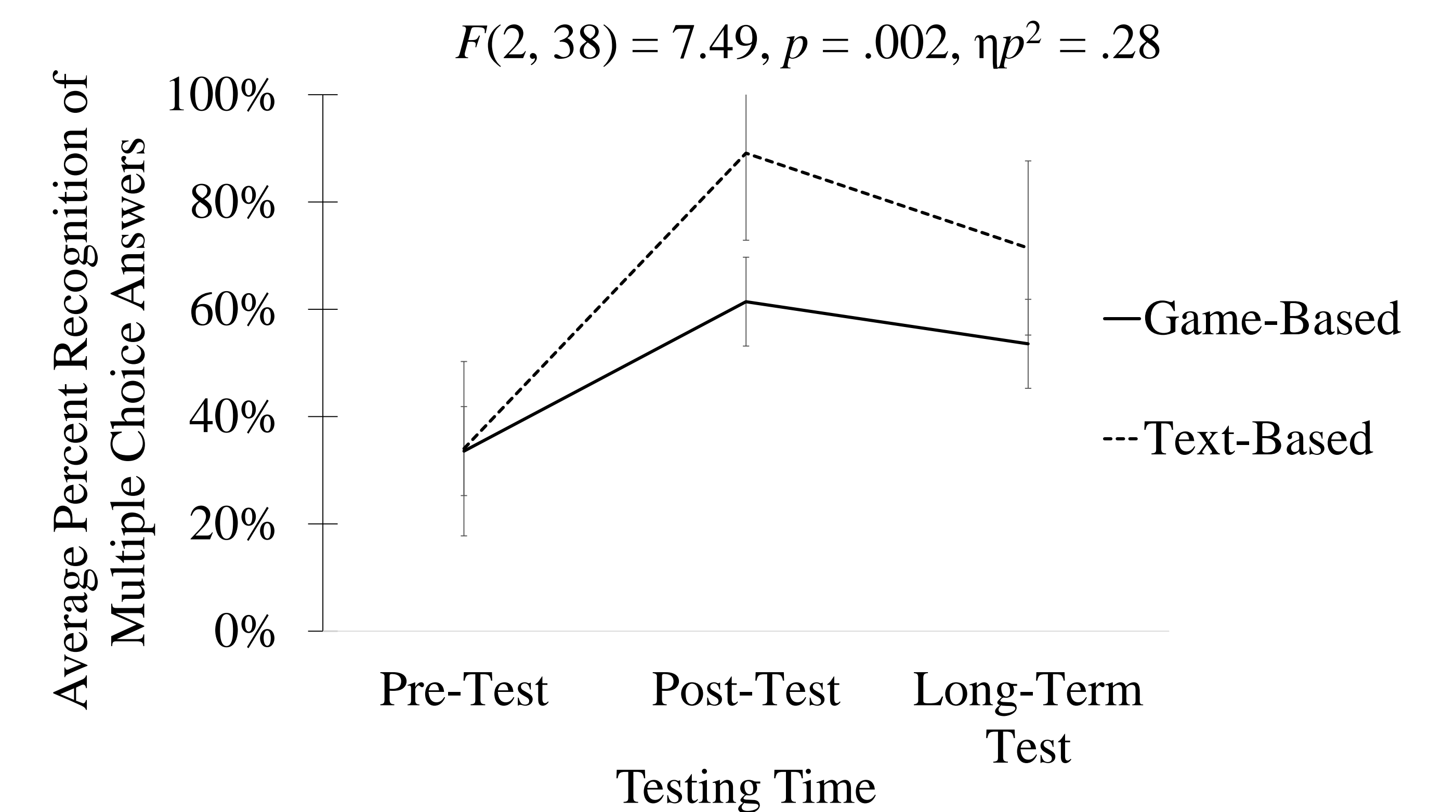
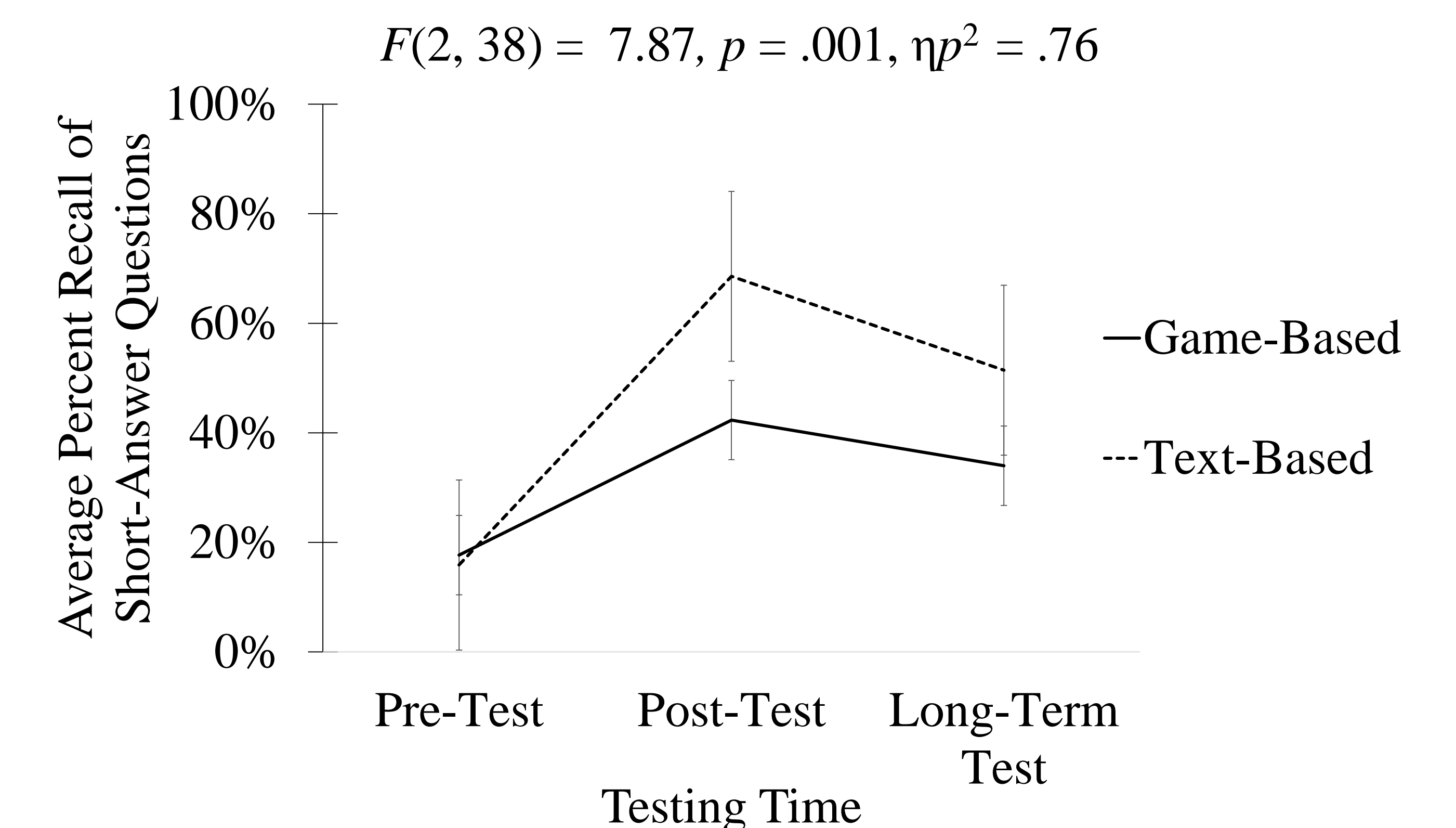


Figure 2. Average Percent Recall of Short-Answer Questions as a Function of Presented Stimulus Format



CONCLUSION

Although both content forms were effective in providing a memory benefit for cancer progression and therapy, there were noted differences between the two conditions. Those in the text-based condition scored significantly higher than those in the game-based condition at both the post- and long-term testing intervals. However, participants in the text-based condition displayed a sharper drop-off in memory between the post-test and long-term testing intervals. A possible explanation might be that while the game-based study provides a more engaging format (for a long-term memory benefit), the complexity of both reading about and playing the game might be too complex of a cognitive task, which future studies could explore.