**HPS203/773 Assessment Task 2: Lab Report Discussion**

Student Name: Michael Alford

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Student ID: 221147552

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**Author Declaration**

I, Michael Alford, declare that I am the sole author of the following work submitted as part of the assessment in HPS203/773. Particularly, I have not colluded with other students in the completion of this work; I have not duplicated work of my peers or from sources such as books, journal articles, or websites without adaptation and due citation; and I have not contracted a third-party to complete any component of this assessment on my behalf. I acknowledge that any of these activities would constitute Academic Misconduct as defined by Regulation 4.1(2) of Deakin University and may consequently attract penalties as defined in Schedule A: Penalties for Student Academic Misconduct.

Discussion

In this study we investigated the influence of two genres of Video Games (VG) on the development of problem solving skills. Participants were separated into two groups engaging in either Strategy Video Games (SVG), or Role-playing games (RPG). A further comparison was conducted between novice gamers (NG) and expert gamers (EG) on the basis of self-reported level of skill. Our hypotheses for these measures were: a) That EGs have a more developed level of problem solving skills than their NG counterparts, and b) that SVGs provide a more conducive environment for the development of problem skills than RPGs. Our results support these hypotheses with EGs scoring significantly higher on the Tower of Hanoi (London) (TOH) than our NG participants, with a significantly higher score also obtained for players of SVGs over RPGs on the TOH task. Specific elements of these results are congruent with the findings of past research with respect to the improvement of problem solving skills.

Support of our results is demonstrated in a number of studies regarding the problem solving subdomain of rule application (Adachi & Willoughby, 2013; Shute et al., 2015), in that participants that self-reported higher levels of problem solving skills (through longer term exposure to SVGs) were found to have more developed problem solving skills overall. Shute et al. (2015) identifies the rule application facets of eductive skill (generation of a sophisticated schema applicable to the rules of a VG), and reproductive skill (the recall and reproduction of a complex schema) in problem solving tasks as practical applications of transfer effect, providing base level theoretical support of our results of transfer effect from SVGs to the TOH test.

The study conducted by Gobet et al. (2014) provides a deeper theoretical analysis of both the benefits of playing action games (AVGs), and the enhancements of specific facets of the cognitive ability of attention, such as distractor interference, and change detection in a stimulus. The method employed in this study through (the Flanker Compatibility Task) was specifically selected to identify a participant’s ability in distractor filtering, coupled with the P300 electrophysiological component. This pairing provides evidence of improved reaction time to target stimulus among EGs as compared to NGs. Further evidence of the influence of AVGs on attention is evident in this study through the change detection task, with the authors noting the improved reaction times of EGs over NGs (in a far transfer task) in performance. The implications of this study highlight the ability to specifically test and measure components of attention, alluding to a promise of isolating specific components of the problem solving domain of cognitive abilities, and indeed, others.

While the current body of evidence supports the possibility of training and improving cognitive abilities through the use of VGs, a number of studies (including ours) have used self-reporting of expertise as a selection instrument for further participation, but not without limitation. Adachi and Willoughby (2013) have pointed out a potential limitation in this approach, stating that self-reported problem solving ability can be seen as subjective and misrepresentative, with an objective measure of this being able to provide more reliable information to researchers of a given participant’s actual abilities. Gobet et al. (2014) echo this limitation, offering that participants play a pre-determined segment of a game in order to rank individuals on actual performance. Choi et al. (2020) also comment on this, adding that self-reporting can induce a participant to underestimate their abilities based on time spent engaging with VGs in general, with little opportunity to reflect on already garnered ability. With these points in mind, it may be of greater benefit for future studies to overlook self-reporting as a measure of expertise in favour of a more objective method.

While the existing body of research into the development of problem solving skill is presently limited, future research in this area has a lot to uncover. The use of fMRI scans in conjunction with the facet specific tasks or measurements of attention (Gobet et al., 2014) suggest a potential method of research into problem solving that would advance this particular direction of research. Shute et al. (2015) has partially employed this approach through the use of instruments specifically designed (albeit adjusted measures, due to time constraints) with specific problem solving facets, such as rule application and functional fixedness in mind. Adachi and Willoughby (2013) commenced this approach through their comparison of problem solving abilities to academic grades and scholastic achievement. While this area of research arguably is still in its infancy, the avenues to narrow focus are ever present.

In conclusion, the results of our study and their comparison to previously attained results, does appear to support previous findings. The potential for further research into more specific elements of problem solving ability is gathering, all the while moving in an affirmative direction towards the positive influence of VG consumption.

References

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