Elm City Stories: Whether the Game Can Help Predict Risky Behaviors

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Overview

Elm City Stories is an educational game that aims to identify teenagers who may need help in the future based on their performance in the game. This data analysis evaluates the game's ability to understand and predict potential drug usage by correlating participants' performance in the drug-related aspects of the game with their S5 survey result, which indicates their ability to resist drugs in the real world. We realized the "Dunning-Kruger Effect" and the "Imposter Syndrome" might play a role in the correlation study, and the S5 survey might have reliability issues.

Methodology

We adopted a set of matrices to evaluate the game's ability to understand the potential in risky behaviors. We utilized the S5 survey data, which indicated a player's real-life resistance to drugs, as a source to compare with the game performances of the players. According to the game manual, we determined that knowledge sense, refusal sense, and people sense were the most important matrices for game evaluation in drug resistance. Then, we analyzed the players' correctness rates in the minigames mentioned above and correlated them to their S5 score at different times of study. We also noticed a group of players who always got 4.0 S5 scores throughout the study and thus, we looked into the 4.0 group. In the end, we tried to explain our findings by using an external data set from the University of Michigan and possible psychological mechanisms.

Results

In the study, we found that the expected negative correlation between game performance and S5 score became positive after 3 weeks for people sense and refusal sense. This reversed correlation happened to knowledge sense after 6 weeks as well. Nevertheless, our study did not discover any significant correlation between players' overall performance across the study and their S5 scores. Furthermore, we noticed a group of players who had 4.0 S5 scores at all stages but performed well in the game (i.e., high correctness rates). This special group was similar to the general population in terms of time and frequency of game playing.

Discussion & Conclusion

There were possible reasons behind the strange result: 1. Biased dataset 2. Psychological effects. The reliability of the survey was challenged when we found an external dataset that suggested the approval rate of drug, alcohol, and cigarettes among teenagers were significantly lower than the S5 survey suggests. Nevertheless, some students had 4.0 S5 scores but performed quite well in the game. These students had similar play frequency and duration of each play as the other players, which indicated these participants indeed played the game seriously. Since correlation became positive after 3 weeks and given that the participants were between 11-14, we suspected that the Dunning-Kruger Effect resulted in bias in the survey. Specifically, this effect caused young participants to underestimate their ability to resist drugs after learning the complex situation involving drugs in the game. We also doubted that the relatively small sample size in the study is another reason that resulted in biased S5 scores dataset.