

ABSTRACT

Using choices in a fantasy adventure game has recently been shown as a reliable method of measuring personality (McCord, Harman, & Purl, 2019), with multiple advantages over traditional Likert scale measurement. This study systematically tests whether additional elements of gamification enhance measurement. We test a text-based gamified personality measure with and without graphics comparing results with a traditional big 5 measure. Results show both versions of the game adequately measure personality in a shorter more engaging task and the addition of graphics did not improve personality measurement over the text-only game.

Introduction

- Traditional personality assessments are typically context-poor and susceptible to faking and careless responding.
- New research on game-like personality measures suggests that gamification can reduce the negative effects associated with traditional measures.
- Gamification: The addition of elements commonly associated with games to a task.
- The current study is a controlled test of additional elements of gamification (e.g. narrative, graphics, points, levels) in game-based personality measures (GPMs).
- The original GPM is a text-based adventure game where decision in game are used to measure personality. We illustrated most items in the original game creating the GPM-Illustrated.
- We tested both correlations between game scores and scores on a traditional Big 5 inventory as well as participant reactions.



As you round the corner and are able to see inside the cave, the first thing that you notice is a pair of glowing yellow eyes meeting yours unblinkingly. You eventually make out the rest of the figure in the dim light and recognize it as an orange tabby cat that seems fairly ordinary apart from being exceedingly mangy. Tufts of burnt orange colored hair are matted over every surface of the small, egg-shaped cave, making it look strangely comfortable, though you'd sleep on about anything right now.

You decide that your best chance of survival involves some rest. You reluctantly ignore the unpleasant mess and doze off with one eye open in the safest corner of the cave, with your weapons in a tactical position in case you'll need to use them quickly

You toss your belongings to the side before plopping down to sleep, not minding the cat or the mess

Though you'd prefer a regular, empty cave, you decide it's time to improvise your plan and ask the cat if this is where he lives.

Figure 1. Figure 1 shows an example item from the GPM-illustrated.

Materials

GPM. The GPM is a 31 item text-based game. Throughout the narrative, the participant has to choose between different options to continue the adventure (measure available on the 1st author's website). 30 of 31 choices are used to measure the big 5 personality factors (6 questions per factor). Response options for each question represent differing levels (high, medium, low) of a personality factor with low-level options being scored 0 and high-level options scored 2. Scores for each factor are the sum of the 6 questions for each factor.

GPM-Illustrated. The GPM- illustrated is identical to the GPM with the addition of illustrations for most items (see Figure 1).

IPIP-50. The IPIP-50 is a 50-item sample questionnaire provided on the IPIP website (www.ipip.org) that has consistently demonstrated high validity and reliability measures (Goldberg, et al., 2006). The IPIP-50 provides 10 statements per personality factor using a Likert-type scale ranging from one (very inaccurate) to five (very accurate). Thus, for each factor, the highest score a participant can obtain is 50 while the lowest is 10.

Enjoyment, ease and effort. To measure participant reactions, we adopted post measures from Weidner and Landers (2018; originally adapted from Croteau et al., 2010; Venkatesh, 2000; and Speer et al., 2016). All responses ranged from 1 – strongly disagree to 7 – strongly agree. Three items measured enjoyment (e.g. the game (questionnaire) was enjoyable), three items measured ease and clarity (e.g. the game (questionnaire) was clear and understandable), and three items measured the perceived effort expended (e.g. the game (questionnaire) wore me out).

Methods

343 Participants volunteered through the website reddit (r/SampleSize). Participants were told that the study was intended to examine the relationship between performance on a text-based game and personality. Participants first filled out a demographic questionnaire and were randomly assigned to play either the GPM or GPM-Illustrated followed by the enjoyment and engagement items. After they completed the game and its' reaction items, and they completed the IPIP-50 followed by the final reaction items. After completing every portion of the study, participants were provided their scores on the IPIP-50 along with information explaining their scores.

Results

- Replicating previous work, the GPM factor scores correlated with scores from the IPIP-50 for each factor though correlations were moderate in size. Table 1 shows the correlation tables for the combined data. Cronbach's alphas for the game scores are relatively low, consistent with previous work and somewhat expected as the game has only 6 items per factor, each on a 3 point scale of choice data as opposed to agreement judgments.
- Because the items in the GPMs were on a 3 point scale which is not advised for CFA, we parceled items together to create three items per factor each on a 5 point scale. Results of this CFA showed an acceptable fit ($\chi^2(80) = 94.8, p = .123; CFI = .839; RMSEA = .0236$).
- To test for differences in correlations between the text based and illustrated GPMs, we conducted simple slopes analysis on each factor. There was not a difference in slopes for any of the five personality factors between the standard GPM-nI and the GPM-illustrated. The observed interaction terms were; Openness ($\beta = -.443, p = 0.127$), Conscientiousness ($\beta = .0124, p = 0.997$), Extroversion ($\beta = -.0583, p = .888$), Agreeableness ($\beta = -.476, p = 0.188$), and Neuroticism ($\beta = .0285, p = .944$).
- Means for the IPIP-50 and both the text and illustrated GPMs are plotted in figure 2. Collapsing across game types, there is a main effect with the GPMs scoring higher in joy and ease and lower on effort. Between the text and illustrated GPMs there was no difference in Joy, ease or effort.
- For the effort scale, the IPIP-50 was rated as requiring more effort than the GPM but the difference between the IPIP-50 and the GPM-illustrated was not significant.

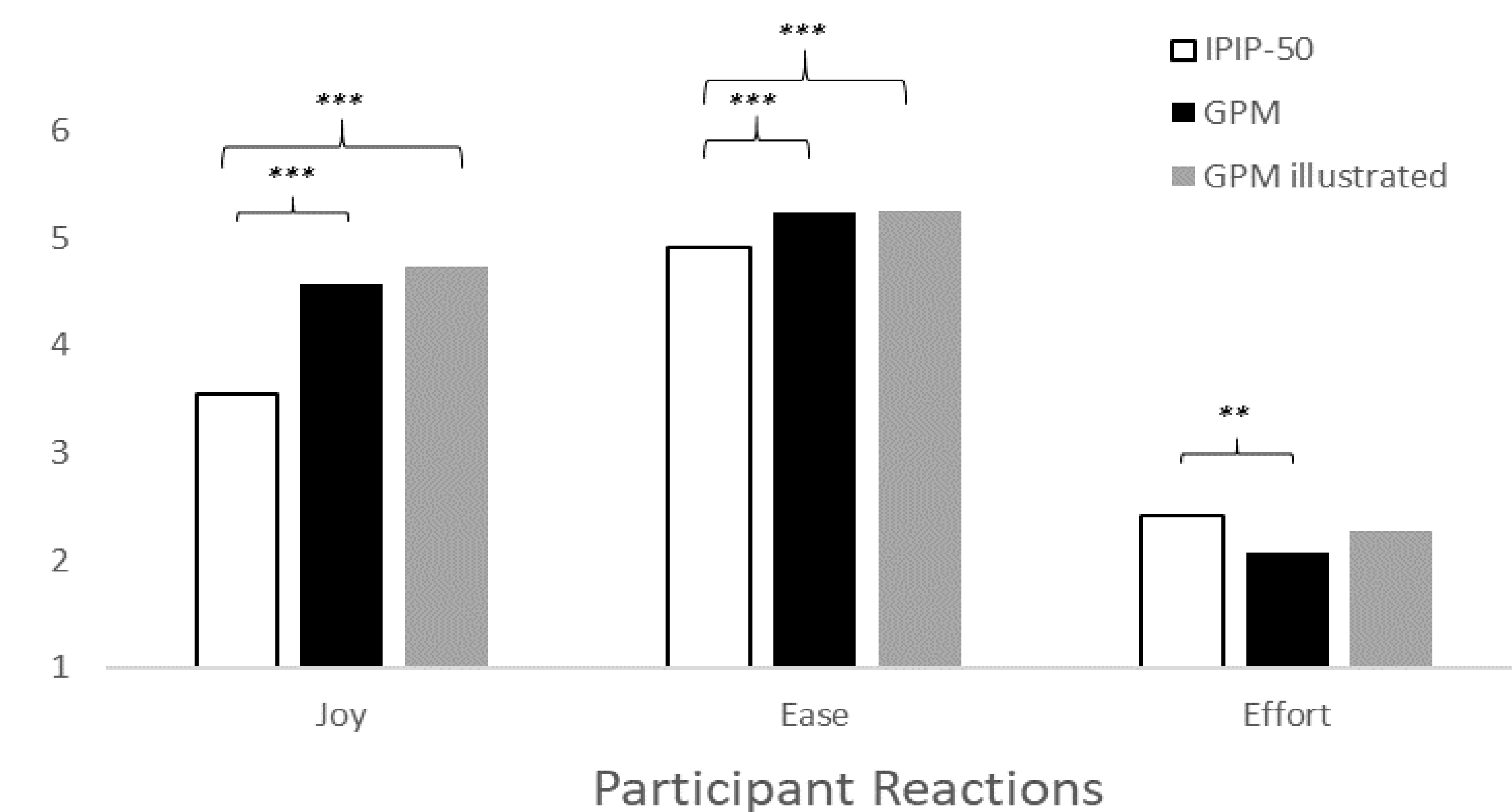


Figure 2. Figure 2 plots the mean participant reaction scores for the IPIP-50, GPM-nI, and GPM-illustrated.

Discussion

The current study adds to the emerging literature on game like assessment of personality and gamification more generally. We tested two variants of game-like personality measures with adding illustrations to a measure already incorporating narrative. Both GPMs obtained modest correlations with each of the Big 5 personality factors, enhancing the proof of concept provided by McCord et al. (2019), though construct and criterion validity remain areas that would require improvement before GPMs would be appropriate for applied use. This study is the first to measure participant reactions to GPMs providing evidence for the advantage of GPMs over traditional personality inventories in terms of perceived enjoyment, ease, and effort. In terms of the primary research question, would adding an additional game element to the measure enhance measurement or participant reactions, the results provide no evidence of additional benefits of illustrations.

References

- Croteau, A. M., Dyer, L., & Miguel, M. (2010). Employee reactions to paper and electronic surveys: An experimental comparison. *IEEE Transactions on Professional Communication*, 53(3), 249-259.
- Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. G. (2006). The international personality item pool and the future of public-domain personality measures. *Journal of Research in Personality*, 40(1), 84-96.
- McCord, J. L., Harman, J. L., & Purl, J. (2019). Game-like personality testing: An emerging mode of personality assessment. *Personality and Individual Differences*, 143, 95-102.
- Speer, A.B., King, B.S. and Grossenbacher, M. (2016). Applicant reactions as a function of test length. *Journal of Personnel Psychology*, Vol. 15 No. 1, 15-24.
- Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information systems research*, 11(4), 342-365.
- Weidner, N. W., & Landers, R. N. (2020). Swipe right on personality: a mobile response latency measure. *Journal of Managerial Psychology*.

SJDM ZOOM link
Poster Session #3
Saturday Dec. 12th 8am-9:15am
<https://lsu.zoom.us/j/5303680575>

Table 1. Correlations between personality factor scores (O, C, E, A, & N) from the GPM (both games collapsed) and the IPIP-50. Cronbach's alpha is listed in the diagonal.

| | GPM | | | | | IPIP-50 | | | | |
|----------------|----------|----------|-----------|-----------|-----------|----------|-----------|----------|---------|------|
| | O | C | E | A | N | O | C | E | A | N |
| GPM | | | | | | | | | | |
| O | .214 | | | | | | | | | |
| C | .051 | .204 | | | | | | | | |
| E | .271 *** | -.154 ** | .125 | | | | | | | |
| A | .077 | -.085 | .334 *** | .322 | | | | | | |
| N | -.161 ** | -.023 | -.349 *** | -.291 *** | .264 | | | | | |
| IPIP-50 | | | | | | | | | | |
| O | .288 *** | .050 | .244 *** | .074 | -.178 *** | .788 | | | | |
| C | .030 | .306 *** | -.118 * | .030 | -.127 * | .020 | .820 | | | |
| E | .191 *** | -.131 * | .398 *** | .038 | -.357 *** | .392 *** | -.037 | .916 | | |
| A | .062 | -.075 | .387 *** | .323 *** | -.191 *** | .215 *** | .013 | .326 *** | .870 | |
| N | -.099 | -.042 | -.042 | -.045 | .206 *** | -.064 | -.229 *** | -.131 * | .150 ** | .783 |

Note. * p < .05, ** p < .01, *** p < .001