

**An Examination of the Effects of Self-Esteem and Perceived Performance on Perceived  
Procedural Justice Within a Game-Based Assessment Context**

Fardau van der Werff

S4160444

Department of Psychology, University of Groningen

PSB3E-BT15: Bachelor Thesis

Mentor group number: 22

Supervisor: dr. Samantha Adams

Second evaluator: Teodora Heihal, MSc

In collaboration with: Clara Borstelmann, David Ulas, Wiert van der Schoor

January 31, 2023

## Abstract

Game-based assessments (GBAs) have gained popularity in selection procedures of organizations. It turns out that GBA elicit more positive reactions by candidates, than traditional assessment selection procedures. This in turn, is beneficial for the reputation of the recruiting company implementing GBA. Therefore, candidates' reactions towards GBA are of high value for the recruiting company. A determinant of candidate's reaction towards a selection procedure is perceived procedural justice. Accordingly, it is important to understand what influences perceived procedural justice. Therefore, this study tested three theories that make different propositions on what influences perceived procedural justice: The simple self-enhancement theory, the compensatory self-enhancement theory, and the self-verification theory. This study is a vignette study ( $N = 214$ ). The results of a linear regression analysis showed a significant positive relationship between perceived performance and perceived procedural justice, and no significant relationship between perceived procedural justice with self-esteem, or with the interaction between perceived performance and self-esteem. This study therefore supports the simple self-enhancement theory.

*Keywords:* Game-based assessment, perceived performance, procedural justice, self-enhancement, self-esteem, verification

## **An Examination of the Effects of Self-Esteem and Perceived Performance on Perceived Procedural Justice Within a Game-Based Assessment Context**

The emergence of new technological developments in the past few decades has been highly influential in almost every aspect of work life. An important function in the workplace that has especially benefited from this emergence is recruitment and selection of employees (Nikolaou, 2021), as there has been several developments of new and unique technology supported procedures that facilitate the selection of personnel (Woods et al., 2020). An important goal of personnel selection procedures is to predict future job performance, so that candidates with the highest predicted job performance will get selected. Unfortunately, traditional selection methods are prone to candidates faking good rather than showing their own qualities, and therefore lack predictive power of future job performance (Landers & Sanchez, 2022; Monaro et al., 2021). However, the development of game-related assessments in selection procedures offers a selection procedure that will be more predictive of job performance (Fetzer et al., 2017). It is hypothesized that candidates may become so immersed in the game that their true behaviors emerge, increasing the predictive power of the assessment.

Within the game-related class of assessments there are three distinctive methods: Gamified assessments, gamefully designed assessments, and game-based assessments (GBAs). Gamified assessments and gamefully designed assessments partly incorporate game design and game elements into traditional assessments (Deterding, 2015). However, GBAs are based on a core gameplay loop (Landers & Sanchez, 2022). So, in contrast to gamified assessments and gamefully designed assessments, GBAs provide a game experience in every aspect of the assessment (Bhatia & Ryan, 2018). In this study we will focus on GBAs as they are the most game related method of assessments and present greater complexity than gamified or gamefully designed assessments (al-Qallawi & Raghavan, 2020).

GBAs are created with the intention of making the selection procedure more fun and enjoyable for candidates in order to elicit more positive reactions to the assessment procedure (Fetzer et al., 2017; Georgiou & Nikolaou, 2020). The perceptions and reactions of candidates towards assessments used within the selection procedure is very important for the organization who is recruiting (Fodchuk & Sidebotham, 2005). Research shows that when candidates are not satisfied with the selection procedure, they are more likely to reject the offer of employment, and are more likely to sue the recruiting company (Conte & Landy, 2019). Additionally, because candidates talk to other people about their reactions and perceptions of the assessment, the assessment is very important for the reputation of the recruiting company (Hausknecht et al., 2004). It is therefore no wonder that GBA has gained popularity with organizations, as research shows that candidates have more positive reactions and perceptions towards GBAs than they have towards traditional assessments (Georgiou & Nikolaou, 2020; Gkorezis et al., 2020). A concept that is a good indicator of the perceptions and reactions of GBA of candidates is perceived procedural justice (Conte & Landy, 2019).

### **Perceived Procedural Justice**

Procedural justice, in general, refers to how fair a process or procedure by which valuation is given is perceived (Conte & Landy, 2019). This study focuses on perceived procedural justice within a GBA context. Thus, in this context, perceived procedural justice entails how fair the selection procedure in which GBA is used is perceived by the candidates. As explained above, the reactions of candidates towards the selection procedure is important for a company's reputation (Conte & Landy, 2019; Fodchuk & Sidebotham, 2005; Hausknecht et al., 2004). Research shows that perceived procedural justice is considered as the primary determinant of reactions of candidates towards the selection procedure (Gilliland, 1993). Consequently, candidates' perceptions of procedural justice within the selection process are important for organizations using GBA in their selection procedure. It is therefore

that this study will investigate the following question: What influences perceived procedural justice within a GBA context?

### **Self-Enhancement Theories and Self-Verification Theory**

There are three theories that each claim a different answer to the later question: The simple self-enhancement theory, the compensatory self-enhancement theory, and the self-verification theory. According to the simple self-enhancement theory, people are motivated to enhance their self-view (Shrauger, 1975; Woo & Frank, 2000). Therefore, people are more accepting towards positive evaluations of themselves than negative ones, as accepting positive evaluations about themselves will increase their self-view, and accepting negative ones will decrease their self-view. So, according to this theory, when people receive positive evaluations within a selection procedure, they are more likely to accept these evaluations, and therefore are more likely to perceive the procedure as fair (Okun & Fournet, 1993). Additionally, when people receive negative evaluations within a selection procedure, they are more likely to reject these evaluations, and therefore are more likely to perceive the procedure as unfair.

In line with the simple self-enhancement theory, the compensatory self-enhancement theory proposes that people are motivated to enhance their self-view. However, what differs the compensatory self-enhancement theory from the simple self-enhancement theory is that it also proposes that the need for self-enhancement is higher for people with a low self-view, than people with a high self-view (Marshall & Brown, 2008; Somers & Levkowitz, 1983) Meaning that people with a low self-view are even more likely to accept positive evaluations of themselves, than people with a high self-view, as their self-view is in more need of enhancement. So, according to this theory, when people receive positive evaluations, the level of acceptance of these evaluations, depends on their self-view. Both people with a low self-view and a high self-view are likely to accept the positive evaluations, but people with a

low self-view are even more likely to accept these evaluations, and therefore are even more likely to perceive the procedure as fair, than people with a high self-view (Okun & Fournet, 1993).

A theory that takes a different standpoint in what influences procedural justice is the self-verification theory. According to this theory, people are not motivated to enhance their self-view, but are motivated to confirm their self-view (Fitch, 1970). This theory proposes that people are more likely to accept evaluations of themselves that confirm their self-view. So, according to this theory, people with a high self-view are more likely to accept positive evaluations of themselves than negative ones. Therefore, people with a high self-view are more likely to perceive the procedure as fair, if they receive positive evaluations of themselves, than negative ones (Okun & Fournet, 1993) Additionally, people with a low self-view are more likely to accept negative evaluations of themselves than positive ones. Therefore, people with a low self-view are more likely to perceive the procedure as fair, if they receive negative evaluations of themselves, than positive ones. So, the more the received evaluations correspond to people's self-view, the more likely the procedure is perceived as fair.

Preceding research shows more evidence arguing in favor of the self-enhancement theories (simple self-enhancement theory and compensatory self-enhancement theory) than the self-verification theory (Kwang & Swann, 2010). However, after reviewing the evidence that argued in favor of the self-enhancement theories, Kwang and Swann (2010) noticed that dozens of studies that argued to display evidence in favor of the self-enhancement theories made invalid conclusions. These studies concluded that regardless people' self-view, people are more likely to accept positive evaluations of themselves, which is in line with the self-enhancement theories. However, these studies did not include any measures of self-view. It could therefore also be possible that these studies show that people are more likely to accept

positive evaluations of themselves, because these studies included samples of people with high self-views, and therefore these evaluations confirm their self-view. So, because of the lack of self-view measures, neither the self-enhancement theories nor the self-verification theory can be ruled out in these studies (Kwang & Swann, 2010). In order to make more valid conclusions regarding the self-enhancement theories and the self-verification theory, this study will include a self-view measure.

### **Current Study**

As explained before, this study investigates the question: What influences perceived procedural justice within a GBA context? We will accomplish this by testing the simple self-enhancement theory, the compensatory self-enhancement theory, and the self-verification theory. These theories are tested by investigating the effects of self-esteem and perceived performance on perceived procedural justice. In this study, self-esteem is a measure of self-view, and perceived performance is a measure of evaluation.

Following the simple self-enhancement theory, when people think they did well in the GBA, they are more likely to accept this evaluation, and therefore are more likely to perceive the GBA as fair. Additionally, when people think they did badly in the GBA, they are more likely to reject this evaluation, and therefore are more likely to perceive the GBA as unfair. So, the simple self-enhancement theory proposes a significant positive relationship between perceived performance and perceived procedural justice within a GBA context.

The compensatory self-enhancement theory takes it a step further and predicts that this effect increases when self-esteem decreases. Meaning that regardless of the level of self-esteem, people will perceive the GBA as fair when they think they did well in the GBA. However, according to this theory, this effect will increase when self-esteem decreases. So, the compensatory self-enhancement theory proposes a significant positive relationship between perceived performance and perceived procedural justice, and a significant

interaction effect between perceived performance and self-esteem on perceived procedural justice within a GBA context.

Following the self-verification theory, people with high self-esteem are more likely to perceive the GBA as fair when they think they did well, and are likely to perceive it as unfair when they think they did badly. Additionally, people with low self-esteem are more likely to perceive the GBA as fair when they think they did badly, and perceive it as unfair when they think they did well. So, the self-verification theory proposes a significant interaction effect between perceived performance and self-esteem on perceived procedural justice within a GBA context.

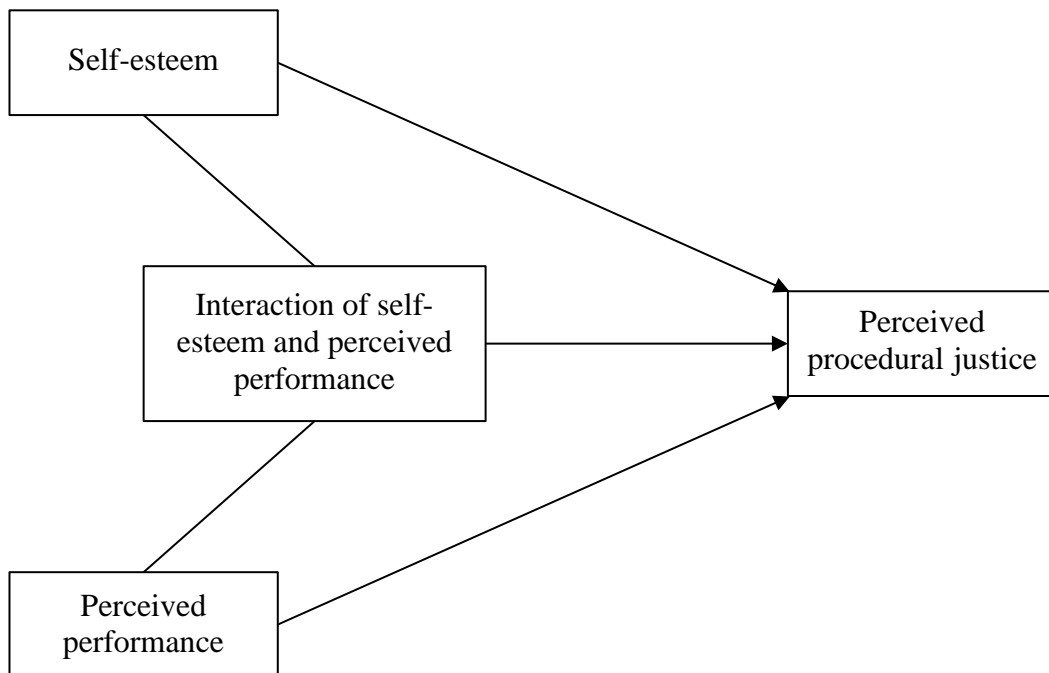
The simple self-enhancement theory, the compensatory self-enhancement theory, and the self-verification theory will be tested by the following hypotheses. This can also be seen in Figure 1.

**Hypothesis 1:** There is a significant positive relationship between perceived performance and perceived procedural justice within a GBA context.

**Hypothesis 2:** There is a significant positive relationship between self-esteem and perceived procedural justice within a GBA context.

**Hypothesis 3:** There is a significant interaction effect between perceived performance and self-esteem on perceived procedural justice within a GBA context.



**Figure 1***Research model*

## Methodology

### Participants

This study used a sample of 214 participants. The sample partly consisted of business students studying at Rijksuniversiteit Groningen who received SONA credits for completing their study. The other part of the sample consisted of acquaintances of the investigators and were invited to participate through various social networks. In order to make valid conclusions regarding the sample, 59 cases were removed from the initial sample that consisted of 273 participants. This is because these cases did not complete their survey entirely, and therefore could endanger the validity of this study.

A majority of 88.8% ( $N = 190$ ) indicated they were in the age category of 18-25 years, 7.9% ( $N = 17$ ) were younger than 18, and 3.3% ( $N = 7$ ) were older than 25. In terms of gender 28% ( $N = 60$ ) identified as female and 72% ( $N = 154$ ) identified as male.

Additionally, none of the participants identified themselves as non-binary, or did not want to indicate their gender. When asked about their level of English proficiency, 22.9% ( $N = 49$ ) indicated that they have a basic understanding, 65.4% ( $N = 140$ ) indicated that they were fluent, and 11.7% ( $N = 25$ ) indicated that English is their native language. Moreover, 67.3% ( $N = 144$ ) of the sample have a high school diploma as the highest education level, .5% ( $N = 1$ ) lower than a highschool diploma, and 32.4% ( $N = 69$ ) higher than a highschool diploma. Furthermore, 52.3% ( $N = 112$ ) indicated that they had experience with recruitment for the workplace in general, and 47.7% ( $N = 102$ ) indicated that they did not. Lastly, 13.1% ( $N = 28$ ) indicated that they had experience with game-based assessments before the current study, 48.1% ( $N = 103$ ) indicated that they did not, and 38.8% ( $N = 83$ ) indicated that they did not know.

An a priori power analysis based on a linear multiple regression showed that 89 participants were required to achieve a small effect size ( $f^2 = .15$ ) and power .95%.

## **Research Design and Procedure**

This study is a cross sectional, vignette study using an online questionnaire. In this study, the independent variables are self-esteem, perceived performance, and the interaction between self-esteem and perceived performance. The dependent variable is perceived procedural justice.

The participants first received a personal link to the online questionnaire where they read some general information about the questionnaire and were asked to give their consent. If participants did not give consent, they were automatically forwarded to the end of the questionnaire. Secondly, the participants were asked to imagine that they applied for their ideal job. Thirdly, they were asked to provide their demographic information and then answered six items regarding their self-esteem. Thereafter, they completed two game-based assessments. Participants were then asked to indicate how the assessment went. Lastly, the participants were asked to answer three items regarding their perceptions of procedural justice of the GBA. The data was collected between 26-11-2022 and 20-01-2023 and has ethical approval from the Ethics Committee of psychology.

### **Game-Based Assessment**

The GBA consisted of two games. The first game is called “The ferry”. In this game, participants had to move a family across the river on a ferry as fast as possible. Only one adult, or one kid, or two kids could be loaded on the ferry at each time the ferry crosses the river. Additionally, the ferry could not cross the river if there was nobody on the ferry. The participant could load and unload the ferry with characters by clicking on the characters. This game was created in order to measure problem solving ability and problem-solving style. The second game is called “Bird spotting”. In this game, the participants were shown a model bird, and were asked to spot as many birds in the virtual environment that looked as

the model bird within a certain time. A bird was “spotted” when the participant clicked on the bird. This game was created to measure speed and accuracy.

## **Measures**

### ***Perceived Performance***

For the assessment of perceived performance, this study used a one item scale adapted from Quinones’s (1995) measure of perceived performance, and has Cronbach alpha of  $\alpha = .90$  (Quinones, 1995). This item consisted of the following question: “What do you think about your performance in the game-based assessment?”. Answers were rated on a 5-point scale (1 = badly to 5 = well).

### ***Self-Esteem***

For the assessment of self-esteem, this study used a component of Heatherton and Polivy’s (1991) State Self-Esteem Scale (SSES). The SSES is a 20-item Likert-type scale designed for measuring temporary changes in individual self-esteem. The component of the SSES that this study used measures the state dependent performance self-esteem (Heatherton & Polivy, 1991; Linton & Marriott, 1996; Schroth & Shah, 2000), and has been proven to be internally consistent with a Cronbach’s alpha of  $\alpha = .89$  (Schroth & Shah, 2000). The state dependent performance self-esteem measure included items such as: “When my performance is being tested, I feel as smart as others”; “When my performance is being tested, I feel confident that I understand things”. Answers were rated on a 5-point scale (1 = not at all to 5 = extremely).

### ***Perceived Procedural Justice***

For the assessment of procedural justice, this study used a three item scale based on Kluger and Rothstein’s (1993) measure of test fairness (see also Georgiou & Nikolaou, 2020; Hiemstra et al., 2019). This measure of test fairness consisted of a 4-item WiLikert type scale designed to measure the perceived fairness of applicants to a selection procedure, and has

Cronbach alpha of  $\alpha = .81$  (Kluger & Rothstein, 1993). The perceived procedural justice measure included items such as: “Do you think this procedure is a fair way to select suitable candidates”; “How fair do you think the assessment procedure was?”. Answers were rated on a 5-point scale (1 = very fair to 5 = not fair at all).

## Results

The self-esteem variable was created by recoding the negative coded third and fourth items of the self-esteem scale into positive coded items, and adding up the individual scores of each item ( $M = 20.79$ ,  $SD = 3.78$ ). As the perceived performance measure consists of one positively coded item, there was no need to create a new variable ( $M = 3.57$ ,  $SD = .88$ ). The perceived procedural justice variable was created by recoding the negative coded items into positive coded items, and adding up the individual scores of each item, see Table 1 for the mean and standard deviation. The interaction variable was created by multiplying the self-esteem variable with the perceived performance variable ( $M = 74.51$ ,  $SD = 24.21$ ).

### Assumptions

Before running the linear regression analysis, it was important to check and correct the assumptions regarding multiple regression. By looking at the residual plot (see Figure 2), it was assumed that there are no major deviations from the assumption of linearity and homoscedasticity. Normality of the residuals was checked by looking at a normal P-P plot (see Figure 3). Again, no major disparities were seen, and normality was assumed. Multicollinearity was checked by running a multiple regression with all the independent variables and the dependent variable. The output of this analysis included  $VIF > 5$  for each independent variable. This was an indication of high collinearity. In order to correct for this high collinearity, the independent variables were transformed into centered variables. The centered independent variables were created by subtracting the mean from the variable. The centered interaction effect was created by multiplying the centered perceived performance variable with the centered self-esteem variable. After creating the centered independent variables, the regression analysis was run again and output showed values of  $VIF < 5$ , so the violation of multicollinearity was corrected.

The following section will present the results in line with the earlier proposed hypotheses.

**H1: There is a significant positive relationship between perceived performance and perceived procedural justice within a GBA context.**

In order to make valid conclusions about the possible relationship between perceived performance and perceived procedural justice, it was necessary to look at the bivariate correlation between these variables. As can be seen in Table 1, results showed a significant positive correlation between perceived performance and perceived procedural justice ( $p = .002$ ). In order to investigate a possible significant effect of perceived performance on perceived procedural justice, a simple linear regression was conducted. Running the simple linear regression, a significant model emerged  $F(4.6) = 10.28, p = .002$ . The model explained 4.2% of the variance in perceived procedural justice ( $R^2 = 0.042$ ). Furthermore, perceived performance was a significant predictor, with a positive relationship to perceived procedural justice. Therefore, this study accepted the first hypothesis.

**H2: There is a significant positive relationship between self-esteem and perceived procedural justice within a GBA context.**

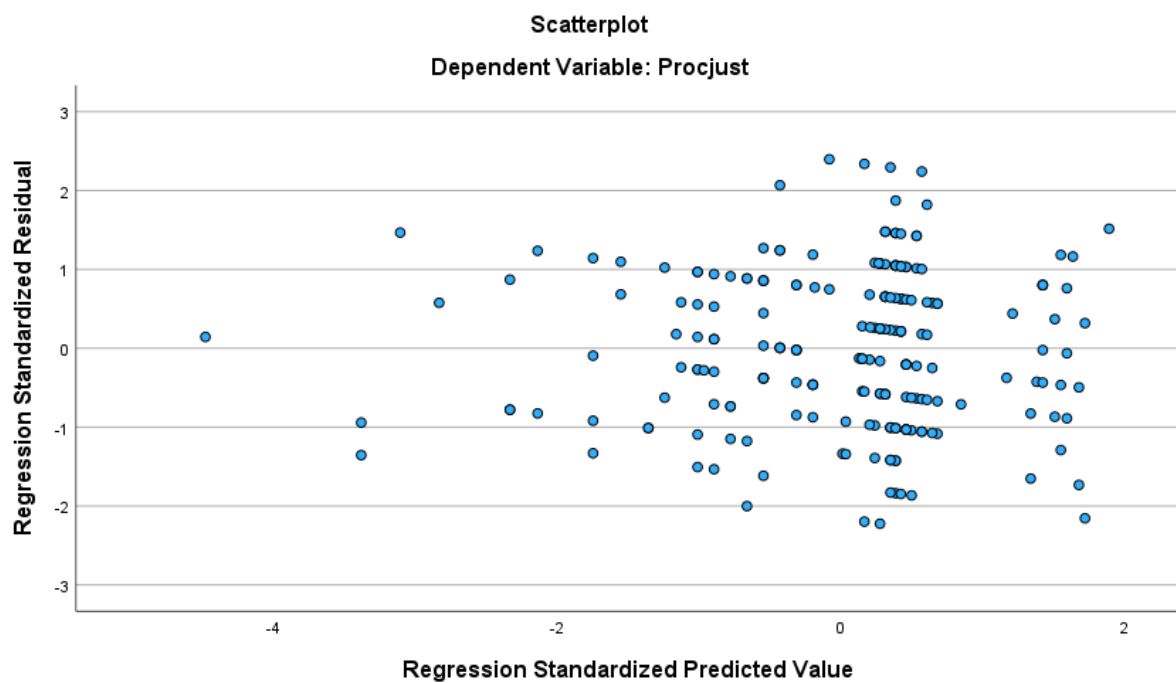
In order to make valid conclusions about the possible relationship between self-esteem and perceived procedural justice, it was necessary to look at the bivariate correlation between these variables. As can be seen in Table 1, results showed a non-significant correlation between self-esteem and perceived procedural justice. There was a non-significant correlation between self-esteem and procedural justice ( $p = .560$ ). Therefore, this study rejected the second hypothesis.

**H3: There is a significant interaction effect between perceived performance and self-esteem on perceived procedural justice within a GBA context.**

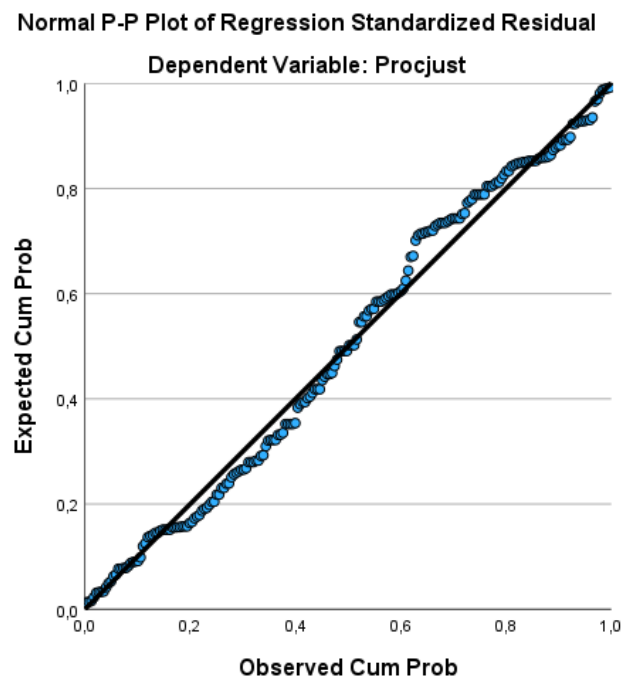
In order to make valid conclusions about the possible interaction effect between perceived performance and self-esteem on perceived procedural justice, it was necessary to look at the bivariate correlation between these variables. As can be seen in Table 1, there was a non-significant correlation between the interaction variable and perceived procedural justice ( $p = .269$ ). Therefore, this study rejected the third hypothesis.

## Figure 2

*Residual scatterplot*





**Figure 3***Normal P-P plot***Table 1**

Means, standard deviations, and correlations between each of the variables.

Variable	<i>M</i>	<i>SD</i>	1.	2.	3.	4.
1. Perceived procedural justice	9.23	2.48	-			
2. Perceived performance <sup>a</sup>	.00	.88	.22**	-		
3. Self-esteem <sup>a</sup>	.00	3.78	-.04	.11	-	
4. Interaction <sup>b</sup>	.37	3.33	.08	.06	-.04	-

*Note.* \* $p < .05$ , \*\* $p < .01$

<sup>a</sup> The variable was centered around the mean.

<sup>b</sup> The variable reflects the interaction between the centered self-esteem variable and the centered perceived performance variable.

## Discussion

This study investigated the relationships between perceived performance and self-esteem with perceived procedural justice within a GBA context. This was achieved by testing the simple self-enhancement theory, the compensatory self-enhancement theory, and the self-verification theory. According to the simple self-enhancement theory there is a significant positive relationship between perceived performance and perceived procedural justice within a GBA (Okun & Fournet, 1993; Shrauger, 1975; Woo, 2000). This also holds for the compensatory self-enhancement theory, however this theory also proposes that there is a significant interaction effect between perceived performance and self-esteem on perceived procedural justice within a GBA (Marshall & Brown, 2008; Okun & Fournet, 1993; Somers & Levkowitz, 1983). Lastly, according to the self-verification theory there is only a significant interaction effect between perceived performance and self-esteem on perceived procedural justice within a GBA (Fitch, 1970; Okun & Fournet, 1993). To test these theories, the following hypotheses were created:

H1: There is a significant positive relationship between perceived performance and perceived procedural justice within a GBA context.

H2: There is a significant positive relationship between self-esteem and perceived procedural justice within GBA context.

H3: There is a significant interaction effect between perceived performance and self-esteem on perceived procedural justice within a GBA context.

We proposed that if hypothesis 1 was supported and hypotheses 2 and 3 were not supported, this was evidence for the simple self-enhancement theory. Additionally, if hypotheses 1 and 3 were supported and hypothesis 2 was not supported, this was evidence for the compensatory self-enhancement theory. Lastly, when hypotheses 1 and 2 were not supported and hypothesis 3 was supported, this was evidence for the self-verification theory.

The results obtained in this study supported hypothesis 1, and did not support hypothesis 2 and 3. Therefore, these results conform to the simple self-enhancement theory. Indeed, the results show that as perceived performance gets higher, the perceptions of procedural justice also get significantly higher within a GBA context. As explained before, this is in line with the simple self-enhancement theory, as this proposes that people are more likely to perceive the procedure as fair when they think they performed well, as this will enhance their self-view. Therefore, these results are in line with prior research showing results in line with the simple self-enhancement theory (Shrauger, 1975; Woo & Frank, 2000). Additionally, the results did not conform to the compensatory self-enhancement theory and the self-verification theory, as there was no significant interaction effect found between perceived performance and self-esteem on perceived procedural justice within the GBA context. Therefore, these findings are not in line with prior research presenting results in favor of these theories (Fitch, 1970; Somers & Levkowitz, 1983).

### **Theoretical and Practical Implications**

As explained before, the results presented in this study conform to the simple self-enhancement theory. These findings can also be explained through the attribution theory (Moran & Toner, 2017). According to the attribution theory, people are constantly making attributions about whether or not their performance reflects their own ability (dispositional attributions) or was instead due to environmental causes (situational attributions). As people have a self-serving bias, they tend to make dispositional attributions when their performance is perceived as high, and situational attributions when their performance is perceived as low. Thus, people internalize high performance, and externalize low performance, which in turn leads them to enhance and protect their self-view (Klein et al., 1976). This is in line with the findings in this study as these findings show that people perceive the GBA as fair when they think they did well. According to the attribution theory this happens because this allows them

to internalize the subjectively perceived high performance, which accordingly enhances their self-view. Additionally, results showed that people are likely to perceive the GBA as unfair when they think they did badly. According to the attribution theory this happens because this allows them to externalize the perceived low performance, which then protects their self-view. Therefore, these results can be seen as evidence for both the simple self-enhancement theory and the attribution theory. However, the attribution theory gives a more extended explanation of the found relationship between perceived performance and perceived procedural justice within a GBA, than the simple self-enhancement theory.

These results also have important practical implications for companies in evaluating their GBA selection procedures on procedural justice. As explained in the introduction, perceived procedural justice of selection procedures are important for the reputation of companies (Georgiou & Nikolaou, 2020; Gkorezis et al., 2020). Therefore, companies do their best to create procedurally fair selection procedures. However, this study shows that the perceived procedural justice is significantly influenced by perceived performance within a GBA. Organizations therefore should take into consideration that when candidates complain about the low procedural justice of the GBA procedure, it is likely that this person perceives it as so because they did not perform well, and thereby try to enhance their self-view. Thus, when organizations that use GBA within a selection procedure, receive complaints about their assessment from candidates, the organization should consider that those complaints might be indications of bad performance and not indication of the actual procedural justice of the GBA.

### **Limitations and future directions**

Interpreting these results, however, should be done with caution as there are some limitations in this study that should be taken into account. Firstly, this study used a convenience sample of mainly business students studying at RUG and originating from

western European countries. The results presented in this study consequently are not representative for people who don't share the demographics of the sample. Therefore, one should be cautious when generalizing these results to groups not represented in the sample. Future research should focus on creating a sample that is more representative of the population, including people from different age cohorts and people with different cultural backgrounds, so that findings can be generalized more extensively. Additionally, it should be noted that students may not have a good mental representation of what a procedurally fair selection procedure entails, as it could be the case that students did not experience a selection procedure yet, or not many, and therefore might have difficulty in judging the procedural justice within a selection procedure. Again, this highlights the importance to also incorporate people from different age cohorts in a sample. However, this proposition should be investigated in future research.

Secondly, it should be noted that this study measures performance state dependent self-esteem (Heatherton & Polivy, 1991). This means that this measure is made to be sensitive to any fluctuations in performance self-esteem. Accordingly, it should be noted that the measure of self-esteem in this study represents the level of self-esteem participants had while answering the self-esteem items, and does not measure the level of self-esteem participants have in general. Therefore, these self-esteem measures are a good representation of self-esteem levels in that moment, but are not a good representation of self-esteem levels outside this moment. This should be considered when generalizing these results outside this timeframe. For future research it therefore can be interesting to also include a trait dependent measure. Trait dependent self-esteem measures self-esteem levels that are insensitive to fluctuations, and represent levels of self-esteem people generally have in life (Braun et al., 2021). In this case, results can be generalized outside the timeframe of the study. Additionally, it could also be interesting to measure self-esteem before the GBA and after the

GBA to investigate a possible change in self-esteem within a GBA (Schroth & Shah, 2000). Therefore, a state dependent self-esteem measure is more suitable, than a trait dependent self-esteem measure, as this is more sensitive to fluctuations in self-esteem.

Thirdly, it should be considered that this study used two demo versions of a GBA consisting of a bird spotting game and a river crossing game. One could argue that these demo versions do not offer a holistic representation of the game-based assessment. As stated in the introduction, one of the advantages of game-based assessment is that it predicts future performance more accurately than traditional assessments, because participants get so immersed in the game that they show their true ability. However, as these demo versions are relatively short, it could be argued that participants did not have the chance to show their competence in this period of time, and therefore the initial advantage of GBA is lost. This might have impaired the perceptions of procedural justice for participants. Consequently, the perceptions of procedural justice within this GBA may be lower, than research that incorporates longer GBAs. However, future research should investigate this further.

Lastly, this study used perceived performance as a measure of performance in the GBA, and results show a significant positive relationship between perceived performance and perceived procedural justice within a GBA. However, one should be cautious of interpreting this result. For future research it can be interesting to test if this relationship becomes significantly stronger or weaker if actual performance is used as a measure of performance instead of perceived performance, as used in this study. Additionally, it could be interesting to investigate the influences of false performance feedback on perceptions of procedural justice within a GBA.

## **Conclusions**

The aim of this study was to investigate what influences perceived procedural justice. In order to do so, this study tested the simple self-enhancement theory, the compensatory

self-enhancement theory, and the self-verification theory. The results show a significant positive relationship between perceived performance and perceived procedural justice, and no significant relationships between perceived procedural justice and self esteem or the interaction of perceived performance and self-esteem. Taken together, these results support the simple self-enhancement theory, and do not support the compensatory self-enhancement theory, and the self-verification theory. Therefore, organizations that use GBA for their recruitment should be cautious when they receive complaints about the procedural justice of the GBA, as these complaints may be indicators of bad performance rather than the actual procedural justice of the GBA.

## References

- al-Qallawi, S., & Raghavan, M. (2022). A review of online reactions to game-based assessment mobile applications. *International Journal of Selection and Assessment*, 30(1), 14–26. <https://doi.org/10.1111/ijsa.12346>
- Bhatia, S., & Ryan, A. M. (2018). Hiring for the win: Game-based assessment in employee selection. In J. H. Dulebohn, & D. L. Stone (Eds.), *The Brave New World of eHRM* (2nd ed. pp. 81–110). IAP Information Age Publishing.
- Braun, L., Göllner, R., Rieger, S., Trautwein, U., & Spengler, M. (2021). How state and trait versions of self-esteem and depressive symptoms affect their interplay: A longitudinal experimental investigation. *Journal of Personality and Social Psychology*, 120(1), 206–225. <https://doi.org/10.1037/pspp0000295>
- Conte, J. M., & Landy, F. J. (2019). *Work in the 21st Century: An introduction to industrial and organizational psychology* (6th ed.). Wiley.
- Deterding, S. (2015). The lens of intrinsic skill atoms: A method for gameful design. *Human-Computer Interaction*, 30(3–4), 294–335. <https://doi.org/10.1080/07370024.2014.993471>
- Fetzer, M., McNamara, J., & Geimer, J. L. (2017). Gamification, serious games and personnel selection. In H. W. Goldstein, E. D. Pulakos, J. Passmore, & C. Semedo (Eds.), *The Wiley Blackwell handbook of the psychology of recruitment, selection and employee retention* (pp. 293–309). Wiley. <https://doi.org/10.1002/9781118972472.ch14>
- Fitch, G. (1970). Effects of self-esteem, perceived performance, and choice on causal attributions. *Journal of Personality and Social Psychology*, 16(2), 311–315. <https://doi.org/10.1037/h0029847>



- Fodchuk, K. M., & Sidebotham, E. J. (2005). Procedural Justice in the Selection Process: A Review of Research and Suggestions for Practical Applications. *The Psychologist-Manager Journal*, 8(2), 105–120. [https://doi.org/10.1207/s15503461tpmj0802\\_2](https://doi.org/10.1207/s15503461tpmj0802_2)
- Georgiou, K., & Nikolaou, I. (2020). Are applicants in favor of traditional or gamified assessment methods? Exploring applicant reactions towards a gamified selection method. *Computers in Human Behavior*, 109, Article 106356. <https://doi.org/10.1016/j.chb.2020.106356>
- Gilliland, S. W. (1993). The perceived fairness of selection systems: An organizational justice perspective. *Academy of Management Review*, 18(4), 694–734. <https://doi.org/10.2307/258595>
- Gkorezis, P., Georgiou, K., Nikolaou, I., & Kyriazati, A. (2020). Gamified or traditional situational judgement test? A moderated mediation model of recommendation intentions via organizational attractiveness. *European Journal of Work and Organizational Psychology*, 30(2), 240–250. <https://doi.org/10.1080/1359432X.2020.1746827>
- Hausknecht, J. P., Day, D. V., & Thomas, S. C. (2004). Applicant reactions to selection procedures: An updated model and meta-analysis. *Personnel Psychology*, 57(3), 639–683. <https://doi.org/10.1111/j.1744-6570.2004.00003.x>
- Heatherton, T. F., & Polivy, J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social Psychology*, 60(6), 895–910. <https://doi.org/10.1037/0022-3514.60.6.895>
- Hiemstra, M. F., Oostrom, J. K., Derous, E., Serlie, A. W., & Born, M. (2019). Applicants perceptions of initial job candidate screening with asynchronous job interviews. *Journal of Personnel Psychology*, 18(3), 138–147 <https://doi.org/10.1027/1866-5888/a000230>

- Klein, D. C., Fencil-Morse, E., & Seligman, M. E. (1976). Learned helplessness, depression, and the attribution of failure. *Journal of Personality and Social Psychology*, *33*(5), 508–516. <https://doi.org/10.1037/0022-3514.33.5.508>
- Kluger, A. N., & Rothstein, H. R. (1993). The influence of selection test type on applicant reactions to employment testing. *Journal of Business and Psychology*, *8*(1), 3–25. <https://doi.org/10.1007/BF02230391>
- Kwang, T., & Swann, W. B. (2010). Do People Embrace Praise Even When They Feel Unworthy? A Review of Critical Tests of Self-Enhancement Versus Self-Verification. *Personality and Social Psychology Review*, *14*(3), 263–280. <https://doi.org/10.1177/1088868310365876>
- Landers, R. N., & Sanchez, D. R. (2022). Game-based, gamified, and gamefully designed assessments for employee selection: Definitions, distinctions, design, and validation. *International Journal of Selection and Assessment*, *30*(1), 1–13. <https://doi.org/10.1111/ijsa.12376>
- Linton, K. E., & Marriott, R. G. (1996). Self-esteem in adolescents: Validation of the state self-esteem scale. *Personality and Individual Differences*, *21*(1), 85–90. [https://doi.org/10.1016/0191-8869\(96\)83741-X](https://doi.org/10.1016/0191-8869(96)83741-X)
- Marshall, M. A., & Brown, J. D. (2008). On the psychological benefits of self-enhancement. In E. C. Chang (Ed.), *Self-criticism and self-enhancement: Theory, research, and clinical implications* (pp. 19–35). American Psychological Association. <https://doi.org/10.1037/11624-002>
- Monaro M., Mazza C., Colasanti M., Ferracuti S., Orrù G., di Domenico, A., Sartori, G., & Roma, P. (2021). Detecting faking-good response style in personality questionnaires with four choice alternatives. *Psychological Research*, *85*, 3094–3107. <https://doi.org/10.1007/s00426-020-01473-3>

- Moran, A., & Toner, J. (2017). *A Critical Introduction to Sport Psychology: A Critical Introduction* (3rd ed.). *Routledge*. <https://doi-org.proxy-ub.rug.nl/10.4324/9781315657974>
- Nikolaou, I. (2021). What is the role of technology in recruitment and selection? *The Spanish Journal of Psychology*, *24*(2), 1–6. <https://doi.org/1017/SJP.2021.6>
- Okun, M.A., & Fournet, L.M. (1993). Academic self-esteem and perceived validity of grades: A test of self-verification theory. *Contemporary Educational Psychology*, *18*(4), 414–426. <https://doi.org/10.1006/ceps.1993.1031>
- Quinones, M. A. (1995). Pretraining context effects: Training assignment as feedback. *Journal of Applied Psychology*, *80*, 226–238. <https://doi-org.proxy-ub.rug.nl/10.1037/0021-9010.80.2.226>
- Schroth, H. A., & Pradhan Shah, P. (2000). Procedures: Do We Really Want to Know Them? An Examination of the Effects of Procedural Justice on Self-Esteem. *Journal of Applied Psychology*, *85*(3), 462–471. <https://doi.org/10.1037/0021-9010.85.3.462>
- Shrauger, J. S. (1975). Responses to evaluation as a function of initial self-perceptions. *Psychological Bulletin*, *82*(4), 581–596. <https://doi-org/10.1037/h0076791>
- Somers, M. J., & Lefkowitz, J. (1983). Self-esteem, need gratification, and work satisfaction: A test of competing explanations from consistency theory and self-enhancement theory. *Journal of Vocational Behavior*, *22*(3), 303–311. [https://doi.org/10.1016/0001-8791\(83\)90015-5](https://doi.org/10.1016/0001-8791(83)90015-5)
- Woo, T. O., & Frank, N. (2000). Academic performance and perceived validity of grades: an additional case for self-enhancement. *The Journal of Social Psychology*, *140*(2), 218–226. <https://doi.org/10.1080/00224540009600462>
- Woods, S. A., Ahmed, S., Nikolaou, I., Costa, A. C., & Anderson, N. R. (2020). Personnel selection in the digital age: A review of validity and applicant reactions, and future

research challenges. *European Journal of Work and Organizational Psychology*,  
29(1), 64–77. <https://doi.org/10.1080/1359432X.2019.1681401>

