Received: 9 April 2023 | Revised: 21 February 2024 | Accepted: 22 February 2024

DOI: 10.1111/ijsa.12466

RESEARCH ARTICLE

International Journal of Selection and Assessment | WILEY

Playful personnel selection: The use of traditional versus game-related personnel selection methods and their perception from the recruiters' and applicants' perspectives

Marie L. Ohlms[1,2] | Klaus G. Melchers[1] | Uwe P. Kanning[3]

[1]Institut für Psychologie und Pädagogik, Universität Ulm, Ulm, Germany

[2]Institut für Psychologie, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany

[3]Fakultät Wirtschafts- und Sozialwissenschaften, Hochschule Osnabrück, Osnabrück, Germany

Correspondence
Marie L. Ohlms, Institut für Psychologie, Albert-Ludwigs-Universität Freiburg, Engelbergerstraße 41, D-79085 Freiburg, Germany.
Email: marie.ohlms@psychologie.uni-freiburg.de

Funding information
Studienstiftung des deutschen Volkes

Abstract

Game-related assessments (GRAs) are increasingly gaining interest in practice and research. However, little is known about how recruiters view these methods. This study examined recruiters' (N = 158) reasons for using GRAs, the influence of their characteristics on their use of these methods, and recruiters' perceptions of GRAs compared to those of potential applicants (N = 144). Results indicated that perceived ease of use, perceived usefulness, innovativeness in IT, and video game pursuit partly explained recruiters' intentions to use GRAs, which then predicted actual usage. The expected positive impact on the organizational image and applicant reactions were among the most important reasons for using GRAs. Recruiters and potential applicants perceived GRAs as more enjoyable and modern than traditional assessment methods.

KEYWORDS

game-based assessment, gamified assessment, personnel selection, recruiter perceptions, technology acceptance model

Practitioner points

- Game-related assessment (GRA) is a new field in personnel selection that is gaining increasing interest among researchers and organizations, but there is limited research on how recruiters perceive these methods.
- This study contributes to our understanding of how recruiters view GRAs and whether their perceptions differ from those of potential applicants.
- Recruiters' perceived ease of use and usefulness of GRAs and their innovativeness in IT and video game pursuit explained intentions to use GRAs, which in turn predicted their actual usage.
- The main reasons for recruiters' intentions to use GRAs are the impact on the organizational image and implementation time.
- Recruiters view computer-based assessments more positively than applicants whereas the opposite was true for paper–pencil tests.

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.
© 2024 The Authors. *International Journal of Selection and Assessment* published by John Wiley & Sons Ltd.

1 | INTRODUCTION

In recent years, digital personnel selection methods have increasingly been used in the selection processes of organizations (Armoneit et al., 2020). Gamified assessment, the addition of game elements to more traditional instruments such as cognitive ability tests and personality questionnaires, or the use of game-based assessments (GBAs), which involve (computer-)games that measure relevant applicant characteristics while applicants participate in a gameplay loop, are two practices that are becoming increasingly popular in practice (Landers & Sanchez, 2022). Gamified assessment and GBA, which are typically summarized under the umbrella term game-related assessment (GRA), are also gaining increasing attention in the research community, leading to recent growth of empirical studies in this field (e.g., Georgiou et al., 2019; Landers et al., 2022). Thus, step by step, more light is being shed on validity (e.g., Hommel et al., 2022; Landers et al., 2022), applicant reactions (e.g., Georgiou & Nikolaou, 2020; Landers & Collmus, 2022), potential subgroup differences in performance and perceptions of these GRAs (e.g., Ellison et al., 2020; Melchers & Basch, 2022), and on other aspects regarding their diagnostic properties (see Ramos-Villagrasa et al., 2022, for a review).

Although there is some evidence regarding applicants' perceptions of GRAs, little is known about how recruiters perceive these assessment tools. Particularly, it is unclear (a) which factors determine whether recruiters use GRAs and (b) how recruiters perceive these methods. Additionally, it remains unclear to what extent recruiters' perceptions of GRAs match those of applicants.

Therefore, the first goal of the present study was to examine the factors that contribute to recruiters' use or nonuse of gamified assessments and GBAs. To do so, we offer several hypotheses based on the technology acceptance model (TAM; Davis, 1989) and its extensions (TAM 2 and TAM 3; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000), as well as on Klehe's (2004) conceptual model, which proposes pressure factors that influence the adoption of personnel selection procedures. The second goal was to compare recruiters' perceptions of GRAs with traditional paper–pencil and computer-based tests and questionnaires.[1] To do so, we used the most influential model on applicant reactions—Gilliland's (1993) organizational justice framework—as well as additional acceptance variables. Finally, we compared recruiters' and applicants' reactions to GRAs as well as to paper-pencil and computer-based assessments.

1.1 | Gamified assessment and GBAs in personnel selection

In our study, we considered paper–pencil, computer-based, and gamified tests and questionnaires, as well as GBAs. Whereas paper–pencil and computer-based assessments have been known and used in personnel selection for decades, the use of GRAs is a much newer phenomenon (Armoneit et al., 2020). In this context, many advantages of gamified assessments and GBAs have been postulated, including the hope of improved applicant reactions, the attraction of new applicant groups, and improved applicant targeting through a more engaging assessment (Bhatia & Ryan, 2018; Fetzer et al., 2017). Additionally, it is suggested that GRAs may reduce socially desirable responding and test anxiety among applicants, which consequently might result in higher test motivation and a more accurate assessment of the constructs of interest (Bhatia & Ryan, 2018; Landers & Sanchez, 2022).

However, in addition to these potential advantages of GRAs, there are also some drawbacks. First, the high cost and time of development relative to more traditional selection methods might discourage organizations from adopting GRAs in their selection process (Bhatia & Ryan, 2018; Klehe, 2004). Also, the technical requirements and computer skills needed to complete these assessments may disadvantage some groups of applicants and might therefore lead to subgroup differences (Melchers & Basch, 2022). Another potential disadvantage of GRAs is that empirical evidence on their psychometric properties is still scarce (Bhatia & Ryan, 2018; Landers & Sanchez, 2022). However, it is unclear to what extent recruiters are concerned about the different drawbacks and whether they consider them when deciding whether or not to use GRAs.

1.2 | Relevant recruiter and organizational characteristics

In addition to the benefits and drawbacks of GRAs, other factors such as the characteristics of the recruiter or the organization may also influence the use or non-use of these methods. In this context, the TAM (Davis, 1989; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000) may serve to explain individual differences in attitudes toward new personnel selection technologies. Furthermore, Klehe's (2004) conceptual model can provide a theoretical foundation for why organizations and recruiters use or do not use certain selection instruments.

The TAM by Davis (1989) and its further developments by Venkatesh and Davis (2000; i.e., TAM 2) and Venkatesh and Bala (2008; i.e., TAM 3) assume that the perceived usefulness and ease of use of a new technology influence how well this technology is accepted and used. The TAM 2 (Venkatesh & Davis, 2000) expands the initial TAM by including determinants of perceived usefulness, for instance, subjective norms or job relevance. Furthermore, Venkatesh and Bala (2008) added antecedents of perceived ease of use in their TAM 3, such as individual differences (e.g., computer self-efficacy, computer playfulness, computer anxiety). Accordingly, TAM 2 and 3 focus on factors predicting perceived ease of use and usefulness, which in turn influence usage intentions and the actual use of new technologies.

In general, the TAM and its extensions are empirically well supported (King & He, 2006; Schepers & Wetzels, 2007) and they have also been successfully applied to consider the use of different personnel selection tools. For instance, Oostrom et al. (2013) found that perceived ease of use and perceived usefulness are positively related to the intention to use new selection technologies. Moreover, Oostrom et al. (2013) examined how recruiter characteristics influence their adoption of these new technologies and found that personnel innovativeness in IT was positively associated with

perceived ease of use, perceived usefulness, and intention to use. Likewise, Basch and Melchers (2021) found that perceived ease of use and usefulness were related to the actual use of technology-mediated interviews. Again, innovativeness in IT proved to be a determinant for perceived ease of use, perceived usefulness, and actual use of technology-mediated interviews. Additionally, research from other fields repeatedly found innovativeness in IT to be associated with usability perceptions, intention to use, and actual use of technologies (Kim et al., 2017; Walczuch et al., 2007). Thus, based on the TAM and its extensions, as well as on the empirical evidence, we hypothesize as follows (an overview of all our hypotheses related to the TAM and its extensions is presented in Figure 1):

Hypothesis 1. Innovativeness in IT is positively correlated with (a) perceived usefulness, (b) perceived ease of use, (c) intention to use, and (d) the actual usage of gamified assessments and GBAs.

Hypothesis 2. Perceived ease of use mediates the relationship between innovativeness in IT and (a) intention to use, as well as (b) the actual use of gamified assessments and GBAs.

In his theoretical framework, Venkatesh and Davis (2000) suggests several determinants (i.e., anchors and adjustments) that may predict the perceived ease of use of a new technology (TAM 3; Venkatesh & Bala, 2008). Specifically, Venkatesh postulates that individuals heuristically form their perceptions of the ease of use of an unfamiliar technology based on available information (i.e., anchors) related to their general beliefs about technology and technology use. In the context of GRAs, perceptions of video games and experience with such games may be a determinant of the perceived ease of use of these methods, especially for GRAs that include extensive game elements such as GBAs and more highly gamified non-GBAs. Specifically, recruiters who are high on video game pursuit (Sanchez & Langer, 2020)—that is, who intentionally pursue video games, are self-confident when playing games, have an affinity for video games, tend to experience flow when playing games, and are comfortable with video game activities—may find GRAs easier to implement and use than individuals scoring lower on video game pursuit. In contrast, recruiters experiencing intimidation and general discomfort or confusion when playing video games (i.e., intimidation with games; Sanchez & Langer, 2020) may perceive GRAs as less easy to use and are more likely to have lower usage intentions than individuals with low levels of intimidation with games. Thus, we hypothesized the following:

Hypothesis 3. Video game pursuit is positively correlated with the perceived ease of use of gamified assessments and GBAs.

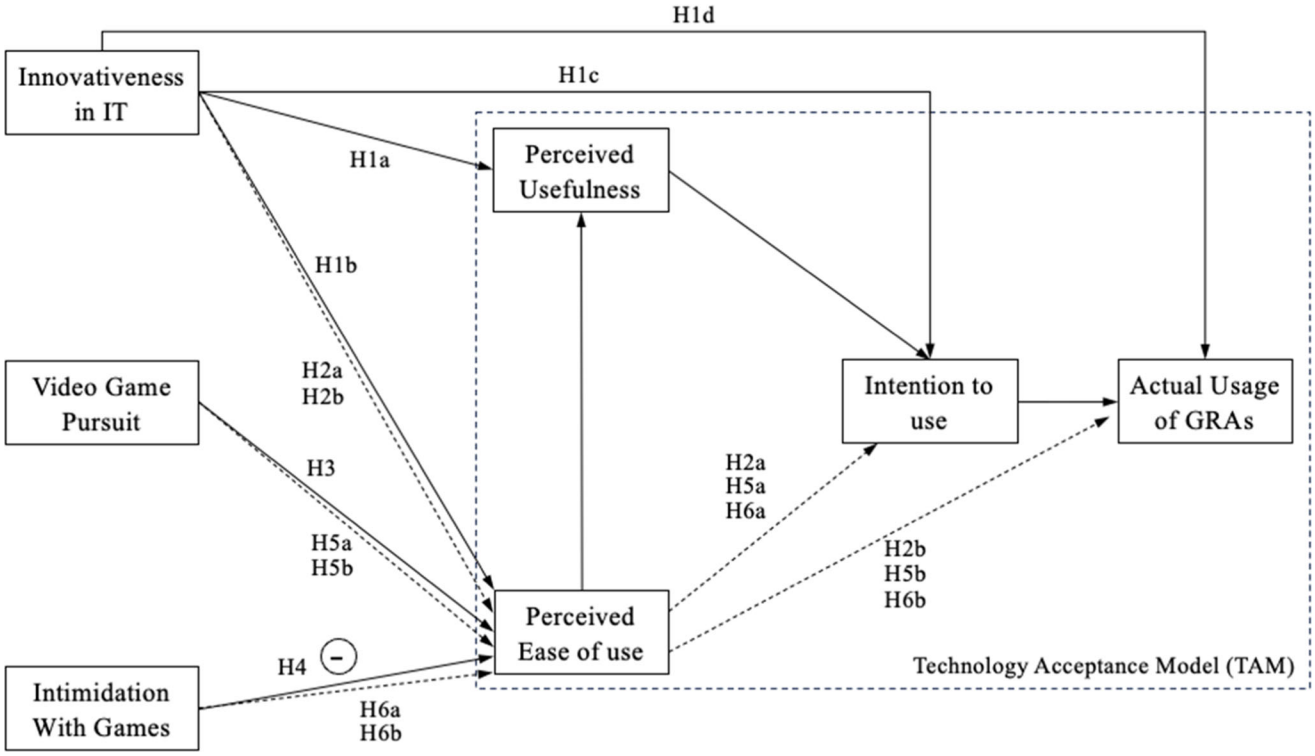


FIGURE 1 Overview of Hypotheses 1–6 related to the technology acceptance model (TAM) 1–3. Dashed arrows indicate mediation hypotheses. Arrows that are not related to a specific hypothesis from the present study are included in the figure for the sake of completeness because they are assumed in the TAM.

Hypothesis 4. Intimidation with games is negatively correlated with the perceived ease of use of gamified assessments and GBAs.

Hypothesis 5. Perceived ease of use mediates the relationship between video game pursuit and (a) intention to use, as well as (b) the actual use of gamified assessments and GBAs.

Hypothesis 6. Perceived ease of use mediates the relationship between intimidation with games and (a) intention to use, as well as (b) the actual use of gamified assessments and GBAs.

Besides recruiters' innovativeness in IT and video game pursuit, we intended to investigate further individual and organizational characteristics that may influence recruiters' attitudes toward GRAs. Regarding organizational characteristics, we were interested in whether organizational size, as well as the number of applications screened and job openings per year affect the intention to use and the actual usage of GRAs. This is because the selection process and the selection instruments used often differ between large versus small organizations, which raises the question of whether these variables are also relevant in the context of GRAs. Additionally, other recruiter characteristics might also determine the perceived usefulness, perceived ease of use, intention to use, and the actual use of GRAs such as their age, gender, and work experience. Specifically, previous studies suggested that age and gender may influence TAM variables (Chung et al., 2010; Tarhini et al., 2014; Venkatesh et al., 2003; Wang et al., 2009). Thus, we aimed to explore the following question:

Research Question 1. *Which characteristics of the organization and the recruiter (e.g., number of employees, number of selection decisions per year, number of applications screened per year, recruiters' years of work experience, age, and gender) are related to perceived usefulness, perceived ease of use, intention to use, and the actual use of GRAs?*

Further, as suggested in a conceptual article by Klehe (2004), additional factors such as costs, assumed applicant acceptance or perceived legality might influence the use or non-use of personnel selection procedures. In line with this, König et al. (2010) found that recruiters' assumed applicant reactions, costs, the procedures' diffusion in the field, perceived organizational self-promotion, and perceived legality determine the use of personnel selection procedures. Furthermore, in the context of digital selection instruments, Basch and Melchers (2021) found that assumed time and cost savings, as well as the possibility to assess a larger applicant pool, were positively associated with the use of videoconference and telephone interviews. In addition to the reasons mentioned above, applicant targeting, and development time of GRAs might affect their use. In particular, the improved targeting of applicants through GRAs is often postulated in the literature (Bhatia & Ryan, 2018; Fetzer et al., 2017) as one of their primary advantages compared to their traditional counterparts. In contrast, the development of GRAs involves high time and monetary investments for organizations. Accordingly, these reasons might also influence organizations' decisions on whether to include GRAs in their selection process. Based on these considerations, we hypothesized:

Hypothesis 7. Assumed applicant reactions, time for development and design, time required for implementation, development costs, costs for implementation, diffusion in the field, impact on the organizational image, data privacy, and applicant targeting correlate with (a) intention to use gamified assessments and GBAs, and (b) the actual use of them.

Another goal of this study was to compare recruiters' and potential applicants' perceptions of GRAs. Prior empirical studies have mainly focused on applicant reactions investigating reaction variables from Gilliland's (1993) fairness model. Among other things, this model postulates 10 rules of procedural fairness that are supposed to influence the perceived fairness of the selection process among applicants.

Existing research on applicant reactions toward GRAs has yielded mixed results so far. On the one hand, several studies found more positive applicant reactions to GRAs compared to their more traditional counterparts (e.g., Hommel et al., 2022; Landers & Collmus, 2022; Landers et al., 2022). On the other hand, other studies found no differences (Landers et al., 2020) or even more negative reactions (Georgiou, 2021; Ohlms et al., 2024). A potential explanation for the mixed findings on applicant reactions towards GRAs as mentioned in a recent review by Ramos-Villagrasa et al. (2022) might be that GRAs comprise several different assessments, including gamified assessments and GBAs. Furthermore, GRAs can vary widely in their appearance owing to differences in their design (e.g., game genre, degree of job-relatedness; Fetzer et al., 2017), and thus, depending on the specific design of a GRA, applicant perceptions might vary. Furthermore, another issue that might also partly explain the mixed results regarding applicant reactions, is that applicants differ in their preferences for GRAs, and thus certain individual characteristics moderate reactions towards them. For example, previous studies found that males, as well as individuals who have higher scores on technology-related self-efficacy and video game experience, tend to have more positive perceptions of GBAs than females and individuals with lower technology-related self-efficacy and video game experience (Ellison et al., 2020; Ohlms et al., 2023).

As recruiters' assumptions about applicants' reactions to selection procedures partly determine whether they use them, recruiters' perceptions are also relevant from a practical viewpoint (Klehe, 2004; König et al., 2010). Accordingly, we aimed to investigate recruiters' perceptions of GRAs and to compare them with those of potential applicants.

Research Question 2. *Do recruiter and potential applicants differ in their (a) perceptions of and (b) perceived favorability for paper–pencil, computer-based, and gamified tests and questionnaires, and GBAs?*

2 | METHOD AND MATERIALS

2.1 | Sample

Participants were recruited via email, job-related social networks (e.g., LinkedIn), and professional contacts of the first author. In total, 166 recruiters employed in various organizations in German-speaking countries and 155 potential applicants completed the online survey. Owing to failing the attention check (see below), 19 participants were removed from the sample, so that the total sample consisted of $N = 158$ recruiters and $N = 144$ potential applicants.

In the recruiter sample (65.2% females), age ranged from 21 to 68 years ($M = 35.89$, $SD = 12.18$). The majority of them held at least a Bachelor's degree (31.6% Bachelor's degree, 46.2% Master's degree, 5.7% PhD). Regarding their educational background, the recruiters were mainly (business) psychologists (43.7%) and business economists (26.6%). The organizational size ranged from 1 to 600,000 employees with a median of 600, but most of the recruiters were employed in an organization with 1–49 employees (20.3%), 50–499 employees (19.0%), or 500–1999 employees (17.7%). Recruiters worked in a variety of industries, the largest group being personnel consulting (15.2%) and public administration (7.6%). Concerning the responsibility for personnel selection in their organization, 70.1% named the HR department, 56.7% the respective specialist departments, and 34.4% the executive management. Recruiters had an average work experience of $M = 7.75$ years (SD = 8.37), screened $M = 378.99$ ($SD = 1244.12$) applications per year, and filled $M = 36.65$ ($SD = 120.41$) vacancies per year.

Within the sample of potential applicants (74.3% females), age ranged from 19 to 66 years ($M = 29.94$, $SD = 10.89$). Participants were employed in a variety of industries and occupational fields, with the largest group working in the healthcare sector (11.8%) and/or as business administrators (15.3%). The majority had a Bachelor's (38.9%) or a Master's degree (22.9%). Participants previously completed $M = 6.08$ ($SD = 5.19$) application processes.

2.2 | Procedure

The study was administered via an online questionnaire. At the beginning of the questionnaire, participants were asked whether they were involved in personnel selection as part of their work. Those who responded "yes" received the recruiter survey, whereas those who answered "no" received the survey for potential applicants. Both surveys were mostly identical and took ~15 min to complete.

The survey consisted of two parts. First, participants received a brief explanation of paper–pencil, computer-based, gamified, and game-based assessments (the exact text is provided in the Supporting Information). In particular, we explained that in paper–pencil and computer-based questionnaires, applicants are shown various statements about themselves to gather self-reported information about their behavior, preferences, and attitudes and that in paper–pencil and computer-based ability tests, applicants are presented with tasks that can be solved either correctly or incorrectly. We emphasized that the difference between paper–pencil and computer-based questionnaires and tests is that the former require responses to be ticked or written down by hand on an answer sheet, whereas the latter are completed by applicants on a computer, tablet, or smartphone. Regarding gamified assessments, we specified that these assessments typically follow the same structure as computer-based questionnaires and tests, but in addition to the actual questions and items they also incorporate various game elements. Moreover, we explained that in a GBA, (computer) games are used to assess knowledge, skills, abilities, or other characteristics of applicants.

Participants in the recruiter sample were then asked about the use of these methods for personnel selection in their organization and the underlying reasons for using them. In addition, recruiters reported the extent to which they would like to use these methods and their assumptions about applicants' willingness to complete them. Next, they received questions about their attitudes toward new technologies in personnel selection (i.e., innovativeness in IT, perceived ease of use, and usefulness of GRAs) and video games. Also, information was gathered on recruiters' academic and professional backgrounds as well as on their organization. Similarly, participants in the sample of potential applicants answered questions about their perceived favorability for, and experiences with, paper–pencil, computer-based, gamified, and game-based assessments, as well as selection processes in general.

The second part of the study focused on recruiters' and potential applicants' perceptions of the different selection methods. Here, a between-subjects design was used and participants in the recruiter and potential applicant samples were each randomly assigned to one of four groups. Depending on the group, they received a detailed text-based description of the respective selection method (gamified paper-pencil test and questionnaire, computer-based test and questionnaire, gamified test and questionnaire, or GBA; the complete descriptions are available in the Supplementary Information) and were shown a video with various examples of the respective assessment method.

The videos had a duration of ~3.5–4 min. The video illustrating paper–pencil tests and questionnaires showed a person completing various paper–pencil cognitive ability and personality test items. The video demonstrating computer-based tests and questionnaires portrayed an individual completing the same cognitive ability and personality test items as shown in the paper–pencil test and questionnaire video, with the distinction that they completed the tasks on a computer. Moreover, to convey to participants that gamified assessments and GBAs can vary considerably in their forms, the corresponding videos featured examples of different GBAs and

gamified assessments from various vendors (such as Criteria Corp and Aon Assessment), which differed in their game genres, game elements, gamification degree, and targeted constructs (e.g., cognitive ability and personality). Specifically, the GBA video included instances of both more playful (e.g., Cognify; see Landers et al., 2022, for a detailed description of this GBA) and serious GBAs (e.g., Minecraft Game; see Ohlms et al., 2024, for a detailed description of this GBA). Similarly, the video on gamified assessments encompassed a diverse range of assessments, featuring elements like avatars, mini-games, or cognitive tasks (e.g., the gamified test used by Ohlms et al., 2023).

Subsequently, participants were asked about their attitudes towards the respective assessment method. For the questions on applicants' or recruiters' perceptions, the difference between the subsamples was that recruiters were asked to imagine they had to fill a vacancy. Potential applicants, in contrast, were asked to imagine that they were applying for an attractive position. In this part of the survey, a manipulation check was also administered asking "Which personnel selection method(s) have you just evaluated?" Unfortunately, 20 recruiters and six potential applicants had to be excluded from the analyses regarding the perceptions of the different selection methods because they did not pass this manipulation check.

2.3 | Measures

Unless indicated, all items were answered on five-point rating scales ranging from 1 = *strongly disagree* to 5 = *strongly agree*. For the current study, scales for which no German version was available were translated to German and were verified via back-translation. All adapted scales (i.e., perceived usefulness, perceived ease of use, innovativeness in IT) are presented in Supporting Information S1: Table S1.

2.3.1 | Usability perceptions

Recruiters' perceived usefulness (e.g., "I would find gamified assessments and GBAs useful in my job"; α = .91) and perceived ease of use (e.g., "I would find gamified assessments and GBAs easy to use"; α = .88) of gamified assessments and GBAs were measured using two adapted scales from Oostrom et al. (2013) who had adapted it from Davis (1989), consisting of six items each.

2.3.2 | Knowledge and usage

Recruiters and potential applicants were asked whether they knew paper–pencil, computer-based, and game-based tests and questionnaires, and GBAs (*yes* vs. *no*). In addition, recruiters had to indicate whether they used these methods for personnel selection, whereas potential applicants had to state how often they have already completed them during a selection process.

2.3.3 | Intention to use

Recruiters' intentions to use gamified assessments and GBAs were assessed using a two-item scale (α = .89) from Oostrom et al. (2013) who had adapted it from Agarwal and Prasad (1998; "I intend to increase my use of gamified assessments and GBAs in the future").

2.3.4 | Reasons to use gamified assessments and GBAs

To assess the reasons for the use of GRAs, recruiters were asked: "In your opinion, to what extent do the following reasons speak for or against the use of gamified assessments or GBAs." On a five-point scale ranging from −2 = *speaks against the use* to 2 = *speaks for the use*, recruiters evaluated the subsequent reasons: applicant reactions, time for development and design, time required for implementation, development costs, costs for implementation, because other organizations use them too, impact on the organizational image, data privacy, and applicant targeting.

2.3.5 | Innovativeness in IT

Recruiters' innovativeness in IT was measured using an adapted four-item scale from Agarwal and Prasad (1998, e.g., "If I heard about a new personnel selection technology, I would look for ways to use it in our organization," α = .61).

2.3.6 | Perceptions of video games

Recruiters' perceptions of video games were assessed using the Video Game Pursuit Scale (α = .95 for the overall scale) consisting of 19 items and the Intimidation with Games Scale (six items, e.g., "I find it difficult to understand video games," α = .91) from Sanchez and Langer (2020).

2.3.7 | Recruiter background

Participants in the recruiter sample were asked about their academic background, years of work experience, current position, applications screened per year, job openings per year, number of employees of their organization, and responsibility for personnel selection.

2.3.8 | Recruiter and applicant perception variables

Six different recruiter and applicant reaction variables were collected, using established scales. Three subscales from the German Selection Procedural Justice Scale (SPJS; Manzey & Gurk, 2005) whose translation is based on the original item set published by Bauer

et al. (2001), were used to measure participants' general procedural fairness perception of the different selection instruments (three items, e.g., "Overall, the method used was fair," mean $\alpha_{recruiter}$ = .90; mean $\alpha_{applicant}$ = .92), job relatedness (two items, e.g., "Doing well in such a [paper–pencil test and questionnaire; computer-based test and questionnaire; gamified test and questionnaire; GBA] means an applicant could do well on the job"; mean $\alpha_{recruiter}$ = .94; mean $\alpha_{applicant}$ = .91), and opportunity to perform ("In such a [...] applicants can really show their skills and abilities"; mean $\alpha_{recruiter}$ = .83; mean $\alpha_{applicant}$ = .86). Furthermore, enjoyment of each selection instrument was assessed with three items from Wilde et al. (2009; e.g., "I would enjoy such a [...]"; mean $\alpha_{recruiter}$ = .87; mean $\alpha_{applicant}$ = .93), privacy concerns were measured using four items from Langer et al. (2019; "In such a [...], applicants are concerned about their privacy"; mean $\alpha_{recruiter}$ = .74; mean $\alpha_{applicant}$ = 0.80), and modernity was measured using a semantic differential with two adjective pairs on a five-point Likert scale (conservative–innovative, traditional–modern; mean $\alpha_{recruiter}$ = .91; mean $\alpha_{applicant}$ = .87) taken from Kanning et al. (2019).

We conducted a confirmatory factor analysis (CFA) with six correlated factors, to test whether the different perception variables indeed represent separable constructs. This CFA revealed adequate fit for the recruiter, CFI = 0.95, SRMR = 0.06, root mean square error of approximation (RMSEA) = 0.08, and for the applicant sample, CFI = 0.96, SRM = 0.05, RMSEA = 0.08. In contrast, a single-factor model fitted poorly in both samples, $CFI_{recruiter}$ = 0.46, $SRMR_{recruiter}$ = 0.18, $RMSEA_{recruiter}$ = 0.23; $CFI_{applicant}$ = 0.52, $SRMR_{applicant}$ = 0.14, $RMSEA_{applicant}$ = 0.24.

2.3.9 | Favorability perceptions

Participants rated how much they would like to use or participate in the different selection methods on a five-point scale ranging from 1 to 5. Specifically, participants in the potential applicant sample were asked "As part of a selection process, how much would you like to participate in the following personnel selection methods?" and had to rate each of the four selection methods. In contrast, recruiters were asked how much they would like to use these methods for selecting applicants and how much they think applicants would like to participate in these personnel selection methods.

2.3.10 | Attention check

In between the items of the Video Game Pursuit Scale, we included an attention check: "We would like to know whether you have read everything carefully. Therefore, please tick 'strongly agree' to show that you read everything" (Ward & Meade, 2023). Participants who failed the attention check were excluded from the analyses (i.e., 19 participants).

3 | RESULTS[2]

3.1 | Preliminary analyses

Table 1 provides an overview of the degree to which degree paper-pencil, computer-based, gamified tests and questionnaires, as well as GBAs were known and used by recruiters and potential applicants. In both samples, the vast majority knew paper–pencil and computer-based tests and questionnaires. In contrast, only 56.3% of the recruiters reported that they knew gamified assessments, whereas only 35.4% knew of GBAs. Among the potential applicants, only 27.1% and 15.3% knew gamified assessments and GBAs, respectively. In terms of usage, computer-based tests and questionnaires (61.2%) were most frequently used by recruiters, followed by paper–pencil tests and questionnaires (45.2%). In contrast, gamified assessments and GBAs were used by just 15.2% and 4.4% of the recruiters, respectively. A similar pattern emerged in the potential applicant sample, where paper–pencil and computer-based methods were completed noticeably more often than GRAs, for which the mean frequency of previous completions was 0.10 (*SD* = 0.40) for gamified tests and questionnaires and 0.04 (*SD* = 0.23) for GBAs.

Moreover, Table 2 presents descriptive information and correlations for the demographic variables of potential applicants and their prior experience with the different selection instruments.

TABLE 1 Knowledge and usage of the different selection methods among recruiters and potential applicants.

	Recruiter (*N* = 158)		Potential applicants (*N* = 144)		
Personnel selection method	Method known *M* (*SD*)	Usage *M* (*SD*)	Method known *M* (*SD*)	Previously completed *M* (*SD*)	Frequency of previous completions *M* (*SD*)
Paper–pencil tests and questionnaires	0.97 (0.18)	0.45 (0.50)	0.88 (0.33)	0.44 (0.50)	1.19 (2.50)
Computer-based tests and questionnaires	0.94 (0.24)	0.61 (0.49)	0.86 (0.35)	0.39 (0.49)	1.30 (2.92)
Gamified tests and questionnaires	0.56 (0.50)	0.15 (0.36)	0.27 (0.45)	0.07 (0.26)	0.10 (0.40)
Game-based assessments	0.35 (0.48)	0.04 (0.21)	0.15 (0.36)	0.03 (0.18)	0.04 (0.23)

Note: Method known, usage, and previously completed are coded 0 = no, 1 = yes.

TABLE 2 Descriptive information and correlations for study variables in the potential applicant sample.

Variable	*M*	*SD*	1	2	3	4	5
1. Age	29.94	10.89					
2. Gender	0.74	0.44	−.31***				
3. Completion of paper–pencil tests	0.44	0.49	.10	−.12			
4. Completion of computer-based tests	0.39	0.49	−.09	−.12	.53***		
5. Completion of gamified assessments	0.07	0.26	.06	−.21**	.09	.34***	
6. Completion of game-based assessments	0.03	0.18	−.01	−.06	.22**	.16	.25**

Note: $N = 144$. Gender is coded 0 = *male*, 1 = *female*. Completion of paper–pencil tests, computer-based tests, gamified assessments, and GBAs is coded 0 = *not previously completed*, 1 = *previously completed*.

3.2 | Results for the TAM variables

The correlations between the different TAM variables (Davis, 1989), their antecedents, and the actual use of the four assessment methods for the recruiter sample are shown in Table 3 (the correlations for the use of GRAs are point-biserial correlations). Because only seven recruiters (i.e., 4.4%) reported using GBAs in their selection process, we decided not to consider GBA usage in subsequent analyses.

To assess our Hypotheses 1–6 (see Figure 1) simultaneously, we conducted a structural equation modeling (SEM)-based path analysis using the *lavaan* package (Rosseel, 2012) in R (Version 4.3.1; R Core Team, 2023). We used Hu and Bentler's (1999) criteria to assess model fit ($p > .05$, CFI > 0.96, and SRMR < 0.08) and interpreted the absolute and relative fit indices considering constraints outlined by Marsh et al. (2004). Given that our model had only three degrees of freedom (*df*s), we did not consider interpreting the RMSEA, as this fit indicator often incorrectly suggests poor model fit for appropriately specified models with small *df*s and sample size (Kenny et al., 2015).

The path model testing Hypotheses 1–6 simultaneously showed moderate fit, $\chi^2(3) = 14.75$, $p = .002$, CFI = 0.96, SRMR = 0.04. Thus, we inspected modification indices to adjust paths that contributed to the greatest misfit, one model adjustment at a time, until achieving adequate model fit. This was accomplished by including paths from video game pursuit and from intimidation with games to perceived usefulness, $\chi^2(1) = 2.60$, $p = .11$, CFI = 0.99, SRMR = 0.02. The results of the path analysis with unstandardized parameter estimates are presented in Figure 2.

First, as predicted in Hypothesis 1, recruiters' innovativeness in IT was positively associated with perceived ease of use (β = .32, $p < .001$), perceived usefulness (β = .48, $p < .001$), and intention to use (β = .51, $p < .001$), but not with the use of gamified tests and questionnaires (β = −.00, $p = .93$). Next, consistent with Hypothesis 3, video game pursuit was positively related to the perceived ease of use of gamified assessment and GBAs (β = .19, $p = .009$). In addition, in line with Hypothesis 4, intimidation with games was negatively associated with perceived ease of use (β = −.17, $p = .03$).

To examine the mediation effects predicted in Hypotheses 2, 5, and 6, we tested the significance of the indirect effects. Consistent with Hypothesis 2a, perceived ease of use partially mediated the relationship between innovativeness in IT and intention to use, since the indirect effect (= 0.11, $p = .005$) as well as the direct effect of innovativeness in IT to intentions to use GRAs (β = .51, $p < .001$) were significant. Similarly, in line with Hypothesis 5a, we found that perceived ease of use fully mediated the relationship between video game pursuit and intentions to use (indirect effect = 0.06, $p = .03$; direct effect = −0.04, $p = .58$). However, in contrast to Hypothesis 6a, perceived ease of use did not mediate the relationship between intimidation with games and intentions to use (indirect effect = −0.05, $p = .06$; direct effect = 0.05, $p = .54$). Furthermore, the relationships between innovativeness in IT (H2b), video game pursuit (H5b), and intimidation with games (H6b) on the one hand and use of gamified tests and questionnaires on the other hand was not mediated through perceived ease of use, all direct effects < |0.01|, all *p*s > 0.57. However, intention to use was positively related to the use of gamified tests and questionnaires (β = .14, $p < .001$).

Concerning the nonsignificant predicted mediation effects, limited statistical power might pose a challenge to our analyses. Specifically, a bootstrapped statistical power analysis using Monte Carlo Simulations within the *WebPower* package (Version 0.9.4; Zhang et al., 2023) in R (Version 4.3.1; R Core Team, 2023) suggested a power of <0.01 for detecting significant indirect effects in our model (1000 iterations per simulation and 1000 bootstrapping replications). Therefore, we additionally considered bivariate correlations and conducted mediation analyses using Model 4 of Hayes' (2018) PROCESS macro v4.1.[3]

First, largely consistent with the path analysis and with Hypothesis 1, recruiters' innovativeness in IT was positively correlated with perceived ease of use ($r = .32$, $p < .001$), perceived usefulness ($r = .48$, $p < .001$), intention to use ($r = .61$, $p < .001$), and use of gamified tests and questionnaires ($r = .26$, $p < .001$). Second, in line with our SEM-based path analysis and Hypothesis 3, video game pursuit ($r = .37$, $p < .001$) correlated positively with the perceived ease of use of gamified assessments and GBA. Third, in line with Hypothesis 4 and the result of the path analysis, intimidation with games correlated negatively with perceived ease of use ($r = -0.32$, $p < .001$).

TABLE 3 Descriptive information and correlations for recruiter characteristics, TAM variables, and use of the different assessment methods.

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Age	35.89	12.18	(–)														
2 Gender	1.65	0.48	−.27***	(–)													
3 Number of job openings	36.65	120.41	−.06	.12	(–)												
4 Number of applications screened	378.99	1244.12	−.07	.13	.08	(–)											
5 Size of organization[a]	21985.38	76197.20	−.05	−.18*	−.00	−.03	(–)										
6 Work experience	7.75	8.37	.79***	−.24**	−.05	.03	−.07	(–)									
7 Innovativeness in IT	3.38	0.69	−.28***	.11	.02	.07	−.10	−.16*	(.61)								
8 Video game pursuit	2.59	0.91	−.22**	−.34***	−.17*	−.02	−.06	−.17*	.12	(.95)							
9 Intimidation with games	2.10	0.86	.17*	.21**	.21**	.00	.16	.11	−.01	−.60***	(.91)						
10 Perceived usefulness	3.06	0.89	−.21**	−.04	.02	.08	.04	−.18*	.48***	.17*	.08	(.91)		.			
11 Perceived ease of use	3.39	0.77	−.22**	−.03	−.13	−.08	−.08	−.14	.32***	.37***	−.32***	.36***	(.88)	.			
12 Intention to use	2.77	1.12	−.21**	.06	.00	.00	−.04	.13	.61***	.14	.03	.71***	.47***	(.89)			
13 Use of paper-pencil tests	0.45	0.50	.12	.05	−.12	−.15	−.05	.11	.01	.02	.02	−.01	−.03	.04	(–)		
14 Use of computer-based tests	0.61	0.49	−.09	−.02	.07	.09	.12	.05	.31***	.03	.07	.12	.08	.28***	.15	(–)	
15 Use of gamified assessments	0.15	0.36	−.11	−.06	−.06	.05	−.02	−.07	.26***	.02	−.07	.21**	.25**	.44***	−.10	.20*	(–)
16 Use of game-based assessments	0.04	0.21	−.14	.03	−.05	.16*	−.03	.11	.09	.02	.02	.10	.05	.21**	−.07	.05	.80

Note: $N_{recruiter}$ = 158. Scale reliabilities (internal consistencies) are shown in the diagonal. Gender is coded 0 = *male*, 1 = *female*. Variables 3, 4, and 5 are reported per/in year(s). Use of gamified assessment and GBAs is coded 0 = *no usage*, 1 = *usage*.

[a]*n* = 155.

*$p < .05$; **$p < .01$; ***$p < .001$.

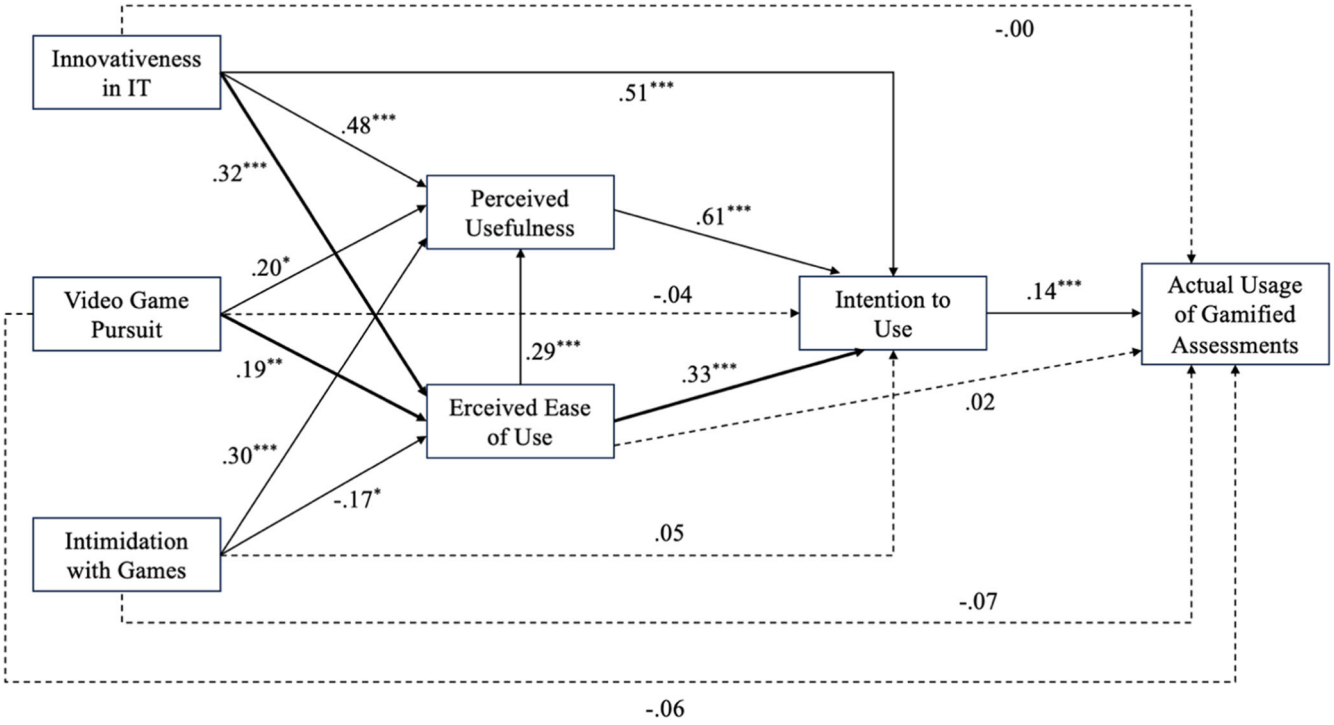


FIGURE 2 Results from the path analysis model to test Hypotheses 1–6 related to the technology acceptance model (TAM) 1–3. Estimates represent non-standardized regression weights. Dotted lines represent nonsignificant relations; bold lines represent significant indirect paths. *p < .05; **p < .01; ***p < .001.

Next, we re-examined the mediation effects predicted in Hypotheses 2, 5, and 6 and found significant mediation effects for all six mediation analyses. In particular, we found that perceived ease of use partially mediated the relationship between innovativeness in IT and intention to use, since neither the confidence interval (CI) for the indirect effect (indirect effect = 0.16, SE = 0.05, 95% CI [0.07, 0.27]) nor for the direct effect of innovativeness in IT to intention to use contained zero (direct effect = 0.83, SE = 0.09, 95% CI [0.65, 1.01]). Similarly, ease of use partially mediated the relationship between innovativeness in IT and the actual use of gamified assessments (indirect effect = 0.27, SE = 0.16, 95% CI [0.03, 0.66]; direct effect = 0.93, SE = 0.41, 95% CI [0.13; 1.72]). Moreover, we found a complete mediation between video game pursuit and intention to use through ease of use, as the direct effect of video game pursuit to intention to use contained zero (direct effect = −0.05, SE = 0.10, 95% CI [−0.25, 0.16]) but the indirect effect did not (indirect effect = 0.22, SE = 0.07, 95% CI [0.11, 0.36]). Additionally, we found that perceived ease of use fully mediated the relationship between video game pursuit and the use of gamified assessments (indirect effect = 0.38, SE = 0.17, 95% CI [0.14, 0.80]; direct effect = −0.30, SE = 0.29, 95% CI [−0.87; 0.27]). Furthermore, we found a partial mediation between intimidation with games and intention to use through ease of use (indirect effect = −0.23, SE = 0.07, 95% CI [−0.36; −0.10]; direct effect = 0.26, SE = 0.10, 95% CI [0.07; 0.45]). In addition, perceived ease of use completely mediated the relationship between intimidation with games and the use of gamified assessments (indirect effect = −0.31, SE = 0.15, 95% CI [−0.66, −0.09]; direct effect = −0.02, SE = 0.30, 95% CI [−0.60; 0.57]).

Therefore, in line with Hypotheses 2a, and 5a, results of the SEM-based path analyses suggest that recruiters who are higher on innovativeness in IT and video game pursuit perceived GRAs as easier to use so that they were more willing to use them in comparison to recruiters with lower innovativeness in IT and video game pursuit. Moreover, results of the individual mediation analyses (but not of the SEM-based path analyses) suggest that recruiters with higher innovativeness in IT and video game pursuit as well as lower intimidation with games perceived GRAs as easier to use so that they were more willing to use them and use them more frequently in comparison to recruiters with lower innovativeness in IT and video game pursuit as well as higher intimidation with games.

To investigate Research Question 1, we examined whether additional characteristics of the organization and the recruiters were related to the perceived ease of use, perceived usefulness, intention to use, and the actual use of GRAs. As shown in Table 3, recruiters' age was negatively correlated to perceived ease of use, usefulness, and intention to use GRAs, all rs < −.20, all ps ≤ .01. Similarly, work experience was negatively related to perceived usefulness (r = −.18, p = .02). However, recruiters' gender, size of the organization, number of selection decisions per year, and number of applications per year were not associated with perceived ease of use, usefulness, intention to use, or the actual use of gamified assessments.

3.3 | Reasons for the use of GRAs

Hypothesis 7 focused on the specific reasons why recruiters use gamified assessments and GBAs. As only 15.2% and 4.4% of the recruiters reported using gamified assessments and GBAs, respectively, we subsequently focused on the intention to use these methods.

First, we conducted one-sample *t*-tests to test whether the reasons for and against the use of GRAs were significantly different from zero. As can be seen in the column with the means in Table 4, applicant reactions, because other organizations use them too, impact on the organizational image, and applicant targeting were reasons for the recruiters to use of GRAs, all *t*s > 7.83, all *p*s < .001 (i.e., the mean ratings were significantly >0). Reasons against the use of GRAs were development costs and time for development and design, as they showed mean values that were significantly <0, both *t*s < −14.11, both *p*s < .001. In contrast, the time required for implementation, data privacy, and costs for implementation differed not significantly from zero, all |*t*s| < 1.58, *p*s > 0.12. Hypothesis 7 was mostly supported.

To further examine which of the various reasons for using GRAs is the most relevant predictor of intentions to use them, we determined correlations between the different reasons and intentions to use gamified assessment and GBAs and also conducted a relative weight analysis (Johnson, 2000) using the R package *rwa* (Tonidandel & LeBreton, 2015). Our focus was mainly on the relative weight analysis, as it provides insight into the relative impacts of the different reasons. Together, the nine reasons accounted for 36% of the variance in usage intentions in a multiple regression. The specific relative weights are shown in Table 4. As can be seen there, impact on the organizational image (rescaled weight = 28.8%), time required for implementation (18.8%), applicant reactions (17.7%), and applicant targeting (14.2%) were especially important predictors of usage intentions.

3.4 | Recruiters' and applicants' perceptions of gamified assessment and GBAs

Participants in both samples (i.e., recruiters and potential applicants) rated either paper-pencil, computer-based, or gamified tests and questionnaires, or GBAs on six different perception variables. First, to test whether the four groups in the recruiter sample differed regarding age, work experience, organizational size, applications screened per year, and the number of job openings per year, we conducted one-way analyses of variance (ANOVAs). No significant differences were found between the groups, all *F*s < 1.19, all *p*s > .31; $\chi^2(3) = 0.84$, $p = .84$. Similarly, for the potential applicants we conducted an ANOVA for age and a χ^2-test to examine any differences regarding gender, but, again, the four groups did not differ in age, $F = 0.37$, $p = .77$, or gender, $\chi^2(3) = 6.26$, $p = .10$.

Next, we conducted a 2 × 4 (Sample × Selection method) multivariate analysis of variance (MANOVA) with the different perception variables as dependent variables to test whether recruiters and potential applicants differed in their perceptions of GRAs (Research Question 2a, see Table 5). We found significant multivariate effects for the selection method, Wilk's $\lambda = 0.28$, $F(18, 744) = 23.52$, $p < .001$, $\eta^2 = 0.35$, and sample, Wilk's $\lambda = 0.93$, $F(6, 263) = 3.41$, $p = .003$, $\eta^2 = 0.07$, whereas the interaction

TABLE 4 Ratings of potential reasons for using gamified assessment and GBAs and relationships and relative weights for reasons for using gamified assessments and GBAs to predict recruiters' intentions to use these methods.

Reasons	Ratings *M* (*SD*)[a]	Relationship between reasons and intention to use gamified assessment and GBAs		
		r	RW	RS-RW (%)
Applicant reactions	0.77 (0.95)[a]	.42*	0.06	17.69
Time for development and design	−0.99 (0.89)[a]	.25**	0.02	5.42
Time required for implementation	0.12 (0.96)	.39*	0.07	18.84
Development costs	−1.18 (0.76)[a]	.20***	0.01	3.44
Costs for implementation	−0.06 (1.07)	.17***	0.01	2.14
Because other organizations use them too	0.51 (0.81)[a]	.22**	0.02	6.53
Impact on the organizational image	1.04 (0.90)[a]	.49*	0.10	28.80
Data privacy	0.04 (0.87)	.24**	0.01	2.89
Applicant targeting	0.71 (0.92)[a]	.41*	0.05	14.24

Note: *N* = 158. Recruiters' reasons for using gamified assessment and GBAs were measured on a scale from −2 = *speaks against the use* to 2 = *speaks for the use*. $R^2 = 36$ for the multiple regression with all the different reasons as predictors of usage intentions.

Abbreviations: GBA, game-based assessment; RS-RW, rescaled relative weight (relative percentage of the accounted variance in intention to use gamified assessment and GBAs); RW, raw relative weight.

[a]Significance levels indicate that a mean differed significantly from 0 in a two-tailed *t*-test.

*$p < .001$; **$p < .01$; ***$p < .05$.

TABLE 5 Recruiter and applicant perceptions of the different selection methods.

	Recruiters (n = 138)				Potential applicants (n = 138)			
Perception variable	Paper-pencil (n = 37) M (SD)	Computer-based (n = 36) M (SD)	Gamified (n = 32) M (SD)	GBA (n = 33) M (SD)	Paper-pencil (n = 40) M (SD)	Computer-based (n = 30) M (SD)	Gamified (n = 30) M (SD)	GBA (n = 38) M (SD)
General procedural fairness	3.59^{a} (0.89)	3.96^{a} (0.83)	3.47^{a} (0.66)	2.84^{b} (0.78)	3.30^{a} (1.05)	3.22^{a} (0.97)	3.31^{a} (0.92)	2.71^{a} (0.96)
Job-relatedness	$2.93^{a,b}$ (0.85)	3.22^{a} (0.71)	3.05^{a} (0.85)	2.41^{b} (0.95)	2.84^{a} (1.05)	2.60^{a} (0.99)	2.83^{a} (0.92)	2.38^{a} (0.77)
Opportunity to perform	2.80^{a} (0.91)	3.12^{a} (0.83)	3.03^{a} (0.80)	2.63^{a} (0.79)	2.64^{a} (0.96)	2.50^{a} (0.89)	2.82^{a} (1.10)	2.47^{a} (0.96)
Enjoyment	2.17^{a} (0.87)	2.83^{b} (0.84)	3.65^{c} (0.69)	3.68^{c} (0.69)	2.64^{a} (1.23)	3.03^{ab} (1.18)	3.71^{b} (1.08)	3.48^{b} (1.08)
Privacy Concerns	2.70^{a} (0.74)	2.49^{a} (0.77)	2.56^{a} (0.65)	2.48^{a} (0.69)	2.49^{a} (0.81)	2.62^{a} (0.74)	2.69^{a} (0.79)	2.51^{a} (0.66)
Modernity	2.03^{a} (0.87)	3.47^{b} (0.99)	4.30^{c} (0.68)	4.29^{c} (0.64)	2.03^{a} (0.95)	3.35^{b} (1.15)	4.48^{c} (0.53)	4.55^{c} (0.55)

Note: Means sharing a common superscript did not differ significantly for the recruiter sample according to Schéffe posthoc tests and for the applicant sample according to Games–Howell posthoc tests.

effect was not significant, Wilk's $\lambda = 0.93$, $F(18, 744) = 1.05$, $p = .40$, $\eta^2 = 0.02$. Subsequent 2 × 4 (Sample × Selection method) ANOVAs regarding the selection method were significant for all perception variables, all Fs > 5.89, all ps < .001, except for opportunity to perform and privacy concerns, both Fs < 2.04, both ps > .10. Furthermore, recruiters and potential applicants differed in their perceptions of general procedural fairness, job relatedness, and opportunity to perform, all Fs > 4.94, all ps < .03, with recruiters holding more positive perceptions than applicants. However, the two groups did not differ concerning enjoyment, data privacy, and modernity, all Fs < 1.30, all ps > .25. In addition, none of the interaction effects was significant, all Fs < 1.66, all ps > .17.

We also conducted separate one-way ANOVAs to further examine recruiter reactions to the different selection methods (paper–pencil, computer-based, gamified, GBA). These ANOVAs revealed significant effects for general procedural fairness, $F(3, 134) = 11.83$, $p < .001$, $\eta^2 = 0.21$, job-relatedness, $F(3, 134) = 5.85$, $p < .001$, $\eta^2 = 0.12$, enjoyment, $F(3, 134) = 29.61$, $p < .001$, $\eta^2 = 0.40$, and image, $F(3, 134) = 61.14$, $p < .001$, $\eta^2 = 0.56$. In contrast, the ANOVAs for opportunity to perform and privacy concerns were nonsignificant, both Fs < 2.44, both ps > .06. Additionally, we conducted post-hoc comparisons using the Scheffé procedure to investigate significant differences between pairs of selection methods (see Table 5, and see Supporting Information S1: Table S2, for detailed information on effect sizes for these comparisons). Although gamified assessments and GBAs scored higher on enjoyment and modernity than their more traditional counterparts, all ds > 0.97, all ps < .001, GBAs were associated with lower fairness ratings compared to the other methods, all ds > −0.87, all ps < .03. In addition, GBAs were evaluated more negatively concerning job-relatedness than computer-based and gamified tests and questionnaires, all ds > −0.71, all ps < .03. Recruiter perceptions for the different selection instruments did not differ regarding opportunity to perform, and privacy concerns, all ds < |0.61|, all ps > .11.

As with the recruiter sample, we also explored applicants' perceptions of the different methods. In the recruiter sample, the ANOVAs were significant for general procedural fairness, $F(3, 134) = 3.13$, $p = .03$, $\eta^2 = 0.07$, enjoyment, $F(3, 134) = 6.14$, $p < .001$, $\eta^2 = 0.12$, and modernity, $F(3, 134) = 75.59$, $p < .001$, $\eta^2 = 0.63$. The results of the other ANOVAs were all nonsignificant, all Fs < 1.98, all ps > .12. Results for post-hoc tests using the Games–Howell method are shown in Table 5 (also see Supporting Information S1: Table S3, for detailed information on effect sizes for these comparisons). As for the recruiter sample, gamified assessments and GBAs scored higher on modernity compared to paper-pencil and computer-based tests and questionnaires, all ds > 1.26, all ps < .001. In addition, paper–pencil tests scored lower than gamified assessments and GBAs concerning enjoyment, all ds > −0.72, all ps < .01. Potential applicants' reactions to the different selection instruments did not differ significantly regarding general procedural fairness, job-relatedness, and opportunity to perform, all ds < |0.64|, all ps > .05.

An interesting aspect of the comparisons between the different selection methods concerned the fairness perceptions of GBAs. Even though only some of the pairwise comparisons were significant in the above analyses, it is noteworthy that—in both samples—GBAs were descriptively rated lower on general procedural fairness, job-relatedness, and opportunity to perform than all other selection procedures, with ds ranging from |0.03| to |1.39|.

To evaluate whether recruiters' perceived favorability for the different methods differed from that of potential applicants (Research Question 2b), we conducted a one-way MANOVA using perceived favorability ratings for the four different selection methods as dependent variables (see Table 6). This MANOVA again revealed a significant difference between recruiters and potential applicants, Wilk's $\lambda = 0.82$, $F(4, 297) = 16.76$, $p < .001$, $\eta^2 = 0.18$. Subsequent ANOVAs indicated significant differences for paper-pencil, $F(1, 300) = 17.60$, $p < .001$, $d = 0.49$, and computer-based tests and questionnaires, $F(1, 300) = 20.40$, $p < .001$, $d = -0.52$ (see Table 6), but no differences for gamified assessments and GBAs, both Fs < 0.53, both ps > .47, both ds < |0.08| (see Supporting Information S1: Table S4, for detailed information on effect sizes for these comparisons).

TABLE 6 Recruiters' and potential applicants' perceived favorability of the different selection methods.

Selection method	Potential applicants' perceived favorability *M* (*SD*)	Recruiters perceived favorability *M* (*SD*)	Recruiters' assumptions of applicants' perceived favorability *M* (*SD*)
Paper–pencil tests and questionnaires	$3.06^{a,1}$ (1.14)	$2.47^{b,1}$ (1.28)	$2.34^{b,1}$ (1.03)
Computer-based tests and questionnaires	$3.43^{a,2}$ (1.11)	$4.00^{b,2}$ (1.08)	$3.32^{a,2}$ (0.93)
Gamified tests and questionnaires	$3.49^{a,2}$ (1.07)	$3.56^{a,3}$ (1.20)	$3.75^{b,3}$ (0.87)
Game-based assessments	$3.33^{a,1,2}$ (1.32)	$3.23^{a,4}$ (1.23)	$3.66^{b,3}$ (0.96)

Note: Within rows, means of applicants' perceived favorability sharing a common letter with recruiters' perceived favorability or recruiters' assumptions of applicants' perceived favorability did not differ significantly. Within columns, means sharing a common number did not differ significantly according to Bonferroni pos-thoc tests.

In addition, we examined whether recruiters' assumptions of applicants' perceived favorability differed from potential applicants' actual perceived favorability. The corresponding MANOVA revealed a significant difference, Wilk's $\lambda = 0.87$, $F(4, 297) = 10.79$, $p < .001$, $\eta^2 = 0.13$. The subsequent ANOVAs found that recruiters assumed that applicants favor GBAs and gamified assessments more than they actually did, with $F(1, 300) = 5.09$, $p = .03$, $d = -0.27$, for gamified tests and questionnaires, and $F(1, 300) = 6.34$, $p = .01$, $d = -0.29$, for GBAs. In contrast, recruiters underestimated applicants' perceived favorability for paper-pencil tests, $F(1, 300) = 32.61$, $p < .001$, $d = 0.66$. However, we found no difference between recruiters' assumptions of applicants' perceived favorability of computer-based tests and potential applicants' actual perceived favorability, $F(1, 300) = 0.85$, $p = .36$, $d = 0.11$.

Finally, we examined whether potential applicants' and recruiters' perceived favorability ratings differed for the four methods (see Table 6; see Supporting Information S1: Table S5, for detailed information on effect sizes for these comparisons). Repeated-measures ANOVAs for both samples with a Greenhouse–Geisser correction revealed that recruiters' and potential applicants' mean perceived favorability ratings, as well as recruiters' assumptions of applicants' perceived favorability, showed statistically significant differences between methods, all $Fs > 5.18$, all $ps < .01$, all $\eta^2 s > 0.03$. Results of post-hoc comparisons using the Bonferroni procedure revealed that recruiters' perceived favorability ratings were highest for computer-based tests and questionnaires followed by gamified, $d = 0.39$, $p < .001$, game-based, $d = 0.67$, $p < .001$, and paper–pencil assessments, $d = 1.29$, $p < .001$. In contrast, potential applicants liked computer-based, gamified, and GBAs equally, all $ds < |0.14|$, all $ps > 0.40$, but favored computer-based, and gamified assessments to paper-pencil tests and questionnaires, $d_{\text{computer-based, paper-pencil}} = 0.33$, $p < .001$, $d_{\text{gamified, paper-pencil}} = 0.39$, $p = .003$.

4 | DISCUSSION

The present study addressed several important issues. First, we examined reasons for the use of gamified assessments and GBAs and found that particularly recruiters' characteristics (but not organizational characteristics) were related to their intentions to use GRAs. Furthermore, our results stress the usefulness of the TAM 1-3 (Davis, 1989; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000) and of Klehe's (2004) model of conceptual pressure factors in predicting recruiters' intentions to use GRAs and their actual use of gamified assessments. Moreover, we examined recruiters' perceptions of and perceived favorability for GRAs, compared them to potential applicants' perceptions of these methods, and found several differences between recruiters and potential applicants. To the best of our knowledge, this study is the first to assess the reasons for the use of GRAs as well as the perceptions of them from both the recruiters' and the applicants' points of view and thus helps us to better understand these new selection methods.

Although the number of providers of GRAs has been increasing in recent years, our results show that the actual use of these methods in personnel selection in German-speaking organizations is still relatively limited so only 15.2% and 4.4% of the surveyed recruiters stated that they had used gamified assessments and GBAs, respectively. However, about half of the recruiters (56.3%) knew about gamification in the context of personnel selection, and one-third (35.4%) at least reported that they had heard of GBA before. Among the potential applicants, only a minority reported knowing of gamified assessments and GBAs (i.e., 27.1% and 15.3%) or having completed them as part of a selection process (i.e., 6.9% and 3.5%). In contrast, most recruiters and potential applicants in our sample were familiar with paper-pencil and computer-based tests and questionnaires.

Regarding the diffusion of more traditional selection instruments, our results are mostly consistent with previous research. Thus, the percentage among the surveyed recruiters using paper-pencil tests and questionnaires closely matched results from a study on the use and evaluation of personnel selection procedures in Germany by Armoneit et al. (2020). In contrast, increasing use of computer-based procedures in German-speaking countries can be observed relative to results from Armoneit et al. (2020), who found that only 23.6% of the organizations used online personality tests and 16.4% used online ability tests, and also compared to a survey of the 1000 largest German organizations in 2016 (Weitzel et al., 2016), who found that 1.2% of the surveyed organizations used GRAs. However, the

increase seems unsurprising given the increasing digitization of personnel selection and might suggest a further expanding use of GRAs in the next years (Tippins, 2015).

Most interestingly, we found that recruiters' individual characteristics seem to influence their usability perceptions and usage intentions of GRAs, whereas organizational factors such as organizational size tend to play a minor role. As such, recruiters who are higher on innovativeness in IT and video game pursuit as well as lower on intimidation with games had higher usability perceptions and usage intentions of GRAs and were more likely to use gamified assessments. Consistent with previous studies examining the impact of recruiters' individual characteristics on their intentions to use digital personnel selection methods (Basch & Melchers, 2021; Oostrom et al., 2013), it appears that innovativeness in IT is a key factor in determining why recruiters might or might not use new technologies.

In addition, and in line with previous research (Oostrom et al., 2013), our results provide support for using the TAM (Davis, 1989) and its extensions (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000) to explain recruiters' intentions to use GRAs. Thus, the present study indicated that recruiters' perceived ease of use and usefulness of GRAs are related to their intentions to use them and their actual use of gamified assessments. Moreover, in line with TAM 3 (Venkatesh & Bala, 2008), we found that perceived ease of use partially mediated the relationship between recruiters' innovativeness in IT and their intention to use gamified assessments and GBAs, as well as their actual use of gamified assessments. Similarly, perceived ease of use fully mediated the relationship between video game pursuit and usage intentions of GRAs and actual use of gamified assessments. The indirect effects of intimidation with games were more equivocal, however. In the (underpowered) SEM-based path model, they were nonsignificant, but in the (more appropriately powered) regression analyses, ease of use partially mediated the relationship between intimidation with games and intention to use GRAs, and completely mediated the association between intimidation with games and use of gamified assessments.

Consistent with previous research on reasons why organizations use certain selection instruments (Klehe, 2004; König et al., 2010), there are reasons both for and against the use of GRAs from the recruiters' point of view. On the one hand, HR professionals indicated applicant reactions, effects on the organizational image, because other organizations use them too, and applicant targeting, as reasons for the use of gamified assessments and GBAs. Among the reasons mentioned against their use were development costs and time for development and design. Surprisingly, the time required for implementation, data privacy, and costs for implementation were no significant reasons for the use or non-use of GRAs from the recruiters' perspective. Thus, these reasons seem to play a minor role for recruiters when deciding whether to use GRAs in personnel selection. Notably, the most relevant reasons for predicting recruiters' intentions to use GRAs were the impact on the organizational image, the time required for implementation, applicant reactions, and applicant targeting. Thus, in general, HR professionals primarily seem to expect the use of GRAs to positively impact the organization's image and increase the efficiency of personnel selection.

Regarding perceptions of GRAs, almost the same pattern of results emerged in the recruiter and potential applicant samples as they only differed significantly in their perceptions of computer-based tests and questionnaires regarding general procedural fairness. More precisely, gamified assessments and GBAs were rated more positively in terms of enjoyment and modernity compared to paper–pencil and computer-based assessments. These results are in line with Georgiou and Lievens (2022), who found that potential applicants perceived a gamified assessment as more enjoyable than its paper–pencil counterpart and that its use positively affected the perceived innovativeness of an organization. However, recruiters perceived GBAs to be less fair than paper–pencil, computer-based, and gamified tests and questionnaires. Additionally, GBAs were rated as less job-related than gamified assessments and computer-based assessments. Furthermore, at least descriptively, all examined fairness variables from Gilliland's (1993) fairness model (i.e., fairness, job relatedness, and opportunity to perform) were evaluated lower in both groups for GBAs than for all the other assessments. Thus, it seems that GBAs are perceived as more entertaining and modern than their traditional counterparts but considered less fair. In contrast, gamified tests and questionnaires seem to be a promising alternative to their traditional counterparts regarding fairness perceptions.

Besides perceptions, we also assessed recruiters' and potential applicants' perceived favorability for the different selection methods, as well as recruiters' assumptions about applicants' perceived favorability. Both recruiters and potential applicants indicated that they would prefer to take or use computer-based assessments or GRAs in comparison with paper–pencil tests and questionnaires. However, recruiters overestimated applicants' perceived favorability for GRAs. Thus, potential applicants' perceived favorability ratings did not differ between computer-based, gamified, and game-based assessments. In contrast, recruiters assumed that applicants would prefer GRAs to computer-based tests and questionnaires. Accordingly, the assumption that GRAs are generally better accepted and preferred by applicants (e.g., Bhatia & Ryan, 2018; Fetzer et al., 2017) was not supported unequivocally.

4.1 | Limitations and future research

Although this study provides an important contribution to research on GRAs, it is not without limitations. A first limitation arises from the fact that before rating the various perception variables, participants were shown only brief text- and video-based excerpts of certain gamified assessments or GBAs. Thereby, we attempted to present a broad spectrum of different gamified assessments or GBAs to give participants an understanding that these assessments can take on very different appearances depending on their specific design (e.g., game genre) and their purpose (e.g., assessment of personality vs. problem-solving skills).

An alternative approach would have been to have participants actually complete the different assessments. However, as a recruiter sample is relatively challenging to recruit, we aimed for a manageable study design that demanded an affordable level of participant engagement. Thus, if we had actually required participants to complete the corresponding assessment method, they would have been limited to completing only one specific assessment, thereby preventing them from experiencing the diverse range of GRAs. Consequently, we decided to show participants excerpts from different GRAs to illustrate the diversity of their manifestations. Yet, the results from Ohlms et al. (2024), who had participants actually complete a GBA, further support our findings. Specifically, Ohlms et al. (2024) also found that their GBA was associated with more negative ratings for traditional applicant reaction variables compared to a paper-pencil test. Nevertheless, it cannot be dismissed that the chosen examples may have influenced participants' perceptions of these methods and that the specific appearance of a given GRA may have influenced reactions toward it. Thus, an option for future research could be to look specifically at reactions to specific GRAs or game elements instead of assessing reactions to gamified assessments and GBAs generally. However, doing this would have considerably increased the complexity of the present study design and would have gone beyond the study's objective, as we aimed to better understand applicants' and recruiters' reactions to GRAs in general. Nevertheless, future research is necessary to gain more in-depth knowledge of the extent to which different manifestations of GRAs impact recruiter and applicant perceptions.

Another limitation relates to the fact that the study variables were measured using self-reports (e.g., TAM variables, applicant reaction variables, or innovativeness in IT). Hence, the observed relationships between these variables may exhibit a positive bias owing to common method variance. However, common method variance poses a recurrent challenge in applicant reaction research (Nikolaou et al., 2015). Therefore, another potential approach to assess individual characteristics, perceptions, and attitudes, such as innovativeness in IT or intention to use GRAs, would have been to use peer reports. Future research should think about this possibility to reduce the potential impact of common method variance.

Furthermore, participants in the potential applicant sample were not real applicants and the selection process was only hypothetical. Even though we attempted to simulate a realistic selection scenario through our instruction, further research is necessary to confirm our findings in a real applicant sample.

Another drawback of this study pertains to the sample size utilized for the between-subjects comparisons within the second part of the survey.[4] This design was intentionally selected to maintain a manageable questionnaire length, allowing participants to complete it within a brief break or during their leisure time without imposing overburdening time commitments. Nevertheless, it is worth noting that adopting a within-subjects design would have amplified the statistical power of the statistical analyses.

4.2 | Practical implications

Digitization has become an indispensable part of modern life. Consequently, organizations are now facing the challenge of gradually digitizing their personnel selection processes (Stone et al., 2013). This raises the question of which factors determine whether organizations and recruiters adopt digital personnel selection methods such as GRAs. Overall, our results emphasize the importance of individual differences on the side of the recruiters such as innovativeness in IT, video game pursuit, and intimidation with games regarding attitudes toward GRAs. Furthermore, we found that recruiters' perceived ease of use and perceived usefulness of GRAs are closely related to their intentions to use them. Thus, organizations seeking to carry out personnel selection in a more digital and modern way may try to establish a positive attitude towards new technologies in general and GRAs in particular within the organization. Accordingly, organizations could offer training to HR professionals with low levels of innovativeness in IT or limited experience with computer games to improve their knowledge of new trends in personnel selection, such as gamified assessment. This may help to reduce recruiters' resistance to digital selection methods. Thereby, a culture promoting the use of new technologies must also be fostered at higher levels in the organization (e.g., department, executive management). Another approach would be to consider characteristics such as innovativeness in IT or computer self-efficacy when hiring recruiters.

Gamified assessments and GBAs may positively impact the organizational image, as they might be perceived as more modern and enjoyable compared to their traditional equivalents. As such, they might work effectively as an employer branding tool. However, it remains to be clarified under which circumstances (e.g., individual differences of applicants, specifics of the game design) GRAs are also associated with more positive fairness perceptions than more traditional methods. Furthermore, besides applicant perceptions, the question of the psychometric quality of GRAs also needs further empirical support. After all, the main goal of personnel selection is not just to promote the organization's image, but to make valid and fair selection decisions.

ACKNOWLEDGMENTS

This work was partially supported by a doctoral scholarship of the Studienstiftung des deutschen Volkes for Marie L. Ohlms. Open Access funding enabled and organized by Projekt DEAL.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in OSF at https://osf.io/5xvmb/?view_only=080ff7cc37924b78ad88ca8107b9c1da.

ORCID

Marie L. Ohlms http://orcid.org/0000-0003-4022-6904
Klaus G. Melchers http://orcid.org/0000-0003-4211-6450
Uwe P. Kanning http://orcid.org/0000-0002-9839-2940

ENDNOTES

[1] We would like to note that GRAs can take on various forms and do not necessarily require that an assessment is delivered by means of a computer or via the Internet even though most GRAs are computer- or web-based (Melchers & Basch, 2022; see, for instance, Fissler et al., 2018, as an example in which performance in a traditional game [a jigsaw puzzle] was related to different measures of cognitive abilities). However, given that the vast majority of GRAs for selection and assessment purposes are computer- and internet-based, we focused on those in the present study.

[2] Results in this section can be reproduced using the anonymized data set and code found at https://osf.io/5xvmb/?view_only=080ff7cc37924b78ad88ca8107b9c1da.

[3] With a sample size of $N = 158$, we had a power of 0.97 to detect medium-sized correlations (two-tailed). And according to Fritz and MacKinnon (2007), we also had sufficient power (0.80) to detect an a-path of 0.26 and a b-path of 0.39 for our mediation hypotheses using percentile bootstrapping (i.e., Hayes', 2018, PROCESS macro v4.1).

[4] However, we would like to mention that post-hoc power analyses for the interaction effect of the 2 × 4 MANOVA (Sample × Selection method) related to Research Question 2a revealed a power of 0.78. Furthermore, with a sample size of $n_{recruiters} = 138$ (and also $n_{potential}$ applicants = 138), we had a power of 0.68 to detect a medium-sized main effect in the subsequent ANOVAs. In addition, we had a power of 0.93 to detect medium-sized main effects in the one-way MANOVAs related to Research Question 2b and a power of 0.99 to detect medium-sized main effects in the subsequent ANOVAs.

REFERENCES

Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information Systems Research*, *9*(2), 204–215. https://doi.org/10.1287/isre.9.2.204

Armoneit, C., Schuler, H., & Hell, B. (2020). Nutzung, Validität, Praktikabilität und Akzeptanz psychologischer Personalauswahlverfahren in Deutschland 1985, 1993, 2007, 2020 [Use, validity, practicability, and acceptance of psychological personnel selection procedures in Germany 1985, 1993, 2007, 2020]. *Zeitschrift für Arbeits- und Organisationspsychologie*, *94*(2), 67–82. https://doi.org/10.1026/0932-4089/a000311

Basch, J. M., & Melchers, K. G. (2021). The use of technology-mediated interviews and their perception from the organization's point of view. *International Journal of Selection and Assessment*, *29*(3–4), 495–502. https://doi.org/10.1111/ijsa.12339

Bauer, T. N., Truxillo, D. M., Sanchez, R. J., Craig, J. M., Ferrara, P., & Campion, M. A. (2001). Applicant reactions to selection: Development of the Selection Procedural Justice Scale (SPJS). *Personnel Psychology*, *54*(2), 387–419. https://doi.org/10.1111/j.1744-6570.2001.tb00097.x

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 2.0* (pp. 81–110). Information Age Publishing.

Chung, J. E., Park, N., Wang, H., Fulk, J., & McLaughlin, M. (2010). Age differences in perceptions of online community participation among non-users: An extension of the technology acceptance model. *Computers in Human Behavior*, *26*(6), 1674–1684. https://doi.org/10.1016/j.chb.2010.06.016

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly*, *13*(8), 319–340.

Ellison, L. J., McClure Johnson, T., Tomczak, D., Siemsen, A., & Gonzalez, M. F. (2020). Game on! Exploring reactions to game-based selection assessments. *Journal of Managerial Psychology*, *35*(4), 241–254. https://doi.org/10.1108/JMP-09-2018-0414

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

Fissler, P., Küster, O. C., Laptinskaya, D., Loy, L. S., von Arnim, C. A. F., & Kolassa, I.-T. (2018). Jigsaw puzzling taps multiple cognitive abilities and is a potential protective factor for cognitive aging. *Frontiers in Aging Neuroscience*, *10*, 299. https://doi.org/10.3389/fnagi.2018.00299

Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, *18*(3), 233–239. https://doi.org/10.1111/j.1467-9280.2007.01882.x

Georgiou, K. (2021). Can explanations improve applicant reactions towards gamified assessment methods. *International Journal of Selection and Assessment*, *29*(2), 253–268. https://doi.org/10.1111/ijsa.12329

Georgiou, K., Gouras, A., & Nikolaou, I. (2019). Gamification in employee selection: The development of a gamified assessment. *International Journal of Selection and Assessment*, *27*(2), 91–103. https://doi.org/10.1111/ijsa.12240

Georgiou, K., & Lievens, F. (2022). Gamifying an assessment method: What signals are organizations sending to applicants. *Journal of Managerial Psychology*, *37*(6), 559–574. https://doi.org/10.1108/JMP-12-2020-0653

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*, 106356. https://doi.org/10.1016/j.chb.2020.106356

Gilliland, S. W. (1993). The perceived fairness of selection systems: An organizational justice perspective. *The Academy of Management Review*, *18*(4), 694–734. https://doi.org/10.5465/amr.1993.9402210155

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (3rd ed.). Guilford.

Hommel, B. E., Ruppel, R., & Zacher, H. (2022). Assessment of cognitive flexibility in personnel selection: Validity and acceptance of a gamified version of the Wisconsin Card Sorting Test. *International Journal of Selection and Assessment*, *30*(1), 126–144. https://doi.org/10.1111/ijsa.12362

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alterna- tives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Johnson, J. W. (2000). A heuristic method for estimating the relative weight of predictor variables in multiple regression. *Multivariate Behavioral Research*, *35*(1), 1–19. https://doi.org/10.1207/S15327906MBR3501_1

Kanning, U. P., Kraul, L.-F., & Litz, R. Z. (2019). Einstellungen zu digitalen Methoden der Personalauswahl [Attitudes towards digital personnel selection methods]. *Journal of Business and Media Psychology*, *10*(1), 57–61. https://journal-bmp.de/wp-content/uploads/8a_Einstellungen-zu-digitalen-Methoden-der-Personalauswahl05.02.2020-1.pdf

Kenny, D. A., Kaniskan, B., & McCoach, D. B. (2015). The performance of RMSEA in models with small degrees of freedom. *Sociological Methods & Research*, *44*(3), 486–507. https://doi.org/10.1177/00491241145432

Kim, Y., Kim, S., & Rogol, E. (2017). The effects of consumer innovativeness on sport team applications acceptance and usage.

Journal of Sport Management, *31*(3), 241–255. https://doi.org/10.1123/jsm.2015-0338

King, W. R., & He, J. (2006). A meta-analysis of the technology acceptance model. *Information & Management*, *43*(6), 740–755. https://doi.org/10.1016/j.im.2006.05.003

Klehe, U. C. (2004). Choosing how to choose: Institutional pressures affecting the adoption of personnel selection procedures. *International Journal of Selection and Assessment*, *12*(4), 327–342. https://doi.org/10.1111/j.0965-075X.2004.00288.x

König, C. J., Klehe, U. C., Berchtold, M., & Kleinmann, M. (2010). Reasons for being selective when choosing personnel selection procedures. *International Journal of Selection and Assessment*, *18*(1), 17–27. https://doi.org/10.1111/j.1468-2389.2010.00485.x

Landers, R. N., Armstrong, M. B., Collmus, A. B., Mujcic, S., & Blaik, J. (2022). Theory- driven game-based assessment of general cognitive ability: Design theory, measurement, prediction of performance, and test fairness. *Journal of Applied Psychology*, *107*(10), 1655–1677. https://doi.org/10.1037/apl0000954

Landers, R. N., Auer, E. M., & Abraham, J. D. (2020). Gamifying a situational judgment test with immersion and control game elements: Effects on applicant reactions and construct validity. *Journal of Managerial Psychology*, *35*(4), 225–239. https://doi.org/10.1108/JMP-10-2018-0446

Landers, R. N., & Collmus, A. B. (2022). Gamifying a personality measure by converting it into a story: Convergence, incremental prediction, faking, and reactions. *International Journal of Selection and Assessment*, *30*(1), 145–156. https://doi.org/10.1111/ijsa.12373

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

Langer, M., König, C. J., & Papathanasiou, M. (2019). Highly automated job interviews: Acceptance under the influence of stakes. *International Journal of Selection and Assessment*, *27*(3), 217–234. https://doi.org/10.1111/ijsa.12246

Manzey, D., & Gurk, S. (2005, September 19-21). *Prozedurale Gerechtigkeit von Personalauswahlmaßnahmen: Untersuchungen zu einer deutschen Version der Selection Procedural Justice Scale (SPJS)*.

Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling: A Multidisciplinary Journal*, *11*(3), 320–341. https://doi.org/10.1207/s15328007sem1103_2

Melchers, K. G., & Basch, J. M. (2022). Fair play? Sex-, age-, and job-related correlates of performance in a computer-based simulation game. *International Journal of Selection and Assessment*, *30*(1), 48–61. https://doi.org/10.1111/ijsa.12337

Nikolaou, I., Bauer, T. N., & Truxillo, D. M. (2015). Applicant reactions to selection methods: An overview of recent research and suggestions for the future. In I. Nikolaou, & J. K. Oostrom (Eds.), *Employee recruitment, selection, and assessment* (pp. 80–96). Psychology Press.

Ohlms, M. L., Melchers, K. G., & Kanning, U. P. (2024). Can we playfully measure cognitive ability? Construct-related validity and applicant reactions. *International Journal of Selection and Assessment*, *32*(1), 91–107. https://doi.org/10.1111/ijsa.12450

Ohlms, M. L., Voigtländer, E., Melchers, K. G., & Kanning, U. P. (2023). Is gamification a suitable means to improve applicant reactions and convey information during an online test? *Journal of Personnel Psychology*. Advance online publication. https://doi.org/10.1027/1866-5888/a000343

Oostrom, J. K., van der Linden, D., Born, M. P., & van der Molen, H. T. (2013). New technology in personnel selection: How recruiter characteristics affect the adoption of new selection technology. *Computers in Human Behavior*, *29*(6), 2404–2415. https://doi.org/10.1016/j.chb.2013.05.025

R Core Team. (2023). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. https://www.R-project.org/

Ramos-Villagrasa, P. J., Fernández-Del-Río, E., & Castro, Á. (2022). Game-related assessments for personnel selection: A systematic review. *Frontiers in Psychology*, *13*, 952002. https://doi.org/10.3389/fpsyg.2022.952002

Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, *48*(2), 1–36. https://doi.org/10.18637/jss.v048.i02

Sanchez, D. R., & Langer, M. (2020). Video game pursuit (VGPu) scale development: Designing and validating a scale with implications for game-based learning and assessment. *Simulation & Gaming*, *51*(1), 55–86. https://doi.org/10.1177/1046878119882710

Schepers, J., & Wetzels, M. (2007). A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects. *Information & Management*, *44*(1), 90–103. https://doi.org/10.1016/j.im.2006.10.007

Stone, D. L., Lukaszewski, K. M., Stone-Romero, E. F., & Johnson, T. L. (2013). Factors affecting the effectiveness and acceptance of electronic selection systems. *Human Resource Management Review*, *23*(1), 50–70. https://doi.org/10.1016/j.hrmr.2012.06.006

Tarhini, A., Hone, K., & Liu, X. (2014). Measuring the moderating effect of gender and age on e-learning acceptance in England: A structural equation modeling approach for an extended Technology Acceptance Model. *Journal of Educational Computing Research*, *51*(2), 163–184. https://doi.org/10.2190/EC.51.2.b

Tippins, N. T. (2015). Technology and assessment in selection. *Annual Review of Organizational Psychology and Organizational Behavior*, *2*, 551–582. https://doi.org/10.1146/annurev-orgpsych-031413-091317

Tonidandel, S., & LeBreton, J. M. (2015). RWA web: A free, comprehensive, web-based, and user-friendly tool for relative weight analyses. *Journal of Business and Psychology*, *30*(2), 207–216. https://doi.org/10.1007/s10869-014-9351-z

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a research agenda on interventions. *Decision Sciences*, *39*(2), 273–315. https://doi.org/10.1111/j.1540-5915.2008.00192.x

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science*, *46*(2), 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, *27*(3), 425–478. https://doi.org/10.2307/30036540

Walczuch, R., Lemmink, J., & Streukens, S. (2007). The effect of service employees' technology readiness on technology acceptance. *Information & Management*, *44*(2), 206–215. https://doi.org/10.1016/j.im.2006.12.005

Wang, Y. S., Wu, M. C., & Wang, H. Y. (2009). Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British Journal of Educational Technology*, *40*(1), 92–118. https://doi.org/10.1111/j.1467-8535.2007.00809.x

Ward, M. K., & Meade, A. W. (2023). Dealing with careless responding in survey data: Prevention, identification, and recommended best practices. *Annual Review of Psychology*, *74*, 577–596. https://doi.org/10.1146/annurev-psych-040422-045007

Weitzel, T., Laumer, S., Maier, C., Oehlhorn, C., Wirth, J., Weinert, C., & Eckhardt, A. (2016). Technikspurung in der Rekrutierung [Technology leap in recruitment]. https://www.uni-bamberg.de/isdl/chris/recruiting-trends/recruiting-trends-2016/

Wilde, M., Bätz, K., Kovaleva, A., & Urhahne, D. (2009). Überprüfung einer Kurzskala intrinsischer Motivation (KIM) [Validation of a short scale of intrinsic motivation]. *Zeitschrift für Didaktik der Naturwissenschaften*, *15*, 31–45. https://pub.uni-bielefeld.de/record/2404161

Zhang, Z., Mai, Y., Yang, M., Xu, Z., & McNamara, C. (2023, October 13). Package 'WebPower'. *Basic and Advanced Statistical Power Analysis*. https://CRAN.R-project.org/package=WebPower

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Ohlms, M. L., Melchers, K. G., & Kanning, U. P. (2024). Playful personnel selection: The use of traditional versus game-related personnel selection methods and their perception from the recruiters' and applicants' perspectives. *International Journal of Selection and Assessment*, *32*, 381–398. https://doi.org/10.1111/ijsa.12466