Playing to win or playing not to lose: Measuring engagement, enjoyment, and performance in the gamification of tasks with positive or negative framing

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ABSTRACT

This study investigated how goal framing influences player behavior and subjective experience in response to game design elements, as measured by player engagement, enjoyment, and performance. Despite the growing prevalence of gamified systems in work and tasks, limited research exists on how framing effects operate specifically in digital environments. Participants (*n* = 100) received either positively or negatively framed feedback while playing a video game. Engagement was measured via emotional arousal using galvanic skin response (GSR) sensors, while self-report scales captured enjoyment. Results indicated that participants in the positive feedback condition experienced higher emotional arousal, suggesting greater engagement. However, no significant differences were observed in enjoyment or performance. These findings highlight the importance of framing feedback in gamified digital environments, such as workplace productivity tools, where engagement is critical. Understanding these effects contributes to optimizing digital experiences for both user well-being and the successful application of gamification in work contexts.

Keywords

arousal, framing, enjoyment, digital game, digital media

INTRODUCTION

The ubiquity of digital media reflects its pivotal role in shaping and enhancing various facets of modern life, from socializing on social media platforms to managing tasks with productivity apps, enjoying games and entertainment, and even monitoring health and fitness through specialized applications. The intricate ways in which individuals perceive, engage with, and are influenced by digital media raises questions about how to design user experiences that align with cognitive and emotional aspects that have consequences for the well-being and behavior of users. Most digital media, such as productivity apps and video games, are designed to increase user engagement over time through gamification (Matrix, 2014). In today's media landscape, the level of user involvement has emerged as a crucial result of dynamic user-system communication facilitated by distinct technological attributes like interactivity (Oh et al., 2015).

Here we specifically refer to cognitive engagement, a multicomponent concept in which cognitive resources (e.g., attention, memory, and emotion) are focused on the task (Sinatra et al., 2015). This form of engagement through interaction is believed to significantly shape how content provided by the medium is perceived (Sundar, 2007). Digital media can frame tasks in either a positive or negative way, and these types of interactions can significantly influence an individual's level of engagement and enjoyment (Goldsmith & Dhar, 2013; Lee & Kim, 2022).

POSITIVE AND NEGATIVE FRAMING

It has been shown that presenting tasks in either a positive or negative way can significantly influence an individual's level of engagement and enjoyment (Goldsmith & Dhar, 2013; Lee & Kim, 2022). This phenomenon, known as the framing effect, is a cognitive bias that affects people's choices based on the way information is either

positively or negatively framed; with the likelihood that one further engages with a task increasing if the information or feedback is positively framed (Sinclair et al., 2023; Tiffany et al., 2020).

While feedback provides information about how close an individual is to achieving their goals based on their performance or actions (a posteriori; Kung & Scholer, 2018), framing refers to a priori contextual presentation of that feedback or information, which can influence how users interpret and respond to it. In other words, feedback refers to *what* the information is, and framing refers to *how* the information is presented. Notably, the valence of framing (positive vs negative) has been suggested to significantly impact not only participation, but also engagement and performance, and has been demonstrated in tasks related to work and education (Giannakos, 2013; Wagner, 2016), sports (Lewis & Weaver, 2015), citizen science (Dickinson et al., 2013), and politics (Gerber et al., 2010).

Positive framing refers to the means resulting in a gain, whereas negative framing refers to the means of avoiding of a loss (Goldsmith & Dhar, 2013). For example, consider a fitness app notification that reads “Reach your daily step goal to unlock achievements, boost your mood, and maintain a healthy, active lifestyle. Celebrate your progress and enjoy the positive impact on your well-being!", compared to "Don't miss out on the benefits of reaching your daily step goal. Falling short may lead to missed opportunities for achievement, potential mood fluctuations, and a decrease in overall well-being. Stay committed to your health journey!". The first positively framed message focuses on the benefits of achieving the step goal, including unlocking achievements and improving mood. The second negatively framed message emphasizes the potential drawbacks and missed opportunities associated with not reaching the daily step goal. The choice of framing can impact users' emotions, motivation, and engagement with the fitness app.

Performance and decision making

Individual performance on a task can also be affected by positive or negative framing. Roney et al. (1995) found that persistence and performance on solving anagrams were greater when positively framed. Other studies have shown that the effect of positive or negative framing may be affected by the specific type of task. For example, one study showed an observed increase in performance when solving negatively framed math problems (Nagel et al., 2021); however, when observing performance on tasks related to clinical skills in medical students, positive framing resulted in better performance (van de Ridder et al., 2015). In another study, adults’ performance on an anagram unscrambling game was either positively framed (win money for correct answers) or negatively framed (lose money for incorrect answers). Negatively framed incentives were more effective at motivating undergraduate students. While one might expect that positive framing would be more motivating, research has shown that positively framed incentives in specific types of tasks result in less task persistence and less motivation than negatively framed incentives (Goldsmith & Dhar, 2013; Nagel et al., 2021; Otterbring et al., 2021).

Related to performance, positive and negative framing can also have significant impacts on decision making (DeKay & Garge, 2023; Dorison & Heller, 2022; Sarlo et al., 2013), forming judgments (Kim et al., 2016; Kreiner & Gamliel, 2019), and the promotion of healthy behaviors (Donovan & Jalleh, 2000; Shamaskin et al., 2010). Research in individual’s judgment and decision-making have examined the loss-gain

framing effect, where decision makers who made risky choices were penalized by observers of their decision making process only when their choice's results were framed as a loss; however, the same risky decisions were rewarded when framed as resulting in a gain (Dorison & Heller, 2022). One study found that individuals evaluating hotel amenities were significantly influenced by the valence of framing of object descriptors and outcomes, demonstrating a strong framing effect aligned with attribute-framing bias, where positive outcomes led to more favorable evaluations (Kreiner & Gamliel, 2019).

Enjoyment

Framing is also associated with positive and negative emotions. Prior work related to emotion has shown that a positively framed task has a greater impact on emotions related to satisfaction, while framing that included a negative outcome focus showed a more significant increase in agitation-related emotions (such as stress and arousal; Roney et al., 1995). Other studies have demonstrated the framing effect in relation to emotional arousal in anticipation of electric shocks, finding that participants exhibited significantly higher arousal when the likelihood of receiving a shock was framed negatively, suggesting that negative framing has a distinct impact on emotional arousal in decision-making contexts (Ring, 2015).

Enjoyment during a task has been associated with strong performances and better learning outcomes (Giannakos et al., 2013; Putwain et al., 2018), but is also influenced by positive and negative framing. For example, in a narrative study on preventing skin cancer, participants were more inclined to adopt recommended health behaviors when the narrative portrayed the character with a positive disposition in a gain-framed context, and they derived greater enjoyment when the positively framed character was featured in a gain-framed story rather than a loss-framed one (Lee & Kim, 2022).

While research on framing in digital media is limited, existing research across other types of tasks supports the claim that positive framing may lead to more enjoyment and satisfaction (van de Ridder et al., 2015; Viciana et al., 2007. One particular type of task not fully explored is digital games. Digital games continue to be increasingly popular, with approximately 1.67 billion mobile game users worldwide in 2023 (Clement, 2023). Furthermore, statistics since the COVID-19 pandemic have shown an increase of over twice the number of active game users (Ortiz et al., 2020). There is a high demand for digital games, and the industry is rapidly growing as individuals use digital games more frequently for learning and education (Schenk et al., 2017; Vogel et al., 2006) and health and cognition (Garneli & Chorianopoulos, 2018; Wang et al., 2022). Despite this rapid growth, there is little research examining the effects of framing in relation to digital game enjoyment, engagement, or performance. The growing number of individuals that play some form of digital game on a daily basis, whether gamified apps or dedicated video game experiences, stresses the need for further understanding of framing effects as a design choice in this context.

CURRENT STUDY

This study examines a gamified task in the form of a digital game, where participants are given various puzzle tasks to solve and earn points, advancing through levels to reach the end of the game. Their goal is either positively framed to win, or negatively framed to avoid losing. Based on previous work using other forms of

digital media, we predict that in the context of a digital game, participants' levels of enjoyment, engagement, and performance will all vary as a function of framing.

To explore the effects of framing on engagement, we created a novel puzzle-based digital game in which the participant would either receive positively or negatively framed feedback. Engagement was measured via autonomic emotional arousal during gameplay through measurement of galvanic skin response (GSR). GSR is a common physiological measure that assesses the changes in the electrical properties of the skin in response to emotional or physiological arousal. The sympathetic nervous system controls the sweat glands in the skin, and their activity is influenced by factors such as stress, emotional arousal, or anxiety. Research has found such arousal measured via GSR to be associated with enjoyment in particular activities, such as in the context of musical activities (Thompson et al., 2001; Lim & Park, 2019). However, arousal has also been shown to have no association with overall enjoyment in the context of other activities, such as watching television (Wirz et al., 2022). This suggests that associations between arousal and enjoyment may partly depend on the task being investigated. We used self-report scales in combination with GSR to assess enjoyment, while also looking at in-game performance.

This research has the potential to provide insight for designing different technologies utilized in the realms of education, work, health, and leisure. It does not, however, intend to make a value judgment either for or against gamification. Rather, we aim to contribute to the ongoing research by examining and reporting its observed effects in a specific short-term context. Previous research has examined framing in various contexts, but this study is novel in providing insight into how goal framing specifically affects users in digital games.

METHOD

Participants

The study included a total of 100 adults (*M* = 21.55, *SD* = 6.99; 19 males, 75 females, 3 non-binary, 3 preferred not to answer). The final analyses included 93 participants, with 6 participants' data removed due to experimenter error and 1 participant that withdrew consent. Random sampling was used to recruit participants at [blinded for review]. The study was conducted in accordance with the standards specified in the 1964 Declaration of Helsinki and approved by the local ethics committee ID 2023-04552-02. Participants received a 5-euro gift voucher for participation.

Materials

iMotions: Galvanic skin response (GSR) device & Webcam

Participants' physiological data were gathered using GSR (Shimmer Research Ltd., using iMotions 9.3 software). Two electrodes were affixed to the middle and ring fingers of the participant's hand, which was operating the computer mouse. The iMotions software was utilized for all analyses and feature extraction of the GSR. A-priori variables included peaks per minute (PPM) and mean amplitude of peaks. Peak onset threshold was > 0.01 uS and offset was < 0 uS, and peak amplitude threshold was .005.

Ludum Platform

The digital game, *Ludum Platform*, was a novel developed game platform designed with Unity Pro. This game platform, which allows custom scenarios and mechanics of a first-person game involving puzzles and exploration, has previously been used to effectively measure causal reasoning (Kross et al., 2024) and learning strategies in both children and adults (Juvrud et al., 2024). Here we describe the custom settings and mechanics used for the current study.

The game was played using a PC, mouse, and keyboard. Headphones were used for audio feedback, including background music and sound effects in the game. There was a "plopping" sound associated with grabbing and placing down blocks. A rewarding chime occurred when the pattern was correct, and the door opened. When walking through the door, there was a vortex sound effect. A low-pitched buzz indicated that the pattern was wrong, and the door would not open. To walk in the game individuals used "w" "a" "s" and "d" keys and to look around in the game players moved the mouse. The researchers designed 10 levels for participants to play. The different levels were connected to one another using specific patterns. The game required participants to place blocks on a platform. After doing so, the participants would press a red button, and if the pattern of block(s) on the platform was correct, a door would open, and the participants would walk through the door. After entering the door, feedback in the form of written text (depending on the framing condition), was given before proceeding to the next level. If the pattern was incorrect the door would remain shut, and the participants would have to place new block(s) on the platform to open the door.

Blocks of different shapes and colors were used in this study but did not differ between conditions. Levels varied in the number and type of blocks being used. The first four levels were connected to one another via a shape pattern, where to open the door, participants had to place the one block that was shaped as a cube on the platform. The second four levels were connected by a color pattern, where to open a door, participants had to place the single block that was yellow on the platform. The last two levels were connected by a combined shape and color pattern where participants had to place the cube block along with the yellow block on the platform to open the door.

Before starting the practice level, written instructions appeared on the computer screen instructing individuals on how to play the game. It also informed players of their goal for the activity; players were told that aliens invaded the ship they were on and now their goal was to find the escape shuttle pod. The door in each room would open once they placed the correct block(s) on the detector and pressed the red button. Players were told they must earn at least 10 points to open the door, but that they would need more than 10 points per level to launch a shuttle pod to escape the aliens. They could earn up to 20 points for each level. They were falsely informed that points were awarded based on speed, accuracy, and efficiency, while in reality, each player received the same number of points regardless of their performance. Performance was measured in the study based on the time participants took to complete each level.

ENJOY Scale

This study used a modified version of the ENJOY Scale (Davidson, 2018) to measure participants' subjective enjoyment. Five questions were removed that were unrelated to the current digital game. There were 20 questions in total, each question using a seven-point likert-scale, which ranged from strongly disagree to strongly agree (e.g., "I lost track of time during the activity"). The modified scale has four subscales: pleasure, competence, challenge/improvement, and engagement. The scale has a Cronbach's alpha of 0.91. It took approximately two minutes to complete the scale.

GUESS Scale

The study used a modified version of the game user experience satisfaction scale (GUESS; Keebler et al., 2020) to record gamer satisfaction as part of the measurement of gamer enjoyment. In total, there were 15 questions that were answered on a seven-point Likert scale that ranged from strongly disagree to strongly agree (e.g., "I find the game's interface to be easy to navigate."). The Cronbach's alpha for the scale is 0.78. It took approximately five minutes to complete the scale.

Prior digital media experience questionnaire

The study used a prior digital media experience questionnaire (Juvrud et al., 2021) to examine participants' frequency using digital devices. There were 8 questions (e.g., "On a normal weekend, select the time that you spend using the following devices: …") on a five-point likert-scale. The scale could be answered with the following responses: none, 1-59 minutes, 1-2 hours, 2-3 hours, 4-5 hours, and 4 or more hours. This questionnaire took approximately five minutes to complete.

Procedure

Upon entering the lab, participants were provided with a written and verbal description of the study and provided consent for participation. During the study, participants sat alone at a desk which had a computer system, headphones, and a chair. Positive and negative conditions were counterbalanced across participants. The GSR electrodes were then placed on the middle and ring fingers of the participant by the researcher, after which a two-minute baseline session was conducted. After two minutes, participants were instructed to put on headphones and press play on the digital game. Written instructions appeared on the game, informing players how to use the controls and play the game. After reading instructions, participants started the game. There were 11 levels that each participant played, including one tutorial level. After each level participants received either positively or negatively framed text, depending on what condition they were assigned to. Framed statements were based on the statements designed in a previous study that looked at positive and negative framing (Roney et al., 2015). After completing the game, which took on average 15-minutes, participants completed the self-report scales in the following order: GUESS, ENJOY, demographics, and then the Prior Video Game Experience Questionnaire. Once the survey was completed, the researchers debriefed participants on the purpose of the study.

RESULTS

Self-report scales

Results were calculated using all survey data for GUESS (*n* = 100), ENJOY *(n* = 99), and the digital media experience questionnaire (*n* = 99). We examined differences in composite enjoyment scores between participants in the positive and negative framing conditions. Enjoyment did not vary by condition for either the GUESS scale or the ENJOY scale ($p < .05$).

A correlation analysis from the GUESS, ENJOY, and experience scales showed no relationship between the scales and time, PPM, and amplitude across all levels ($p < .05$). There was also no relationship between the scales and the outcome variables when examining by condition (see Table 1).

	Positive Condition	Negative Condition
ENJOY	M= 17.74 (SD= 4.21)	M= 22.40 (SD= 4.93)
GUESS	M= 38.49 (SD= 8.12)	M= 37.87 (SD= 6.59)
Experience	M= 24.41 (SD= 5.24)	M= 25.02 (SD= 5.36)

Table 1. Self-report scores by condition

GSR Results

A total of eight participants' GSR data could not be included in the analysis due to signal loss during test. Results from repeated measure ANOVA revealed a significant main effect of level for PPM $F(9, 603) = 2.17$, $p = .022$, $\eta^2 = .031$ and for amplitude $F(9, 369) = 2.87$, $p = .017$, $\eta^2 = .052$, but not for time. There was also a significant interaction between level and condition for PPM $F(9, 603) = 2.984$, $p = .002$, $\eta^2 = .042$ and amplitude $F(9, 603) = 4.56$, $p < .001$, $\eta^2 = .10$, but not for time.

Planned post-hoc tests found several differences between positive and negative framing when level-wise comparisons were performed. Independent samples t-tests for condition and PPM (see figure 1) showed a significant effect for Level 6 $t(71) = -2.83$, p = .006), Level 7 $t(71) = -2.83$ $p = .006$), Level 9 $t(68) = -2.29$, $p = .025$), and Level 10 $t(67) = -2.74$, $p = .008$). There was no significant difference in PPM across all levels when combined. Independent samples t-tests for condition and peak amplitude (see figure 2) showed a significant effect for Level 3 $t(68) = -3.06$, $p = .003$), Level 6 $t(65) = -2.12$, $p = .037$), Level 7 $t(63) = -2.27$, $p = .027$), Level 8 $t(57) = -3.83$, $p < .001$), Level 9 $t(63) = -2.50$, $p = .015$), and Level 10 $t(60) = -2.65$, $p = .010$). There was no significant difference in amplitude across all levels when combined. All other comparisons were not significant.

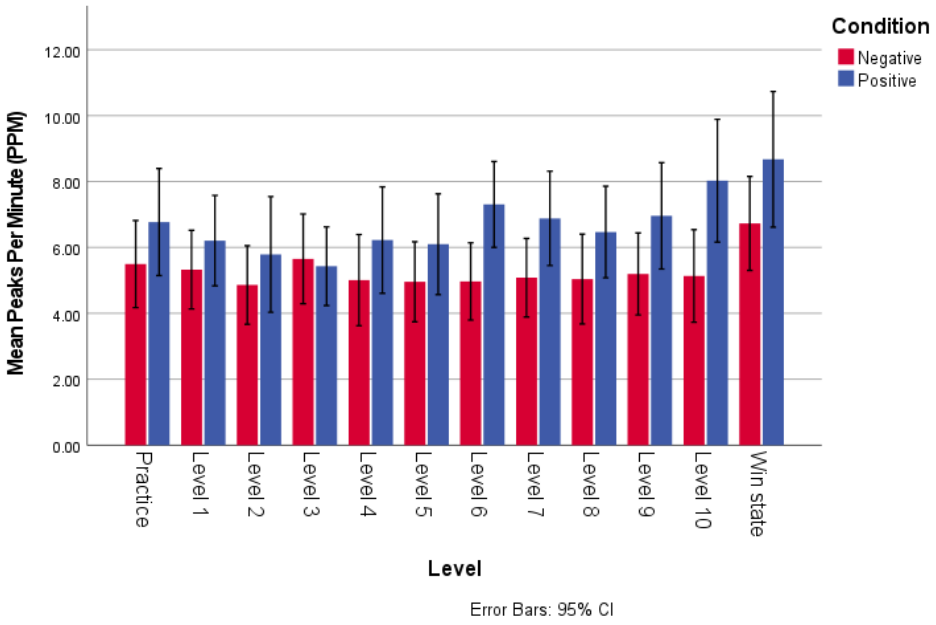

Figure 1. Differing arousal levels measured by PPM between the positive and negative conditions

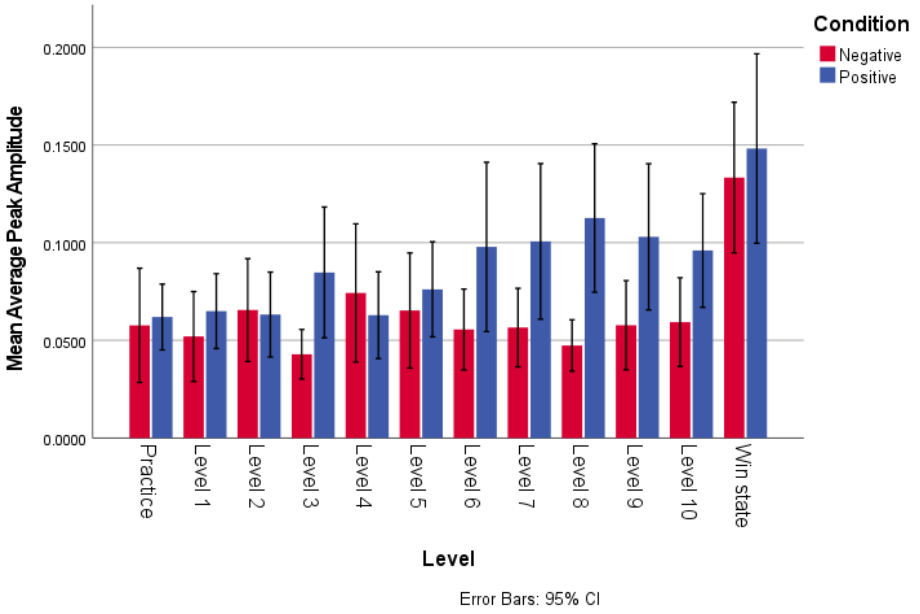

Figure 2. Differing arousal level measured by peak amplitude between the positive and negative condition

DISCUSSION

This study investigated how positive and negative framing influences cognitive engagement, enjoyment, and performance in a digital game task. As the daily use of digital tasks continues to increase, and the user base for digital media grows, the importance of understanding how the design choice of framing goals in digital tasks is related to engagement, enjoyment, and performance is of interest to researchers and developers alike. Both researchers and developers are interested in the benefits of digital media and digital tasks media (Ferguson, 2007; Granic et al., 2014; Griffiths, 2019; Markey, et al., 2021) as well as the drawbacks (Ferguson, 2007; Gonzálvez et al., 2017; Shoshani & Kor, 2022). Our results showed that positive framing had a positive relationship with engagement, while no significant results were found relating framing type and enjoyment or performance.

We found that there was a significant difference between positive and negative framing across game levels in PPM and amplitude, but not for enjoyment and performance. Previous research has shown mixed results relating to framing type, enjoyment, and performance (Nagel et al., 2021, Roney et al., 1995, van de Ridder et al., 2015). In the current sample, it appears that there was an equal level of enjoyment and performance regardless of framing types.

The GSR data from participants in the positive condition showed higher average PPM than participants in the negative condition. There was also a significant association between framing condition and amplitude of the GSR data across the majority of game levels, with participants in the positive condition showing an increase in the mean peak amplitude compared to the negative condition. These results indicate that the positive framing condition had an impact on participant arousal during a majority of levels of gameplay, with particularly increased levels toward reaching the end of the game goal. Consistent with previous research showing higher levels of arousal to be associated with engagement (Shi et al., 2007), we interpret these findings to mean that compared to participants who received negative goal framing feedback, participants who received positive goal framing feedback found the gameplay to be more engaging.

One alternative explanation could be that differences between levels or framing condition were due to higher cognitive load or a result of increased stress from participants (Shi et al., 2007). The increase in GSR responses, including PPM and peak amplitude, could indicate that while the participants were playing the game, certain levels or framing conditions might have required more focus and cognitive load, or resulted in increased stress. As a result, one would expect an increase in arousal in players. However, if this were the case, one would expect that negative framing would also result in increased cognitive load or stress (Brooks et al., 2019), which was the opposite of what was observed in the current sample. Additionally, there were no differences observed across measures of enjoyment and performance between the framing types, making this explanation unlikely. Prior work that has shown a positive link between emotional arousal measure via GSR and stress (Sahoo & Sethi, 2015; Shi et al., 2007), as well as a negative link between increased stress and enjoyment (Frey, 2007; McEwen, 2006). Both of these links, between arousal and stress and stress and enjoyment, were not evident in the current study. Instead,

it appears there was a more direct link between positive framing and increased emotional arousal, an indicator of engagement.

These findings provide support to the claim that positively framed goals are more engaging for individuals compared to negatively framed goals (Dorison & Heller, 2022; Kreiner & Gamliel), at least in the context of a digital game task. This is consistent with some findings in other tasks, such as Terkildsen and Makransky (2019), who found an association between higher gaming presence and greater GSR peaks per minute during gameplay. It is possible that feedback conveying outcome-based success induced more emotional investment and overall presence as the game progressed, possibly due to a greater sense of dedication to improve and/or attend more to the game in order to continue success.

The importance of engagement in digital games

As digital games become an increasingly integral part of day-to-day life, understanding how to make them engaging is increasingly important. The growing field of digital game-based learning (DGBL) focuses on the use of digital games for educational purposes. Studies in the realm of education have acknowledged the importance of engagement, identifying the benefits it has for learning as well as linking it to constructs like motivation (Dickey, M.D., 2005; Park, 2003; Rieber et al, 1998; Theofylaktos et al. 2018). DGBL builds on this foundation further, incorporating the concept of play (Rieber et al., 1998). Play, if designed well, should be inherently engaging, making it a valuable learning tool. Games designed for education should aim to combine established concepts of engagement with modern technology to improve educational outcomes. Using physiological metrics to identify factors that affect digital game engagement can provide developers with insights that will allow them to further refine DGBL.

Autonomous measures such as GSR are uniquely beneficial due to their objectivity and being outside of conscious control. Concepts like engagement can often be understood as similar constructs such as immersion and interest. These varying definitions can become apparent in self-report measures, depending on how participants interpret the questions. However, physiological metrics like GSR identify changes that occur at a subconscious level, reducing the misunderstanding and biases that can occur with self-report measures. For instance, a study examining engagement in audio narratives compared to video narratives found that while participants rated the video narrative as more engaging, physiological measures found higher levels of arousal during the audio narrative (Richardson et al., 2020). The increased stimulation through two sensory modalities for video may have drawn more interest or attention, but due to the co-creative imaginative process involved in picturing an audio narrative, the audio narrative required greater cognitive and emotional processing. Similarly to the results of the current study, GSR allows for a more unbiased view at engagement and digital games, providing a more physiological measure of engagement.

Future directions

Future studies should examine possible gender effects of framing when completing a digital task. A limitation of the current study was that the majority of participants self-identified with the female gender identity, limiting the generalizability of the results to other gender identities. Female gender identity has been found to

experience differing levels of performance and affective responses when perceiving stereotype threat in video games compared to the male identity, which could impact the response to positive and negative framing (Vermeulen et al., 2016).

The current study examined a digital task in the context of a digital game, but it is important to examine other kinds of digital tasks, particularly those that are typically not associated with games, but are increasingly becoming gamified. This includes digital apps for health and behavior, finance and banking, and learning and education. Indeed, previous studies have shown that the type of task can result in different framing effects (Nagel et al., 2021; van de Ridder et al., 2015).

Finally, future studies should examine the consequences for increased or decreased engagement in digital tasks in regards to well-being, learning, and other outcomes after the game is completed. Digital engagement has been determined to have both positive and negative effects on both academic performance in youth and quality of life in older adults, making it an important area of study (Damant et. al., 2017; Hietajärvi et al., 2022). Engagement in DGBL could have significant impacts for learning outcomes, either enhancing or impairing comprehension and memory of the learning material (Damant et. al., 2017). For older adults, engagement with digital games could promote improved social well-being and connection, especially with individuals of younger generations. Conversely, varying performance and digital literacy levels could negatively impact self-esteem (Hietajärvi et al., 2022). Potential effects of engagement with digital tasks should be studied further to better understand their impact.

Conclusions

Psychology research has not thoroughly examined framing effects in digital contexts, such as in completing tasks. The current study found that positive framing led to higher engagement as indicated by physiological arousal in a puzzle-based digital game task. A strength of the current study was the use of multiple scales to measure game enjoyment, including the GUESS and ENJOY scales. The use of multiple scales increases the reliability of the construct measured. Another strength was the inclusion of an autonomic and unconscious measures of engagement through arousal (GSR), which has shown to be a more accurate measure of arousal compared to self-report measures (Li et al., 2015). The findings showed that positively framed goals have the potential to increase engagement in the digital game, but not enjoyment or performance in the game.

Although the findings of this study suggest that positively framed feedback in a gamified context enhances engagement, these results are based on a short-term interaction. The lack of longitudinal data presents a limitation, as increased engagement observed in the short term may not accurately reflect the long-term influence of either positively framed feedback or gamification. Thus, these results cannot be generalized to longer-term contexts. Prior research has shown that the effects of gamification often diminish over time due to the novelty effect, in which increases of motivation or performance are attributed not to the inherent effectiveness of the intervention, but to its novelty and perceived newness (Rodrigues et al., 2022). However, additional studies suggest that over time, the familiarization effect, in which individuals become more comfortable and efficient with repeated exposure to a system, can counteract the novelty effect and even enhance the long-term impact of gamification (Rodrigues et al., 2022; Tsay et al.,

2019). Therefore, further longitudinal research is needed to disentangle whether the short-term engagement effects observed in this study would be consistent with exposure over time.

Moreover, while this study provides support for the idea that gamification combined with positively framed feedback may enhance engagement, it does not ignore the broader context of gamification's potential risks. These include increased risk of addiction, unhealthy competition, and task-irrelevant behavior (Andrade et al. 2016). However, the presence of these risks does not negate gamification's potential benefits, such as increased participation in academic settings, improved information retention, and enhanced problem-solving skills (Wulan et al., 2024). Ultimately, the current study does not make a value judgment either for or against gamification. Rather, it contributes to the ongoing research by examining and reporting its observed effects in a specific short-term context.

These findings have implications for the subtle, yet powerful effects framing can have on engagement with digital tasks. This finding is relevant for researchers due to the rise of digital activity, and therefore important for understanding how individuals interact with these digital tasks. Furthermore, these findings provide insights into how digital media designers can increase engagement with their respective digital apps or platforms.

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