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Feasibility of RPG for Learning about Empathy, Creativity, and Self-efficacy

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Abstract: The field of psychology has a growing interest in role-playing games (RPGs) and is committed to exploring the processes of learning and development involved in RPG gaming. However, there is currently limited research on RPGs in the discipline of psychological science, as RPG was once considered a form of leisure that did not consider the potential learning and development involved. Therefore, the topic of the present review is the relationship between RPG gaming and the development of personal competencies involving empathy, creativity, and self-efficacy. The paper reviews various past related studies, all of which used a self-report format in a laboratory setting to collect data from RPG and non-RPG players on scales related to empathy, creativity, and self-efficacy to measure their levels of these competencies. The results show that RPG players demonstrate higher levels of empathy and creativity than non-RPG players, and that there is no correlation between RPG gaming experience and self-efficacy. Creativity and self-efficacy are positively correlated for both RPG and non-RPG players. Behaviorism, constructivism, and sociocultural learning explain the mechanisms underlying the improved competencies. Future research could establish more accurate procedures for measuring the abilities discussed in this review and test whether current results can be replicated. Also, future research could explore what in-game mechanisms or settings are more conducive to stimulating the acquisition and cultivation of various competencies in RPG players.

Keywords: Role-playing game (RPG), learning, empathy, creativity, self-efficacy

1. Introduction

The COVID-19 pandemic has significantly changed people's lifestyles, such as quarantine, working from home, and online classes. The increase in individual solitude time and physical and psychological distance from others have become threats to people's mental health. However, during COVID-19, sales of role-playing games (RPGs) show an upward trend compared to the past, as RPG was treated as a way to cope with players' negative psychological effects of the pandemic [1]. To explore how RPG helps players overcome the mental health difficulties experienced during the pandemic, the field of psychological science begins to examine the relationship between RPG gaming and players' personal learning and development of various competencies. Existing research suggests that the virtual world in RPGs provides players with a supportive platform that encourages them to empathize with others, to learn from observation, and to address problems positively [1]. All these

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processes have positive contributions to players' learning and development. However, learning underlying RPG gaming is still an under-explored area, with contradictory findings and results that are not replicated. Therefore, the present paper focuses mainly on players' three competencies: empathy, creativity and self-efficacy, and reviews existing research on the relationship between RPG gaming and the three competencies. The review will also discuss the possible mechanisms underlying the translation of virtual game experience into real-life learning and development for players.

2. Theoretical Framework

2.1. Role-playing Game (RPG)

Role-playing game (RPG) is a genre whose central feature is role-play. Players will take on the role of a character in the game and interact with the virtual world within the rules of the game [2]. In this process, players must put themselves in the perspective of the character they are playing and understand and act in accordance with the character's thinking, emotions, and motivations [3]. RPG will enable players a degree of freedom to manipulate the character to take actions that will have a different impact on the game world. Players need to be considerate of their manipulated characters and attempt to take appropriate actions to achieve desired outcomes.

2.2. Empathy

Empathy refers to an individual's ability to understand the world from another person's perspective and to perform behaviors or interact based on that person's needs [4]. Empathy involves both cognitive and affective dimensions. The cognitive aspect emphasizes the understanding of the situations others face, while the affective aspect emphasizes shared emotional experiences with others, which means that the emotional experience is aligned with others [5]. In the RPG gaming experience, empathy could be indicated when players care about and identify with their manipulated characters. Empathy develops when players identify their manipulated characters and are willing to adjust their cognitions and behaviors to match the characters.

2.3. Creativity

Creativity refers to the extent to which an individual is able to generate new ideas and use them to solve problems [6]. The field of psychological sciences usually uses divergent thinking as the primary indicator to evaluate creativity [7]. In the existing research, creativity is mainly concerned with the cognitive dimension, measuring an individual's ability to generate novel and innovative ideas [7]. In the RPG experience, creativity could be expressed in players' ability to overcome obstacles and solve problems or perform diverse actions to achieve in-game objectives.

2.4. Self-efficacy

Self-efficacy refers to an individual's belief in coping with a given situation and achieving a desired outcome [6]. Self-efficacy is often associated with confidence [6]. One feature of RPG is that the behaviors performed by characters manipulated by players will largely affect the game world. Even experiencing failure does not have a negative impact on real life. Therefore, players are encouraged to try multiple approaches to solving problems. When players experience their choices changing the game world, they build confidence, enhancing self-efficacy. Self-efficacy is multifaceted, and the present review only discusses general self-efficacy.

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2.5. Behaviorism

Behaviorism suggests that learning is a product of conditioning and reinforcement [3]. Learners make connections between behaviors and their consequences, reinforcing those behaviors accompanied by consequences that are evaluated with positive valence. In the RPG experience, complex situations that, in reality, consist of multiple factors interacting with each other are simplified. Players can easily connect their actions and subsequent consequences, thus facilitating learning.

2.6. Constructivism

Constructivism suggests that learning involves integrating newly acquired knowledge with prior knowledge and constructing new mental models [3]. RPG players have the opportunity to interact with characters with different backgrounds and face situations they do not experience in real life. These experiences help them reshape their previous mental models.

2.7. Sociocultural Learning

Sociocultural learning suggests that observation and modelling motivate learning [3]. RPG players have the opportunity to observe various distinctive characters, allowing learning to occur. Additionally, observing others' responses to specific situations helps RPG players consider their own responses to those situations.

3. The Impact of RPG on Empathy

3.1. The Relationship Between RPG and General Empathy

Rivers et al. explored whether the RPG gaming experience is associated with changes in players' empathy level because RPG requires players to understand and act as their manipulated characters, as empathy involves factors such as understanding others' thoughts and validating others' emotions [8].

For methodology, the study recruits 127 subjects aged 27-46 years old, all of whom are RPG gamers. Subjects take a self-report form and complete the Interpersonal Reactivity Index Scale (IRI) to measure their empathy level and compare it to the general population's. The IRI assesses four dimensions of empathy: fantasy empathy, empathic concern, personal stress, and perspective thinking. Fantasy empathy relates to the extent to which subjects are able to identify with a character in a virtual medium. Empathic concern measures subjects' tendency to react to others' experiences. Personal stress investigates the extent to which subjects experience negative emotions as a result of others' experiences. Perspective taking refers to the subjects' ability to accept others' cognitions and behaviors [8].

The IRI scale is validated for test-retest reliability and validity [8]. Test-retest reliability indicates low random measurement error, and validity indicates low systematic measurement error in this study. Results show that all subjects score higher in empathy than non-RPG players [8]. The score difference between RPG players and non-RPG players is mainly in the dimensions of fantasy empathy, empathic concern, and perspective taking—no statistical differences in the results. Therefore, the results suggest that empathy is not considered a dispositional trait but can be acquired and developed [8]. RPG gaming experience contributes to enhancing players' empathy levels.

The mechanism underlying the enhancement of empathy levels by RPG gaming experiences can be explained by sociocultural learning. Neural research shows that while observing others' responses to the environment, individuals exhibit neural activity patterns similar to when they respond [9]. Applying this finding to the RPG gaming experience, players can share the thinking patterns and

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emotional states experienced by manipulated characters. As a result, by modelling the neural activity patterns of others, players can enhance their understanding and identification with them, thus switching to others' perspectives. This provides a possible explanation for the elevated empathy level through RPG.

One limitation of the study is that the subjects are mostly recruited from universities who possess high educational levels. Previous research shows a positive correlation between educational levels and empathy [8]. Therefore, the study is unable to determine if the subjects' high educational levels mediates the elevation of empathy levels by RPG experience. Educational level may be a confounding variable in the study.

3.2. The Relationship between RPG and Global Empathy

In addition to general empathy, Bachen et al. researches the relationship between a specific type of empathy, global empathy, and the RPG gaming experience [4]. While general empathy typically involves understanding people who are physically and psychologically close, global empathy considers whether empathy can also be induced for physically and psychologically distant [4]. Therefore, the study explores the relationship between the RPG experience and the development of global empathy.

For methodology, the study recruits 301 high school students. 181 are assigned to the experimental group and 120 to the control group. Subjects are instructed to learn the living conditions of people in countries different from theirs, but the experimental and control groups adopt different learning methods. Subjects in the experimental group learn by engaging in RPG and manipulating male and female characters who are different from their countries. Subjects in the control group learn by searching for information and making a PowerPoint. Subjects complete the scales of ethnocultural empathy and identification with characters in the form of self-report to measure their global empathy levels one week before the experiment, the following day after the experiment, and three weeks after the experiment [4].

The results of the scale of ethnocultural empathy show that subjects who learn through RPG score higher on global empathy than those who learn through making PowerPoint, indicating the effectiveness of RPG in facilitating the learning of global empathy [4]. Additionally, in conjunction with the results of the scale of identification with characters, identification with the manipulated characters in RPG is positively correlated with global empathy levels [4]. When players care about and identify with their manipulated characters, they are more willing to learn about people who are culturally different from themselves and are more likely to care about others' living conditions. Thus, the results suggest that global empathy has plasticity and can be fostered through RPG experiences [4]. The development of global empathy is not affected by physical or psychological distance.

One factor associated with empathy is immersiveness [10]. The role-playing feature of RPG makes it easier for players to immerse in the experience of manipulated characters. The immersiveness that RPG brings to players weakens their real-world thinking patterns and behavior tendencies [3]. Thus, players' schemas become vulnerable to change. In the RPG experience, players will accept or even internalize characters' beliefs, emotions and behaviors in a more open manner. One outcome of the updated schema is reduced stereotypes and prejudices about unfamiliar groups, as evidenced by the fact that people are more likely to attribute others' behaviors to situational factors rather than dispositional factors [4].

One limitation of the study is that the results may be affected by social desirability response biases. The self-report form may allow subjects to base their responses on societal expectations rather than on the actual experiences in the experiment. Therefore, subjects may report higher global empathy levels than they actually do.

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Through a review of existing research, RPG promotes the development of empathy, including both general empathy and global empathy. Empathy can be acquired through sociocultural learning, and its cultivation is demonstrated by the likelihood of RPG players to share mental processes with others. The development of global empathy motivates RPG players to be more open to the thoughts, feelings, and behaviors of people who are physically or psychologically distant from them.

4. The Impact of RPG on Creativity and Self-Efficacy

4.1. The Relationship between Rpg and Creativity

Dyson et al. argued that the central feature of RPGs is problem-solving, which requires players to manipulate their characters to try different ways to overcome problems as far as the game rules allow [2]. This process may promote players' creativity [2]. Therefore, the study explores the relationship between RPG gaming and creative potential.

For the methodology, 39 subjects aged 18-26 were recruited for the study and randomly assigned to experimental and control groups. Subjects in the experimental group are asked to consider the thinking patterns and behavioral tendencies of the manipulated characters as much as possible during RPG gaming rather than imposing their own thoughts on the characters. Additionally, when faced with a choice, subjects in the experimental group are instructed to think about different potential approaches and their consequences in the attempt to solve the problem. The experiment lasts five weeks, subjects in the control group do not participate in the experiment. After the experiment, subjected completed the Abbreviated Torrance Test for Adults (ATTA) questionnaire before and after the experiment to measure their creative potential [2].

The results show that for the subjects in the experimental group, their scores on the creativity questionnaire taken after the experiment are higher than their scores before the experiment, indicating that RPG gaming increases the subjects' creative potential [2]. Comparing the experimental and control groups, subjects in the experimental group score higher on creativity than subjects in the control group, and the difference between the scores of the two groups is statistically significant [2]. When players are able to be considerate about the past experiences of their manipulated characters and are motivated to act with the purpose of helping them achieve their desirable outcomes, their creative potential can be nurtured and enhanced. Therefore, the results of the study suggest that RPG gaming plays a positive role in developing players' creative potential.

The positive effect of RPG gaming on creative potential can be explained by behaviorism. In games, the consequences of a decision usually follow immediately after that decision without too much time delay. This means that players can easily perceive a decision's consequences and thus learn the connection between the two. Hammer et al. also state that RPG provides players with psychosocial moratorium [3]. While players' decisions within the game largely influence the game world, they do not have an impact on players' real lives [3]. As a result, they will be more open to experimenting with various decisions to learn about the possibilities within the game world, thus providing support for creativity building.

One drawback of the study relates to the validity of its experimental results. If the experimenters consider that a subject's decision is not the most desirable for the manipulated character, they would discuss it with the subject and redecide. This step is not consistent with players playing RPGs in real life. Therefore, there is room for discussion of the generalizability of the results.

4.2. The Relationship between RPG and Self-efficacy

In addition to creativity, psychological science is also concerned with the relationship between RPG and self-efficacy. Some studies show a positive correlation between RPG and self-efficacy [4]. The

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learning of self-efficacy can be explained by constructivism [4]. RPG provides players with platforms and opportunities to practice and develop knowledge into competence within the virtual world. For example, a game world that changes in response to players' decisions may foster their autonomy. Players manipulating characters to achieve in-game objects may develop their problem-solving skills. It is important to note that RPG focuses on authenticity [4]. This suggests that while there are differences between the game world and the real world, there are still connections between the two. To some extent, learning within the RPG gaming experience can be translated and applied to real life. The products of learning in RPG may help players cope with specific situations in their lives, thus building self-efficacy. However, in response to the relationship between RPGs and self-efficacy, Spinelli's study shows contradictory results to previous research [6]. The study explored the relationship between RPG gaming experience and creativity and self-efficacy.

For the methodology, 85 subjects aged 18-25 are recruited for the experiment, 49 report little knowledge of RPG and 36 report playing RPG every month. The study adopts both self-report and one-on-one interviews to collect data. Subjects complete the Creativity Scale to measure creativity levels and the General Self-Efficacy Scale to measure self-efficacy. In the following one-on-one interview, the experimenters ask key questions on the scales twice but encourage open-ended responses from the subjects [6].

The results show that, first, in terms of creativity, consistent with the findings of Dyson et al. RPG players score higher on the Creativity Scale than non-RPG players [6]. Second, in terms of self-efficacy, RPG and non-RPG players do not demonstrate differences in the General Self-Efficacy Scale scores [6]. In the following one-on-one interviews, RPG players also do not report perceived increases in self-efficacy levels as a result of the RPG gaming experience. Therefore, the study does not find a correlation between RPG gaming experiences and self-efficacy. However, it is worth noting that the study also examines the relationship between creativity and self-efficacy, showing that creativity is positively correlated with self-efficacy [6]. It suggests that although a direct correlation between RPG gaming and self-efficacy is not found, if players boost their creativity during RPG gaming, it may also indirectly affect their self-efficacy, though they are unable to perceive it directly. It also explains why subjects do not report increased self-efficacy levels in either the scale or the one-on-one interviews. Therefore, the study shows no relationship between RPG and self-efficacy, but developing creativity through RPG gaming may affect self-efficacy.

One shortcoming of the study is that the subjects recruited for the experiment are between the ages of 18 and 25, but the studies that find a positive correlation between RPG gaming and self-efficacy involve a much larger age span of subjects. The study is unable to determine if age mediates the relationship between RPG and self-efficacy, and a correlation between RPG and self-efficacy may unfold as age increases.

A review of prior research suggests that the RPG gaming enhances players' creativity as they are encouraged to experiment with various ways of coping with in-game tasks. No significant difference is found in self-efficacy between RPG and non-RPG players. However, there is a positive correlation between creativity and self-efficacy.

5. Discussion

In terms of RPG and empathy, RPG players are more empathetic than non-RPG players. The result is consistent with the findings of previous studies. The impact of RPGs is usually manifested in cognitive and motivational aspects [3]. Cognitive influence refers to players' tendency to transfer the learned empathy achieved through RPG to real life. Motivational influence refers to the tendency of players to be more willing to learn about others and experience emotions shared with others. The development of empathy through RPG emphasizes players' identification with and acceptance of their manipulated characters. Thus, successful RPGs need to design characters and create stories that

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are easy for players to empathize with, taking into account their individual differences. Future research can further explore the character traits and storylines more conducive to stimulating empathy and applying the abilities acquired in games to real life.

In the relationship between RPG, creativity and self-efficacy, RPG players have higher creativity levels than non-RPG players, and RPG gaming is positively correlated with the development of creativity. This result is consistent with previous findings. However, RPG and non-RPG players do not show statistically significant differences in self-efficacy levels. This result contradicts previous findings in related fields. Past studies suggest a positive relationship between RPG and self-efficacy based on the fact that RPG encourages players to change the game world by themselves [6]. The contradictions in the findings guide future research directions. Future research can explore whether existing findings can be replicated.

Given the results above, a novel finding is the strong positive correlation between creativity and self-efficacy for both RPG and non-RPG players. One interpretation is that RPG may indirectly influence players' self-efficacy, even though they do not report a perceived increase in self-efficacy. In the one-on-one interviews, subjects report elevated executive functioning [6]. Therefore, one possibility is that there is some connection between the skills required to enhance creativity and self-efficacy. RPG gaming influences players' creativity and self-efficacy levels by developing these skills. Therefore, future research could attempt to explore the skills needed to build self-efficacy and how the RPG gaming experience relates to these skills, thus further exploring the potential impact that RPG has on self-efficacy. Additionally, the indirect effects of RPG on self-efficacy may explain why subjects do not report changes in self-regulation in the General Self-Efficacy Scale and the one-on-one interviews. In order for future RPG and self-efficacy-related studies to produce more accurate results, it may be necessary to design procedures that can objectively measure self-efficacy levels.

Moreover, while the present review focuses on the positive effects of RPGs, excessive gaming - for example, 15 or more hours of gaming per week - may contribute to elevated levels of depression in players [9]. Building on existing findings, future research can further explore whether excessive gaming would have counterproductive consequences on players' empathy, creativity, or self-efficacy and the possible mechanism underlying them.

6. Conclusion

Over the past few years, a growing body of research focuses on the feasibility of players acquiring and honing various abilities through RPG gaming. The present review explores the relationship between RPGs and players' empathy, creativity and self-efficacy. The review finds that RPG gaming enhances players' empathy and creativity levels but does not have a significant effect on self-efficacy. Additionally, a positive correlation between creativity and self-efficacy is shown for both RPG and non-RPG players. Therefore, the impacts of RPG on self-efficacy may be indirect. Future research could design methodologies to objectively measure self-efficacy levels to examine whether the results of existing studies can be replicated. Additionally, while moderate gaming plays a positive role in players' learning and development, excessive gaming or gaming addiction may be detrimental to players' learning and mental health. Future research can discuss the game lengths in which RPG can contribute to positive effects for players.

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