The effect of tabletop role-playing games on the creative potential and emotional creativity of Taiwanese college students

Scott Benjamin Dyson, Yu-Lin Chang⁎, Hsueh-Chih Chen, Hsiang-Yu Hsiung, Chien-Chih Tseng, Jen-Ho Chang

Department of Educational Psychology and Counseling, National Taiwan Normal University, No. 162, Sec. 1, Heping Rd., Taipei City 10610, Taiwan, ROC

ARTICLE INFO

Article history:
Received 31 January 2015
Received in revised form 6 August 2015
Accepted 11 October 2015
Available online 17 October 2015

Keywords:
Role-play
Creative potential
Emotional creativity
Creativity training

ABSTRACT

Research on the effect of tabletop role-playing games (TRPGs) on creative potential and emotional creativity has been sparse. The present study aimed to examine how role-playing games influence creative potential and emotional creativity. Participants were assigned into either a treatment group (N = 19) or a control group (N = 20). After taking the Emotional Creativity Index (ECI) and Abbreviated Torrance Test for Adults (ATTA) as pre-tests, the treatment group played TRPGs once every week for four weeks. Upon the completion of the treatment, the participants retook the tests. The control group only took the pre-tests and post-tests and did not play any role-playing games. The results showed treatment group significantly enhance their creative potential as compared with the control group, but not on emotional creativity. The current study supports that TRPGs improve creative potential, implications and limitations are discussed.

© 2015 Elsevier Ltd. All rights reserved.

1. Introduction

Definitions of creativity typically focus on the cognitive domain (Guilford, 1963; Torrance, 1966; Williams, 1980) and problem solving (Mumford, Mobley, Reiter-Palmon, Uhlman, & Doares, 1991 Mumford, Mobley, Reiter-Palmon, Uhlman, & Doares, 1999). Averill and Nunley (1992) extended the idea of creative expression to emotional aspect, suggesting that people differ in their ability to experience and express emotions creatively, and can be judged in three dimensions: novelty, effectiveness, and authenticity (Averill, 1999).

All of the creativity training investigated thus far focused on cognitive rather than affective ones (Ma, 2006; Scott, Leritz, & Mumford, 2004). Experimental studies attempting to train emotional creativity are rare, though Averill (1999) proposed that dramatic acting could potentially increase emotional creativity. One candidate for creating an improved creativity training tool by including emotional and cognitive creative competence is tabletop role-playing games (TRPGs). Karwowski and Soszynski (2008) showed that training similar to TRPGs have an effect on creative thinking and imagination. Th present
study builds on previous work while simultaneously attempting to duplicate, in an ethnic Chinese participants, and using TRPG-based training to improve creative potential and emotional creativity.

1.1. Creative potential and its measurement

Williams (1969) first proposed the cognitive-affective model of creativity, which proposed creativity into two dimensions, the cognitive and the affective dimension. Additionally, the creative potential can be represented an individual’s creative cognitive abilities, which is used to produce new and useful objects or ideas (Jauk, Benedek, & Neubauer, 2014; Runco & Jaeger, 2012), and it is important to note that creative potential is not equivalent to creative ability, though it nonetheless is a good predictor of it (Runco & Acar, 2012). Since (1956, 1977, 1988) included divergent thinking in his structure of intellect theory, divergent thinking has become a commonly used measure of creative potential (Acar & Runco, 2014). Studies reviewed by Runco and Acar (2012) revealed that divergent thinking tests are a useful and significant predictor of certain types of creative performance. Although divergent thinking is not creativity itself, it is still an essential indicator of creative potential, and many studies have relied on divergent thinking to conceptualize creativity (e.g., Furnham, Batey, Anand, & Manfield, 2008; Silvia et al., 2008; Silvia, Nusbaum, Berg, Martin, & O’Connor, 2009).

The most famous and widely used divergent thinking measurement is the Torrance Tests of Creative Thinking (TTCT; Torrance, 1966). The TTCT contained four aspects of creativity: fluency, flexibility, originality, and elaboration. Fluency is the number of ideas one can produce; flexibility is how many different categories those ideas can fit into; originality is how unusual those ideas are; and elaboration is how well detailed the products of creativity become (Guilford, 1977; Torrance, 1966; Almeida, Prieto, Ferrando, Oliveira, & Ferrándiz, 2008). The TTCT was found to significantly predict creative achievement even 50 years after initial testing (Runco, Millar, Acar, & Crandall, 2010). Because it can predict outcomes, the TTCT can be used to evaluate the effectiveness of creativity training.

1.2. Emotional creativity

Emotions can be transformed as well and these sorts of transformations are creative in nature (Averill, Chon, & Hahn, 2001). As that is the case, if people can learn emotional creativity then they could learn to find joy where none was before, and to lead a more emotionally fulfilling life. Averill has worked extensively to develop emotional creativity as an idea (Averill & Nunley, 1992) from a social-constructionist view of emotion (Averill, 1980), and has differentiated it clearly from emotional intelligence (Averill, 2004; Ivcevic, Brackett, & Mayer, 2007). Furthermore, he strongly implies that emotional creativity could train, rather than just natural talent.

Averill (1999) conducted a series of six studies to see if the ECI had validity, and concluded that the ECI is not just a theoretical idea nor based on inaccurate introspection. Specifically, Fuchs, Kumar and Porter (2007) studied the relationship between Averill’s ECI and self-report measures of creative capacity with alexithymia, fantasy proneness, and styles of creativity in everyday life. They discovered that the ECI and its subscales correlated with a measure of fantasy proneness and negatively correlated with a measure of alexithymia. Furthermore, Lee (2009) tested the ECI on a Taiwanese sample and found, through an exploratory factor analysis of the ECI, that the ECI measured four factors: preparedness, novel origin, novel reaction, and effectiveness. Further study with confirmatory factor analysis again supported the ECI structure. The preparedness is how ready the subject is to feel an emotion, and whether they are ready to analyze what feeling is appropriate. The novel origin refers to the tendency of the subject to seek out and identify new emotional reaction, or novel uses of emotion. The novel reaction refers to one can apply an emotional reaction to a situation where a different reaction would normally perform. Finally, the effectiveness is the ability to judge which emotion in any given situation would be best.

1.3. Creativity training

Scott et al. (2004) performed an in-depth meta-analysis of creativity training, including 70 studies on a large variety of different approaches. They found that cognitive creativity can be taught. Of all of these approaches, the strongest effects were revealed from divergent thinking and problem solving methods. Scott et al. then concluded that using divergent thinking in creativity training was highly effective. However, they did not examine emotional creativity, though Averill (1999) theorizes that dramatic techniques used in acting could elevate one’s creativity.

Moreover, creativity training interventions are quite similar to each other and there is always a need to explore new ways of improving creativity. Recently, a few scholars introduced new methods with activities that inspire learner interest and match the learner’s background, in which uses a doodle-book or intercultural competence training to enhance children’s creativity (Dziedziewicz, Gajda, & Karwowski, 2014; Dziedziewicz, Oledzka, & Karwowski, 2013). In the present study, we take a new Role-play games training approach that could be an invigorating and new combined training method for increasing both creative potential and emotional creativity.

1.4. Role-play and creativity

Role-playing games attempt to represent a real or imagined world through simplified game-rules. They then focus on the interaction between people (characters) in various situations (Van Ments, 1989). Role-playing games not only engage
the mind with imagination, but also require the player to use their cognitive problem-solving skills to accomplish their character’s goals. Therefore, Role-playing games provide a rich test-bed for both of imagination and problem-solving in great abundance, we expect practice role-playing could allow individuals to enrich their creativity. In addition, based on Scott et al. (2004), the amount of practice and the realism of the practice made important contributions to the effect size of any given training method. Role-play may be well suited to provide both ample and realistic practice for other emotional and cognitive creativity training techniques, and should increase motivation in students as compared to case-learning (Cherryholmes, 1966).

In a TRPG, participants describe their characters’ actions through speech and determine the actions of their characters based on their characterization. The actions succeed or fail according to a formal system of rules and guidelines. Within the rules, players have the freedom to improvise; their choices shape the directions and outcomes of the game. Most role-playing games require the participation of a game-master (GM), who creates a setting for the game session, portrays most of its inhabitants and acts as the moderator and rules arbitrator for the players. During a typical game session, the GM will introduce a goal for the players to achieve through the actions of their characters. Slipping into the shoes of another person and engaging with problems creatively and emotionally could impact the creative potential and emotional creativity of an individual, especially if the game is written with this purpose in mind.

Chung (2013) found that TRPG players had higher creativity scores (e.g., divergent thinking) than non-players and electronic RPG players. This implies a causal link between TRPGs and creative potential. Karwowski and Soszynski (2008) sought to test the effectiveness of Role Play Training in Creativity (RPTC) on enhancing creative performance, and to determine whether or not distributed practice had an effect or not. The same exact treatment was performed on two different groups. The only difference was one group utilized distributed practice, and so their training was spread over four weeks, one two-hour session a week. The other group received all of their training in one single eight-hour session. They used a modified Test of Creative Imagination (TCI; Karwowski, 2008a,b) and the Test of Creative Thinking—Drawing Production by Urban and Jellen as pre-tests and post-tests. Both tests were somewhat similar to divergent thinking tests. For their final analysis, Karwowski and Soszynski found RPTC did increase creative potential at similar levels to the average effectiveness of trainings reviewed by Scott et al. (2004), and that the group who utilized distributed practice had much higher gains in flexibility compared to the single-day group. However, their experiments had two limitations. Firstly, a one-group experiment structure is methodologically inferior to experiments including control groups. Secondly, they only take the cognitive aspect of creative and ignore the emotional creativity. Thus, our study modifies and extends their work in order to investigate the effectiveness on enhancing creativity of TRPGs with evidence that is more powerful.

2. The present study

We aimed to build on the Karwowski and Soszynski’s (2008) work by examining the effects of TRPGs on creativity. We included a control group for comparison and then included measures of creative potential and emotional creativity. The present study emphasized consequences of choices and stressed continuity in every session, included GMs in each treatment sub-group, and had a completely passive experimenter, so should model TRPGs much more precisely, and thus answer whether players of TRPGs have higher creativity because of self-selection, or because TRPGs actually encourage creative growth. In addition, the current study recognizes the essential emotional element of role-play. In order for a player to act in a fashion suitable for their character, they have to predict and simulate their character’s emotions, much as an actor would in drama. This flexing of one’s emotional “muscles” should alter one’s ability to experience and produce emotions. Therefore, the present study formulated the following two hypotheses:

**H1.** Compared with the control group, the tabletop role-playing game could enhance their creative potential.

**H2.** Compared with the control group, the tabletop role-playing game could enhance their emotional creativity.

2.1. Methods

2.1.1. Experimental design

This study was a nonequivalent control group pretest-posttest quasi-experimental design. Based on their prospective availability, the participants were assigned to either the treatment group or the control group. The participants of the treatment group engaged in weekly sessions playing through TRPG story modules, while those of the control group did not receive any treatment. The dependent variables measured in this study were creative potential and emotional creativity.

2.1.2. Participants

Thirty-nine participants completed the whole sessions (Mean age = 20.64, SD = 1.66, ranged from 18 to 26), and 26 of them were male (66%). 19 participants (7 males) were assigned to the treatment-group (one participant dropped out during the course of play, so he was not included in any analysis) and 20 participants were assigned to the control-group. All participants were complete volunteers and were informed they could leave at any time. The participants were undergraduates and graduates. All of the students were native Taiwanese and ethnic Chinese.

2.1.3. Materials
2.1.3.1. Instructions. Immediately after the pretests were completed, the first material presented to the participants was an instruction manual on how to play TRPGs. It explained the rules of how to play a TRPG, and all participants learned what both players and GMs were supposed to do. Players were to remain in character as much as possible, speaking as if they were their character. When describing actions they wished performed, they could not determine the outcome themselves: they had to defer judgment to the GM. What the player could do, is decide how their character felt about/would react to any given thing/action, and decide what their character would attempt to do as a result.

Game-masters (GMs) were responsible for arbitration: they decided what the attempted actions of the player-characters actually did. The GM had the power to decide what would be most reasonable and best for the story. If the GM felt uncertain, they were instructed to confer with the players for what would be best for the story and then make a decision, or decide with a mutually agreed-to method. They were also in charge of all characters not controlled by the players, in which included both minor characters, such as shopkeepers, and recurring characters such as the primary villain. The most important responsibility for the GM was preparing and directing play according to the story module. Instructions on how to interpret and use the story modules were included in the manual. It was always emphasized that the modules were guidelines, and the GM was free to alter and expand on the material presented in the module in any way they deemed suitable.

2.1.3.2. Story modules. The main type of materials used in the treatment had four story modules. Story modules are scaffolding to help new or under-prepared GMs create an original story with a group of players. The modules rarely provided definitive answers, but they offered hints and direction so that the GMs were not left with the full creative burden of writing an entire story and setting themselves—a daunting task even for professional authors. The modules provided a rough guideline for the GM to use to allow smooth story progression, but did not overly limit choices. Each story module was designed to take a little longer than three hours to complete with the intent that each group would spend the entire time allotted playing a TRPG.

This sub-section will be dedicated to supporting decisions made on how the modules were designed. First, the modules were written in a way to encourage cognitive creativity through perspective change, divergent thinking, critical thinking, and problem solving. Second, character creation was crafted such that students could identify with their own characters, and other scenarios were drafted to introduce drama and a variety of emotional reactions. The story could best be described as “Indiana Jones in Space.” It was a soft-scifi space opera style story, with no emphasis on technological descriptions. The player characters were space treasure hunters who were recruited by their government to find a legendary artifact of considerable power. To find this artifact, the characters had to make use of several fantastic items with exotic powers. They traveled the galaxy going to four different planets, each with their own set of obstacles and non-player characters.

The modules were written to include divergent thinking as a core aspect of game play. In the first module, each group of players were given a selection of “god items” that had marvellous but exotic uses. An example was the unmoving object: a bowling-ball-sized object that with the press of a button could be made to have infinite inertia for a short time. The ball has no obvious mundane uses, but a plethora of creative applications. These items were designed this way to quickly elicit creative outputs. Then, after players selected a number of these items, each time in the module a problem arose, the players were reminded to make use of their god items to solve the problem. In pilot studies, the players complained about how “useless” the items were, but then made excellent use of them to solve their problems. This showed that the module was functioning as intended. Subjects employed divergent thinking in their problem solving through brainstorming how each god item could be used to help the group, and they were forced to do this frequently because often no obvious choice existed.

Further, the core of TRPG game play is essentially problem solving. The most entertaining stories, whether they are in movies or novels, all include problems that the protagonists must overcome somehow. This element of TRPGs was preserved in the modules. Because GMs were expressly forbidden to reveal potential solutions, players were forced to solve problems themselves rather than rely on an author to reveal the solution. Thus, in each session the game play involved multiple problems of varying natures. For example, players had to formulate how to break into a king’s treasure vault. Many potential solutions existed and were presented in the module to the GM, but not the players. The players had to think critically about which solution would work or could work, and what consequences they may have in relation to other choices. The players had to also consider things from a personal perspective: What would they do if their character gets caught doing something, or if they can’t speak the language, or is injured? Consequences in the story occurred not only because of the choices they made, but also depending on the role they were playing. The modules were flexible enough to allow for total failure, up to and including every player-character dying, so consequences for choices were preserved. Several choices made by the players also had implications much further along in the story, so everything had to be considered carefully. Further, the module provided ready-made motivations and overall goals so that the players were never left unguided. This hopefully avoided the problem Scott et al. (2004) pointed out about unguided, unstructured creativity training producing weaker effects on creativity overall.

Emotional creativity was also a focus when designing the story modules. As mentioned previously, Averill (1999) drew from Bloch (1993) in referring to drama as a way that human beings can practice feeling and displaying emotions. Role-playing requires that participants take on the perspectives and feelings of characters in order to accurately portray their reactions. However, one major complaint about role-playing as a method is that unprepared participants often resort to stereotypes rather than attempting to portray real people (Sogunro, 2004). To avoid this problem, and help give participants experience playing more developed characters, character generation was scaffolded. Each player was given a character sheet
with various questions on it with deep implications for the psychology of the character. These questions also encouraged the player to create a character they could identify with, and thus would care about. Two examples are “I don’t like to talk about it much, but I ______” and “Why am I a treasure hunter instead of something else?” These questions were included to force the player to give the character an inner mental life, thus steering them away from flat stereotypes. Pilot testing received good feedback, and the players informed me that the character sheet helped them make characters they cared about. GMs did not have a character sheet, but similarly each main-character they controlled had a well-developed personality and background that they could study and become familiar with.

Additionally, the story modules themselves included several emotional scenes that were supposed to expose the partici-
pants to a wide range of affective responses. The characters witnessed an entire world, one they had just departed, bombed into oblivion. This was described at-length to allow participants an opportunity to feel sadness, or other emotions. They also had to deal with angry dark elves, shouting at liars and impending doom, play politics with nobility, rescue an alien race from extinction, and narrowly escape the onslaught of an enemy fleet. The large variety of scenes in the story hopefully gave each participant many opportunities to both feel and aware themselves, and to react as if they were in their character’s shoes.

2.1.3.3. Abbreviated torrance test for adults (ATTA). We use the Abbreviated Torrance Test for Adults (ATTA) to measure creative potential. The ATTA combines figural tasks and verbal tasks into a simplified version applicable to adults, and produces norm-referenced, criteria-referenced scores on the four sub-scales of creativity index (CI): fluency, flexibility, originality, and elaboration. It also consists of four norm-referenced abilities along with fifteen criterion-referenced creativity indicators that when added together will give the creativity index (CI). This study uses Chen’s (2006) translated manual for the ATTA, originally constructed by Kathy Goff and E. Paul Torrance. In Chen’s research, the test-retest reliability of each creativity index ranged from .34 to .68; the inter-rater reliability ranged from .37 to .97. In the present study, a single trained rater scored participants’ responses. The test-retest reliability of each creativity index ranged from .29 to .68. In addition, based on Chu’s (2005) findings, the correlation between the ATTA and the Creative Problem Solving Assessment was from .37 to .46. Moreover, Lin and her colleagues revealed that the Chinese version of ATTA’s inter-rater reliability ranging from .83 to .96, and the subscale scores were mostly correlated with each other (rs = .31 to .83, p < .01), only originality and elaboration exhibited no correlation (r = .07, p = .24).

2.1.3.4. Emotional creativity index. Lee (2009) translated Averill’s (1999) ECI into Mandarin Chinese, including four subscales: (1) preparedness (e.g., When I have a strong emotional reaction, I will think about the reason why), (2) novel origins (e.g., I like to actively seek out music, dance, and artwork that elicits new and unfamiliar emotional reactions), (3) novel reactions (e.g., When I am in an emotionally charged situation, I will try to react differently from others), and (4) effectiveness (e.g., When I react emotionally, it helps positively develop my interpersonal relationships). Lee (2009) found that each subscale had acceptable internal reliability, Cronbach’s Alphas ranged from .67 to .76, and the overall Cronbach’s Alpha was .81. In addition, further confirmatory factor analysis found that GFI = .95, AGFI = .93, and RMSEA = .049, in which reflected an acceptable fit performance (Lee, 2009).

2.2. Procedure

In the first session, we described how the participants were to be monetarily compensated and distributing group assignments. Then we divided the participants of the treatment group into four sub-groups: each group had one GM and four players (one player dropped out during the course of play, and was not included in further analysis). Because the responsibility of being a GM was different than that of a player, they were selected from a subset of the participants who had indicated interest in being a GM. The GMs then received slightly different instructions. All participants took the ATTA and ECI as pre-tests. From then on the procedure for each session was identical: after arrival play began, play continued until the time was up, and the GM was given the next module to preview. This continued each week, except for one week that was skipped due to a holiday. This culminated in four sessions over five weeks. On the final day, each group took the ATTA and ECI again as a posttest. The control group was simpler to administer. They all came to laboratory one evening and took the ATTA and ECI as a pretest. Then five weeks later they were once again tested in the evening with the ATTA and ECI as posttests.

3. Results

3.1. Creative potential

The statistics presented in Table 1 shows that there was improvement in the treatment group on mean overall creativity index (CI) score (68.47–70.26) whereas the control group actually received lower scores on average on the posttest than the pretest (67.1–66.35). Because this study was a nonequivalent control group pretest-posttest quasi-experimental design, therefore we ran an ANCOVA with the posttest cognitive creativity scales as the dependent variable, group membership as the fixed factor, and pretest scores as the covariate. The adjusted mean of the treatment group was 69.80, and the adjusted mean of the control group was 66.79. The ANCOVA results in Table 1 show that the difference between the pretest and post test scores of the treatment group, when compared to the control group, showed statistical significance (F[1,36] = 3.227,
Table 1
Group pre-test, post-test, adjusted means and F-test for cognitive creativity scales.

<table>
<thead>
<tr>
<th>Group (n)</th>
<th>Pre-test Mean (SD)</th>
<th>Post-test Mean (SD)</th>
<th>Adjusted post-test Mean (SE)</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall CI</td>
<td>Treatment(19)</td>
<td>68.47(8.57)</td>
<td>70.26(6.73)</td>
<td>69.80(1.20)</td>
<td>3.23 .04</td>
</tr>
<tr>
<td></td>
<td>Control(20)</td>
<td>67.1(5.90)</td>
<td>66.35(7.29)</td>
<td>66.79(1.17)</td>
<td></td>
</tr>
<tr>
<td>Fluency</td>
<td>Treatment(19)</td>
<td>14.11(4.46)</td>
<td>15.47(5.18)</td>
<td>15.65(0.72)</td>
<td>0.15 .35</td>
</tr>
<tr>
<td></td>
<td>Control(20)</td>
<td>14.5(3.73)</td>
<td>16.2(4.09)</td>
<td>16.04(0.70)</td>
<td></td>
</tr>
<tr>
<td>Flexibility</td>
<td>Treatment(19)</td>
<td>4.37(2.89)</td>
<td>4.88(2.54)</td>
<td>4.74(0.47)</td>
<td>2.54 .06</td>
</tr>
<tr>
<td></td>
<td>Control(20)</td>
<td>3.7(1.53)</td>
<td>3.55(1.93)</td>
<td>3.70(0.45)</td>
<td></td>
</tr>
<tr>
<td>Originality</td>
<td>Treatment(19)</td>
<td>4.32(4.40)</td>
<td>4.79(3.17)</td>
<td>4.67(0.44)</td>
<td>1.42 .12</td>
</tr>
<tr>
<td></td>
<td>Control(20)</td>
<td>3.15(1.60)</td>
<td>3.5(2.31)</td>
<td>3.61(0.63)</td>
<td></td>
</tr>
<tr>
<td>Elaboration</td>
<td>Treatment(19)</td>
<td>7.32(4.77)</td>
<td>7.26(4.46)</td>
<td>6.69(0.82)</td>
<td>1.27 .14</td>
</tr>
<tr>
<td></td>
<td>Control(20)</td>
<td>5.2(3.02)</td>
<td>4.85(3.63)</td>
<td>5.40(0.80)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2
Glass’s Δ of this study compared to other trainings.

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Mean effect (Glass’s Δ)</th>
<th>Number of effects</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall CI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall effectiveness</td>
<td>0.58</td>
<td>1</td>
<td>This study</td>
</tr>
<tr>
<td>(1-tailed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluency</td>
<td>0.68</td>
<td>70</td>
<td>Scott et al. (2004)</td>
</tr>
<tr>
<td>Flexibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Originality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elaboration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall effectiveness</td>
<td>1.05</td>
<td>137</td>
<td>Wiśniewska &amp; Karwowski (2007)</td>
</tr>
</tbody>
</table>

Table 3
Group pre-test, post-test, adjusted means and F-test for emotional creativity scales.

<table>
<thead>
<tr>
<th>Group (N)</th>
<th>Pre-test Mean (SD)</th>
<th>Post-test Mean (SD)</th>
<th>Adjusted post-test Mean (SE)</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ECI</td>
<td>Treatment(19)</td>
<td>67.95(9.78)</td>
<td>69.58(10.76)</td>
<td>67.91(1.13)</td>
<td>0.63 .22</td>
</tr>
<tr>
<td></td>
<td>Control(20)</td>
<td>64.2(6.99)</td>
<td>65.05(6.39)</td>
<td>66.64(1.10)</td>
<td></td>
</tr>
<tr>
<td>Preparedness</td>
<td>Treatment(19)</td>
<td>21.42(3.02)</td>
<td>21.58(3.29)</td>
<td>21.51(0.46)</td>
<td>1.011 .16</td>
</tr>
<tr>
<td></td>
<td>Control(20)</td>
<td>21.25(2.19)</td>
<td>20.8(2.24)</td>
<td>20.86(0.45)</td>
<td></td>
</tr>
<tr>
<td>Novel origins</td>
<td>Treatment(19)</td>
<td>19.58(3.55)</td>
<td>20.05(3.29)</td>
<td>19.53(0.41)</td>
<td>0.68 .21</td>
</tr>
<tr>
<td></td>
<td>Control(20)</td>
<td>18.15(2.43)</td>
<td>18.55(2.19)</td>
<td>19.05(0.40)</td>
<td></td>
</tr>
<tr>
<td>Novel reactions</td>
<td>Treatment(19)</td>
<td>14.95(2.97)</td>
<td>15.58(2.95)</td>
<td>14.86(0.38)</td>
<td>1.341 .13</td>
</tr>
<tr>
<td></td>
<td>Control(20)</td>
<td>13.10(2.31)</td>
<td>13.55(2.11)</td>
<td>14.23(0.37)</td>
<td></td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Treatment(19)</td>
<td>12.00(2.13)</td>
<td>12.37(2.19)</td>
<td>12.26(0.32)</td>
<td>&lt;.001 .49</td>
</tr>
<tr>
<td></td>
<td>Control(20)</td>
<td>11.70(2.30)</td>
<td>12.15(1.98)</td>
<td>12.25(0.32)</td>
<td></td>
</tr>
</tbody>
</table>

\(p = .04\), 1-tailed, \(\eta^2 = .08\). This turned out to be the most significant result. When the control and treatment groups were compared, fluency, flexibility, originality, and elaboration all failed to attain statistical significance \(F[1,36] = 0.152, p = .35, 1\)-tailed; \(F[1,36] = 2.54, p = .06, 1\)-tailed; \(F[1,36] = 1.420, p = .12, 1\)-tailed; and \(F[1,36] = 1.226, p = .14, 1\)-tailed.

To evaluate the strength of observed effects, we calculated Glass’s \(\Delta\) (Glass, McGaw, & Smith, 1984) in Table 2, as the same way as Scott et al. (2004) and compared it to their results and results provided by Wiśniewska and Karwowski (2007). The adjusted mean of overall CI score of Glass’s \(\Delta\) is 0.58, which is less than those presented by Scott et al. (Glass’s \(\Delta\) = 0.68) and Wiśniewska and Karwowski (Glass’s \(\Delta\) = 1.05).

3.2. Emotional creativity

Although minor improvements were found for each subscale of the ECI (see Table 3), subsequent ANCOVA results revealed the overall score did not achieve statistical significance \(F[1,36] = 0.630, p = .22\). The subscales preparedness \(F[1,36] = 1.011, p = .16\), novel origins \(F[1,36] = 0.680, p = .21\), novel reactions \(F[1,36] = 1.341, p = .13\), and effectiveness \(F[1,36] < 0.001, p = .49\) fared no better.

4. Discussion

4.1. Creative potential

The creativity index score was significant, but no other sub-scale even approached acceptable levels of significance. Chung (2013) found that playing TRPGs correlated with higher creativity scores when compared to people who had never played TRPGs. As the present study shows a significance in the creativity index, the results partially support the idea that TRPGs actually improve creative potential. In addition, the results suggest that this study supported the results of Karwowski and
Soszynski (2008). According to their result, the overall creative index, fluency, and originality of participants significantly increased after taking the RPTC. Although the tests used by these two studies differ, the present study used the ATTA to measure participants’ overall creative thinking potential, flexibility, elaboration, originality, and fluency, while in Karwowski and Soszynski’s study, the scores that were obtained from TCI were the scales of fluency, originality, elaboration and transformation. The scales obtained from Test of Creativity—Drawing Production (TCT-DP) were fluency, originality, elaboration, ability to synthesize, non-conformism, readiness to undertake risk, sense of humor and emotional engagement. The ATTA, TCI, and TCT-DP all use divergent thinking as an indicator of creative potential, so while the tests differ, both studies show that role-playing games positively influence creative potential.

Beyond having different testing methods, there are three major differences between Karwowski and Soszynski’s (2008) study and this study. Firstly, their research did not include a control group but our study did. Because the present study included a control group, thereby the effect of the experiment could be more precisely confirmed. Secondly, the sample size of this study was small, with only 19 participants in the treatment group and 20 participants in the control group, whereas Karwowski and Soszynski’s study included 47 participants in their treatment. Although the present study used ANCOVA to eliminate the initial individual differences between the treatment group and the control group to increase the sensitivity of the test, the small sample size was still a problem. This is likely the cause of all of the subscales yielding non-significant results. The third major difference is the involvement of the experimenter. In their experiment, the experimenters actively attempted to change the participant’s attitudes towards creativity. However, in this experiment, the experimenter remained as aloof as possible, to the point where he returned almost all questions to the sub-groups to answer for themselves. This was to allow for easier replication of the experiment, as well as to isolate the effect of TRPGs from the instructional skills of an experimenter. This difference is likely the largest difference between RPTC and TRPGs: in TRPGs, and consequently this experiment, beyond the GM there is no clear authority figure actively pushing the participants to challenge themselves. The module frequently reminded the GM that the group should use their creativity to solve problems, but this may affect participants differently from an authority figure standing in front and guiding discussion. Therefore, this study’s training program more closely approximated the actual TRPG hobby, further clarifying the relationship between TRPG play and increased creative potential.

Furthermore, when comparing the strength of observed effects of the training in this study to those found in previous meta-analyses (Scott et al., 2004; Wiśniewska & Karwowski, 2007), we found our effect to be relatively low. The small sample size limiting the statistical power of the test likely lowered the effect. However, it could also be partly explained in a fashion similar to Karwowski and Soszynski (2008), who believed that slightly lower effectiveness could be explained in terms of different areas of abilities. It is possible that those who attend TRPG sessions will learn other cognitive skills, not just restricted by divergent thinking tests. Finally, it is noteworthy that our sample included only Taiwanese students, and in many areas of creativity students in much of East Asia routinely scores lower than their Western counterparts (Niu & Sternberg, 2002). Further research could clarify all of the above points.

### 4.2. Emotional creativity

The results for Emotional Creativity were that nothing returned clearly significant. The closest to significance was the Novel Reactions Score ($F(1,36) = 1.341, p = .25$), which was still quite far away from significant levels. All minor differences between the pre- and post-test could not be safely attributed to anything but random chance. According to these results, TRPGs have no effect on emotional creativity. A small sample size probably had an effect on the lack of significance of the results, but that is most likely not the only reason. With no previous experiments to compare to, it is hard to say exactly what would happen if the sample size increased. Large sample sizes show significance more easily than small ones, but given that both the control group and the treatment group showed gains it is likely that, if significant, TRPGs would have still only a small effect size on total emotional creativity.

Averill (1999) proposed that learning emotional creativity came about in a fashion similar to learning dramatic acting, and that encountering new events in our daily lives naturally would raise our emotional creativity. This may still be true, but it seems that learning emotional creativity may be taught. This is the major difference between the studies. Emotions, and how to properly display or control them, does not typically raise into conscious awareness unless prompted to by social mores. An angry child will be scolded by her parents for being angry if the anger is deemed unacceptable. A crying boy might be told to cry or feel sad because of social gender roles. Emotions embody the value of any given culture, and society can be especially intolerant towards emotions that fall outside the norm (Averill et al., 2001), and such things may simply be too serious or uncomfortable to imagine without specific and guided instruction.

When playing a game of imagination, social repercussions for novel emotions are easily avoided because the emotions may not be felt by the player at all: the player may cognitively deem it unlikely a socially adjusted adult (their character) would feel a socially inappropriate emotion, and thus even thoughts of what emotion would be appropriate would never occur. Without a clear impetus and constant reminder to evaluate and re-evaluate the emotional experience of the character, the player may have delved into the simpler and less stressful method of deciding emotion based on cognitive appraisal: “My character saw someone die, and the acceptable emotion in this case is sadness, so he will react with distress.” Unfortunately, change and growth may not occur unless people leave their comfort zone and adapt to discomfort.
The module written for this experiment perhaps put insufficient stress on the emotional lives of the characters, and thus the players simply avoided the difficult path of emotions by only allowing themselves to feel what was safe. In this case, the safety of the imagined world may have worked against the goal of improving emotional creativity.

4.3. Limitations and future directions

This study was exploratory in nature, meant to investigate the potential use of TRPGs to divergent thinking and emotional creativity. Therefore, this study has several limitations. First, the sample size was small, with 19 participants in the treatment group and 20 participants in the control group. This could have affected the statistical significance of the results. Additionally, because all previous research indicates TRPGs improve creativity, our hypothesis only posits one direction. In this situation, a one-tailed test is appropriate (Howell, 1997). However, this form of statistical test more easily achieves significance. Thus, more tests are necessary to confirm our findings.

Second, to represent creativity as a whole, this study only used the ATTA, a measure of divergent thinking, and the ECI, a measure of emotional creativity. However, creativity is much more complex in reality, and includes many aspects, such as insight thinking, creative problem solving, creative personality, creative motivation, etc. (Amabile & Hennessey, 1992; Runco, Johnson, & Gaynor, 1996; Ruscio, Whitney, & Amabile, 1998; Ryhammar & Smith, 1999; Sternberg & Lubart, 1991).

All of these could potentially be influenced by TRPGs, and future study could explore these directions.

Third, this study used an exclusively Taiwanese sample, and thus there are limits to its generalizability. Future research could investigate cross-cultural topics. Furthermore, the author of this study’s story module was American and a native English speaker, and consequently the story modules were first written in English and then translated. This could have influenced the results of this study, and future studies could ensure cultural and linguistic homogeneity between the author and test subjects.

4.4. Conclusion

The results of this study lead to the conclusion that TRPGs have a positive effect on creative potential or divergent thinking but no effect on emotional creativity. When Scott et al. (2004) analyzed much of the creativity training, they found that focusing on increasing problem solving or divergent thinking had the highest effect size overall, and further showed that the presentation methods of case-based learning and cooperative learning increased the effect size the most. They did not evaluate the effectiveness of role-play as a presentation method. As far as we are aware, the present study is the first one to use a sample of Asian students while, via a controlled quasi-experimental design, investigating the training effect of TRPGs on creativity. The findings support that TRPGs can improve students’ creative potential, and corresponded with the findings of Karwowski and Soszynski (2008). The importance of creativity to the world and to individuals is not going to go away. Creative people make the planet a better place to live, and a wider variety of emotional responses can help people live better. Role-playing may show inconsistent results, but the research in this area is still quite limited, and ripe for more investigations. Many avenues remain unexplored with questions unanswered. Further study on ways to enhance creativity is warranted to ensure future economic success and improvements in the quality of life for all people.

Acknowledgements

This research is partially supported by the “Aim for the Top University Project” and “Center of Learning Technology for Chinese” of National Taiwan Normal University (NTNU), sponsored by the Ministry of Education, Taiwan, R.O.C. and the “International Research-Intensive Center of Excellence Program” of NTNU and Ministry of Science and Technology, Taiwan, R.O.C. under Grant no. NSC 104-2911-I-003-301.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.tsc.2015.10.004.

References


