Effects of Vocabulary Games on Lexical Growth and Retention of Low-Motivated EFL Learners in Taiwan

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To examine the effects of a vocabulary strategy game program on compound noun learning and consolidation, a 20-hour quasi-experimental single group time-series research study was designed. A total of 79 low-motivated Taiwanese college students at the CEFR A1 (pre-basic) and A2 (basic) English proficiency levels participated in the study. Poker, Chinese chess, and gohbang, along with several memorization-enhancing techniques, were utilized to facilitate vocabulary learning. Four specific research questions guided the study. The first looked independently at the effects of the invented poker, chess, and gohbang games on vocabulary learning; the second at the holistic effect of the vocabulary program; the third at the effect of the game program on lexical retention one month later; and, finally, the fourth examined the effects across subgroups of different proficiency levels. Data were collected via the administration of a 174-item compound-noun test as pretest, after-poker test, after-chess test, posttest, and retention test. The data were analyzed with one-way repeated measures ANOVAs with subsequent protected t-tests on top of descriptive statistics and independent-samples t-tests. The results have shown that the vocabulary games, whether utilized independently or as a whole program, effectively facilitate learners' lexical growth and retention. Pedagogical implications and suggestions for further studies are addressed.

Keywords: vocabulary learning, language game, compound noun, game-based language learning, lexical growth and retention

Vocabulary learning is considered a vital part of the groundwork for successful language performance (Chen, 2009a; Gu & Johnson, 1996; Horwitz, 1988). Inadequate vocabulary size and knowledge has been found to be a major barrier to reading and comprehension fluency (Laurel, 1989; Laurel & Sim, 1985) and quality writing (Corson, 1997; Englar, 1995). For communication to be effective, sufficient lexicon is regarded as an important or even the most important element for L2 learners to express a wider range of meanings (Gass & Selinker, 1994; Laurel & Sim, 1985). Nevertheless, despite the significance of vocabulary to language performance, learning burdens of new lexical items for L2 learners are often too heavy to generate efficient learning or trigger learning motivation. Nation (2001) defined the "learning burden" of a word as the amount of endeavor required to learn it. Different words have different learning burdens to learners of different characteristics. Teachers can help students lighten the learning burden through various methods (Nation, 1990, 2001). On top of knowing the form and meaning, knowing a word also involves use of it (Nation, 2001). Thus, Pica (2000) and Nation (2001) argued that both receptive and productive learning should be provided. Teachers should design learning tasks that involve learners in meaningful and multiple exposures to the target words as well as opportunities to produce output of the lexicons. Additionally, timely and informative feedback on the production can help learners modify or reinforce their learning of the target language (Gass, 1999; Pica, 2000).

Many studies of vocabulary learning have focused on specific aspects of vocabulary learning strategies, including contextual guessing, association, note-taking, dictionary use, and rote repetition. For example, Nation (2001)
stressed the importance of repetition because it requires more than one meeting with a word for one to fluently access it. O’Malley, Chamot, Manzanares, Russo, and Kuper (1985) have found that repetition as a strategy has been much more frequently used than strategies requiring complex manipulation of information. Nation (1982) noted that tools involving rote memory, such as word lists, are considered effective in enhancing the learning of a great deal of vocabulary in a short period of time. Empirical studies further indicated that spaced repetition brings about better vocabulary learning and retention (Bloom & Sheull, 1981) than massed repetition. Besides, learners’ vocabulary size and overall language proficiency were found to correlate to their ability to make skilful use of a dictionary (Gu & Johnson, 1996; Scholfield, 1997) and to their willingness to invest time on practicing newly-learned words (Gu & Johnson, 1996).

Among the existing literature on effectiveness of vocabulary learning strategies, research findings reveal discrepancies. Some found that learning vocabulary through repetition and review actually strengthened memory and facilitated vocabulary retention for a longer term than learning vocabulary incidentally (Martin-Chang, Levy, & O’Neill, 2007; Paribakht & Wesche, 1993). Others, on the other hand, disagreed with learning vocabulary independently from contextual reading (Francis & Simpson, 2003). They believed that vocabulary learning became meaningful and could be transferred into learners’ knowledge only through reading. Regardless of the controversy, nobody challenged the importance of vocabulary, and experiments on investigating effective vocabulary learning strategies have been conducted (Gu & Johnson, 1996; Schmitt & Schmitt, 1993), and vocabulary learning methods and programs have been implemented (Gu & Johnson, 1996; Murefati & Shimi, 2003; Sityanova & Schmitt, 2007).

In addition to strategy training programs, a surge in attempts to apply tasks, simulations, and games in education, particularly in the field of language learning, has occurred in recent years (e.g., Gaudard, 1999; Kumar & Lightner, 2007; Perez-Sabater, Montero-Fleta, & Rising, 2009). Positive effects such as better understanding and longer retention of knowledge have been observed. In addition, simulation and gaming promote collaborative learning, since both involve interaction and experiential learning. According to Vygotsky (1978), when learners interact with peers, a greater understanding of the material can be achieved. Working with peers is academically beneficial because learners are close to one another in their levels of proximal development.

Chen (2009a) argued that learning effect is ultimate if it takes place under “edutainment” activities, i.e., activities that can achieve the purposes of both “education” and “entertainment.” “Edutainment” strategies are strategies designed to deliberately place educational issues into entertaining elements (Brown et al., 2006). Examples of edutainment include learning via drama performance, story telling, film, television, radio, and hybrid applications. Among which computer games are the most commonly used and most widely studied (e.g., Khine & Shalheb Bin Su’ai’ee, 2008; McGraw, Yoshimoto, & Benett, 2009). In addition, “English villages” in Korea and Taiwan (Joon, 2010; Mitchell, 2009) were built to reflect a belief that, if learning provides fun experiences, it would simultaneously motivate voluntary participation. This belief explains why game designers have treated fun, pleasure, competition challenges, and goals as essential elements of a game (Crookall, Oxford, & Saunders, 1987; Langran & Purcell, 1994; Shie, 2004).

According to Langran and Purcell (1994), a good language game should provide opportunities to practice repetition with enjoyment instead of tedium. This principle has been incorporated in L2 vocabulary learning games of various modes, including computer-assisted vocabulary games (Cooley, 2001; McGraw et al., 2009) as well as vocabulary card games and board games (Chen, 2009a, 2009b, 2009c, 2009d; Huyen & Nga, 2003; Uberman, 1998). While studies focusing on vocabulary size enhancement through specially designed games are limited, positive effects have been observed. For example, speech-enabled card games (McGrath et al., 2009) and online vocabulary games (Yip & Kwan, 2006) were found to facilitate L2 vocabulary learning and retention. Use of poker and gobang were found to increase and retain learners’ English prefix and suffix (Chen, 2009a). A vocabulary program incorporating poker, chess, and gobang were found to facilitate not only gains (Chen, 2009b, 2009c) and retention (Chen, 2009b) on compound nouns but also vocabulary learning strategy utilization (Chen, 2009d). Learning and consolidation of vocabulary were also observed in studies using other types of board games, including Snakes and Ladders (Huyen & Nga, 2003) and Puzzle Pieces Board (Uberman, 1998), as well as popular games such as Hangman and Simon Says (Huyen & Nga, 2003). Although the aforementioned games differ in their pedagogical groundings and technical complexity, they share the same aim of enhancing learners’ vocabulary through a repeated yet enjoyable process.

The present study aimed to investigate whether a gamelbased vocabulary learning program could help struggles L2 learners learn and consolidate English vocabulary. A compound-noun learning program consisting of poker, chess, and gobang (Chen, 2008. Patent Application No. 097101167) served as the learning tool in an attempt to facilitate vocabulary learning, with compound nouns as the focus. Throughout the paper, these games are also referred to as strategy games because the outcome of the games, instead of relying on pure chance, depends on the player’s decision-making skills to a certain degree. In this study, the learners played the three games in the order it was mentioned, with a higher degree of strategy skills and a lesser degree of luck each time a new type of game was introduced.
Although prior studies by the game program inventor found the game set helpful in facilitating vocabulary gains and retention (Chen, 2009b, 2009c), the new invention required more empirical studies to support the effectiveness of the vocabulary learning method among different learning communities (Chen, 2009c). The purpose of the present study, therefore, was twofold. First, it sought to examine the effectiveness of the game program; second, it endeavored to find out if the positive outcomes in prior studies would be supported in this study and shed light on effective and interesting ways of learning vocabulary for long-time low-motivation struggling learners. Four specific research questions guided the study. The first looked independently at the effects of the invented poker, chess, and gobang games on vocabulary learning; the second at the holistic effect of the vocabulary program; the third at the effect of the program on lexical retention one month later; and, finally, the fourth examined the effects across subgroups of different proficiency levels.

**METHODS**

A quasi-experimental research design, or more specifically, a single group time-series design, was chosen for the study. The study was conducted for 20 hours in weeks 3 to 5 of the second semester of the subjects’ freshman year. Arrangement was made so that the game program was completed in 17 days to minimize potential threats to validity (Creswell, 2002).

**Subjects**

The subjects included 79 college freshmen in a private technology university, with 43 at A2 (basic) and 36 at A1 (pre-basic) English proficiency level based on the Common European Framework of Reference for Languages (CEFR) (European Union, 2002). The proficiency level was measured with the Freshman English Placement Test upon their entrance into the university and the Department English Proficiency Test in the sixteenth week of the first semester. The items on the tests were scrutinized for content validity by a team of subject-matter experts. Reliabilities of the two tests were sound at .91 and .88, respectively. Correlation between the two tests was significant at the .05 level. Although the subjects were English majors, they lacked strong motivation in learning English in general (M = 3.1 on a five-point Likert scale) and in learning English vocabulary (M = 1.71) based on a survey administered two weeks before the vocabulary learning program. The reliabilities of the survey and its vocabulary learning motivation subscale were robust at .94 and .90, respectively.

**Game-based vocabulary learning program**

The goal of the vocabulary program was for the learners to learn compound nouns while playing and enjoying strategy games. The program included three types and seven sets of compound-noun learning games, i.e., two sets of poker, four sets of chess, and one set of gobang. The rationales behind the use of the games was to wrap vocabulary learning in pleasure and fun, which, according to Bruner (1974), could provide a less threatening and lower risk situation in which unusual combinations of language learning and play could be tried. Since the subjects were college students rather than children, the researchers selected strategy games instead of games of pure chance to enhance the spice of competition and mental challenges. Hopefully the element of competition and the excitement driven from mental challenges would activate vocabulary learning while learners forget about making mistakes or feeling embarrassed in front of their peers (Rivers, 1981). The game program included 157 original single words (see Table 1), which were all nouns. The 157 words could be matched among each other to create up to 455

<table>
<thead>
<tr>
<th>Game Type</th>
<th>Coding</th>
<th>Unrepeated Original Words</th>
<th>Repeated Original Words</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poker</td>
<td>P1</td>
<td>11</td>
<td>32</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>P2</td>
<td>11</td>
<td>33</td>
<td>44</td>
</tr>
<tr>
<td>Chinese Chess</td>
<td>C1</td>
<td>4</td>
<td>28</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>C2</td>
<td>14</td>
<td>18</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>C3</td>
<td>18</td>
<td>14</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>C4</td>
<td>21</td>
<td>11</td>
<td>32</td>
</tr>
<tr>
<td>Gobang</td>
<td>G</td>
<td>17</td>
<td>43</td>
<td>60</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td>96</td>
<td>178</td>
<td>274</td>
</tr>
</tbody>
</table>

*Note. When calculating total single words used in the program, each repeated single word was only counted once. For example, the word “power” appeared in games P2, C1, and G. Although the word was counted toward the total number of repeated original words in each individual game, it was counted once instead of three times toward total single words used in the program.*

Table 1: Original Word Counts
Table 2

<table>
<thead>
<tr>
<th>Game Type</th>
<th>Coding</th>
<th>Unrepeated Compound Nouns</th>
<th>Repeated Compound Nouns</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poker</td>
<td>P1</td>
<td>53</td>
<td>110</td>
<td>163</td>
</tr>
<tr>
<td></td>
<td>P2</td>
<td>57</td>
<td>91</td>
<td>148</td>
</tr>
<tr>
<td>Chinese</td>
<td>C1</td>
<td>12</td>
<td>48</td>
<td>60</td>
</tr>
<tr>
<td>Chess</td>
<td>C2</td>
<td>16</td>
<td>23</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>C3</td>
<td>24</td>
<td>10</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>C4</td>
<td>29</td>
<td>6</td>
<td>35</td>
</tr>
<tr>
<td>Gobang</td>
<td>G</td>
<td>100</td>
<td>122</td>
<td>222</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td></td>
<td>410</td>
<td>701</td>
</tr>
</tbody>
</table>

Total Compound Nouns to Be Learned in the Program 455

*Note. When calculating total compound nouns to be learned, each repeated compound noun was only counted once. For example, the word "handline" appeared in games P1, P2, and C3. Although it was counted toward the total number of repeated compound nouns in each individual game, it was counted only once toward total compound nouns.

compound nouns (Table 2). The program aimed to expose the compound nouns to the learners through the games so that they could learn as many of the 455 compound nouns as possible through playing.

**Poker.** The poker games followed the rule of PickRed (紅牌), a simple poker game many Taiwanese people started to play since early childhood. The vocabulary poker included 2 sets of cards, P1 and P2. The same as the regular deck of poker, P1 and P2 each had 54 cards. There was an original word, which was a noun, on every card. The mission of the players was to make a compound noun by matching two cards in the set. As shown in Table 1, P1 and P2 used 43 and 44 original words, respectively. Some higher-frequency words were used more than once on the cards. As shown in Table 2, players of P1 and P2 could generate up to 163 and 148 compound nouns respectively.

**Chinese chess.** Four sets of Chinese chess, C1 to C4, were used in the study. Players followed the rule of Chinese blind chess, or half chess (盲棋), with small adaptations. Each chess set comprised 32 word pieces with eight red core words and 24 black ones to be matched. As shown in Table 2, players of C1 to C4 could generate 34 to 60 compound nouns in each set, or 168 compound nouns once they played all four.

**Gobang.** It followed the rule of the traditional gobang, or five in a row (五子棋). Each player had the same 60 go pieces, all noun words. One player had black pieces while the other, red ones. To place a go piece on the board, the piece had to match one of the pieces already on the board and make a compound word. Whoever lined up five pieces of his or her color won the game. The players could generate up to 222 compound nouns in the game.

How the intervention was expected to help students with low motivation

One objective of the study was to find ways of learning vocabulary for long-time low-motivated struggling learners. The selection of the intervention was supported by motivational theories and social cognitive theories. First, the integration of games could benefit low-motivated learners due to attributional factors. Weiner (2000) believed that motivation is affected by how people attribute their past success or failure. The low motivation of the subjects was likely caused by their unsuccessful language learning experiences. In fear of having to acknowledge incompetence in case of unsatisfying performance, they might withdraw from learning tasks so that they could attribute possible failure to lack of effort to retain their sense of control and self-worth (Bandura, 1993; Covington, 1992). With these in mind, the researchers of the present study selected the game program partly because, on top of vocabulary knowledge, game strategy skills and degree of luck also played a role in determining the outcome of the games. The nature of gaming thus gave low-motivated learners leeway to attribute the winning or losing to different reasons to prevent demotivation.

Second, instead of sitting in rows, passively receiving knowledge and learning byrote, which had been proven unsuccessful to these low-motivated struggling learners, the subjects were provided opportunities in the game program to work with peers (Slavin, 1995) within their zone of proximal development (Vygotsky, 1978), during which multiple intelligences in the logic, spatial, linguistic, and interpersonal domains (Gardner, 1983) could be applied. Although the goal was to learn vocabulary, the design of the intervention offered all the subjects, particularly the
low-motivated struggling learners, additional venues to strive for success.

**Instrument**

A 174-item vocabulary test was administered five times in the study to measure lexical gains and retention. The test was constructed by the game designer (Chen, 2009c) based on the format of Schmitt, Schmitt, and Clapham’s (2001) Vocabulary Level Test, which contained validity and reliability evidence and had been widely used in vocabulary assessment and research. Before the test was administered to the subjects of the present study, the researchers and one additional expert examined the items to ensure content validity. In addition, the researchers altered the sequence of the 174 test items in each test administration to minimize the effect of short-term memory (Hughes, 2003). In the five test administrations, the Cronbach alphas ranged from .68 to .82, giving adequate reliability for the purpose of the study.

**Procedure**

The games were played in the order of poker, Chinese chess, and gohang. See Figure 1 for an overview of the program implementation. Each type of game was allotted approximately five and half hours to play. Within that time frame, depending on the nature of the particular game type and how soon a group had a winner, a learner had the opportunity to play each game type for at least three to four rounds.

**Grouping.** The subjects were divided into small groups of similar English proficiency. The poker was played in groups of four, with two in a team to compete against another pair of players. The blind chess was played in groups of three; each person competes on his or her own. The gohang was played in pairs. The grouping was based on the test scores at the Freshman English Placement Test and the Department English Proficiency Test. The rationale behind

![Figure 1](image-url)

*Figure 1.* Implementation of the vocabulary strategy games and compound-noun tests.
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