Why Humor Enhances Creativity From Theoretical Explanations to an Empirical Humor Training Program: Effective “Ha-Ha” Helps People to “A-Ha”

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Creativity empowers people with a better future and is an important research area. Studies have consistently indicated a significant relationship between creativity and humor (Edgar & Pryor, 2003; Sun, 2000). Some studies have suggested that humor facilitates creativity and have proposed models to explain this (Amabile, Hill, Hennessey, & Tighe, 1994; Chen, 1995; Chen, Cheng, & Cho, 2001; Fredrickson, 2004; Morris, 1989; Suls, 1972, 1977; Wyer & Collins, 1992). In order to identify the effectiveness of humor to creativity, Chen and colleagues (Chen, 2004; Chen & Hsu, 2006) developed a humor training program that was
designed according to the cognition, emotional, motivational, and behavioral facets of humor. This humor training course improved not only the comprehension and appreciation of humor, but also creative performance more generally. Results of this training program have shown that effective humor experiences are helpful to creative performance (Chen, 2004; Chen & Hsu, 2006). In other words, effective humor helps people to be creative. The present chapter discusses the relationship between creativity and humor, introduces models related to why humor helps creativity, and conducts a humor training program to empirically indicate the influence of humor on creativity. Here is the framework of the chapter (Fig. 4.1).

**RELATIONSHIP BETWEEN HUMOR AND CREATIVITY**

Treadwell (1970) asked participants to create titles for cartoons and found that the funniness of the captions, as rated by judges, and scores
of creativity tests—including Remote Associates Test scores, Gestalt Transformations test scores, and Novelty of Productions scores—were strongly related. Ziv (1976, 1983) has indicated that humorous atmosphere facilitated the performance of divergent thinking tests; high school students of the experimental group were first given some funny cartoons and films. Then, they completed the Torrance Tests of Creative Thinking; their scores on the creativity test were significantly higher than the control group (Ziv, 1983). One study (Chang, Chen, Hsu, Chan, & Chang, 2015) investigated the relationship between creativity and humor style in a sample of 1252 Taiwanese adolescents. The study used the following measurements: the Humor Styles Questionnaire (Martin, Puhlik-Doris, Larsen, Gray, & Weir, 2003) for sense of humor, the figure-drawing test section of the New Test of Creative Thinking (Wu et al., 1998) for creative potential, and a divergent-feeling exercise from the Creativity Assessment Packet (Lin & Wang, 1994; Williams, 1980) for overall creativity, curiosity, imagination, complexity, and risk-taking. In particular, the Humor Styles Questionnaire classifies people’s humor styles into four types: affiliative, self-enhancing, aggressive, and self-defeating. The figure-drawing test of the New Test of Creative Thinking assesses participant’s fluency, flexibility, originality, and elaboration, and includes a set of different sizes of the same Chinese character “人” (which means human). Participants complete as many drawing as possible within 10 minutes. Using a typological approach, the cluster analysis classifies these adolescents’ humor styles into four clusters: general humor endorser, humor denier, positive humor endorser, and negative humor endorser. General humor endorser indicates people who use humor in daily life—whether it be a friendly or mean type of humor, their mean z-scores are above-average on each humor style; humor denier refers to people who rarely use humor, their mean z-scores are below-average on each humor style; positive humor endorser means people who often use good humor, such as affiliative humor and self-enhancing humor, their mean z-scores are above-average on positive humor styles, but below-average on negative humor styles; and negative humor endorser refers to people who often use negative humor, such as aggressive humor and self-defeating humor, their mean z-scores are below-average on positive humor styles, but above-average on negative humor styles. Results indicated that general humor endorsers outperformed the other three clusters in creativity (Chang et al., 2015).

The positive correlation between creativity and humor is not only for children, but also consistently seen in all stages of life (Getzels & Jackson, 1962; Holmes, 2007; Humke & Schaefer, 1996; Jen, Chan, & Chen, 2011; Kovac, 2000; Lang & Lee, 2010; Liu, 1984; Liu, 1990; Rubin, Fein, & Vandenberg, 1983; Treadwell, 1970; Verma, 1981;
Wycoff & Pryor, 2003; Ziv, 1980). In a survey of sense of humor among school teachers, humor was significantly correlated with four creative thinking skills: imagination, flexibility, originality, and open-mindedness (Kerlinger & Pedhazur, 1967). Holmes (2007) analyzed the workplace interactions among white-collar workers in New Zealand and found that humor facilitated effective workplace relationships and workplace creativity. Research by Lang and Lee (2010) indicated that humor was significantly related to organizational creativity in the workplace; in particular, liberating humor had a positive correlation, while controlling humor had a negative correlation with workplace creativity. Also, stress-relieving humor showed no relationship with organizational creativity. Liberating humor refers to humor that helps to throw away old mind-sets and see things in a new light. Stress-relieving humor refers to humor that helps to release the pressure in the workplace. Finally, controlling humor refers to humor that implies commands, or reprimands, in order to carry out subtle control over the behavior of other people (Lang & Lee, 2010). Corresponding to Martin’s four humor styles (Martin et al., 2003), liberating humor is similar to affiliative humor since affiliative humor increases likability, and creates a positive environment; positive environment encourages openness to new ideas, while stress-relieving humor is similar to self-enhancing humor. Self-enhancing humor is a coping mechanism for handling stress, while controlling humor is similar to aggressive humor because aggressive humor in the workplace sometimes demonstrates an initiator’s power and gains the behavioral compliance of others (Scheel & Gockel, 2017). Previous research indicates that gelotophobes (i.e., people who have a fear of being laughed at; Titze, 1996) also appear to be humorless. Gelotophobia gives us an alternative perspective to see the connection between humor and creativity; to discuss it, Chan et al. (2013) analyzed data from 392 undergraduates and concluded that gelotophobia was negatively correlated with the score of divergent-feeling exercise from the Creativity Assessment Packet (Lin & Wang, 1994; Williams, 1980). Gelotophobia was also negatively correlated with the score of verbal-based test of New Test of Creative Thinking (Wu et al., 1998). Gelotophilia (i.e., the joy of being laughed at), in contrast, was positively correlated with the verbal-based test scores of the New Test of Creative Thinking and the scores of divergent-feeling exercises from the Creative Assessment Packet (Chan et al., 2013).

In general, people who enjoy laughter and have no fear of being teased have a stronger disposition toward being creative. A humorous atmosphere seems to encourage people to think outside the box and to think differently; as a consequence, humor inspires novel ideas.
HUMOR ENHANCES CREATIVITY IN COGNITION, EMOTION, AND MOTIVATION

In order to know why creativity and humor are strongly connected, it should begin with understanding the process of humor. The present section will introduce the process of humor, particularly in the cognitive path of the humor process, and the motivational and emotional paths of the humor process with the confluence model of humor process. Then, we will present the models that explain humor and creativity in the aspects of cognition, emotion, and motivation.

UNDERSTANDING THE HUMOR PROCESS: THE CONFLUENCE MODEL OF HUMOR PROCESS

How you define humor depends on your construction of the term. You can feel humor by how it presents itself, by what it brings to you, by how it changes you; humor pops up in a comedy, humor rushes to you with an inexplicable feeling, humor makes you laugh out loud, and humor can make your day. Humor contains humor development, the feeling of funny- ness, humor recognition, humor appreciation, and the ability to use it (Warnars-Kleverlaan, Oppenheimer, & Sherman, 1996). Martin et al. (2003) claimed that humor involved cognition, emotion, behavior, a physiological reaction, and a social interaction. They also later developed the Humor Styles Questionnaire, which evaluated four humor styles: affiliative humor, self-enhancing humor, aggressive humor, and self-defeating humor. Thorson and Powell (1993) developed the Multidimensional Sense of Humor Scale (MSHS) to observe humor with six perspectives: the ability to create humor, playfulness traits, using humor as an interpersonal manner, humor appreciation, approving of humor usage, and coping with humor. Humor consists of multiple concepts: Many studies discuss the humor process through different perspectives, including the cognitive, motivational, emotional, and behavioral aspects of humor. For an integrated account of humor, Chen and Hsu (2006) proposed the Confluence Model of Humor Process, which interpreted humor processing on the cognitive level, as well as on the emotional and motivational levels. The Confluence Model of Humor Process is described as follows.

The humor process begins with receiving humor stimuli, such as verbal jokes, in which an individual recognizes and receives the stimuli by two dimensions: humor structure and humor content. Humor structure means the way that stimuli are present and their attributes; it is usually about humor skills, such as exaggeration, mocking, pretending, contradiction, or double-meaning. On the other hand, humor content refers to
meanings, or topics of stimuli; e.g., sex, aggressive behaviors, or something ironic to the situation can make up humor content.

Once the humor stimuli are recognized by the individuals, the inner humor process activates. From a reception to a response, the humor process operates on two levels: the cognitive level, and the emotional and motivational level. The confluence model of humor process is illustrated through Fig. 4.2. Humor stimuli are varied, including printed jokes, such as funny pictures and cartoons. In order to interpret the confluence model of humor process, we take verbal jokes as an example.

On the cognitive level, the humor structure of stimuli is analyzed. Humor structure refers to the rhetorical skills used in the jokes; e.g., exaggeration, contradiction, double-meaning, and rhetorical skills are all humor skills. First, humor skills cause individuals a brief period of “all-of-a-sudden” in that momentary subconscious background. Another specific situation is called “incongruity,” which is usually accompanied by physiological arousals; e.g., being nervous, uncomfortable, or irritating. According to Cognitive Dissonance Theory (Festinger, 1957), when experiencing internal inconsistency, individuals will seek to reduce a

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FIGURE 4.2  Confluence model of humor process (Chen & Hsu, 2006).
psychologically uncomfortable by way of justifying cognition, or adding new elements to the cognition, that caused inconsistency. However, incongruity caused by humor is not easy to justify by ordinary ways of thinking; it requires individuals to give up their familiar or superior schemas, and to use novel or unique ones. This step is called “schema shifting.” Successful schema shifting resolves incongruity; otherwise, the weird feeling remains to individuals. Instead of using comprehensive and correct logic by performing schema shifting, paradoxical or sophisticated arguments will hit it; this only requires partial understanding of humor stimuli. If schema shifting is successful, it is called a “resolution,” which helps individuals to release physical tension. It takes some action, such as deep breathing and laughing, and individuals will then return to a restful state.

On the emotional and motivational levels, humor content of stimuli is decoded. Humor content usually involves challenging social norms or taboos, as well as attacking or ridiculing taboo subjects. One important function of humor is to skillfully release the instinct drives, such as death and sex (Freud, 1960). However, certain humor content does not directly present, but just implies, some indirect representations that speak for these inner forces, through inner processes of inference and elaboration. When people realize what humor content is actually about, and feel a little bit of challenging and teasing taboos, however, people tend to be less nervous, feel less pressure, and eventually, feel kind of amused.

Lastly, the response to humor stimuli is the feeling of being relaxed and feeling pleasure, as well as feeling the effect of external behaviors, such as smiling or laughing. Humor behaviors decrease psychological pressure. Sometimes, humor feedback comes with a feeling of superiority and an increase in self-esteem (Cantor & Zillmann, 1973; Hsu, Chen, & Chiou, 2005). However, an overdose of humor might bother other people. A positive use of humor should not establish happiness through others’ pain, but rather, positive humor use can be helpful to establish interpersonal harmony and retrospection on life.

Regarding the mechanism by which humor helps creativity, many models contributed their interpretations (Chen et al., 2001; Wyer & Collins, 1992; Zillman, 1983). Every model has its unique and powerful viewpoints. In general, these viewpoints can be classified into cognitive, motivational, and emotional perspectives.

Wicker (1985) analyzed humorous articles about the content, structure, and rhetoric skills, and concluded that the incongruity-resolution
process of humor, context inconsistency, and metaphor ambiguity were not only the sources of free and playful atmosphere, but also the creative performance, themselves. Murdock and Ganim (1993) conducted a content analysis on 13 important definitions and 11 humor-dominant theories mentioned in the previous studies. They found that the definitions and measurements were different among these studies; there was also a significant correlation between creativity and humor sense. These two concepts are similar in theoretical structures.

Theories interpret the humor process through a cognitive perspective, including the Incongruent-Resolution Theory (Suls, 1972, 1977), the Comprehension-Elaboration Theory (Wyer & Collins, 1992), and the Opposition-Coherence Theory of Humor (Chen, 1995; Chen et al., 2001). All these theories agree that humor comprehension has several stages. First, individuals shift from an original and dominant schema to opposite and conflicting schemas. Then, for making schema shifting happen, individuals have to find a reasonable link between these schemas through particular methods, such as creative thinking skills. These methods help individuals to think of, or link to, rarely used schemas that would never come to mind in an original situation, but are really helpful to creativity. Therefore, the cognitive process of humor—namely humor comprehension—includes the following stages: Individuals receive the stimuli that are inconsistent to preexisting schemas, so unexpected experiences happen in order to find some solutions; individuals have to give up the original schema, but try new or opposite schema in current situation; during the process of humor comprehension, the skills used by individuals—such as thinking outside the box, a breakthrough of conventions, and using new interpretation—all together are an exact procedure that pushes individuals to use some important skills of creativity.

Creativity and humor are not two separate mental processes. Instead, humor usage is an indicator to evaluate the potential of creativity; the better the humor comprehension, the higher the creativity. This finding is not only for adults, but also for children as well (Bleedorn, 1982).

HUMOR HELPS CREATIVITY FROM AN EMOTIONAL PERSPECTIVE

Humor helps people to release their inner drive, to develop wide and openness to new situations, as well as to break the restrictions by freeing your imagination.

Problems, or difficult situations, sometimes make people felt uncomfortable and anxious; however, humor brings positive power to people by delivering relaxing signals. The Excess Energy Theory of
Humor interprets that inner emotions, such as anger, would continuously gather and occupy psychological resources and eventually lead to mental unbalance. Releasing oneself from these inner drives is the only solution the superego is monitoring (Freud, 1960; Spencer, 1860). However, a funny joke can open a gateway; once the inner pressure is relieved, individuals can manage their inner resources to solve problems, or even to create new solutions. Humorous situations release individuals from anxiety; therefore, helping the learning process and creative performance (Smith, Ascough, Ettinger, & Nellson, 1971).

The cognitive tuning model claims that personal feelings are indicators to danger and safety, in which individuals adjust their bodily awareness and cognitive system accordingly (Morris, 1989). Bad moods imply external threats, or a lack of psychological resources, so that individuals would rather be conservative while decoding external information. On the contrary, positive feelings indicate a welcome and open atmosphere; certainly, individuals would free the imagination, which results in creative performance (Fiedler, 1988; Schwarz, 1990).

The broaden-and-build theory (Fredrickson, 2004) says that positive emotions can broaden our thinking and action scope, which results in creative performance. It is what humor does; humor helps us to find happiness again. The first key proposition of the broaden-and-build theory claims that a subset of positive emotions—including joy, interest, contentment, and love—broadens an individual’s thought–action repertoire, since these emotions initiate individuals’ want to play, explore, appreciate and integrate, and stay in a close relationship (Fredrickson, 2004). Among these emotions, joy can be invoked by humor because humorous things often make people smile from the bottom of their heart. Humor is defined as having a strong character, liking to laugh, finding enjoyment in making jokes, making people smile, and believing in the bright side no matter how difficult situations are (Park, Peterson, & Seligman, 2004).

The broaden-and-build theory has a second key component that claims that these broadened mind-sets help individuals to look for novel and creative outputs, as well as interpersonal bonding, which eventually enriches an individual’s personal resources. The broaden-and-build theory points out the importance and the influence of positive emotions toward an individual’s personal thinking and behavior; these positive emotions direct individuals to seek creative outcomes. Humor is one definite resource of positive emotions, and includes joy, happiness, and pleasure.

Humor makes people relax, builds positive attitudes, and forms the atmosphere of playfulness; humor cues a welcome for trial-and-error, so that the fear of being judged and dread of being mocked are no longer a concern. Humor is not only a manner to cope in difficult situations, but also a way back into being creative.
HUMOR HELPS CREATIVITY FROM A MOTIVATIONAL PERSPECTIVE

The major element of intrinsic motivation includes self-determination, competence, task involvement, curiosity, enjoyment, and interest (Amabile et al., 1994). Intrinsic motivation is strongly related to personal performance, acquired knowledge, memory, positive emotions, and commitment to future career, as well as physical and psychological health (Deci & Ryan, 1992). Interesting things enhance internal motivation. As past studies indicated that creative people often have fun with their work, rather than seeing work as a duty, people with creativity take work as a hobby, a game, and have strong internal motivation; e.g., students who like to write and enjoy poetry themselves eventually harvest and develop more creative outcomes in their writing class (Amabile, 1983). Students who happily write will also complete the task with a higher level of creativity (Hill, 1991). If individuals can be truly happy and enjoy themselves during creative activities, it will turn into powerful intrinsic motivation and drive individuals to create.

Humor brings pleasure to people, pleasure enhances internal motivation, and internal motivation leads to being creative. Therefore, using humor skills to increase internal motivation and build learning atmosphere is generally seen and applied in school learning. Humor provides some classroom magic to build a positive learning environment (Ferguson & Campinha-Bacote, 1989; Hill, 1988; Schwarz, 1989; Walter, 1990; Warnock, 1989). Humor also improves personal interest and internal motivation (Robinson, 1977); teaching with humor helps students to have better performed school works (Ziv, 1988). Humor encourages students’ learning interests (Dodge & Rossett, 1982). It also increases positive attitudes toward being creative in class (Powell & Andresen, 1985), and appropriate humor enhances students’ comprehension and attention to learning material in the class (Powell & Andresen, 1985). Humor improves students’ ability to understand, learn various subjects, and evaluate teachers (Johnson, Johnson, & Smith, 1991). Finally, it increases students’ attention and motivation (Wandersee, 1982). Humor integrates motivational classroom elements, so that the teacher and students will both engage themselves in the learning process (Kher, Molstad, & Donahue, 1999).

In this section, we talk about how humor improves creativity in cognition, emotion, and motivation, as well as many models that claimed the benefits of humor for creativity. Humor comprehension is actually a creative thinking process, and understanding the humor stimuli is just like giving individuals creativity training. Humor helps individuals to find the way back to creativity because humor indicates a relaxing and
safe atmosphere, and frees individuals’ imaginations. Humor naturally makes people happy, and happy people are self-motivated and willing to try to learn. To demonstrate the power of humor for creativity, a systematic design of humor training material and a series of teaching courses have been implemented to empirically support the notion that humor indeed enhances creativity (Chen, 2004; Chen & Hsu, 2006). This training program will be introduced in the next section.

CREATIVITY INCREASES AFTER HUMOR TRAINING: A HUMOR TRAINING PROGRAM AND TEACHING EXPERIMENTS

The helpful and beneficial role of humor for creativity is not only proposed by theoretical models, but also verified in experimental conditions in the past studies. For example, Jurcova (1998) has invited participants to create captions for articles describing daily conflictive situations. Then, if participants were asked to create interesting and humorous captions in the beginning of the task, the titles of these materials would be developed with totally different perspectives, and the outcomes were found to be more creative. Both the development of humor and the creativity process start at one point, which is through knowing the weakness of current thinking patterns. During the process of understanding a joke, readers would be surprised; the inexplicable feeling makes readers question, challenge, and destroy the formerly deemed superior schema. Readers use a whole new context to interpret the joke itself and, therefore, have a new interpretation of this process. The process discussed is agreeable to the flexibility and originality claimed by Torrance, but also to the divergent thinking proposed by Guilford.

Sense of humor can be trained (Nevo, Aharonson, & Klingman, 1998; Salameh, 2007; Wu, Liu, Kuo, Chen, & Chang, 2016; Ziv, 1988). Many studies develop humor training courses and are used in the fields of education, clinical health, and special education, as well as other fields (Cai, Yu, Rong, & Zhong, 2014; Chen & Hsu, 2006; Chiou, Chen, & Cho, 2003; Falkenberg, Buchkremer, Bartels, & Wild, 2011; Nevo et al., 1998; Payo, 1993; Salameh, 2007; Wu et al., 2016; Ziv, 1988). After a humor creation course was taught for 10 hours a week, Chiou et al. (2003) indicated that undergraduates had significantly improved their humor skills. Humor training is also effective for people with special needs. Falkenberg et al. (2011) implemented an 8-week humor training course for people with major depression; their tendency of using humor as a coping strategy increased after training. Wu et al. (2016) held a 15-hour
humor skills workshop for people with autism spectrum disorder, and found their comprehension and appreciation of nonsense jokes increased after the workshop.

Overall, creativity and humor are significantly correlated, and humor comprehension is similar to the creative thinking process. Sense of humor can also be improved with training: An idea was developed that increasing sense of humor would benefit creativity. In order to implement this idea, Chen and colleagues designed a humor training program according to the four facets of humor—cognition, emotion, motivation, and behavior—and implemented teaching experiments. The detail of this training program is described as follows (Chen, 2004; Chen & Hsu, 2006).

**HUMOR TRAINING PROGRAM**

**Course Design and Teaching Strategies**

This humor training course was developed according to the cognitive, emotional, motivational, and behavioral facets of humor, and every facet of humor has its own specific teaching strategy.

Regarding the design for the motivation to use humor, after training, participants were expected to increase their tendency toward humor usage. Therefore, the course was designed to make participants understand the importance of humor, believe that they can be more humorous, and appreciate and create humorous things. Teaching strategies for the motivation of engaging in humor are lecture, demonstration, and reinforcement.

Relating to the design to measure the cognition of humor, the training program focuses on three topics: strengthening positive life beliefs, enlarging the database of humor repertoire, and increasing the sensitivity of meta-messages and humor skills. First, the program aims at making participants more open-minded, less judgmental (Moody, 1978), able to accept uncertainty, enjoy imagination, willing to change and welcome new ideas, being funny and childish (Kris, 1952), being aware of harmful thoughts to self (Ellis, 1973), and being able to relax. Then, in order to enrich the humor repertoire database, the program arranges participants to read lots of humorous materials, including jokes, funny news, tag lines, jingling rhymes, and amusing events in daily life. It also asks participants to present these humorous materials after reading. Lastly, for improving meta-message sensitivity and humor skills, the program lectures on the humor skills in these materials, such as exaggeration and funny verbal expressions (Goodman, 1983), double-meaning or ambiguous elements (Chen, 1995), and how to cognitively...
shift (Morreall, 1987) and temporally distort partial reality. Teaching strategies for the cognition of humor are to develop positive life beliefs, to enlarge the humor repertoire, and to practice humor skills.

Regarding the change for the emotions behind humor, the training program guides participants in the ability to emotionally shift (Morreall, 1987), in finding their inner child (Kris, 1952), in temporally denying the actual state, in expressing anger, and anxiety with humor skills (Freud, 1960), in coping with pressure with humor, and in laughing at themselves and accepting that no one is perfect. Teaching strategies for the emotion behind humor includes playing games, learning through practice, the introspection, or encouragement for expressing your inner feelings, and role-playing in high-pressure situations.

After training, participants would change behaviorally by frequently showing an appreciation for humor, making life events humorous—such as smiling or laughing—and laughing with people, instead of laughing at others. To increase humorous behaviors, teaching strategies include practicing using humor through these tasks, so that participants can get used to using humor skills.

Course Topics

The training course had eight topics, including knowing humor, expressing humor, overcoming the fear of being humorous, a humor scripts rehearsal, humor creation skills, coping with humor, avoiding bad humor, and laughing practice. The course starts with an understanding of the nature of humor and its functions in emotion, cognition, motivation, social, and physiological influences. Through telling verbal jokes, participants learn an effective expression of humor, as well as the timing and situation of telling jokes; by doing so, they overcome the fear of doing something funny. Then, participants move on to rehearse the humor scripts, practice creating humor and the development of humor skills, as well as using humor skills to cope with difficult life events. Lastly, the course guides participants in how to tell the difference between bad and good humor. It also encourages participants to laugh out loud, which is a function of laughing. This laughing in daily life is also introduced in the class.

TEACHING EXPERIMENTS

To verify the effect of the humor training program, Chen and colleagues (Chen, 2004; Chen & Hsu, 2006) also conducted teaching
experiments accordingly. The experimental design and training results are introduced as follows.

Experimental Design, Method, and Participant Description

To compare the effect of the training program, Chen and colleagues invited voluntary participants by a posters including information about the study and randomly assigned them into an experimental group and a control group. The experimental group took the course, and took a pretest and posttest on creativity and sense of humor. The control group did not take the course, but also took the pretest and the posttest at the same time as the experimental group did. In the experimental group, there were 20 undergraduate students and 35 adults; in the control group, there were 35 undergraduate students and 35 adults.

To measure their sense of humor and creativity, Chen and colleagues used the following measurements: the MSHS (Chen & Chen, 2005) to measure their sense of humor, the New Test of Creative Thinking (Wu et al., 1998) for the cognition of creativity, and the exercise of divergent feelings in the Creativity Assessment Packet (Lin & Wang, 1994; Williams, 1980) for the disposition of creativity. Chen and colleagues interviewed undergraduates about their feelings after every class; however, instead of interviewing, adults were evaluated about their life changes after the course with the Creative Life Experience Questionnaire (Wu et al., 1996). The humor training program was a total of 30–36 hours. The experimental group finished the program. Both the undergraduates and the adults in the experimental group as well as the undergraduates in the control group completed all the measurements; however, for the adult sample in the control group, 28 of them completed the MSHS (Chen & Chen, 2005), 33 of them completed the New Test of Creative Thinking (Wu et al., 1998), and all of them finished the exercise of divergent feelings in the Creativity Assessment Packet (Lin & Wang, 1994; Williams, 1980).

Results

Data was analyzed by a statistical analysis of covariance (ANCOVA). First, the data of both groups conformed to the hypotheses: parallelism and equality of intercepts existed in all three assessments.

The results of the ANCOVA indicated that after the humor training course, there was a change in sense of humor that was different between the two groups. The experimental group increased significantly in their sense of humor more than the control group (undergraduate sample, Wilks = 0.603, F(6,42) = 4.62, P < .01; adult sample, Wilks...
In particular, the undergraduate sample and the adult sample had different patterns of change. For the undergraduate sample, the changes were most significant in humor coping (P < .001) and tendency to laugh (P < .001), and then in humor comprehension (P < .01), humor creation (P < .01), humor in interpersonal situation (P < .01), and humor attitude (P < .01), (Chen, 2004). For the adult sample, the changes were most significant in humor creation (P < .001), then in humor in an interpersonal situation (P < .01), humor coping (P < .01), humor attitude (P < .01), and tendency to laugh (P < .01). However, there were not any significant findings in change of humor comprehension for the adult sample (P > .05) (Chen & Hsu, 2006). Table 4.1 lists the ANCOVA results for the MSHS for the undergraduate sample and Table 4.2 lists the same scale for the adult sample.

As for the performance of creativity after humor training, the results of the New Test of Creative Thinking assessment showed a change in creative thinking that was different between the two groups; the experiment group had a greater increase in creative thinking than the control group after the humor training course (undergraduate sample, Wilks = 0.682, F(7,40) = 2.66, P < .05; adult sample, Wilks = 0.64, F(7,52) = 4.14, P < .01) (Chen, 2004; Chen & Hsu, 2006). Also, the undergraduate sample and adult sample had different patterns of change in creative thinking; the undergraduate sample improved particularly in verbal fluency (P < .05), figure fluency (P < .001), figure originality (P < .001), and figure elaboration (P < .05). However, there were no significant changes in verbal flexibility (P > .05), verbal originality (P > .05), and figure flexibility (P > .05) for the undergraduate sample (Chen, 2004). The adult sample improved largely in verbal fluency (P < .05), verbal flexibility (P < .01), figure fluency (P < .001), and figure flexibility (P < .01), but there were no significant findings in figure originality (P > .05) and figure elaboration (P > .05) (Chen & Hsu, 2006). Table 4.3 lists the ANCOVA results for the New Test of Creative Thinking for the undergraduate sample, and Table 4.4 lists the results for the adult sample.

Lastly, for the change in creative disposition, there were not significant differences between the two groups for both samples after the course (undergraduate sample, Wilks = 0.93, F(4,46) = 8.27, P > .05; adult sample, Wilks = 0.93, F(4,40) = 1.18, P > .05) (Chen, 2004; Chen & Hsu, 2006). Tables 4.5 and 4.6 list the ANCOVA results for the exercise involving divergent feelings in the Creativity Assessment Packet for the undergraduate sample and the adult sample, respectively.

In the training course interviews, 90% of undergraduates indicated that the training course made their thinking and behavior more open and more creative, and were more curious about all things than before. Also, 84% of undergraduates were more willing to take risks, and 95%
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<td>Humor comprehension</td>
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<td>Humor creation</td>
<td>3.20 (0.89)</td>
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<td>Humor in social situation</td>
<td>2.96 (0.96)</td>
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<td>Humor coping</td>
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<td>Humor attitude</td>
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<td>4.46 (0.47)</td>
<td>4.54</td>
<td>4.45 (0.48)</td>
<td>4.26 (0.49)</td>
</tr>
<tr>
<td>Tendency of laugh</td>
<td>3.11 (0.62)</td>
<td>3.58 (0.73)</td>
<td>3.80</td>
<td>3.49 (0.77)</td>
<td>3.47 (0.88)</td>
</tr>
</tbody>
</table>

Wilks = 0.603, $F(6,42) = 4.62$, $P < .01$ (Chen, 2004).

* $P < .05$, ** $P < .01$, *** $P < .001$.  

<table>
<thead>
<tr>
<th></th>
<th>Experimental group (N = 34)</th>
<th>Control group (N = 28)</th>
<th>T-test</th>
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<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
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</tr>
<tr>
<td>Humor comprehension</td>
<td>3.65 (0.38)</td>
<td>3.79 (0.29)</td>
<td>3.80</td>
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<tr>
<td>Humor creation</td>
<td>3.11 (0.78)</td>
<td>4.06 (0.86)</td>
<td>4.18</td>
</tr>
<tr>
<td>Humor in social situation</td>
<td>2.81 (0.87)</td>
<td>3.41 (0.82)</td>
<td>3.52</td>
</tr>
<tr>
<td>Humor coping</td>
<td>3.51 (0.64)</td>
<td>3.89 (0.54)</td>
<td>3.94</td>
</tr>
<tr>
<td>Humor attitude</td>
<td>4.19 (0.64)</td>
<td>4.56 (0.38)</td>
<td>4.59</td>
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<tr>
<td>Tendency of laugh</td>
<td>3.23 (0.63)</td>
<td>3.62 (0.69)</td>
<td>3.70</td>
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</table>

Wilks = 0.554, $F(6,49) = 6.57$, $P < .001$ (Chen & Hsu, 2006).

*P < .05, **P < .01, ***P < .001.
## TABLE 4.3 ANCOVA Results of New Test of Creative Thinking for Undergraduates

<table>
<thead>
<tr>
<th></th>
<th>Experimental group (N = 20)</th>
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<th></th>
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<th>Control group (N = 35)</th>
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<th></th>
<th></th>
<th></th>
<th>T-test</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>Posttest</td>
<td>Adjusted mean</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Adjusted mean</td>
<td>T-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal fluency</td>
<td>12.8 (5.20)</td>
<td>17.4 (6.78)</td>
<td>18.72</td>
<td>15.41 (9.06)</td>
<td>16.23 (9.07)</td>
<td>15.47</td>
<td>2.08*</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Verbal flexibility</td>
<td>8.30 (2.57)</td>
<td>9.80 (3.13)</td>
<td>10.09</td>
<td>9.00 (2.99)</td>
<td>9.20 (2.69)</td>
<td>9.03</td>
<td>1.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal originality</td>
<td>7.45 (4.76)</td>
<td>11.45 (6.99)</td>
<td>12.53</td>
<td>9.26 (9.61)</td>
<td>10.49 (10.42)</td>
<td>9.86</td>
<td>1.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Figural fluency</td>
<td>15.75 (5.74)</td>
<td>22.00 (6.72)</td>
<td>22.07</td>
<td>15.91 (6.20)</td>
<td>17.51 (5.10)</td>
<td>17.47</td>
<td>4.05***</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Figural flexibility</td>
<td>9.90 (2.78)</td>
<td>12.30 (2.75)</td>
<td>12.45</td>
<td>10.46 (3.04)</td>
<td>11.03 (2.48)</td>
<td>10.94</td>
<td>1.79</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Figural originality</td>
<td>11.25 (5.76)</td>
<td>15.55 (7.66)</td>
<td>15.29</td>
<td>10.69 (6.58)</td>
<td>10.71 (5.41)</td>
<td>10.86</td>
<td>3.52***</td>
<td></td>
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</tr>
<tr>
<td>Figural elaboration</td>
<td>9.75 (4.11)</td>
<td>11.80 (4.90)</td>
<td>11.34</td>
<td>8.60 (4.77)</td>
<td>8.43 (4.43)</td>
<td>8.69</td>
<td>2.62*</td>
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</tr>
</tbody>
</table>

Wilks = 0.682, $F(7,40) = 2.66$, $P < 0.05$ (Chen, 2004).

*P < .05, **P < .01, ***P < .001.
<table>
<thead>
<tr>
<th></th>
<th>Experimental group (N = 34)</th>
<th>Control group (N = 28)</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest Mean (SD)</td>
<td>Posttest Mean (SD)</td>
<td>Adjusted mean Mean (SD)</td>
</tr>
<tr>
<td>Verbal fluency</td>
<td>20.53 (7.64)</td>
<td>25.62 (10.25)</td>
<td>23.29</td>
</tr>
<tr>
<td>Verbal flexibility</td>
<td>11.29 (2.50)</td>
<td>12.29 (3.02)</td>
<td>11.92</td>
</tr>
<tr>
<td>Verbal originality</td>
<td>14.06 (8.43)</td>
<td>20.26 (13.87)</td>
<td>16.69</td>
</tr>
<tr>
<td>Figural fluency</td>
<td>16.79 (4.60)</td>
<td>23.21 (5.87)</td>
<td>23.71</td>
</tr>
<tr>
<td>Figural flexibility</td>
<td>10.88 (2.57)</td>
<td>13.26 (2.45)</td>
<td>13.49</td>
</tr>
<tr>
<td>Figural originality</td>
<td>12.03 (5.81)</td>
<td>18.35 (8.03)</td>
<td>17.99</td>
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<tr>
<td>Figural elaboration</td>
<td>4.68 (3.18)</td>
<td>4.21 (1.93)</td>
<td>4.17</td>
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</tbody>
</table>

Wilks $= 0.64, F(7, 52) = 4.14, P < .01$ (Chen & Hsu, 2006).

*P < .05, **P < .01, ***P < .001.
### TABLE 4.5 ANCOVA Results of the Exercise of Divergent Feeling in the Creativity Assessment Packet for Undergraduates

<table>
<thead>
<tr>
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<th>Experimental group (N = 20)</th>
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</tr>
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<tbody>
<tr>
<td></td>
<td>Pretest Mean (SD)</td>
<td>Posttest Mean (SD)</td>
</tr>
<tr>
<td>Risk-taking</td>
<td>2.10 (0.23)</td>
<td>2.20 (0.21)</td>
</tr>
<tr>
<td>Curiosity</td>
<td>2.06 (0.24)</td>
<td>2.14 (0.25)</td>
</tr>
<tr>
<td>Imagination</td>
<td>2.08 (0.21)</td>
<td>2.13 (0.23)</td>
</tr>
<tr>
<td>Complexity</td>
<td>2.15 (0.13)</td>
<td>2.16 (0.20)</td>
</tr>
</tbody>
</table>

Wilks = 0.933, $F(4,46) = 8.27$, $P < .05$ (Chen, 2004).

* $P < .05$, ** $P < .01$, *** $P < .001$. 
<table>
<thead>
<tr>
<th></th>
<th>Experimental group (N = 34)</th>
<th>Control group (N = 35)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td><strong>Adjusted mean</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk-taking</td>
<td>2.07 (0.20)</td>
<td>2.20 (0.23)</td>
</tr>
<tr>
<td>Curiosity</td>
<td>1.96 (0.22)</td>
<td>2.18 (0.28)</td>
</tr>
<tr>
<td>Imagination</td>
<td>2.00 (0.22)</td>
<td>2.11 (0.30)</td>
</tr>
<tr>
<td>Complexity</td>
<td>2.12 (0.15)</td>
<td>2.29 (0.29)</td>
</tr>
</tbody>
</table>

Wilks = 0.93, F(4,60) = 1.18, \( p < .05 \) (Chen & Hsu, 2006).

*\( p < .05 \), **\( p < .01 \), ***\( p < .001 \).
of undergraduates said that this humor training course did indeed increase their creativity. For the discussion of creative events for the adult sample, the results of the Creative Life Experience Questionnaire indicated that participants reported more creative life events after the humor training course, including performance act and creation ($P < .05$), lifestyle change ($P < .05$), open-mindedness ($P < .01$), and surprises in life ($P < .001$).

Generally, sufficient humor experiences made people change their sense of humor, show improvement in creativity, and lead a more interesting daily life.

**CONCLUSION**

People with a sense of humor usually have higher creativity (Getzels & Jackson, 1962; Humke & Schaefer, 1996; Kovac, 2000; Treadwell, 1970; Verma, 1981; Ziv, 1980), and humor is also one facet of creativity (Amabile, 1987; VanGundy, 1984). In this chapter, we briefly described that past research has found the connection between creativity and humor. In order to discuss the relationship between creativity and humor, it has to start with knowing the process of humor; therefore, we used the Confluence Model of Humor Process to explain the process of humor. We also introduced several models that included the cognitive, emotional, and motivational levels of humor to interpret why humor facilitates creativity: In the cognitive perspective, that process of humor comprehension is similar to the practice of creativity skills; in the emotional perspective, humor makes individuals relaxed and happy. It also builds the atmosphere of playfulness and helps people to find the way back to being creative, while in the motivational perspective, humor brings joy to people, which enhances their internal motivation, and therefore, drives people to being more creative. To demonstrate the influence of humor to creativity, Chen and colleagues developed a humor training program and conducted the teaching experiments to compare the training effect between the experimental and control groups. Results provided empirical support that humor enhances creativity; after the humor training course, the experimental group had a greater improvement of humor sense and creative thinking than the control group. Regarding the change of creative thinking for the undergraduate sample, there was a more prominent effect in the experimental group than the control group, especially in verbal fluency, figural fluency, figural originality, and figural elaboration. For the adult sample, the change in creative thinking was more prominent in the experimental group than the control group, particularly in verbal fluency, verbal flexibility, figural fluency, and figural flexibility. The effect of the humor training course was not significant in
the change in creativity disposition, and the experimental group reported a change in the way of thinking; behavior was also found to be more open and creative, and for participants to report more interesting and creative life events. In general, humor is the wind beneath the wings of creativity, giving the effective experience of “Ha-Ha,” which helped more people to experience “A-Ha.”

Acknowledgments

This work was financially supported by the “Institute for Research Excellence in Learning Sciences” and “Chinese Language and Technology Center” of National Taiwan Normal University (NTNU) from The Featured Areas Research Center Program within the framework of the Higher Education Sprout Project by the Ministry of Education (MOE) in Taiwan.

References


REFERENCES


