Chapter One

Introduction

Interaction relationship comprehension theory suggests that pictorial memory is based on understanding the relationship among the contents of a picture more than understanding the content itself; the content of the picture is of secondary importance (Brooke, 1977). For example, compare two pictures of the same subjects, a bed and a house. The first picture presents an interaction between the bed and the house and shows the bed banging against the house. The second is a still picture that does not contain an action between the two variables. The students will recall the picture that has action lines more than the still picture; the interaction relationship helps students to remember the nature of the picture. Brooke (1977) claimed that students remember the interaction between details more than they remember the details themselves. Interaction helps students to determine the nature of the relationship among the details (Brooke, 1977).

The cartoon is an art form that has become an important visual language affecting human emotions and spreading a message with symbols that provoke the reader using funny lines and shapes. One of their uses is as devices in classrooms to facilitate learning for both children and adults (Ball, 1982; Eulie, 1969; Nelson, 1975; Smith & Leptich, 1963; Wright, 1982). Cartoons' exaggeration of lines, size, shape, and meaning have interested and excited children, adolescents, and adults alike (Nelson, 1975; Wright, 1982). They attract the eye at first, then draw the mind into a world of fantasy and fun (Wright, 1982). Specifically, political cartoons have been investigated by many educators (Bedient & Moore, 1985; Entin, 1958; Sheffer, 1930), who suggest that understanding and interpreting political cartoons, in particular, is based on the students' background.

Individuals process information differently, in that each individual has multiple concepts that enable him/her to represent his/her individuality with respect to both cognitive and non-cognitive variables. Human sensors determine what and how much information a person acquires from instructional presentations. The effect of internal drive and external stimuli have to be considered when attempting to change behavior through the learning process (Dwyer, 1978). The most important theory related to understanding individual differences is field dependence/independence cognitive style (field dependence/field independence), which is concerned with individual differences and the way people acquire and process information.

The roots of field-dependence/independence go back to the 1940s when Witkin and his associates started to investigate differentiation in human perception (Witkin, 1976). From then until the present, an increasing number of researchers have applied this concept to educational problems (Witkin et al., 1977). These researchers focus on the differentiation of individuals and how they perceive and process information within the medium or methods.

Purpose of the study

In the area of instructional technology, educators do not believe that there is one best instructional procedure to teach all individuals (Dwyer, 1978). The purpose of this study is to find out if the exaggeration of elements within cartoons packaged in two formats differentially affect the achievement of field-dependent students possessing different levels of field dependence when they learn English grammar. The hypothesis is that the cartoon's exaggeration enhance the ability of the field-dependent student to

understand English grammar concepts. The questions are the following: Will relevant cues be more salient for field-dependent learners when the exaggeration of the cartoons is employed for coding visuals? Can the exaggeration of cartoons be more effective than no exaggeration?

The need for the study

Human characteristics are a complex of natural ability and environmental experiences that make people differ based on styles of acquiring and processing information and their learning ability. Many studies indicate that instruction has to be designed based on different variables of the individual, and educators have to consider these variables in developing learning strategies (Dwyer, 1978). Cognitive style is a concept that refers to psychological dimensions that represent individual differences in acquiring and processing information, so the characteristic of cognitive style is consistent over time (Ausburn & Ausburn, 1978; Goodenough, 1976). Field-dependence/independence is an aspect of the cognitive style family (Witkin, 1976). Field-dependence/independence is defined as an analytic as opposed to global style of perception. The individual of field-dependence/independence analyzes existing organization and restructures information for meaning when necessary.

A person characterized as field-independent tends to perceive visual stimuli separate from the overall visual context. This person relies on internal cues; he/she has the ability to disembed, organize, and structure information. The field dependent person is passive. This person may have difficulty recalling information if relevant cues are not salient. The learner tends to remember the most important cues in the stimuli whether or

not they are relevant, which may not be effective. However, a field-dependent individual needs a special technique to make salient the relevant cues that would facilitate information recall (Witkin et al, 1977). The assessment of field-dependent learners would depend on the amount of new information they acquire when they use a certain visual strategy. This individual tends to perceive the information in its totality and accept the organization structure as it exists, often missing the most relevant clues; this person tends to rely on the external environmental field for perceptual cues (Witkin, 1949; Witkin & Goodenough, 1981). Field-dependence/independence has been investigated by many researchers for the purpose of understanding the relationship of this construct to various aspects of cognition and teaching/learning strategies (Witkin, 1976).

There are many studies that have been conducted to determine how field-dependence/independence relates to information processing (Canelos & Taylor, 1981; Coward & Lang, 1979; Frank & Keene, 1996; Moore, 1985; Packard, 1996; Reardon & Moore, 1985; and Wise, 1984). These studies explored the relationship between field-dependence-independence cognitive style and the type of visual presentation. Dwyer (1978) suggested that there are many effective teaching strategies that have been used successfully under various conditions. However, these particular strategies might not work under some conditions and there is no teaching strategy that can work under all conditions. The cartoon, as a device that facilitates learning, was investigated by many specialists who have tried to encourage educators to employ cartoons to improve students' achievement. Entin (1958) indicated that cartoons improved classroom discussion. Smith and Leptich (1963), who indicated that teachers would use cartoons more effectively if the cartoons provided information that related to instruction, also

found that cartoons are easily understood by students because they are humorous simple line drawings. Moreover, some studies indicated that cartoons are understood by adults more than by young children (Bedient & Moore, 1985; Brooke, 1977; Entin, 1958; Sheffer, 1930).

Only one study, by Hunter, Moore, and Sewell (1990), connected the two variables, field-dependence and cartoons. The results of that study suggested that this relationship, needs to be investigated further, which is the main purpose of this study. Hunter, Moore, and Sewell (1990) studied the individual's ability to interpret editorial cartoons. The results indicated that there were no significant differences between field-dependent and field independent students in the interpretation of editorial cartoons. It was suggested that the reason that field independent students failed to be superior over field-dependent students might be because of the exaggeration that the artists used in features, line drawings, and shades. The exaggeration was used as a salient cue by field-dependent students, which helped them to interpret the editorial cartoons. If the authors' assertion were true, then the exaggeration in the cartoons would facilitate learning for field-dependent students. The current study will test Hunter, Moore, and Sewell's suggestion (1990) that exaggeration can be used as a learning strategy that facilitates learning for field-dependent students. Hunter, Moore, and Sewell (1990) framed the hypothesis of the current research, which holds that field-dependent learners will be affected by the exaggeration of the cartoons' coded visuals more than by the lack of exaggeration of drawings' coded visuals in perceiving visual cues as more salient and identifiable. Field-dependent learners are affected by cues that are salient (Goodenough, 1976), and their

performance is improved when structure, media plan, or instruction is provided for them (Witkin, 1977).

In the cartoons, the exaggeration might be in the meaning of the illustration, the action that is illustrated, or the line drawing, features and shades. Brook (1977) indicated that the action lines serve as clues that facilitated recall of entire details in the picture. Smith (1996) indicated that there are two ways that the humor in the cartoons can benefit from principles of visual organization. First, these principles can act as codes in the cartoons when they supply the missing elements of reality. For example, a balloon in the cartoons indicates a speaker, and a series of lines gives motion to the still cartoon. Second, when cartoons emphasize or exaggerate the important visual elements to readers, these elements become the code of the cartoon, so people do not have to consider all the meaning in the cartoons (Fein & Kasher, 1996).

Review of the Literature

To support the development of this study, the literature discussing these specific areas were investigated: superiority in remembering visual over verbal stimuli, the encoding and retrieving of information, the superiority of simple line drawings over complex details, the attributes of cartoons that facilitate encoding, cognitive style, and test develpment.

Visual Memory

Visual memory has the capacity to store large amounts of details from visual information (Shepard, 1967; Standing, Canezio & Haber, 1970). Individuals will perform

with high recognition when they recall details from pictures. In Dual-Coding theory, Pavio (1971) assumed that pictures have superiority for encoding information in the memory over concrete words or abstract words. A number of studies (Bazeli & Bazeli, 1992; Hitch et al., 1989; Shepard, 1967; Snodgrass et al., 1972) investigated the effect of visual and verbal materials on human memory, and they found that visual information is stronger than verbal information in facilitating recall. Dwyer (1977) suggested that increasing the amount of realistic details that are contained in the illustration does not mean that the amount of information that is acquired by students will increase. Wu and Dwyer (1986) suggested that, when code is used in print examples, students would be helped to concentrate on the most important information and reduce the time required for processing the information.

Some studies (Abed, 1991; Brook, 1977; Dwyer, 1985; King, 1989; Pezdek & Chen, 1982) indicated that simple line drawings have superiority over complex details in facilitating learning. Case (1975) found that students sometimes fail to learn; he attributed this problem to the amount of information to be learned being greater than the capacity of the short term memory that is available to process this information. Another reason for students' failure to learn is the capacity to overcome the barriers of problem solving without any help from another person. Jenning and Dwyer (1985) found the use of both simple and elaborate visual cueing was that equally effective in facilitating student achievement. Travers (1964) suggested that the transmission system has to provide an effective means of external storage and the learner has to be flooded with realistic information. Effective communication simplifies the external information by separating the important elements of the message from the less important elements. So,

when the learner fails to make the separation, the teacher will make the separation for him/her, and the teacher's role is compatible both with the objectives of learning and with the information handling mechanism of the learner. Green and Purohit (1976) tested recognition memory for pictures. The results suggested that complex, detailed pictures would affect recognition memory more than pictures that contained less complex details. Their results showed that complexity improved recognition memory.

The Dual-coding theory (Pavio, 1971; Pavio 1986) indicates that verbal and visual information are encoded by different systems, one system for visual images and the other for verbal language. The two systems are interconnected, in that when stimuli are represented as an image in the visual system, they can be represented as verbal language in the other system. The dual-coding theory assumes that memory for pictures is better than memory for words. Shepard (1967) considered that pictures are superior for recognition over words or sentences. Bazeli and Bazeli (1992) indicated that visual information is superior over verbal information. Hitch, Wooden, and Baker (1989) suggested that, when the information is presented both verbally and visually, students give attention to visual information and ignore the verbal. Beck (1987) found out the retrieval of cued pictorial measures was more effective than verbal measures in the evaluation stage.

Miller and Burton (1994) assumed that the speedy and accurate retrieval of information depends on how a person encodes and gives attention to stimuli. Tulving (1983) suggested that there is a relationship between encoding and retrieval, so that if the stimuli are successfully retrieved, the stimuli have been encoded, and if the items are not retrieved, then the stimuli have not been encoded. Tulving and Oscar (1968) argued that

the cues would be effective if they were specifically encoded at the time of learning. If the time of learning went on, and if there were no cues presented during learning, cues would not be effective. Beck (1987) found out that pictures with encoded cues were more effective than non-cued pictures, and that labeled pictures were more effective than arrowed pictures and pictures with no cues.

Various studies have indicated that an individual encodes distinctive events that do not occur all the time more than they record routine events (Ashbrook, 1988; Bower, 1992; Ellis, & Brewer, 1988). The number of details retrieved from memory depends on the person's reaction to the events (Bohannon, 1982). Friedman (1972) suggested that a picture will support memory recognition when the visual shows an unexpected object(s) that would not normally be found in a scene. Humor also has been the focus of much research (Bryant & Zilman; 1989; Nelson; 1984; Schmidt, 1994; 1981; Ziv ,1988), with finding that humor facilitates encoding and retrieval. With humor, the receiver is led to expect one thing only to have something else happen (Nelson, 1984), so the unusual structure attracts attention and receives a great amount of processing (Wollen & Cox, 1981). Ziv (1988) indicated that the use of humor increases recall and that students who learn through humor learn significantly more than students who are not exposed to humor. Bryant and Zilman (1989) assumed that humor enhances students' attention and keeps them alert because they can not anticipate what is coming next. Schmidt (1994) studied the effect of humor on sentence memory in graduate students. The author explored the effectiveness of humor on attention, arousal, rehearsal, retrieval, and surprise explanation. The results indicated that humor enhances sentence memory. The author indicated that humorous items command increased attention, and he suggested that

humor should be integrated into course content to increase retention. Ball (1982) wrote that researchers are finding indications that socially-accepted behaviors can be communicated through the funny medium.

Cartoons

A cartoon is a combination of humor, exaggeration, and symbols, which presents a point of view in a simple line drawing. Eulie (1969) pointed out that a cartoon has a message, and when it is carefully chosen, it can provide information through symbols and exaggeration. Smith and Leptich (1963) have investigated the advantage of using cartoons in the classroom; they indicated that both teachers and students appreciate using cartoons in the classroom and they had the ability to prepare their own cartoons to be used in the classroom.

Cartoons can be used more effectively in teaching if the cartoons provide information that relate to sources. Also, researchers have found that cartoons are easily understood by students because they are simple line drawings and have a humorous touch. Wright (1982) mentioned that in many high schools and colleges, students read comics. Schiffman (1982) reported that students enjoy reading science material when cartoons are combined with the material of subject matter. Swain (1982) collected data for a study on the use of comic books to teach reading and language arts. He found that comic books were read by more students who made good grades than students who made poor grades, and students reported that they had learned many things by reading comic books. The data suggest that using comic books and/or comic strips in reading and language arts classes may be an effective learning strategy, in that most students like to

read them, they are educational, and they do not discourage students from reading other types of books. The cartoon can encourage students to operate at higher cognitive levels (Heitzmann, 1982), and cartoons become meaningful tools in the educational process (Ellman, 1982). Cartoons have the imagery that educators need to reach their students (Brocka, 1982; Urbani, 1982) and may be used to encourage students to develop ideas to write a story (Vail, 1982). Calder, et al (1982) and Urbani (1982) pointed out that teachers and students can use the language of cartoons with satisfaction in all areas of the curriculum.

The cartoon is a kind of drawing that stands by itself as a work of art (Nelson, 1975) and uses common objects and images, visually transforming them into symbols (Sewell, 1994). Horn (1980) wrote, “cartoons have the ability to make a point without the semantic ambiguities inherent in the written words”; it is a universal language (Horn, 1980; and Muse, 1984) and invites the readers to use their imagination (Nelson, 1975). Dobrowolski (1982) reported that students successfully completed their assignments, and the comic books attracted students to learn history in a fun way. He suggested that text material can be dull, but a comic book can be fun and interesting. Hunter (1994) suggests that, when shown a cartoon, the student must be able to see that the exaggerated features of a figure represent the characteristic of a particular person. Philippe (1980) indicated that using cartoons is effective because they are familiar, can exaggerate events, and can reveal many facts at a glance.

Harrison (1980) suggested that there are many functions of cartooning, a fast growing new literature. The cartoon might be seen as an educator and editorialist, as a seller and seducer, as a purveyor, or a perverter of culture, as art or literature, or both or

neither. The cartoon provides a unique illustrative message to communicate with other humans. The communication might be grim rather than humorous as many people expect; it might leave the audience with trauma rather than with humor. Gesture in cartoons can produce effects that are understood by people because the meaning of the gestures lies in the gesticulary act, and the comic gesture is understood by most people. Moreover, the effect of gesticulary acts in real life are reflected in the ingesticulary in cartoons (Fein, Kasher, 1996).

Although young children enjoy learning through cartoons, there were investigations that indicated that political cartoons were understood by adults more than young children. (Bedient & Moore, 1985; Entin, 1958; Sheffer, 1930). Brooke (1977) indicated that older children benefit from the action lines in cartoons because of their extensive experience with still cartoons and comics. Other investigations suggested that cartoons are better interpreted by educated professionals more than middle class people (Carl, 1965). Other research suggested that children with above-average ability interpret cartoons even better than older, average-ability children (Bedient & Moore, 1985). All researchers affirm that understanding and interpreting cartoons is related to the background of the students. Brooke (1977) claimed that the reason children learn through cartoons and comics is that they are new activities and the interest in reading cartoons is not developed as a device to understand the content. Cartoons are used to motivate the child rather than inform or entertain. Steinfirst (1994) pointed out that the greatest changes in children's political thought takes place between the ages of eleven and fifteen. In order to decode the cartoon, a reviewer has to be familiar with the literary or cultural source that the cartoon reflects.

Field-Dependence/independence Cognitive Style

The relationship between perception and learning memory is an essential consideration of cognitive style in educational investigations (Goodenough, 1976). The theory of field-dependence or independence is considered to be a bipolar expression of individual differences: one end is not better or worse than the other (Witkin, 1978). At one end is the global mode of the field-dependent, and at the other end is the articulate mode of the field independent (Goodenough, 1976; Witkin, 1978; Witkin &Goodenough, 1981; Witkin, et al., 1977). For someone with a relatively global cognitive style, experiences are governed by the organization of the surrounding field. In contrast, for someone with a relatively articulated cognitive style, experiences can be analyzed and the person is able to disembed an object from its surrounding field. The literature indicates that the role of cognitive style in differentiation has reflected the bipolarity of field-dependence and independence, in that people move toward poles or domains that are suited to their cognitive and social characteristics. The review of the literature indicates that characteristics of cognitive style in the given individual are consistent over time (Witkin, 1949; Witkin, 1978; Witkin et al., 1977).

A number of studies have investigated differences in sex, age, and race as they relate to cognitive style; most of these studies confirmed Witkin and associate's findings that there are differences in cognitive style between people of different cultures, sex, and age. Some of the investigations revealed different findings, and the researchers had explanations for these differences. Barrett and Thornton (1967) found that engineers and technical personnel were less field-dependent than other college males, or Witkins's sample (1978) suggested that college students were more field-independent than non-

college individuals. McLeod (1987) and Perney (1979) agreed with Witkin et al (1977) that males were more field-independent than females. McLeod (1987) found that white students were more field independent than African American students, and that African American girls were more field-dependent than African American boys and white girls. Male athletes were more field-independent than female athletes and female athletes were more field-independent than non-female athletes (Perney, 1979). Svinicki (1974) indicated that active people were more field-independent than inactive people, but there were no differences in performance between males and females. Also, Al-Saai and Dwyer (1993), found that there were no differences between field-dependent and field-independent females from another culture, and that there were no significant differences in performance among cognitive style who had the same level of cognitive style and were of the same sex as the Qatarian students. However, Al-Saai and Dwyer (1993) suggested that it was not appropriate to generalize their findings or any study that related to learning style from one culture to another until conducting a confirmation study. A study by Vought (1965) indicated that high masculine (low femininity) role identity and high ego strength were related to field-independent performance regardless of biological sex. The author suggested that individuals with high ego strength resist the environmental pressures that act to disorganize articulate perceptual functioning. Vought (1965) suggested that "cognitive style" differences should not be explained by biological sex alone. However, the unexpected results of Svinicki et al's (1974) study and Al-Saai and Dwyer's (1993) study might refer to ego strength, to role identification, or to both variables.

There were a number of studies (Couch, 1990; Dwyer & Moore, 1994; Halpin & Peterson, 1986; James, 1989; Packard, 1996; Powers, 1977; Reardon & Moore, 1988) that investigated individual differences between field-dependent and field-independent subjects in learning and memory.

Moreover, Dwyer and Moore (1992) indicated that color can be utilized as salient relevant cues for field-dependent students. James (1989) reported that field-dependent students had significantly higher performances when they used imposed visual and imagery strategies than other students from the same level of cognitive style who did not use imagery strategy.

Reardon and Moore (1988) investigated whether subjects classified as field-dependent moderately field-independent, or field-independent could manipulate visual learning materials and if they could make materials easier to learn. There were three treatments: intact treatment, additive treatment, and part-by-part treatment. The results indicated that there was no significant interaction between visual design format and the cognitive style variable, but that there were significant differences for cognitive style. Field-independent subjects performed significantly higher than field-dependents. Also, the results indicated that for map learning, additive strategy and part-by-part strategy were easier than intact strategy for field-dependent students. Blevins and Moore (1987) suggested that zoom techniques would facilitate the achievement of field-dependent learners. Wise (1984) indicated that field-dependent students who received line drawing treatment performed significantly better than students who received realistic photograph treatment, so they would improve their learning when simple line drawings were involved. Fleming (1984) indicated that, when complexity was involved in the stimuli,

field-independent learners perform better than field-dependents, but with simplicity, the performance of field-dependence would be superior over the performance of field independence. Moore and Dwyer (1994) had unexpected results, in that they found field-dependent students got higher scores in verbal tests over visual tests. However, they suggested that the information was not presented with sufficient intensity to facilitate coding, and if the same cues that were used in the presentation were presented in the test, it would facilitate retrieval. These investigations tried to emphasize the active individual's role in acquisition, storage, and retrieval of information, which makes it easy for cognitive function to express a broader dimension of information processing. The findings of that investigation were very helpful for instructional designers to determine the strengths and weaknesses of such studies before manipulating them in instruction.

To investigate the printed materials that were specifically designed to match/mismatch the stylistic dimension of field-dependent and field-independent cognitive style students, Halpin and Peterson (1986) suggested that there were significant differences among subjects for each of these variables, and students performed as well on the materials designed to match their cognitive style. A study about passive transformation was conducted by Powers and Lis (1977). They suggested that field-dependent learners had difficulty with combinations that required them to isolate the essential elements of sentences and use them in a different form. There were also a number of studies that investigated the effect of different learning strategies on the acquisition of information by students classified as field dependent or field-independent. Couch (1990) investigated the effect of different imagery strategies on the performance

of cognitive style students. He argued that the use of different types of imagery strategies did not improve the learning of either field dependent or field-independent students.

For visual complexity, Canelos et al (1981) indicated that field-dependent students performed better when they were given a large amount of time to process the information. They also suggested that field-dependent students performed poorly when the task required recalling the function of a part of the heart, in terms of its relation to the set of all possible parts. In Al-Saai and Dwyer's (1993) study, the results indicated that field-dependent students performed better in illustration presentation than simple line drawings, which was unexpected. Canelos and Taylor (1981) suggested that, when field-dependent students receive training in complexity, they would improve their learning behavior. Coward and Lang (1979) and Frank and Keene (1996) indicated that field-dependent students performed better with categorization strategy than students who were not required to initiate active study performance. Moore (1985) had unexpected results, in that he found field-dependent students performed better in the linear presentation mode, than in the multiple presentation mode and he suggested that some factors might interact between presentation and cognitive style.

Computer-Assisted Instruction has been used in a number of investigations to examine the ability of field dependent and field-independent cognitive style students to learn. Packard (1996) tried to predict how the Computer-Assisted Instruction (CAI) presentation method was best suited to cognitive ability; he presented three methods to be learned through (CAI): text only, text plus static graphics, and text plus animated graphics. He also had unexpected results, in that he found field-dependent students performed better in text only methods than text and static graphics methods, and he

suggested that another study would require testing with a larger sample. Carrier, et al (1984) found that field-dependent students performed better when they were given the opportunity to select options in a computer-based lesson dealing with advisory concepts than when they did not have the opportunity to see the option items. Burwell (1991) found that field dependent students performed significantly better than field-independent students under the learner control program strategy than under the program control strategy because they spent more time on all lessons in order to process the information. Hahan (1983-84) suggested that field dependent students who learned through a CAI strategy performed better than field intermediate students who used multimedia strategy.

Fitzigibbon, et al (1965) and Eagle and Goldberger (1969) suggested that recall and recognition of social words were related significantly to field-dependent students, and field dependent students recalled more social visual incidental material than neutral visual incidental material. There were no differences between field-dependent and field-independent students in memory for relevant and irrelevant words (Eagle, et al., 1969). A study by Eagle et al (1966) indicated that there was no significant relationship between field-dependence and incidental memory for social task irrelevant social cues, and they suggested that this was because of the interaction between the students and the social context of the experiment. Messick and Damarin (1964) found that field-dependent students recalled faces significantly more than field-independent students. A study by Hunter, Moore, and Sewell (1990) suggested that there were no significant differences between the performance of field-dependent and field-independent students in interpreting political cartoons. The investigators suggested that because of their cartoons' saliency and complexity, the artists might make the cues overwhelmingly salient in

exaggeration using features, line drawings, and shading or cues. The most salient cue is the most important for interpretation by field-dependent individuals in that they attend primarily to the salient. According to Hunter, Moore, and Sewell (1990), another possible reason for the failure of field-dependent learners to be superior was that editorial cartoons might not be so complex as to be misinterpreted by field-dependent students.

Test Development

Witkin and his associates (Witkin, et al., 1977) developed three tests: the Rod and Frame Test (RFT), the Body Adjustment Test (BAT), and the Rotating-Room Test (RRT). An individual who performed well in all three of these tests would be considered field-independent.

In the Rod and Frame Test (RFT), there is a tilted luminous frame in a darkened room; the participants are asked to adjust a tilted luminous rod centered within the tilted frame to the upright. In the Body Adjustment Test (BAT), participants are asked to adjust their own body to the upright when seated in a tilted chair within a tilted room. In the Rotating-Room Test (RRT), the participant is seated in a chair within a small, lighted room which is driven on a circular track. The rotation applies a resultant force between pull and centrifugal on the subject who is asked to adjust the chair to the upright. Each participant has to perform consistently in the three tests. For example, the individual who performs well in the (FPT) should perform as well in the (BAT), and the person who has problems with adjusting the rod to the upright within the tilted frame should have problems adjusting the chair in the other tests. The study of field-dependent individuals indicated that subjects differ in how they process information from their body and the

field in terms of upright. The characteristic that allows the person to process the information about field factors and sensory experience leads to understanding the achievement of the person's perception of the upright.

The Embedded Figure Test (EFT)

The individual differences that were considered from the three tests (FPT, BAT, and RRT) were the consequence of the conflict created between the standard of upright and the standard derived from within the body. There was a third situation that did not involve perception of the upright or the body, but involved an embedded figure. In the embedded figure situation, the person was shown an item, which was a simple geometric design contained within a complex organized field, and the person was asked to locate the simple figure within the complex design. In the situation of the embedded figure, a simple figure was used instead of the rod or the body, and a complex design was used instead of the frame or the room. In the two situations that involved an upright and the body, the person's score was based on the number of degrees of the rod or body from the upright. In the embedded-figure situation, the score was based on the amount of time taken to locate the simple figure in the complex.

The Group Embedded Figure Test (GEFT)

To classify participants as field-dependent or field-independent, there are many tests can classify participants as field dependent or field-independent, one of which is the Group Embedded Figure Test (GEFT) (Witkin et al., 1971). The GEFT, similar to the Embedded Figure Test (EFT), is used to classify students' cognitive style. In the GEFT,

students are required to locate a simple figure in a complex geometric figure. The GEFT is usually printed in booklet form. This booklet contains twenty-five figures that are divided into three sections: the first section contains seven unscored figures that are used as examples for practice; and the remaining two sections contain nine scored figures each. The participant has to trace a figure that is embedded among seven other simple figures. These figures are shaded and complex.

The time limit of this booklet section is two minutes and is not scored. The time limit for the scored sections are five minutes each. On the back cover of the booklet, simple figures are printed. The participant has to look at either the complex item or the back cover of the booklet, which means the student cannot look at both of them at the same time. The participant has to identify the figure among the complex figures by tracing it with a pencil. The score is the total of the number of correct traced figures that are in the second and third sections combined. The items that are not traced or disembedded are scored as incorrect (Witkin, et al., 1971).

A review of the literature indicated that individual differences in learning are influenced by cognitive style variables. Field-dependence/independence cognitive style is a factor that has been identified in a number of studies. Field-dependence/independence cognitive style is defined as perceiving stimuli, then organizing and processing information. A field dependent learner attends to the salient in learning from visuals. A field independent cognitive style person relies on internal cues; such a learner has the ability to disassemble information, organizing and restructuring the information.

Also, the literature indicated that cartoons are successful devices in education and are acceptable to both teachers and students. The cartoon might be used to promote

motivation in learning, to develop cognitive memory, and to facilitate recall because cartoons exaggerate the events that make them distinct. The literature indicated that information processing is the bridge that links instructional methods and concepts of cognitive style. The educational designers have tried to find out what instructional treatment interacts best with which cognitive style, and students' achievement is increased by finding significant statistical interaction among individual differences variables (Dwyer, 1978).

The Research Questions

The current study was designed to answer the following questions that arose from the review of the literature:

(1) Which treatment maximizes performance of students possessing different level of field-dependence?

(2) Are there improvements in performance of students classified as field-dependent cognitive style learners in each of the two forms of instruction (exaggeration and no-exaggeration)?

(3) Is there an interaction between the teaching strategy through exaggeration and field-dependent cognitive style?

Research Hypotheses

The following hypotheses were tested in response to the research questions indicated above.

H # 1 Subjects who learn by means of the exaggeration of the cartoons will perform better than subjects who learn through the no exaggeration treatment.

H #2 The exaggeration of cartoons' treatment will be more effective in the performance of field-dependent learners than the no-exaggeration treatment.

H #3 The field-dependent level students who use the exaggeration of the cartoons for teaching/learning will perform better than field-dependent students who do not use exaggeration.

Chapter Two

Methodology

Introduction

Participants of this study were undergraduate students at Virginia Tech. The Group Embedded Figure Test was used to classify students as field-dependent, field neutral, or field-independent. The students were randomly assigned to two groups: exaggeration or non-exaggeration. The exaggeration group used the exaggeration of cartoons as supplementation devices for verbal information. The participants in the non-exaggeration treatment received visual material with no-exaggeration to supplement the information. The dependent variable was a written test. Data were analyzed using two-way Analysis of Variance. Main effects and interaction among independent variables were studied. Alpha sat at .05 for all analyses.

This study's design is based upon the assertion of Hunter, Moore, & Sewell (1990), that field-dependent student performance is positively affected by the use of exaggerated visual and salient cues in a cartoons. So, this study explored the effect of cognitive style and the exaggeration of the cartoon on the performance of field dependent students, using the methods of the study of Hunter, Moore, and Sewell (1990).

In their study, Hunter, Moore, and Sewell (1990) explored the effect of teaching strategy and cognitive style on the ability of students to understand editorial cartoons. They presented the cartoons through videotapes. Each student had an editorial-cartoon comprehension booklet test. All cartoons that were presented for the study were selected form *Best Editorial Cartoons of the Year, 1990 Edition*, by Charles Brook. When the

researchers selected the editorial cartoons, they adhered to the principle that there were two cartoons that were drawn by the same artist. The information in the cartoon was presented both visually and verbally, but labels and captions were not intrusive. The student interpreted the editorial cartoons in two parts. In Part A, the student was asked to identify and define the symbols in the cartoon. Part B was a written task that required the student to write a global thematic interpretation by writing the point or meaning of the cartoon that was presented in the booklet. The instructions were provided in the booklet.

The Present Study

In this study, the cartoons were presented through PowerPoint©. All the drawings in the two treatments were done by the same person. Each drawing was presented only once. Slides were presented at six-second intervals. Before presenting a slide, the instructor explained the grammar point that a slide is trying to illustrate with the exaggeration of the cartoon.

Example One:

The instructor explained what an "independent clause" is: "An independent clause is a group of words that can stand alone to make a complete sentence. The sentence of the independent clause contains the main subject, the verb, and the object."

After the explanation, the slide was presented for a six-second period (Figure 1, Appendix D). The second slide presented a fused sentence, and the instructor explained the meaning of a fused sentence as follows: "When two independent clauses (complete

sentences) are used in one sentence without putting a comma and coordinating conjunction between them a fused sentence will be the result."

After the explanation of a fused sentence, the demonstrator presented the slide that illustrated the fused sentence (Figure 2, Appendix D). The same procedure was used with all the problems that might occur with comma splices and fused sentences, and the slides demonstrated the correction of comma splices or fused sentences. The slides also introduced the coordinating conjunction, conjunction adverb, and transitional phrases (Figures 4 and 8, Appendix D).

Example Two:

The instructor presented a list of the coordinate conjunctions: *such, as, and, or,* and *yet* (Figure 4, Appendix D). "When two independent clauses are joined in one sentence, and they are separated by the comma alone, the comma splice results" (Figure 5 in Appendix D).

The explanation of the meaning of conjunctive adverbs such as *whatever, also,* and *meanwhile* , and transitional phrases such as *as a result, for example,* and *in addition* were provided for the students (Figure 8, appendix D). "When a conjunctive adverb or a transitional phrase only appears between independent clauses without appropriate punctuation, a comma splice is the result" (Figure 9, Appendix D).

There are four choices to avoid a fused sentence or comma splice:

- Use both a comma and a coordinating conjunction for separating the independent clauses.

(The comma has to precede the coordinating conjunction).

-Use a semicolon alone or accompany it with a conjunctive adverb or a transitional phrase.

-The semicolon is required between independent clauses that have been linked with a conjunctive adverb or transitional phrase.

-Separate the two clauses into sentences. If one independent clause is a statement and the other is a question, they should be separate sentences. If one independent clause is a long sentence, using separate sentences will be better.

Materials

Group Embedded Figure Test (GEFT)

The Group Embedded Figure Test was used to classify students' cognitive style. Students were required to locate a simple figure in a complex geometric figure.

Written Test

Students solved thirty problems of comma splices and fused sentences.

Power Point© Presentation

10 Slides of exaggeration of the cartoons (see Appendix D).

10 Slides of simple line drawings with no exaggerated cartoons (see Appendix E).

Participants

Undergraduate students attending the Writing Center at Virginia Tech were assigned randomly to one of two treatment groups. Students within each group were classified as field-dependent, neutral, or field-independent by using the Group Embedded Figure Test (GEFT).

Use of the GEFT

Before the treatment was administered, all students were given the Group Embedded Figure Test (GEFT) (Oltman, Raskin, & Witkin, 1971). In the GEFT, learners were required to find a simple geometric figure embedded within a complex one. There were 18 items; students' scores were based on the number of simple figures traced correctly. Students were randomly assigned to two treatment groups: one in which there was exaggeration of the cartoons, the other with no exaggeration. The GEFT was used to determine whether the students tended to be either field-dependent (FD), field-neutral (FN), or field-independent (FID) learners. Each subject was categorized as field-dependent, field neutral, or field-independent according to his/her score on the GEFT. The grand mean and the standard deviation were found first. Then, students were divided into levels of field-dependence according to their GEFT score. Students with one-half standard deviation above the mean were considered to be field-independent learners. Students with one-half standard deviation below the mean were considered to be fiel-dependent. Students in the middle were considered to be field-neutral.

Teaching Treatments

In the exaggeration treatment, the students viewed PowerPoint© computer presentations about comma splices and fused sentences. All demonstrations of the lesson used the exaggeration of the cartoons, which were designed for this purpose (Appendix D). The instructor first explained independent clauses, and then identified comma splices and fused sentences. After that, the demonstration was about using the separation of two independent clauses with either a comma and coordinating conjunction, a semicolon, or restructuring the sentence by subordination clauses. Each role was followed by an example. The second group (no exaggeration) studied the same materials. Their presentation used simple line drawings, designed for this study, with no exaggeration of the concepts (Appendix E). After the study period, the students were tested on comma splices and fused sentences as a dependent measure. The questions on the post-test were selected from *A Writer's References* by Diana Hacker.

In this study, one instructor taught both treatments. The instructor was trained in using the cartoon-based teaching; she was also trained in using the computer to demonstrate the new method of teaching with exaggeration and no-exaggeration. To assure that any differences within the presentations, the teacher made a conscious effect to present the material in the same way and use the same language in each treatment.

Dependent Measure

After the demonstration, the students in both groups had post-tests on comma splices and fused sentences. The sentences were selected from *A Writer's Reference, Third Edition*, by Diana Hacker (St. Martin's Press). In this test, the students were asked

to use a technique that they found effective to revise any comma splices or fused sentences in 30 test sentences (Appendix C). Each correctly revised sentence received one point; therefore, the scores could range from 0 to 30.

Examples of the Dependent Measure:

Revise any comma splices or fused sentences using a technique that you find effective. If a sentence is correct, write "correct" after it.

1- I ran the three blocks as fast as I could but I still missed the bus. (The right answer is omitting the coordination conjunction "*but*" and write "*However*" instead".

2- The duck hunter set out his decoys in the shallow bay and then settled in to wait for the first real bird to alight. (Correct)

3- The suburbs seemed cold, they lacked the warmth and excitement of our Italian neighborhood. (Use semicolon after the word cold)

To evaluate the students' performance, each correct revision received one point. The wrong or blanked answer received no points. An exercise book that includes the correct answers was used to assure validity of the answers.

Validity and reliability

Validity

The exercises in *A Writer's Reference, Third Edition,* by Diana Hacker were designed to evaluate the performance of undergraduate students when they study English grammar. The exercises in the book have been used for many years by different

institutions in the United State that teach the English language (Appendix A), including the Writing Center at Virginia Tech (Appendix B). These institutions are satisfied with the exercises in the book and have found that the exercises measure what they are intended to measure. Using these exercises has also resulted in the improvement of abilities.

Reliability

This study used Kuder Richardson Formula 21 to measure the reliability of the items; the students had thirty problems to solve, taken from *A Writer's Reference, Third Edition,* by Diana Haker (St. Martin's Press) and its accompanying book of exercises.

Research Design

This study investigated the relationship between the individual learner variable (level of field-dependence/independence cognitive style) and the dependent variable (score on criterion test) when identical instruction was presented by means of two different instructional formats (exaggeration of the cartoon, no exaggeration).

A 3x2 post-test only design was employed to determine significant differences in the main effects. The independent variables were cognitive style (field-dependent, field-neutral and field-independent) as measured by the Group Embedded Figure Test (GEFT); there were two treatment groups (using exaggeration of the cartoons and no exaggeration.) The dependent variable was an immediate written test.

When Analysis of Variance (ANOVA) is applied to the study, the researcher will be able to find: (1) if there are significant differences in the performance of the subjects

under the teaching strategies; (2) if there are significant differences in the performance of the subjects with the aptitudes; and (3) if there is an interaction between the two variables (Ary et al., 1996; Howell, 1996; Pedhazur & Schmelkin, 1991).

The main effect occurs when a researcher tries to investigate the significance of one factor, the independent variable, on performance. The interaction refers to the relationship between the factors. Scores on the post-test would be regressed on the scores on the GEFT for each treatment group. Plots of these regressions would show which levels of the GEFT and treatment options maximizes the post-test scores for all participants. To indicate the significance of the main effect and the interaction, the researcher would use the F -ratio at the end of the analysis.

Chapter Three

Results

The purpose of this study was to determine the efficacy of cognitive style and exaggeration of cartoons as a treatment on the students classified as field-dependent. The participants were sixty-six freshman students attending the Writing Center at Virginia Polytechnic Institute and State University. The participants were randomly distributed to one of two treatments (exaggeration of the cartoons and no-exaggeration). The Group Embedded Figure Test (GEFT) was employed to determine their level of field-dependence, the range was 0-18. The students were classified as field-dependent, field neutral, or field independent according to their scores in the GEFT (Appendix F). The mean (M= 14. 258) and the standard deviation (S.D.= 4.032) of the scores in the GEFT were used to determine the classification of the students as field-dependent, neutral, or field-independent (Table 1). Students whose scores were one-half standard deviation above the mean were classified as field-independent. Students with one-half standard deviation below the mean were classified as field-dependent. Students in the middle were classified as field neutral. The results of the GEFT indicate that the lowest score that students have performed was 3, and the highest score was 18. No student with a score lower than 17 was classified as field-independent and no student with a score higher than 12 was classified as field-dependent. The scores of field-neutral were from 13 to 16 (Appendix F).

Table 1
Mean and Standard Deviation for Group Embedded Figure Test Scores

Variable	N	Mean	Standard Deviation
GEFT	66	14.258	4.032

A two-way Analysis of Variance (ANOVA) was employed to determine main effects of the treatments, the cognitive style, and the interaction. The alpha level was set at .05 for all analyses. The two-way ANOVA (Table 2, Appendix G) indicated that no significant differences existed for treatments, $F(1, 60) = .8109$; $p > .05$; Cognitive style $F(2, 60) = 1.174$; there were no interaction indicated between the independent variables $F(2, 60) = 1.174$; $p > .05$. (Table 2, Appendix G)

The dependent measure was an immediate post-test on comma splices and fused sentences. The thirty problems in the test were selected from *A Writers Reference, Third Edition,* by Diana Hacker. Reliability of this test was estimated to be (.85) using the Kuder-Rechardson Formula 21.

To determine the significant difference of the main effects and the interaction, there was an additional analysis answering the research questions 1, 2, and 3. Each result was related to the specific research hypothesis.

Research Question #1. Which treatment maximizes performance of students possessing different levels of field dependence? (Hypothesis #1 Subjects who learn by means of the exaggeration of the cartoons will perform better than subjects who learn through the no-exaggeration treatment).

The two-way ANOVA in Table 2, Appendix G summarizes the results and indicates that there were no significant differences in the main effects for the teaching strategies, exaggeration (M= 25.121) of the cartoons and no-exaggeration (M= 25.152), $F(1, 60) = 1.385$. p>. 05. Therefore, failed to reject the null hypothesis. (See Table 3 for means).

Table 3

Means and Standard Deviations By Main Effects

Group	N	Mean	Std. Dev.
Cognitive Style			
Field-Dependent	18	23.77	4.930
Field-Neutral	21	24.905	5.019
Field-Independent	27	26.222	3.806
Treatment			
Exaggeration	33	25.121	4.601
N0-Exaggeration	33	25.152	4.617

Note. Maximum possible score is 30. N = 66, $\overline{X}$= 25.137

Research Question #2: Are there improvements in the performance of students classified as field-dependent cognitive style learners in each of the two forms of instruction (exaggeration and no-exaggeration)? (Hypothesis #2: The exaggeration of cartoons' treatment will be more effective in influencing the performance of field-dependent learners than the no-exaggeration treatment.)

Two-way ANOVA in Table 2, Appendix G indicates that there is no significant difference in the main effects of cognitive style, $F(2, 60) = 1.385$, $p > .05$. The summary of the differences is demonstrated in Table 3 (field-dependence was $M = 23.77$, field-neutral, $M = 24.905$, and field-independence, $M = 26.222$) the hypothesis was nor supported. See Table 3 for mean scores.

One-way ANOVA in Table 4, Appendix G summarizes the compression of only field-dependent students in the two treatments, without regard to the performances of field-neutral and field-independent students in both treatments.

The summary in one-way ANOVA (Table 4, Appendix G) indicates that there were no significant differences in the treatment means, $F(1, 16) = 0.69$, $p > .05$. Table 5 demonstrates the group means for only students classified as field-dependent under the two treatments: exaggeration treatment group, ($M = 23.0$) and no-exaggeration treatment group, ($M = 25.0$). The field-dependent students in the exaggeration treatment did not perform better than field-dependent students who learn through no-exaggeration treatment, therefore, the hypothesis was rejected.

Table 5
Table of Means and Standard Deviations of Field Dependence Only

Treatment	N	Mean	St. Dev.
Exaggeration	11	23.00	4.712
No-exaggeration	7	25.00	5.385

Research Question #3: Is there an interaction between the teaching strategy of cartoon exaggeration and cognitive style? (Hypothesis #3: The field-dependent students who use the exaggeration of the cartoons for teaching/learning will perform better than field-dependent students who do not use exaggeration.)

The two-way ANOVA (Table 2, Appendix G) indicated that there was no interaction between teaching strategy using cartoon exaggeration and field-dependent cognitive style, F (2, 60) = 1.74, $p > .05$. Therefore, the hypothesis was rejected.

In addition to the investigation, one-way ANOVA (Appendix G) was used to explore the differences in the performance between field-dependence and field-independent students who participated in the exaggeration treatment. Also, the differences in the performances between field-dependent and field-independent students in the no-exaggeration treatment were investigated. Table 6, Table 8, and Table 10 in Appendix G summarize the results of the investigation. As a secondary analysis, this study investigated the differences in the performance between field-independent students in the two treatments in order to find out if the exaggeration would affect the performance of field-dependent learners as well (Table 10, Appendix G).

The data in Table 6, Appendix G indicated that there were no significant differences in the performance between field-dependent and field independent students who learned through the exaggeration of the cartoons $F(1, 20) = 2.90$, $p > .05$. Table 7 in presents the mean and standard deviation in the exaggeration treatment: field-dependent (M= 23,00, St. Dev.= 4.712); field independent (M=26.40, St.Dev.= 4.402).

Table 8, Appendix G, in which one-way ANOVA is presented, indicates that there were no significant differences in the performance between field-dependent and

field-independent students who learn through the no exaggeration treatment, F (1,23)= .36, P > .05. Table 9 demonstrates the means and the standard deviations: field dependence (M= 25, St. Dev.= 5.385); field independence (M= 26.118, St. Dev.= 551).

One way ANOVA (Table 10, Appendix G) indicated that there were no significant differences in the performance between field-independent students only who learn through the two treatments, $F(1, 25) = 0.03$, p >.05. Table 11 demonstrates the group means for only students classified as field-independent under the two treatments: exaggeration treatment group, (M= 26.400, St. Dev.= 4.402) and no-exaggeration treatment group, (M= 26.11, St. Dev.= 3.551). The field-independent students in the exaggeration treatment did not perform better than field-independent students who learn through no-exaggeration treatment

The results of the investigations will be discussed in more detail in Chapter Four.

Table 7
Table of Means and Standard Deviations of Field Dependence and Field Independence in the Exaggeration Treatment Only

Level of Cognitive Style	N	Mean	St. Dev.
Field dependence	11	23.00	4.712
Field independence	10	26.40	4.402

Table 9
Table of Means and Standard Deviations of Field Dependence and Field Independence in the No-Exaggeration Treatment Only

Level of Cognitive Style	N	Mean	St. Dev.
Field-dependence	7	25.00	5.385
Field-independence	17	26.118	3.551

Table 11
Table of Mean and Standard Deviations of Field-independence Only

Treatment	N	Mean	St. Dev.
Exaggeration	10	26.400	4.402
No-exaggeration	17	26.118	3.551

Summary

A two-way Analysis of Variance summarizes the investigation of the effect of teaching strategies (exaggeration of the cartoons vs. no-exaggeration) and cognitive style (field-dependence/field-independence) on the performance of field-dependent students. One-way Analysis of Variance was also conducted to investigate the significant difference between students classified as field-dependent only, without regard to field-neutral and field independence. The following results were inferred from the data:

1. The teaching strategy that employed the exaggeration of the cartoons did not maximize the performance of field-dependent students over the strategy that employed no-exaggeration of the cartoons.
2. There was no difference in performance between either treatments, regardless of the levels of field dependence.
3. There was no improvement in performance of all subjects using one treatment over the other (exaggeration vs. no exaggeration).

Chapter 4

Discussion

The purpose of this study was to investigate the effect of cognitive style and the use of cartoon exaggeration as a teaching strategy on the performance of field-dependent students when learning English grammar. The hypothesis of this study was that field-dependent students would benefit from the exaggeration of cartoons by enhanced learning, as compared to field dependent students whose lessons did not incorporate the use of cartoon exaggeration.

A review of the literature provided some support that exaggeration in the concepts of cartoons would improve the performance of students classified as field-dependent more than students classified at same level of cognitive style who did not use the same materials in learning. Field-dependent level students rely on the external or surrounding field to separate part from the whole (Witkin, 1949; Witkin & Goodenough, 1981), and they are unaffected by salient cues for learning from visual (Goodenough, 1976). Therefore, the hypothesis of this study was that exaggeration would highlight the salient cues that would help field-dependents to learn from information presented. This study hypothesized that it would be an interaction between cognitive style and teaching strategy. The assumption was that field-dependent students, would improve their learning positively when they learn from the exaggeration strategy more than field-dependent level who learned from no-exaggeration strategy.

Sheffer (1930) investigated the interpretation of political cartoons by children of different ages. Besides his original investigation, the results demonstrated the researcher's observation of the children's responses, but the truth was cartoons were employed for another situation, the interpretation of political cartoons by students of different ages, not for teaching matter. The researcher provided a mass of suggestions about the interests of using cartoons in the classrooms, but the data presented information about the interpretation of political cartoons by different ages only. Moreover, the suggestion did not include the interesting concepts of cartoons that affected students. These findings would arouse certain questions, such as why students and teachers were interested. Did students break the details and benefit from the elements of cartoons separately, or did they enjoy cartoons as one piece when they studied through cartoons? In other words, the elements of cartoons were simple line drawings, relationships between the details, action in the lines, simplicity, exaggeration, and the humor; the question is: did students accept cartoons with all these concepts together or did they separate these concepts and they interested form each one alone? Did the acceptance of particular elements depend on the type of student? Goodenough (1976) indicated that the field-dependent person relies on the salient or more noticeable cues when visual stimuli is involved. So, the assumption of the current study was that exaggeration of the cartoons could be used as a salient cue for field-dependent learners when they learn English grammar.

Two-way Analysis of Variance was used to analyze the data. Also a one-way Analysis of Variance was used to analyze the differences in performance between field-

dependent subjects only without regard to the two levels of field neutral and field independence.

Generally, the present study was concerned about the role of visuals in education and concentrates on the ability to use cartoons as a supplementary device for providing information. Field-dependence cognitive style and the exaggeration of the cartoons were the main interest of this study.

The suggestion of Hunter, Moore, and Sewell (1990), that the exaggeration might highlight as salient cues to help field-dependents learn from the visual, built the hypothesis of the current study. It was assumed, that when exaggeration of the cartoons were used as a teaching strategy, the performance of field-dependents would be improved more than field-dependent students who did not receive exaggeration treatment. The results of current study were contrary to that of Hunter, Moore, and Sewell (1990). The statistical data demonstrated no significant differences in performance between field-dependent students with or without exaggeration treatment. This result indicates that the suggestion of Hunter, Moore, and Sewell (1990) was not true and that exaggeration does not maximize the achievement of field-dependent students.

The literature discussed many factors that positively affected the performance of field-dependent students to improve their learning. Fleming (1984) indicated that, when the degree of complexity of stimuli is low, the differences in the performance between field dependents and field-independents would be decreased. Moreover, field-dependents improve their performance when they receive the information through simple line drawings (Canelos et al., 1980; Wise, 1984); retrieving information by students is faster when the amount of information is reduced (Jenning & Dwyer, 1985). As indicated, field-

dependence is affected by many factors, such as salient cues, low degree of complexity, simple line drawing, and reduction of amount of information. In other words, these factors might maximize the performance of field dependents in learning when cartoons are used in which artists have combined all these other factors in addition to exaggeration and humors.

The results of this study indicated that there were no differences in the achievement of field-dependent and field-independent students when they learn through exaggeration or through no-exaggeration treatments. The two strategies in this study have used cartoons, but the concepts of English grammar were exaggerated in the teaching treatment only. As mentioned earlier, there were no significant differences in the achievement of the filed-dependent students in the two treatments. Another result was that no significant differences in performance occurred between students classified as field-dependent or field-independent students in the no exaggeration treatment. This indicates that cartoons for field-dependent students performed at the same level as field-independent students with or without the exaggeration of concepts (see Table 5, 7, and 9). Moreover, in this study, field-dependent students might have been affected by another factors such as decreasing complexity, as Hunter, Moore, and Sewell (1990) suggested, or they might be affected by another elements of the cartoons, such as humor, interaction between detail, action line drawing, or by all elements of the cartoons.

As a secondary investigation, this study explored the differences in the performance of field-independent learners only in the two treatments. The investigation indicated that no significant differences in performance existed between field-independent students in the two treatments (Table 10, Appendix G). The results of this

study indicated that field-independent learners did not benefit from external help to understand the stimuli.

The present study suggests that exaggeration did not affect the performance of field-dependent or field-independent students, but there were other elements of the cartoons that might be used as salient cues in the visual. Cartoons contain many elements that help students to get information from them, and exaggeration is only one of these elements. The result of this study indicated that exaggeration alone would not improve learning for field dependents.

In this study, cartoons as interpreted and developed by the author were used in both treatments and that interpretation might affected the study's results. Moreover, in this study, cartoons were used in both treatments, so the suggestion is, future studies should involve cartoons in the experimental treatment only, the control treatment should use another instrument without cartoons in order to provide more contrast in comparing the results.