ENHANCING SOCIAL PERSPECTIVE TAKING IN DELINQUENT
ADOLESCENTS THROUGH COGNITIVE FLEXIBILITY IN A HYPERMEDIA
PROGRAM

A Thesis in
Instructional Systems

by

John C. Rubisch

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The thesis of John C. Rubisch was reviewed and approved* by the following:

Roy B. Clariana  
Associate Professor of Instructional Systems  
Thesis Adviser  
Chair of Committee

Francis M. Dwyer  
Professor of Education

William Milheim  
Professor of Education

Barry O. Williams  
Assistant Professor of Instructional Design

Vicki Williams  
Special Member

Alison A. Carr-Chellman  
Associate Professor in Education  
In Charge of Graduate Programs  
In Instructional Systems

*Signatures are on file in the Graduate School
ABSTRACT

The purpose of this study was to see if social perspective taking (SPT) could be enhanced in juvenile delinquents by a Cognitive Flexibility Hypermedia (CFH) program consisting of video vignettes. Seventy juvenile delinquents (forty-nine male, twenty-one females) participated. The average age was 13.5. The ethnic composition was 46% Caucasian, 31% Black, and 23% Hispanic.

Participants were randomly assigned to treatment and control groups. The former used a CFH program of video vignettes of adolescents on a laptop computer that was designed for this study. The CFH program was developed from the tenets of Cognitive Flexibility (Spiro & Jehng, 1990). The content of the vignettes was based on classroom materials that were originally in a text format (Rubisch, 1992). Participants could click on links to view how three characters perceived the same situation. Controls did not participate in the CFH program of video vignettes.

After participating in the CFH, the SPT of treatment and control participants was measured by the Chandler Cartoon Sequence (CCS, Chandler, 1973) and the Twin Rivers Video (TRV). The CCS consisted of a series of cartoon panels. Participants were asked to look at the panels and tell a story from the perspective of the main character. They were then asked to tell a story from the perspective of a secondary character who did not have the same knowledge of events as the main character. The TRV, in a video format, was similar to the CCS. The TRV was constructed specifically for this study. Scores on the CCS and TRV were based on the ability of participants to separate knowledge that they knew from knowledge possessed by the bystander character.

The Kruskal-Wallis test was used to test the hypotheses. Results were insignificant for the total population (p = .08). However, there were significant differences for the female subgroup between those that used the CFH program and those who did not (p = .03). This may be due to the fact that the characters in the CFH program were female. There was a .6441 correlation between the CCS and TRV in the measurement of SPT. Further research is warranted.
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“Please sir, we've done what you told us. We brought you the broomstick of the Wicked Witch of the West.”

From the movie, The Wizard Of Oz (1939), MGM
Chapter One

Introduction

*Statement of Problem*

In recent years, there has been a renewed interest in affective learning. For example, problematic behavior in society (i.e., substance abuse, crime, eating disorders) has resulted in a call for educational solutions (Martin & Reigeluth, 1999). In 1998, *Educational Technology* published a special issue on integrating the Cognitive and Affective domains of learning. In their introductory article for the issue, Martin and Wager (1998) stated:

> In our attempt to analyze the domains (affective and cognitive), we are learning that we can only go so far without beginning the process of synthesis. The more we learn about the domains separately, the more we learn that they do not stand alone, but rather that they are intimately entwined. (p. 5)

Affective education has been equated with ethics, morals, emotions, feelings, personal development, social development, spirituality, aesthetics, and motivation (Ackerson, 1991/1992; Beane, 1990; Martin & Reigeluth, 1999). McLeod (1991) went so far as stating that affect is anything that is not cognition. Perhaps because of its multiple definitions and dimensions, it has had a capricious role in American education. From the height of importance in the nineteenth century when Horace Mann insisted that it was more important to teach virtue than knowledge (McClelland, 1999), to its near extinction with the assent of logical positivism in the first half of the twentieth century (Lickona, 1999), affect has been a vacillating variable in the educational mix.
The recent interest in affective education has resulted in a reexamination of social perspective taking (SPT). SPT has been defined as “…freeing oneself of one's own view and to recognize and understand the thoughts, feelings, and motives of the self and others” (Menna & Cohen, 1997, p. 189). On a continuum, SPT extends from believing the thoughts and feelings of others are more or less identical to one's own, to going beyond the perspectives of individuals to that of society. For example, SPT has been shown to aid the formation of adolescent friendships (Vernberg, Ewell, Beery, & Abwender, 1994) and to facilitate identity formation (Enright & Deist, 1979). Further, a positive correlation has been shown between SPT with pro-social behavior and empathy (Eisenberg, Carlo, Murphy, & Van Court, 1995). SPT has been advocated to counteract violence among youth (American Psychological Association, 1993), to foster empathy (Merydith, 2000) and to promote interethnic understanding (Rios, Trent, & Castaneda, 2003). Chandler (1973) has developed an assessment device, the Chandler Cartoon Sequence (CCS), which has demonstrated reliability and validity in measuring SPT. Thus, SPT provides one accepted and measurable dimension of affect, and so provides the central focus for this investigation.

A Cognitive Flexibility Hypermedia (CFH) program is a possibility for increasing SPT. Cognitive flexibility is an adaptive response to changing demands in a situation maintaining that if knowledge is represented along multiple dimensions, one will spontaneously restructure one's schema (Spiro & Jehng, 1990).

Purpose of Study

The purpose of this study is to determine if social perspective taking can be enhanced in juvenile delinquents who receive instruction via a hypermedia program.
Research Questions

1. Can social perspective taking in delinquent adolescents be enhanced by cognitive flexibility in a hypermedia program?

2. Is gender a factor in the enhancement of social perspective taking in delinquent adolescents by use of cognitive flexibility in a hypermedia program?

3. How does the Twin Rivers Video (TRV), an assessment tool developed for this investigation, compare to the CCS?

Hypotheses

\( H_{01} \): There will be no significant differences in posttest scores for social perspective taking for delinquent adolescents between individuals who participate in instruction via a cognitive flexibility program in hypermedia and those who do not.

\( H_{11} \): \( H_{01} \) is false.

\( H_{02} \): There will be no significant differences in posttest scores for social perspective taking by gender between individuals who participate in instruction via a cognitive flexibility program in hypermedia and those who do not.

\( H_{12} \): \( H_{02} \) is false.

\( H_{03} \): There will be no significant differences between social perspective taking scores on the CCS and the TRV for delinquent adolescents who participate in instruction via a cognitive flexibility program in hypermedia.

\( H_{13} \): \( H_{03} \) is false.
Historical Context

Early Influences

The lack of focus on affective learning can be traced back to the evolution of psychology as a discipline more than a century ago. William Wundt, the father of modern psychology, emphasized imagery and introspection, thus integrating affect and cognition. However, contemporaries became dissatisfied with this method of exploring the human mind (Gardner, 1985).

For example, in the United States, in 1890, the work on evolution of Darwin influenced William James and his pragmatic approach to psychology. James felt that Wundt was missing the important issues for psychology, specifically, problems encountered in everyday life (Gardner, 1985). Instead, he advocated resolving apparently contradictory truths by their practical outcomes rather than affect. For James, a “…mental state was an inward activity or passion…” related to, but separate from, a stimulus-response relationship (James, 1890, p. 185).

Further, in 1896, John Dewey refined James’s pragmatic approach with Darwin’s emphasis on adaptation to focus on the stimulus-response relationship. Engendering the Chicago School and the Functionalist approach to psychology, consciousness and experience were part of the response. Behavior was an adaptation to the environment, leading to a combination of evolutionary biology with experimental techniques (Boring 1957; Dewey, 1896). Functionalisit worked with animals to a much greater degree than any other school of psychology existing at the time, thus further removing affect as a consideration in cognition.
Behaviorism

John B. Watson began as a functionalist. In fact, he graduated from the University of Chicago and worked with James Angell, a colleague of Dewey's. In 1908, Watson broke with the Chicago School on the need to infer a state of consciousness to an observed behavior. Unobservable inner states (such as affect) were considered to be intractable and their analyses unnecessary. For Watson, and what would become behaviorism, mental states could only be analyzed in terms of observable behavior. Behaviorism consumed functionalism, while maintaining the practical concerns of pragmatism (Boring, 1957).

The effort to establish psychology as a respected, verifiable, scientific field, similar to biology or physics, led to the emergence and dominance of behaviorism. The influence of other psychologists, who allowed for factors eliminated by the reductionistic approach used by behaviorists, was limited or modified. Consequently, a more substantial role for affective variables in education failed to take place.

Würzburg School

There were negative reactions to Wundt's emphasis on introspection in his home country of Germany as well as in the United States. At the beginning of the twentieth century, the Würzburg School argued that consciousness could not be reduced to images, feelings, and physical sensations. Instead, the Würzburg School hypothesized that the inner workings of the individual also consisted of a deeper level called Bewusstseinslagen. Literally, Bewusstseinslagen was translated to mean conscious attitudes or situation. However, what the Würzburg psychologists meant by the term was obscure, intangible, unanalyzable, indescribable, and imageless. Examples of
Bewusstseinslagen were doubt, certainty, affirmation, and dissent. The important contribution of the Würzburg School to the future of psychology was the idea that some aspects of consciousness were not directly amenable to definition and observation, thus opening the door to the possible role of affect (Boring, 1957).

Another important contribution by the Würzburg School was the concept of the Aufgabe. The Aufgabe, as introduced by Watt (1905) was the first of four steps in the stimulus-response relationship. It was a preparatory step, specifically the task given by Watt to his participants. Later, Ach (1905) modified the Aufgabe. It became a predetermining tendency that strongly influenced a response. The Aufgabe was now a combination of the inner workings of the mind and outside instructions. For example, if asked to think of a word related to black, the most frequent response might be white. However, if directed to think of a word that rhymes with black, the response may be tack. The instruction of rhyme, and the participant's knowledge of vocabulary and the definition of rhyme, established the Aufgabe (Boring, 1957). The Aufgabe was the task and the mental activity in the learner that results from the task.

Speaking in 1912, Oswald Külpe, the most prominent member of the Würzburg School, spoke of the Aufgabe as a task with a "...determining tendency which emerges from it..." (Diamond, 1974, pp. 427-428). He elaborated that participants must willingly accept the task and set themselves for the requested activity. A set was the act of matching ideas in the consciousness with the perceived demands of the task.

Behaviorism and Affective Learning

Külpe's concept of set was a crucial determinant in the role of affect in psychology at that time. Edwin B. Holt, on the fringe of behaviorism, introduced the
concepts of drive, wish, and motivation (Boring, 1957). Mixing Freud with behaviorism, Holt modified Külpe's set to mean "impulse, tendency, desire, purpose, attitude" (Holt, 1915, p.56) to prepare the neuromuscular system for a response. He further stated that this biological response for preparation did not actually have to result in observable behavior. Thus, the Aufgabe had evolved from the original Würzburg concept of directions for an experiment to a combination of outside task and mental preparation to a physiological response for potential action. Holt's work resulted in behaviorism absorbing the concept of consciousness and reducing it to behavioral observations (Boring, 1957; Holt, 1915; Wozniak, 1997).

Holt's influence was profound. In 1935, Gordon Allport, in a direct reference to Holt, defined attitude as "...a mental and neural state of readiness...exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (Allport, 1935, p. 784). Allport's definition of attitude is still the prevalent one used today (Matthys & Lantz, 1998; McLeod, 1991). Thus, affect had been reduced to a minor physiological variable that may influence behavioral outcomes.

**Gestalt**

Others in psychology remained closer to the intentions of the Würzburg School on the concept of the Aufgabe. Both Max Wertheimer and Kurt Koffka, founders of Gestalt psychology, studied with Külpe at Würzburg (Green, 2002). In Gestalt psychology, the concept of field maintains that a whole is different from the sum of its parts. To separate something in order to analyze its parts (as in behaviorism) changes its very essence. This is similar to the Würzburg School’s concept of data as sensory stimulation and the previous known meaning elicited by this sensation. As opposed to behaviorism, Gestalt
considered factors other than observable aspects of behavior. In the 1930’s when Wertheimer, Koffka, and Wolfgang Köhler emigrated from Nazi Germany, Gestalt held an influential, if secondary, role to behaviorism in the United States (Ash, 1998).

**Biosocial Approach**

Koffka held that an individual is the result of collaboration between inner and outer conditions of development (Daniels, 2000). James Mark Baldwin also stressed the relatedness of an individual to the objects making up its environment. Like others in the late nineteenth century, Baldwin was also influenced profoundly by the work of Darwin. He was against a reductionistic method of scientific inquiry, as he believed it would eliminate the adaptive process an individual encounters in interacting with the environment (Murchison, 1930). Thus, society was of utmost importance, an individual was a "social outcome not a social unit" (Murchison, 1930, p. 5) that can only be described and understood within the social context.

Baldwin influenced Mead's concept of symbolic interactionism, Vygotsky's enculturating force of society, and Piaget's stages of development (Wozniak, 1999). Each of the latter three place importance on the influence of the interaction between the human organism and others. Certainly there are differences between the three, with Mead being the most sociological of the group and Piaget the more psychological. However, they offer an alternative view of psychology from the behaviorists, specifically a perspective that emphasizes interaction and development and consequently, affect (Veresov, 1998).

The basis for interaction and development are tools that enable mastery of the environment, and the most important of these tools is language (Vygotsky, 1978). Mead refers to language as a significant symbol (Cronk, 2001; Mead 1934). Symbols do not
necessarily have to be related to speech or words. For example, in Mead's famous dogfight, dogs may approach each other warily, the act of one dog being a stimulus to the other to respond, which then is a stimulus to respond for the first dog (Cronk, 2001; Mead 1934).

Language enables the individual to master the challenges presented by society. Vygotsky and Mead maintained that development of an individual is engendered by meeting these challenges (Yaple, 2001). Piaget is less clear on the origin of development, although he says it occurs after acquisition of information from the world as the individual attempts to maintain equilibrium through accommodation and assimilation (Glassman, 1994). Mead maintained that language enables one to take the external situation into one’s self, which results in individual development (Mead, 1934). Vygotsky (1978) stated that “Every function in the child's cultural development appears twice: first on the social level, and later, on the individual level; first between people (interpsychological), and then inside the child (intrapsychological)” (p.57).

For Vygotsky, words were "microcosms of human consciousness." (Vygotsky, 1987, p. 285). Social interaction engendered language, which engendered development. And what engendered social interaction? “…Drives and needs, our interests and urges, our affects and passions" (Vygotsky, 1982, p. 357).

This chain of consequences, from drives/needs to social interaction to language to development, is longer and more comprehensive than the stimulus-response sequence in behaviorism. If one inserts Allport’s (1935) attitude, “…a mental and neural state of readiness…exerting a directive or dynamic influence upon the individual’s response…” (p.784), between the stimulus and response, it can be asked from where did this attitude
arise? If it is only biological, then it need not be separated from the response. If it is something more than biological, then what is it and how did it come to be?

One likely answer lies in the drives/needs-social interaction-language-development chain of consequences from the biosocial approach. The chain ends with development; individuals are not the same as they were before the chain began. They have learned. Affect has been defined as the activation of the autonomic nervous system and the individual’s interpretation of this activation (McLeod, 1991). The traditional behaviorist approach has ignored the possibility that the interpretation by individuals of the same stimulus and response may differ, and in doing so, has failed to focus on affect and subsequently, the learning and development of the individual.

Vygotsky was not the first to advocate the preeminence of affective factors. Baldwin held that all cognition is a means to meeting emotional responses in humans (Murchison, 1930). Piaget saw affect as supplying the energy upon which intelligence structures were built (Piaget 1981). Mead theorized that the minds of people were the attitudes of others, which were received through significant symbols. In communicating with others, people modify a potential response, give the modified response, and in doing so, modify themselves (Mead, 1934).

In summary, affective factors in learning have been emphasized by only a small but preeminent number of individuals and groups over the last one hundred years. During this time, the behaviorists approach to psychology has attempted to substantiate and control the elusive affective factor in learning, mainly by the use of taxonomies.
Affective Learning

While affective learning may be an integral part of the biosocial approach to learning, it is best known by the taxonomy of educational objectives for the affective domain of Krathwohl, Bloom, and Masia (1964). This domain has its roots in Bloom’s classification of levels of intellectual behavior (see Table 1). Bloom’s domain arose from a need to facilitate communication among psychologists in regards to educational testing (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956).
<table>
<thead>
<tr>
<th>Level</th>
<th>Definition</th>
<th>Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving</td>
<td>Being aware of, or attending to, something in the environment</td>
<td>Listen, watch, touch, observe</td>
</tr>
<tr>
<td>Responding</td>
<td>Showing some new behaviors as a result of experience</td>
<td>Ask, assist, answer, participate, practice, perform, do</td>
</tr>
<tr>
<td>Valuing</td>
<td>Showing some definite involvement or commitment</td>
<td>Initiate, perform voluntarily, discuss with a friend, inquire, reflect</td>
</tr>
<tr>
<td>Organization</td>
<td>Integrating a new value into one's general set of values, giving it some ranking among one's general priorities</td>
<td>Articulate, plan, integrate, formulate judgments</td>
</tr>
<tr>
<td>Characterization by Value</td>
<td>Acting consistently with the new value</td>
<td>Change behavior, develop and enact a code of behavior, act consistently with one's espoused values</td>
</tr>
</tbody>
</table>

However, even Krathwohl et al. (1964) had difficulty in defining the term affective. They state that the affective domain consists of "... objectives that emphasize a feeling tone, an emotion, or a degree of acceptance or rejection" (p. 7). They go on to state, "The fact that we attempt to analyze the affective area separately from the cognitive is not intended to suggest that there is a fundamental separation. There is none" (p. 7).

A half-century after Watson concluded that affective states were unobservable and thus unnecessary for further examination, Krathwohl and his colleagues were still plagued with the inability to separate affect from cognition, and were still dealing with it indirectly by observing physical actions. As Kratwohl et al. (1964) is still the most cited work for affective education today, there has been little progress in this vital component of education. The relegation of affect to a minor role in education has occurred despite the work of a few who have recognized its importance.

Recently, Martin and Reigeluth (1999) have constructed a new instructional model for the affective domain, citing the influence on education of social issues such as teen pregnancy, violence, and abuse. As opposed to the focus on individual values by Krathwohl et al. (1964), Martin and Reigeluth (1999) place greater emphasis on social context (see Table 2).
## Table 2

Martin and Reigeluth Model of Affective Domain

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Knowledge</th>
<th>Skills</th>
<th>Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional Development</td>
<td>Knowing that others experience the same emotions you do, such as joy and anger</td>
<td>Recognizing emotions</td>
<td>I want to be happy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Controlling one's emotions</td>
<td>I don't like to be angry</td>
</tr>
<tr>
<td>Moral Development</td>
<td>Understanding moral and ethical rules of the culture, such as caring, justice, equality</td>
<td>Moral reasoning skills</td>
<td>I want to be honest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Problem-solving skills in the realm of morals</td>
<td>I am in favor of having ethical standards</td>
</tr>
<tr>
<td>Social Development</td>
<td>Understanding group dynamics and democratic ideals, such as the role of the facilitator</td>
<td>Social skills, including interpersonal communication skills</td>
<td>I want to interact positively with others</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ability to love others selflessly</td>
<td>I am opposed to resolving disagreements by fighting</td>
</tr>
<tr>
<td>Spiritual Development</td>
<td>Knowledge of religious precepts about the spiritual world, such as the nature of the soul</td>
<td>Skills for getting in touch with your inner self</td>
<td>I want a spiritual life</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I am in favor of prayer to build a relationship with God</td>
</tr>
<tr>
<td>Aesthetic Development</td>
<td>Understanding the subjective nature of aesthetics, such as the relationship between one's values and one's judgments</td>
<td>Skills for assessing aesthetic qualities</td>
<td>I want to surround myself with things of beauty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skills for generating aesthetic creations</td>
<td>I appreciate an elegant theory</td>
</tr>
<tr>
<td>Motivational Development</td>
<td>Understanding internal and external rewards for sustained activity, such as joy and sense of accomplishment</td>
<td>Skills for developing one's interests, both immediate and lifelong</td>
<td>I want a career that I enjoy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I am opposed to hobbies related to guns</td>
</tr>
</tbody>
</table>

For Martin and Reigeluth (1999), the standard for measurement for affective development is the individual and is thus, subjective. For example, "understanding group dynamics," means that one understands others more so than one did at a past point in time. Similar to SPT, an individual allows for expanded interpretations of the actions of others. Martin and Reigeluth see the affective domain as not only a process of individual growth, but as the goal of the affectively well-adjusted person. Dimensions were included if there were a strong attitude component that could influence behavior and if these behaviors could be widely applied to different situations.

In summary, it is only recently that there has been a call to separate affect from cognition, and a recognition that observable physical actions often fail to adequately measure the subjective component of affect. Specifically, affect should be measured separately from cognition, and can be influenced separately from cognition. Given the current views of affect in the learning process, this present investigation intends to determine if affect can be influenced by SPT in a CFH program.

CFH may be a likely way for enhancing SPT. Cognitive flexibility is an adaptive response to changing demands in a situation. Cognitive flexibility maintains that if knowledge is presented along multiple dimensions, one will spontaneously restructure one's schema (Spiro & Jehng, 1990). Learning takes place when the restructured schema is transferred to a new situation. In the case of SPT, one would restructure schema to take in to account the multiple perspectives of individuals who will have different perceptions of the same situation. CFH is the predominate use of cognitive flexibility in technology for learning. An example would be a computer program with links to different dimensions of knowledge.
Significance of Study

To understand group dynamics or the other concepts cited by Martin and Reigeluth (1999), the individual must realize that there are multiple views other than one's own. SPT is the freeing of oneself from one's own view in order “…to recognize and understand the thoughts, feelings, and motives of the self and others” (Menna & Cohen, 1997, p. 189). The purpose of this study is to determine if SPT can be enhanced through the use of cognitive flexibility theory in a hypermedia program. SPT has been shown to be amenable to instructional efforts and subsequent improvement has shown a concomitant improvement in social behavior (Chalmers & Townsend, 1990; Chandler, 1973). Furthermore, SPT has been shown to be measurable by quantitative analysis.

Justification

Schools are a social milieu. Learning, intentionally or unintentionally, is interwoven with affective factors (Beane, 1990). Additionally, schools are increasingly perceived as the agent to address societal concerns. Racism, substance abuse, and teen pregnancy vie with English, math, and science for instructional time (Martin & Reigeluth, 1999). Violence within the schools has become an issue of its own (Johnson & Johnson, 1996).

Despite the driving need for merging affective factors into education, the research related to SPT is limited. For example, two of the most influential studies in SPT have been conducted with only one gender. Chandler (1973) found that the social perspective ability of male adolescents could be improved through instruction. Chalmers and Townsend (1990) found the same results with institutionalized female adolescents. This study will seek to enhance the social perspective ability of both genders.
Definitions

Affective education lacks a commonly agreed upon vocabulary. Theorists and researchers have often used contradictory or mutually exclusive conceptualizations (Corsini, 1984). For example, in most cases, affect is a generic term used to describe emotions, attitudes, beliefs, moods, and conation (Simon, 1982).

The following terms will be used in this study:

1. Affect - is not an emotion, but a number of different interrelated states such as emotion, mood, and feelings (McLeod, 1991). The differentiation among these states is as follows:

   (a) Emotion - an arousal of the autonomic nervous system accompanied by a visceral reaction such as increased heartbeat, knot in the stomach, etc., and a cognitive interpretation of the activation. In engendering its cognitive interpretation, emotion interrupts ones thought process and redirects attention (McLeod, 1991; Simon, 1982).

   (b) Feelings - are body sensations (visceral reaction) that accompany activation of the autonomic nervous system, be it emotions or mood (McLeod, 1991).

   (c) Mood - a less intensive activation of autonomic nervous system and interpretation of the activation. Mood orients an individual’s thought processes on the aspect of the stimulus that is most congruent with the mood (McLeod, 1991; Simon, 1982).
2. **Attitude** - A state of readiness or a learned predisposition to behave in a consistent way. Like a mood, attitude orients the thought processes. Unlike mood, it is of longer duration (Martin & Reigeluth, 1999).

3. **Chandler Cartoon Sequence (CCS)** - is an assessment device consisting of cartoon panels on paper to measure SPT designed by Chandler (1973). The CCS is a series of panels of cartoons with a bystander character that appears in the middle of the series. The bystander character has no knowledge of events prior to his/her appearance. In the final version used to assess participants, the CCS consisted of three series of cartoon panels. The CCS is scored on a zero to four inverse scale with a zero indicating that the participant is able to take the social perspective of another, while a four indicates that the participant is unable to separate his/her perspective from that of another.


5. **Cognitive flexibility hypermedia (CFH)** - computer-supported links that represent multiple cases that allow a non-linear organization of abstract information and promote a deep conceptual understanding that is transferable to new situations. Items that are linked may be graphics, audio recordings, animation, and video clips, as well as text (Jacobson & Archodidou, 2000).
6. **Cognitive Flexibility Hypermedia (CFH) program of video vignettes** - an interactive hypermedia program with links to twenty-four video vignettes to enhance SPT, which was created specifically for this study.

7. **Delinquency** - youth adjudicated delinquent by the courts in the state of Pennsylvania.

8. **Mental capacity** - the maximum number of independent schema that can be coordinated at any one time (Lapsley & Quintana, 1989).

9. **Social perspective taking (SPT)** - the freeing of one’s self of one's own view in order “to recognize and understand the thoughts, feelings, and motives of the self and others” (Menna & Cohen, 1997, p. 189). Social perspective taking is not a mood, a feeling or an emotion. Instead, it is a cognizance that another does not share these factors.

10. **Twin Rivers Video (TRV)** - is a video assessment to measure SPT specifically designed for this research study. Similar to the CCS, the TRV presents a short story with a bystander character that appears in the middle of the story. The bystander character has no knowledge of events in the story prior to his/her appearance in the story. In the final version used to assess participants, the TRV consisted of three video stories.
Summary

The affective component of education has been undervalued for close to a century. This was mainly due to the ascendance of the behaviorism school of psychology, which generally relegated everything that was not observable into the affective category. Furthermore, if affective variables could not be measured, they were not interpreted. Other psychologists, most notably Baldwin, Vygotsky, Mead, and Piaget, as well as schools of psychology such as Würzburg and Gestalt, have advocated the interdependence of such factors as emotion, mood, feelings, and attitude with cognition and behavior. Recent events have resulted in a call for the reintegration of these former factors in the educational process (Martin & Reigeluth, 1999). SPT training has been shown in the past to improve pro-social behavior. As an increase in SPT involves acknowledging a perspective of another, CFH, which provides multiple perspectives, may offer a new means of instruction for SPT. This study will extend the SPT research base by examining the influence and potential of CFH to affect SPT.
Chapter Two

Review of the Literature

*Social Perspective Taking*

SPT has been defined as freeing oneself of one's own view in order “…to recognize and understand the thoughts, feelings, and motives of the self and others” (Menna & Cohen, 1997, p. 189). The beginnings of SPT can be traced to Mead’s (1934) theory that the socialization of the self consists of the ability to take the role of another.

Next, Piaget’s (1964) theory of cognitive development, with its emphasis on integrative patterns of cognition throughout development and across domains, furthered research on the concept of SPT (Menna & Cohen, 1997). Of particular importance were his concepts of egocentrism and decentration. Egocentrism is the inability to differentiate self from others, while decentration is the ability to consider multiple perspectives (Inhelder & Piaget, 1972; Youniss & Robertson, 1970). Initial research dealt with a physical perspective of egocentrism, specifically how does an object look to people who are positioned at different angles (Huttenlocher & Presson, 1973; Youniss & Robertson, 1970).

Subsequently, other researchers began to examine decentering from a social perspective view (Flavell, Botken, Fry, Wright, & Jarvis, 1968; Miller, Kessel, & Flavell, 1970; Selman, 1980; Selman & Byrne, 1974). They found that SPT ability increased in children with age. Flavell et al. (1968) had participants view a series of seven pictures and asked them to tell the story from the illustrations. Three pictures were then removed and participants were asked to tell a story as a person who only viewed the remaining pictures. Participants who could tell the story correctly from the four pictures received the
maximum score for SPT. Flavell et al. (1968) found that SPT ability improved developmentally to the age of ten (near his upper limit) and hypothesized that improvement extended into the teen years.

Selman (1973) examined the development of children’s SPT stages and compared them to Piaget's developmental stages and found that there was an approximation. In Selman’s studies, participants viewed vignettes (paper format) about a main character who encounters a situation and makes a decision. In a subsequent structured interview, Selman measured SPT by scoring subject responses to how a secondary character, not present during the situation, would perceive the decision made by the main character.

Selman (1973) found that initially, children develop an uncoordinated, individualist understanding of others. Subsequently, they evolve to an understanding that coordinates two perspectives (that of their own and that of one other), and then eventually to an understanding that one must acknowledge a complex social system in forming a perspective. Selman identified five stages (see Table 3).
Table 3

<table>
<thead>
<tr>
<th>Age In Years</th>
<th>Piaget (Driscoll, 1994)</th>
<th>Selman (1973)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Sensimotor Stage (0-2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Modifies reflexes to make them more adaptive</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Becomes goal oriented in behavior, with goals moving from concrete to abstract</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Begins to mentally represent objects and events</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Preoperational Stage (2-7)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Acquires the semiotic function.</td>
<td>Stage 0 (ages 3-6) children cannot distinguish clearly between their own interpretation of a situation and another person's point of view</td>
</tr>
<tr>
<td></td>
<td>Engages in symbolic play and language games</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Has difficulty seeing another person’s point of view. Thought and communication are egocentric</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Reasons from a focus on one perceptual dimension of problems</td>
<td>Stage 1 (ages 5-9) Although children realize others may have different views than their own, they are unable to understand such views</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Concrete Operational Stage (7-11)</td>
<td>Stage 2 (ages 7-12) Older children and preadolescents can reflect on their thoughts and feelings from another person's viewpoint, but they cannot hold both perspectives simultaneously</td>
</tr>
<tr>
<td>8</td>
<td>Performs true mental operations (conservation, re-versibility) and solves concrete problems logically</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Has difficulty thinking hypothetically and systematically considering all aspects of a problem</td>
<td>Stage 3 (ages 10-15) Can step outside their own viewpoints and those of others to assume the perspective of a neutral third person</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Stage 4 (adolescence-adulthood) Can now understand their thoughts and behaviors from a more abstract level that is capable of a societal perspective</td>
</tr>
<tr>
<td>11</td>
<td>Formal Operation Stage (11-up)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Solves abstract problems in systematic fashion</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Reasons hypothetically and often develops concerns over social issues</td>
<td></td>
</tr>
</tbody>
</table>
Later studies have further established the relationship between cognitive stages and SPT stages. Walker (1980) found that it was necessary for a cognitive development stage (as based on the work of Piaget, 1964) to precede an SPT stage. His participants were 64 fourth through seventh graders (stage 3). Although some participants had SPT stages that were equal to their cognitive stages, none had social perspective stages that exceeded their cognitive stages. Selman (1973), like Walker, found that children must obtain the cognitive level before being able to function at the same social-perspective level. A number of studies have found that although cognitive levels are necessary, they are insufficient in themselves to increase SPT (Chandler, 1973; Chandler & Helm, 1984; Selman, 1973).

However, what has been determined to be most critical to the development of SPT is mental capacity. Lapsley and Quintana (1989) defined mental capacity as the maximum number of independent schema that can be coordinated at any one time. In a study involving ninety-nine elementary students (stage 2 and 3), they found that success on an SPT test developed by Chandler (1973) was contingent on coordinating a large number of mental schema.

*Attempts to Influence Social Perspective Taking*

Since the underlying cognitive processes are not yet well understood, attempts to improve the social-perspective taking of early adolescents have had mixed results. In the best known of these studies, Chandler (1973) found that the SPT skills of early adolescent delinquents were inferior to that of non-delinquents. SPT was measured by ten cartoon panel sequences. Each sequence had a central character who becomes involved in a chain of cause and effect events. A bystander, with no knowledge of the previous
events, is introduced midway in each sequence. For example, in one sequence a boy (central character) hit a baseball and broke a window. In fear, he raced home, where his father (bystander) sat reading a newspaper. A knock at the door caused the boy to react with alarm.

In subsequent interviews, subjects were asked by the examiner to recount the events of the CCS. After doing so, the examiner would ask subjects to tell the story that the bystander would tell. In order to correctly interpret the cartoon sequence, the subjects had to separate their perspective from that of another. In this study, the delinquents would attribute “privileged” information to the bystander. In this example, they would say that the father knew the boy was alarmed because he had broken the window. Most non-delinquents correctly replied that the father did not know the source of the boy being alarmed.

For this study, Chandler had three treatment groups. In the experimental group, the participants developed skits of real life situations. Participants took turns playing the different roles in the skits, thus experiencing the situation from multiple perspectives. The participants, also, filmed the skits for later viewing. The control group, also, used video equipment, but in an unrelated way. Their use was limited to making documentary films about their neighborhood. Additionally, they could not be participants of their own film. There also was a non-treatment (i.e., no video), test-only control group. After treatment, the experimental group showed significant improvement in their SPT ability compared to the control group. More impressively, an eighteen-month follow-up showed a significant decrease in recidivism for the delinquents who received the training, which strongly highlights why SPT interventions may be of value.
Interrater reliability for the CCS in this study was .94. Kaplan and Arbuthnot’s (1985) study of thirteen and fourteen year olds, which had subjects that were both delinquent and non-delinquent, had an interrater reliability of .88. The Spearman-Brown split-half reliability coefficient for alternate forms of the CCS is .92 (Chandler, 1973). Thus, besides interrater reliability, the CCS also exhibits test reliability.

CCS is a construct valid scale for SPT based on three criteria cited by Enright and Lapsley (1980). The first is that the CCS correlates with other SPT scales, Miller et al.’s (1970) recursive thinking task and Rubin’s (1978) nickel-dime game.

Secondly, scores on the CCS demonstrate a relationship between reasoning and behavior. This criterion is met in Chandler’s study (1973) that shows that delinquent adolescents score lower on the measure than non-delinquent youth.

Lastly, Enright and Lapsley (1980) maintain that there should be a higher within-domain correlation than correlation between the scale and general intelligence. The CCS shows convergent-discriminant validity with an internal consistency of .92 and a correlation of -.30 with IQ of 11-13 year old delinquents, as measured by the Peabody Picture Vocabulary (Chandler, 1973).

Chalmers and Townsend (1990) conducted a similar study. Their participants were adolescent girls (mean age 13.7) who were institutionalized for "habitual antisocial or socially maladjusted behavior" (p. 179). They used the same cartoon sequence as Chandler (1973) to measure SPT. The experimental group received training in interpersonal skills consisting of examination of one another’s beliefs, attitudes, and knowledge, which were modeled and explained by a teacher. Subsequently, participants were asked to demonstrate the skills. Then, similar to Chandler’s group, they were asked
to use these skills to role-play situations they may encounter in life. The control group engaged in a physical exercise program. The experimental group showed a significant improvement in SPT over the control group.

However, other studies to enhance SPT have not been as successful. Marsh, Serafica, and Barenboim (1980) trained early adolescents of above average ability (mean age 13.7) in role-playing. Individuals are given a character and a scenario and instructed to behave, as they believe the character would in the scenario, for example a thirteen-year-old may be told to act like a student who is having a verbal confrontation with a teacher. Subsequently, participants role-played situations that were filmed using a video camera, then watched the video. To measure SPT, Marsh et al. used a method similar to that of Chandler's cartoons. There were no significant differences compared to the control group that participated in "regular curriculum activities." Marsh et al. (1980) speculated that the reason for the result was that the population was “above average”, and that change in SPT could only take place if there were an initial deficit.

Replication of Chandler's differences in social-perspective taking for delinquents and non-delinquents have also had mixed results. Kaplan and Arbuthnot (1985) found no significant differences between delinquents and non-delinquents for SPT on Chandler's cartoon test. However, the participants as a whole were older than those studied by Chandler, ages 13 to 15 as opposed to 11 to 13. Additionally, the study is confounded since delinquents were older than the non-delinquents. Using related instruments, Lee and Prentice (1988) found that delinquents were lower on modes of role-taking, logical cognition, and moral reasoning than non-delinquents. Also, the mean age of the participants was 16.05, which is the oldest for studies on influencing SPT.
In Piagetian theory, adopting a frame of reference of another, as is required in SPT, would involve changing cognitive structures through a process of assimilation and accommodation. Whereas assimilation involves the interpretation of new events in terms of already existing cognitive structure, accommodation is the modification or changing of these cognitive structures due to the new events in the environment (Piaget, 1973). To facilitate accommodation, activities should engage learners while they adapt their existing schema.

In advocating the need for adaptation, Piagetian theory is congruent to cognitive flexibility with its premise that if knowledge is presented along multiple dimensions, individuals will spontaneously restructure their schema (Spiro & Jehng, 1990). Due to this non-linear approach, cognitive flexibility has the potential to impact SPT with its multiple views and difficult to define concepts of thoughts, feelings, and motives. The next section describes the likely relationship between SPT and cognitive flexibility.

**Cognitive Flexibility Theory**

Spiro and Jehng (1990) gave the following definition of cognitive flexibility:

By cognitive flexibility, we mean the ability to spontaneously restructure one's knowledge, in many ways, in adaptive response to radically changing situational demands...this is a function of both the way knowledge is represented (e.g., along multiple rather than single conceptual dimensions) and the processes that operate on those mental representation (e.g., processes of schema assembly rather than intact schema retrieval). (p. 165)
Cognitive flexibility, with its use of case studies with multiple perspectives, is a promising approach for enhancing SPT. The concept of cognitive flexibility consists of the knowledge as well as the processes the student uses to interpret that knowledge. One goal of cognitive flexibility is to transfer the skills beyond the initial learning situation (Spiro & Jehng, 1990). As learning is considered to be context dependent, instruction should make use of real-world situations.

However, to avoid over-simplicity, which would result in students over-generalizing in future situations, knowledge presentation should take place in a complex, ill-structured domain. Case studies, a problem or activity about a real or hypothetical situation, allow learners to understand and appreciate the complexity of knowledge environments (Ludwig 2000). For example, Coulson, Feltovich, and Spiro (1997) found that by providing different case studies through cognitive flexibility, medical students were more likely to understand the different sources of hypertension. The demands of the ill-structured, interconnected, multiple perspectives (case studies) lead to the restructuring of the schema of individuals.

Perhaps, the maximum value of multiple perspectives comes in examining and then contrasting the perspectives. This process as been referred to as the crisscrossed landscape (Spiro, Vispoel, Schmitz, Samarapungavan, & Boerger, 1987; Wittgenstein, 1953). Users traverse multiple case studies in a nonlinear manner only to return to the starting location from differing points. Consequently, users develop a complex yet flexible knowledge representation.

Shown in Figure 1 is a representation of the crisscrossed landscape of cognitive flexibility. There are three different case studies (A, B, C), and four different individuals
(W, X, Y, Z), with their own unique perspective of each case study. In cognitive flexibility, learners are free to transverse the case studies and perspectives as they deem necessary. In the diagram, the lines interconnecting the blocks indicate only a few of the paths that learners could travel. For the sake of legibility, other combinations are not shown. For example, learners could go from Case Study A, Perspective of Individual W to Case Study C, Perspective of Individual Y.
Figure 1. Crisscrossed Landscape of Cognitive Flexibility showing the interrelationship between Case Studies and Perspectives
Multiple perspectives, as opposed to a single perspective, have been found to facilitate SPT (Steins & Wicklund, 1996, 1997; Wicklund & Steins, 1996). Many of the studies by Steins and Wicklund ask participants to take the role of another. In one study, Steins and Wicklund (1997) found that when participants listened to themselves on tape, they were more apt to accept the perspective of another. The authors reasoned that essentially, hearing their own voice on the tape was perceived as another person, and so provided practice in perspective taking.

*Use of Hypermedia with Youth*

Facilitating a crisscrossed path through the different perspectives of the learning environment is important, as the use of hypermedia (on computer) is insufficient to guarantee high-level learning in middle school students (Oliver & Hannafin, 2000). Thus, facilitation should be accomplished through some type of over-arching task (Godshalk, Harvey, & Moller, 2004; Harvey, 1999; Harvey, Godshalk, & Milheim, 2001).

For example, Wittrock and Alesandrini (1990) found that when participants were given tasks, such as two ways to personalize experience, they had a higher degree of learning compared to participants that attempted the same assignment without a task. Qiu (1993) found that a specific task (find the correct size of a node) resulted in more analytical searching as opposed to a more general task (find information in hypertext). Chan, Burtis, Scardamalia, and Bereiter (1992) found that middle school students, who attended to connections and relationships between ideas, had a higher construction of knowledge than those who applied a linear strategy. In general terms, these studies have considered the effects of taking multiple perspectives on cognitive outcomes, though a few studies have examined the effects of cognitive flexibility on affective outcomes.
Cognitive Flexibility and Affective Learning

The use of cognitive flexibility in affective learning has been advocated and tested in the last decade. To assist pre-service teachers with the practice of teaching, Nelson and Smith (1995) developed a CFH called Chronicles of Teaching. The hypermedia system indexed classroom situations by subject, teaching activity, grade level, and keyword descriptors. An evaluation showed that the program achieved its intended purpose to facilitate discussion and reflection about education among preservice teachers. Thus, CFH at least initiates internal analyses and probing of events, and at least sets the stage for taking multiple perspectives.

In using CFH for the topic of sexual harassment with adults in a corporate environment, Harvey (1999) found that participants given the task of making a policy on sexual harassment, became more sensitive to the issues as measured by self-report compared to those who were asked to judge innocence or guilt. Fitzgerald, Wilson, and Semrau (1997) developed a hypermedia program, which included video segments to enhance the problem-solving skills of teachers working with special education children. There were no significant differences in the teachers’ perspectives on emotional and behavioral disorders as measured from on-line user records, embedded computer-generated reports, and qualitative interviews. However, structured interviews revealed that the teachers did gain an appreciation of multiple perspectives in general and the need for a diverse team approach to problems. Further analyses of the study reveals that it did not follow all the tenets of cognitive flexibility in that there was no crisscrossing between cases. Also, their investigation shows that different measurement approaches are more or less sensitive to the CFH treatment effects.
Both Chandler (1973) and Chalmers and Townsend (1990) took an approach similar to cognitive-flexibility in their studies of social-perspective taking. Participants had a chance to view themselves in multiple perspectives. Initially, they acted the role themselves. Then they had an opportunity to play different roles. Finally, (in the case of Chandler) they had the opportunity to watch their role-plays on video. Chalmers and Townsend’s (1990) participants received role-play training, which would also give them an opportunity to contrast their usual interactions with what they were being shown. The learning was context-dependent, yet specific in that participants role-played situations with which they were familiar. Such situations can be considered the equivalent of case studies and perspectives in CFH. Finally, in the case of the Chandler study, transfer of the skills learned went beyond the initial learning situation in that the recidivism rate was much lower for the participants in the treatment group than those in the control group. Thus, real-life learning situations resulted in the transfer of that knowledge to real-life situations, something Chandler shares with cognitive flexibility advocates (Brown, Collins, & Duguid, 1989).

**Dual Coding**

In a hypermedia program, cognitive flexibility has the potential to more closely resemble real-life learning situations through its use of multiple forms of media (Campbell, 1997). Both Chandler (1973) and Chalmers and Townsend (1990) found that people could receive a message through images and words. Langer (1969) found that while it is best to initially introduce complexity to create disequilibria, people learn best in the medium that is easiest for them. Physiologically, human beings are engaged by the visual medium. For example, Libby, Lacey, and Lacey (1973) reported that the pupils of
the eye dilated when merely looking at pictures. Similarly, when people's attention is engaged, their pupils dilate (Libby et al., 1973). Thus, pictures engage attention.

In Paivio's (1971) dual coding theory, there are at least two separate information processing systems in human beings, one for verbal language and one for visual information. Furthermore, he stated that while verbal information may be transmitted, visual information will be transmitted. Considerable empirical research has supported Paivio's theory (O'Connor & Hermehn, 1978). Of critical importance, O'Connor and Hermehn found that while children with low intellectual ability (as measured by an IQ test) had difficulty in converting words to precepts, they were equal to peers of average intellectual ability in recognizing visual representations. Consequently, children with cognitive deficits are not as disadvantaged when a visual medium is utilized.

Thus, visual stimuli may be the optimal basis of schema and schema change for learner’s with lower mental capability, by physiologically bypassing, at least initially, cognitive, verbally- based evaluation. The visual and verbal systems in children do not merge until the age of about seven, at Piaget's concrete operational stage (Tower, 1983). Consequently, the early formation of cognitive schema is dominated by the representations of images (Tower, 1983). However, life experiences at this early age simply may not be rich enough to engender SPT. Thus, CFH that uses a “visual” format may provide added depth or richness of associations for young children to acquire SPT. The use of digital video in CFH has increased rapidly in recent years (Spiro, Collins, & Thota, 2003).
Cognitive Load

Sweller’s (1988) cognitive load theory has implications for cognitive schema change through visual presentation. Cognitive load theory is based on the long known idea that working memory is limited (Miller, 1956; Simon, 1974), though the number of “chunks” that can be held in memory does increase with age. As a result of these likely limitations, it is more difficult to assimilate information with multiple elements. Presenting multiple elements individually and out-of-context, as is often done in instruction, loses the natural relationships between the elements.

This problem can be mitigated through the combination of motion visuals and audio text which lessens the “load” of the learner compared to only visual or verbal presentation (Mayer & Anderson, 1991, 1992; Mayer & Sims, 1994). Tindall-Ford, Chandler, and Sweller (1997) found a reduction in cognitive load when information was presented in two modes, audio text and visual, as opposed to only visual.

Learning Assessment by Visual Media

Visuals have also been found to have a positive effect in learning assessment. Video assessment (a digital video tape to evaluate the learning of participants) has been shown to facilitate learning (Bakx, Siitsma, & Vander Sanden, 2000; Smit & Van der Molen, 1996). Holsbrink-Engels (1998) found an increased time for reflection with multimedia assessment. Pisters, Bakx, and Lodewijks (2002) found that a video assessment program enhanced the motivation to learn.
**Peer Interaction and Social Perspective Taking**

Based on previous studies with adolescents, the content of visuals could be important in facilitating social-perspective taking. Watching peers interacting with each other has been shown to be effective. For example, Froming, Nasby, and McManus (1998) found that if a youngster can act as a role model in perspective taking, the perspective taking would result in pro-social behavior. Further, modeling by peers has been found to be effective for children between the onset of the preoperational thinking stage and that of operational thought (Fein, 1973; Fouts & Liikanen, 1975; Gottlieb, 1968). It is possible that the familiarity of peer interaction reduces further cognitive load, thus freeing mental resources.

**Summary**

SPT is the ability to recognize and understand the thoughts, feelings, and motives of self and others. It has been shown to be a factor in promoting pro-social behavior. SPT ability is intimately related with Piaget's theory of cognitive development, that one must be able to simultaneously coordinate different perspectives. CFH offers students the chance to integrate different perspectives. Research has shown that practice in taking the perspective of another increases SPT (Chalmers & Townsend, 1990; Chandler, 1973). Video can reduce the cognitive load in learning (Mayer & Anderson, 1991, 1992; Mayer & Sims, 1994). It seems likely that cognitive flexibility in a hypermedia video program relieves students of a heavy cognitive load that may impinge on their ability to coordinate the perspectives. Media using peers has proven to be the most successful with adolescents. Taken together, this supports the use of video-based CFH for enhancing SPT in the present investigation.
Further, since the matching of learning and assessment formats facilitates recall (Morris, Bransford, & Franks, 1977), a video assessment format may measure SPT more accurately than the cartoon panel sequences alone since the instruction is video based.

Improved measures of SPT can lead to a new generation of instructional design research melding the cognitive and affective domains. Since delinquents take longer to achieve the same SPT level as non-delinquent peers (Kaplan & Arbuthnot, 1985), a program to assist developmentally ready potential delinquents increase their SPT would be beneficial to the individuals and society.
Chapter Three
Methods and Procedures

Predicted Effects

It was expected that a CFH program of video vignettes would enhance Social Perspective Taking (SPT) in delinquent adolescents. The use of hypermedia would enable delinquent youngsters to overcome the problems they have with cognitive load. It was expected that gender would not have an effect on the enhancement of SPT in delinquent adolescents who participated in a CFH program of video vignettes. Finally, it was expected that the interrater and test reliability of the TRV would equal the interrater and test reliability of the CCS.

Pilot Study

A pilot study was conducted as a formative evaluation in order to validate and improve the CFH treatment of video vignettes, the research interview, protocol, and the TRV. The pilot included twenty participants, nine males, and eleven females with an average age of 13.6. Courts in Pennsylvania had previously found all of the youth delinquent.

The pilot included two assessment devices. The first was the CCS developed by Chandler (1973), consisting of five print-based cartoon sequences, which included Baseball, Coin, Plane, Sandcastle, and Snowman. The second was the TRV, consisting of six videos developed for this study. Included in the TRV were the videos Dance, Dress, Maybe a Calc, Rumor, Tumblin’, and Wrong Number.

Participants were asked to view all twenty-four links to the CFH program of video vignettes and to tell the researcher when they got bored. Fifty percent of the participants
viewed all twenty-four video vignettes. Collectively, the twenty-four video vignettes told a story of three adolescent girls. Participants reported that they were motivated by curiosity as to the outcome of the events in the CFH program of video vignettes. Some participants, however, had difficulty sustaining interest. For these participants, the number of CFH video vignettes viewed ranged from 12 to 16 with an average of 13.

It became readily apparent in the pilot study that some of the assessments in the CCS and TRV were incomprehensible to the participants. In the CCS, seventy percent of the participants had difficulty understanding the actions of the characters in “Coin.” Because of the poor quality of the photocopy of the original, most of these participants were unable to determine that the object being tossed by a boy in the air was a coin.

For the same reason, fifty-five percent were unable to understand “Plane.” In this sequence, participants were unable to relate the connection between a real plane and a toy plane, or were unable to determine that a black object in the cartoon was the toy.

In the TRV, thirty percent were unable to comprehend “Tumblin’.” The problem for most was that the connection between the events in two separate scenes was based on a verbal exchange rather than a video of events. The same percentage was unable to understand “Maybe a Calc.” In this TRV assessment, subjects were unable to make a connection between an object in the first scene (a can of beer) and the appearance of the same object in the second scene. Thus, Coin and Plane from the CCS, and Tumblin’ and Maybe a Calc from the TRV, were excluded.

Next, participants were assigned randomly to receive the two assessment devices for SPT, the CCS and the TRV, either before or after the treatment of CFH program of video vignettes. Those who received the CCS and TRV before the CFH program of video
vignettes did not have benefit of the instruction in SPT. Responses on the CCS and TRV were scored on a zero to four inverse scale developed by Chandler (1973) with a zero indicated that the participant was able to take the social perspective of another, while a four indicated that the participant was unable to separate his/her perspective from that of another (see Table 4).

Table 4

Pilot Scores on the Chandler Cartoon Sequence (CCS) and Twin Rivers Video (TRV)

<table>
<thead>
<tr>
<th>Assessments</th>
<th>Before HV Mean</th>
<th>Before HV Std Dev</th>
<th>After HV Mean</th>
<th>After HV Std Dev</th>
<th>Pre-Post Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS-Baseball</td>
<td>1.90</td>
<td>1.71</td>
<td>0.25</td>
<td>0.71</td>
<td>1.65</td>
</tr>
<tr>
<td>CCS-Sandcastle</td>
<td>1.70</td>
<td>1.85</td>
<td>0.00</td>
<td>0.00</td>
<td>1.70</td>
</tr>
<tr>
<td>CCS-Snowman</td>
<td>1.70</td>
<td>2.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.70</td>
</tr>
<tr>
<td>TRV-Dance</td>
<td>1.70</td>
<td>2.00</td>
<td>0.40</td>
<td>1.27</td>
<td>1.30</td>
</tr>
<tr>
<td>TRV-Dress</td>
<td>0.00</td>
<td>0.00</td>
<td>0.75</td>
<td>1.56</td>
<td>-0.75</td>
</tr>
<tr>
<td>TRV-Rumor</td>
<td>2.10</td>
<td>2.17</td>
<td>0.50</td>
<td>1.20</td>
<td>1.60</td>
</tr>
<tr>
<td>TRV-Wrong Number</td>
<td>3.00</td>
<td>1.41</td>
<td>0.33</td>
<td>0.89</td>
<td>2.67</td>
</tr>
</tbody>
</table>

*Note. Inverse scale ranges from 0 (high) to 4 (low).*

In using the CCS with female adolescents (ages 10 to 16, mean 13.7), Chalmers and Townsend (1990) received an average mean of 4.5 and standard deviation of 2.88 before treatment and a .88 mean and 1.13 standard deviation for after treatment, a gain of 2.0. These scores were for three different (unspecified) CCS combined. Therefore, the average mean for a single CCS in the Chalmers and Townsend study was 1.5 before and .29 after.

As a result of the pilot study, Coin, and Plane were removed from further use from the CCS, as a large percentage of the participants were unable to draw a conclusion from the story due to their failure to decipher the nature of objects in the cartoons. In the TRV, Tumblin’ and Maybe a Calc were removed due to the inability of participants to
make connection between events in two different scenes. Due to its inability to differentiate between treatment and control participants, Dress was removed from further use from the TRV. Thus, Baseball, Sandcastle, and Snowman from the CCS, and Dance, Rumor, and Wrong Number from the TRV were used in the primary investigation.

Also, due to the limited attention span of some participants in the pilot study, it was determined that subjects would view only thirteen of the twenty-four video vignettes in the CFH program in the subsequent investigation. Participants in the primary study were from the same demographic background as those in the pilot.

Primary Study Participants

Delinquent participants were of both genders and were between the ages of 10 and 14. Participants were assigned at random to the control or treatment group based on a coin toss.

Treatment

There were a total of twenty-four CFH video vignettes adapted from text material, *Mill River Junior High* (Rubisch, 1992). The video vignettes were videotaped and edited by the researcher with the students from his school serving as actors.

The twenty-four CFH video vignettes were divided into six groups of four each (see Figure 2). Within a group, four hyperlinks lead participants to a different video version of one event. The only difference in the versions was the insertion of a character's "thoughts." For example, the vignette “Library” showed the three primary characters talking to each other in the library. The vignette, “Library: Holly’s Thoughts” used exactly the same video as “Library”, but added Holly’s thoughts about the conversation,
thus revealing more information. Thoughts were distinct from other footage in three ways:

1. The video vignettes portraying thoughts were in black and white.

2. In the video vignettes portraying thoughts, the character addressed the camera directly.

3. The video vignettes portraying thoughts were clearly labeled (e.g. "Mousey’s Thoughts").

For each one of the six groups of video vignettes, there were "thought" versions of three different characters, and a fourth version without thoughts. The vignettes told a short story of three early adolescent girls named Holly, Mousey, and Gina. The groups of video vignettes were dated and had a location: First day of school, Library; October 13, Lunch; November 25, Basketball Tryouts; February 4, Class 1; February 5, Holly’s House; February 6, Class 2.
Figure 2. Cognitive Flexibility Hypermedia (CFH) video vignettes (required vignettes denoted by * to the right of link, vignettes without * could be viewed if desired).
Posttest Assessment Materials

There were two sets of materials for the posttest: the paper-based CCS designed by Chandler (1973) and the TRV, similar to the CCS with the exception that the format was video. The TRV was videotaped, edited, piloted, and revised by the researcher with the students from his school serving as actors.

Chandler Cartoon Sequence (CCS) Posttest Measure

Baseball.

In this sequence a boy hit a baseball that broke a window. In fear, he raced home, where his father sat reading a newspaper. A knock at the door caused the boy to react with alarm. The father raised his arms, hands to the ceiling.

Sandcastle.

A boy stood proudly next to a sandcastle, which he had built. Suddenly, a girl on a bicycle appeared, and ran over the sandcastle while knocking over the boy. With his sandcastle destroyed, the boy cried and angrily walked home. Entering the house, he saw a younger sibling who proudly pointed toward a castle of cards. Still angry, the boy blew over the cards, while the younger sibling sat perplexed with a question mark over his head.

Snowman.

A girl made a snowman. However, the sun came out and melted it. Distraught, she began to walk home. Passing a bakery on the way, she brightened, as she smelled the odor that drifted from the shop. The baker happily waved her in and offered her cookies. The cookies were in the shape of snowmen. In the last panel, the girl began to cry and a question mark appeared over the baker’s head.
Twin Rivers Videos (TRV) Posttest Measure

Dance.

Two girls were talking at a dance. Amy stated that she hoped Zac would ask her to dance, that he had said that he would in school earlier that day. Her friend responded that Zac was not good looking and “dumb.” She concluded, “But it’s your life,” and walked away.

Zac came up to Amy and asked her to dance. He was stunned when she said no. He said, “Maybe later?” She responded, “Maybe, not.” Zac looked dismayed.

Rumor.

Two girls were seated at desks talking in a classroom. Katie told Nina that Nina’s friends, Heather and Kim, talked about her “all the time”, called her fat and “a sleeze.” Nina was surprised.

In the next scene, Nina entered the cafeteria with a friend, Krista. Heather and Kim waved to the two girls and asked them to sit down. Nina said, “C’mon Krista. I think there is room on the other side of the cafeteria.” Heather, Kim, and Krista looked perplexed by Nina’s actions.

Wrong Number.

Jennifer, seated in a classroom, was bothering the student sitting next to her. The teacher came to her and stated that it was the third time that day that he had had to talk to her about her behavior. He said that her parents might receive a phone call from him that evening. Jennifer looked disturbed.

In the second scene, Jennifer was eating supper with her mother. The phone began to ring. She was alarmed. The phone continued to ring. Finally, the mother asked her
daughter if she was going to answer the phone. Jennifer responded that it was probably a wrong number or “somebody selling stuff.” Disgruntled, the mother got up to answer the call while saying, “I don’t know what is wrong with you sometimes.”

Procedures

Treatment Group

On a laptop computer, the participants interacted with the CFH program of video vignettes. Participants were required to watch thirteen vignettes: four from the section entitled “Library”, two from the section entitled “Basketball Tryouts” (“Tryouts Holly’s Thoughts”, “Tryouts Mousey’s Thoughts”), and were allowed to watch seven that they selected on their own. It was previously discovered during the pilot study that some participants had not understand the concept of the thoughts of three different characters in one situation. Consequently, the four vignettes entitled Library were used to introduce the concept of the different thoughts of the three characters as well as introducing the characters themselves and thus were required viewing. The Library vignettes were viewed first by all participants.

Similarly, from participant responses in the pilot test, the four vignettes entitled Basketball Tryouts were determined to best demonstrate that two people could view a situation in different ways. In Basketball tryouts, Mousey offers to help Holly improve her basketball skills. From watching Tryouts Holly’s Thoughts, participants learn that Holly believes Mousey is making fun of her. However, from watching Tryouts Mousey’s Thoughts, they discover that Mousey is sincere in her offer. Consequently, all participants viewed were required to view at least two of the vignettes from Basketball Tryouts.
After watching a vignette, the researcher interviewed participants in a structured interview (Rogers, 2001) on what they saw in the vignette, and asked them to contrast that vignette with previously seen vignettes, thus the researcher interacted with the participant throughout the instruction, not just at posttest.

**Control Group**

The Control Group, consisting of half of the participants, received only the Posttests and not the CFH program of video vignettes.

<table>
<thead>
<tr>
<th>Treatments (40 minutes)</th>
<th>Posttests (20 minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFH (n=35)</td>
<td>CCS (on paper)</td>
</tr>
<tr>
<td>24 video vignettes</td>
<td></td>
</tr>
<tr>
<td>Control (n=35)</td>
<td>TRV (on video)</td>
</tr>
<tr>
<td>nothing</td>
<td>Basketball</td>
</tr>
<tr>
<td></td>
<td>Sandcastle</td>
</tr>
<tr>
<td></td>
<td>Snowman</td>
</tr>
<tr>
<td></td>
<td>Dance</td>
</tr>
<tr>
<td></td>
<td>Rumor</td>
</tr>
<tr>
<td></td>
<td>Wrong Number</td>
</tr>
</tbody>
</table>

*Figure 3. Procedure for Treatment and Control Groups.*

**Time**

The average time for completion by participants in the treatment group was one hour. The average time for completion by the control group was twenty minutes (see Table 5). Participants were allowed to stop their session at any time if they chose to do so. Participants were allowed to use as much time as needed with the CFH and posttest materials.
Table 5

Time of Involvement for Participants in Study

<table>
<thead>
<tr>
<th>Participant Group</th>
<th>Average Time with CFH Program of Video Vignettes</th>
<th>Average Time with CCS and TRV Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Control</td>
<td>NA</td>
<td>20</td>
</tr>
</tbody>
</table>

*Note.* Cognitive Flexibility Hypermedia (CFH), Chandler Cartoon Sequence (CCS), Twin Rivers Video (TRV)

*Posttest Procedures*

After the CFH treatment, participants were tested with the three different cartoon sequences from the CCS and the three different video scenarios from the TRV. In the case of the control group, participants began with the CCS and TRV. The order of posttest presentation (CCS or TRV) was randomized. In using video in the posttest in the TRV, it was believed that learning could be enhanced according to the Encoding Specificity Principle (Tulving & Thomson, 1973). Also, the use of video has shown transference to success in the lives of research participants (Olivier & Scott, 1982, 1983).

Participants were told that they could watch each individual TRV video as many times as needed to understand what had occurred in the video. They were told to inform the investigator if they could not see or hear the video. Similarly, in using the CCS, participants were told that they could view the cartoons as long as they needed to do so to understand what had occurred.

At the conclusion of the viewing of each video of the TRV, participants were asked if they needed to see the video again to comprehend the events in the video. If
subjects stated that they comprehended the video (or in the case of the CCS, the cartoon), the investigator would begin the interview process. Responses were recorded (audio only) for evaluation at a later date,

Again, as in the pilot test, it was determined to use a structured interview. If subjects did not volunteer the rationale for the main character’s behavior in the CCS or TRV, the interviewer prompted the subject with a question. The interviewer asked, “If we could talk to the boy/girl, how would (s)he tell what happened?” The participants’ response was recorded.

Next, the interviewer asked, “If we could talk to the bystander (bystander would be called by name, for example, mother) here, how would she say what happened?” After subjects concluded their description of the bystander’s perspective, the investigator would repeat their answer to ensure it was the answer they gave (for example, “So the mother would not know who was on the phone?”).

The scoring procedures previously used by Chandler (1973) and Chalmers and Townsend (1990) were used for evaluating responses to the CCS and TRV. A score of 4 was assigned to descriptions by participants in which the participant explicitly attributed information to the bystander that was only available to the participant. A 3 was assigned to accounts that conditionally or probabilistically attribute privileged knowledge to the bystander (e.g., "The father would probably think the boy broke the window."). A score of 2 was assigned whenever a participant attributed privileged information to the uninformed bystander but embedded this attribution in a series of non-egocentric alternatives ("The father would think that somebody was chasing him or that he broke a window, or something."). A score of 1 was assigned when the participant attributed
privileged information to the bystander, but later corrected this mistake. A zero was scored when the participant clearly distinguished between privileged information known only to the participant and facts available to both the participant and the bystander. There were two posttest scores for each participant: the average of the three CCS scores and the average of the three TRV scores. Interrater reliabilities computed on a sample of 50 responses indicated a high level ($r = .98$) of interrater agreement. Cronbach alpha reliability for CCS was alpha = .6856 and for TRV, alpha = .6104. Reliability for the combined CCS and TRV scores was alpha = .6441.

*Design and Analysis*

The dependent variable was SPT as measured by the CCS and the TRV. The study design was experimental. Since it could not be assumed that the data was distributed normally, the Kruskal-Wallis test was used to test the hypotheses. An alpha level of .05 was established for the rejection of all null hypotheses. Kruskal-Wallis was also able to identify any significant interactions, which in turn affected interpretation of any significant main effects.
Chapter Four

Results

The purpose of this study was to investigate whether SPT can be enhanced in juvenile delinquents who receive instruction via a CFH program. Participants were seventy juvenile delinquents. Originally, this study aimed to replicate the age of the subjects in the Chandler (1973) study, eleven to thirteen year olds. However, it was difficult to obtain subjects less than thirteen years of age. Consequently, fourteen year olds also participated. The average age of the participants was 13.5 and seventy percent were male. The ethnic background of the participants was 46 percent Caucasian, 31 percent Black, and 23 percent Latino.

$H_{01}$: There will be no significant differences in posttest scores for social perspective taking for delinquent adolescents between individuals who participate in instruction via a cognitive flexibility program in hypermedia and those who do not.

The Kruskal-Wallis test was performed to compare the SPT scores (combined CCS + TRV) of the control group versus those of the treatment group. No significant difference was found between the two groups at .05 ($p = 0.087$). $H_{01}$ could not be rejected at the .05 level (see Table 6).

Table 6

Results of $H_{01}$

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Median</th>
<th>Average Rank</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>35</td>
<td>.33</td>
<td>39.2</td>
<td>1.53</td>
</tr>
<tr>
<td>CFH</td>
<td>35</td>
<td>0.00</td>
<td>31.8</td>
<td>-1.53</td>
</tr>
</tbody>
</table>

Note. $H = 2.92$ df = 1 $p = 0.087$ (adjusted for ties). Inverse scale with zero as the highest score.
**H_{02}:** There will be no significant differences in posttest scores for social perspective taking by gender between individuals who participate in instruction via a cognitive flexibility program in hypermedia and those who do not.

The Kruskal-Wallis test, which is especially sensitive to unbalanced designs (Kruskal & Wallis, 1952), was used to compare scores of the unequal number of males and females in the treatment groups. Comparing the scores of females who received treatment, females who did not receive treatment, males who received treatment, and males who did not receive treatment, no significant difference was found between the four groups at .05 (p = 0.211). H_{02}: could therefore not be rejected at the .05 level (see Table 7).

Table 7

**Results of H_{02}**

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Median</th>
<th>Average Rank</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Treatment</td>
<td>10</td>
<td>0.00</td>
<td>27.4</td>
<td>-1.36</td>
</tr>
<tr>
<td>Female Control</td>
<td>11</td>
<td>.33</td>
<td>43.2</td>
<td>1.37</td>
</tr>
<tr>
<td>Male Treatment</td>
<td>25</td>
<td>0.00</td>
<td>33.5</td>
<td>-0.60</td>
</tr>
<tr>
<td>Male Control</td>
<td>24</td>
<td>0.00</td>
<td>37.4</td>
<td>0.56</td>
</tr>
</tbody>
</table>

*Note* H = 4.52 df = 3 p = 0.211 (adjusted for ties). Inverse scale with zero as the highest score.

**H_{03}:** There will be no significant difference between social perspective taking scores on the CCS and the TRV for delinquent adolescents who participate in instruction via a cognitive flexibility program in hypermedia.

The Spearman correlation value for the CCS and TRV are listed (see Table 8).
Table 8 Spearman Correlations for the Chandler Cartoon Sequence (CCS) and Twin Rivers Video (TRV)

<table>
<thead>
<tr>
<th></th>
<th>Baseball CCS</th>
<th>Sandcastle CCS</th>
<th>Snowman CCS</th>
<th>Wrong# TRV</th>
<th>Rumor TRV</th>
<th>Dance TRV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseball CCS</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.341 (**)</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.004</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandcastle CCS</td>
<td>.352 (**)</td>
<td>.590 (**)</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.003</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.003</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snowman CCS</td>
<td>.173</td>
<td>.319 (**)</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.151</td>
<td>.007</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.195</td>
<td>.155</td>
<td>.012</td>
<td>.258 (*)</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Wrong # TRV</td>
<td>.081</td>
<td>.444 (**)</td>
<td>.080</td>
<td>.280 (*)</td>
<td>.553 (**)</td>
<td>1.000</td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.106</td>
<td>.201</td>
<td>.919</td>
<td>.031</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.056</td>
<td>.000</td>
<td>.513</td>
<td>.019</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).
Results indicate significant correlations between the three CCS items. There were also significant correlations between the three TRV items indicating that CCS and TRV items are internally consistent. However, Sandcastle was the only item on the CCS to correlate with items on the TRV, Wrong Number, and Dance suggesting that the CCS and TRV are measuring different aspects of SPT.

The Sign Test for Median was performed to determine if there was a significant difference between the CCS and TRV in their measurement of SPT. No significant difference was found between the CCS and the TRV (p = 0.1849). H$_{03}$ could not be rejected at the .05 level (see Table 9).

Table 9

Results of $p$

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Below</th>
<th>Equal</th>
<th>Above</th>
<th>p</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS-TRV</td>
<td>70</td>
<td>18</td>
<td>42</td>
<td>10</td>
<td>0.1849</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*Note. Chandler Cartoon Sequence (CCS), Twin Rivers Video (TRV)*
This study was done to see if a cognitive flexibility in hypermedia program could influence SPT. No significant differences were found between subjects who received training in SPT via a CFH program and those that did not. Neither was there a difference in posttest SPT scores by gender. The third hypothesis, that there would be no difference between the CCS and the TRV, could not be rejected.

In regard to the first hypothesis, that a cognitive flexibility in hypermedia program could influence SPT, a determining factor may have been the gender of the characters in the video vignettes. Although some of the secondary characters were male, females played the main roles. As reported earlier, Chandler (1973) and Chalmers and Townsend (1990) used same sex populations (Chandler-male, Chalmers & Townsend-female). In both studies, subjects filmed themselves acting, and subsequently watched these videos. Thus, males improved SPT by watching video of males, females by watching video of females. In this study, a Kruskal-Wallis test of the female subjects in the study is significant at the .05 level (see Table 10).

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Median</th>
<th>Average Rank</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>10</td>
<td>0.00</td>
<td>8.2</td>
<td>-1.97</td>
</tr>
<tr>
<td>Control</td>
<td>11</td>
<td>0.33</td>
<td>13.5</td>
<td>1.97</td>
</tr>
</tbody>
</table>

Note. $H = 4.61$ $df = 1$ $p = 0.032$ (adjusted for ties). Inverse scale with zero as the highest score.

The large number of males in the survey (70%) may have resulted in insignificant findings for the entire sample, since the main characters in the hypermedia vignettes,
adolescent females engaged in non-delinquent acts, may have influenced the results. Any conclusion that the treatment was effective with the female subjects must be tempered by the increase of the chances of a Type I error as a consequence of the lack of homogeneity in the variances of the two subject groups, the conversion of raw scores to ranks and the unequal number of participants in the groups (Zimmerman, 2004).

Another factor may have been the nature of the video vignettes, all of which portrayed non-delinquent acts. Two studies, Chandler and Helm (1984) and Steins and Wicklund (1997) have found that SPT is enhanced by shared experiences. Male participants, as opposed to their female counterparts, may not have shared as many of the same experiences as the characters. Delinquent males have been found more likely to have close peer relations with other delinquents as opposed to females (Mears, Ploeger & Warr, 1998). Additionally, Kaplan and Arbuthnot (1985) found that delinquent boys had greater difficulty than delinquent females empathizing with others.

A contributing factor to the insignificant results may have been the inability to obtain participants of less than the age of thirteen. As reported earlier, the ability to SPT increases with age (Selman, 1973; Walker 1980,). The average age in this study was 13.5 (see Table 11). In Chandler’s (1973) study, the average age of participants was 12. In studies that had insignificant results, the average age was older than the 13.5 in this study—Marsh et al. (1980), 13.7; Kaplan and Arbuthnot (1985), 14.99; Lee and Prentice (1988); 16.05. It could be possible that there was a ceiling effect—too many of the participants in this study had already reached SPT maturity.
A limitation of this study may have been the amount of time the two subject groups were engaged in the study. With the addition of the CFH instruction to the posttest of the CCS and TRV, the treatment participants took an average of sixty minutes on task, while the control participants, who were limited to the CCS and TRV, spent an average of twenty minutes on task. Like Chandler’s study (1973), future research should consider adding an unrelated task, such as watching video segments, to compensate for the additional time. Practical ramifications made this unrealistic for this study.

Another limitation of this study also involved time, specifically the exposure the subjects had to SPT training. Chander’s subjects participated in preparation for the SPT training, and the training itself for forty hours. In the Chalmers and Townsend (1990) study, subjects received training for fifteen hours. In both studies, subjects showed improvement in observable behaviors after the completion of the training. The early findings of an ongoing program of SPT training in London indicate promising results (Wells, 2001). The same could not be expected for the subjects of this study due to their limited exposure to training in SPT.

As this study was done to see if a cognitive flexibility in hypermedia program could influence SPT, subjects who received treatment had a choice of viewing vignettes
featuring the thoughts of one, two, or three different characters. Although not significant at the .05 level, those who elected to view vignettes of all three characters in their seven non-required selections, did better on SPT as measured by the CCS (but not the TRV) than those who viewed two or less (see Table 12).

Table 12

Chandler Cartoon Sequence (CCS)- Participants who viewed vignettes featuring all three characters versus two or less

<table>
<thead>
<tr>
<th># Vignettes</th>
<th>N</th>
<th>Median</th>
<th>Average Rank</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3 Characters</td>
<td>13</td>
<td>0</td>
<td>20.4</td>
<td>1.06</td>
</tr>
<tr>
<td>3 Characters</td>
<td>22</td>
<td>0</td>
<td>16.6</td>
<td>-1.06</td>
</tr>
</tbody>
</table>

Note. \( H = 2.60 \ df = 1 \ p = .107 \) (adjusted for ties)

Similarly, participants who viewed vignettes of all three characters did better on Baseball, the most difficult of the three CCS cartoons (see Table 13).

Table 13

Baseball-Participants who viewed vignettes featuring all three characters versus two or less

<table>
<thead>
<tr>
<th># Vignettes</th>
<th>N</th>
<th>Median</th>
<th>Average Rank</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3 Characters</td>
<td>13</td>
<td>0</td>
<td>20.0</td>
<td>0.87</td>
</tr>
<tr>
<td>3 Characters</td>
<td>22</td>
<td>0</td>
<td>16.8</td>
<td>-0.87</td>
</tr>
</tbody>
</table>

Note. \( H = 2.48 \ df = 1 \ p = 0.115 \) (adjusted for ties)

Further Study

Further study should be done on the affect of “forced choice” in CFH programs. As participants were only able to view thirteen of the twenty-four vignettes in the CFH, they had to deliberate on their selection of vignettes. As cited above, there was a tendency for scores to be better for SPT for those that viewed a greater variety of vignettes.

Although this study found that there was some correlation between the CCS and the TRV, further research needs to be done on the validity of the TRV as an instrument to
measure SPT. The Spearman correlation coefficient for the CCS and TRV was .64. The correlation coefficient for the TRV was .61, and for the CCS .69. A ceiling effect may be responsible for the low correlation values. Only five of the seventy respondents scored less than a perfect score of zero (inverse scale) on Sandcastle, with the same number scoring less than perfect on Snowman. Conversely. Wrong Number, the most difficult item on both the CCS and TRV, approached significance for females (see Table 14).

Table 14

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Median</th>
<th>Average Rank</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>10</td>
<td>0</td>
<td>9.5</td>
<td>-1.06</td>
</tr>
<tr>
<td>Control</td>
<td>11</td>
<td>0</td>
<td>12.4</td>
<td>1.06</td>
</tr>
</tbody>
</table>

$H = 3.01$ $df = 1$ $p = 0.083$ (adjusted for ties)

This study was conducted to see if a CFH program could influence SPT in juvenile delinquents. Although statistically not significant, collectively the findings support the case for further research in this area.

As significant differences were found between females but not male subjects, future studies should use hypermedia programs that more closely reflect their participants particularly in regards to gender. Future studies should also address younger subjects to avoid a ceiling effect. Sixty-four of the seventy participants (91.4%) were over the age of twelve. Past research has shown that SPT can increase precipitously in early adolescence (Chandler, 1973; Kaplan & Arbuthnot, 1985; Marsh t al., 1980).

Additional research needs to be done on the validity of the TRV to measure SPT. Although there was some degree of correlation between the scores from the two assessment devices (Sig. 64), a higher degree is desirable. Future research may explore if the media format of the two different assessment devices (CCS cartoon panels on paper,
TRV short vignettes on video) had any affect in this study. Perhaps video inherently has the capacity of drawing the attention of the observer to extraneous cues. If the cartoons in the CCS were converted to a video format, this could be ascertained.

Affective learning has long been the overlooked stepchild in educational research. The influence of cognitive flexibility on social perspective taking gives a unique opportunity to correct this oversight.

It is important to us to have citizens who are productive and mentally healthy and honest, who are able to take care of themselves and their families, and who promote the welfare of others. Without attention to affect, schools are shortchanging students and, ultimately, society. (Martin & Reigeluth, 1999, p. 489).

CFH is a valid approach of positively influencing SPT.
References


Appendix A

Interface of Cognitive Flexibility Hypermedia Program of Video Vignettes

Required Vignettes Denoted by Asterisk to the Right Of Link

- 1st Day of School
  - Library*
  - Library Holly’s Thoughts*
  - Library Mousey’s Thoughts*
  - Library Gina’s Thoughts*

- October 13
  - Lunch
  - Lunch Holly’s Thoughts*
  - Lunch Mousey’s Thoughts*
  - Lunch Gina’s Thoughts

- November 25
  - Basketball Tryouts
  - Tryouts Holly’s Thoughts
  - Tryouts Mousey’s Thoughts
  - Tryouts Gina’s Thoughts

- February 4
  - Class 1
  - Class 1 Holly’s Thoughts
  - Class 1 Mousey’s Thoughts
  - Class 1 Gina’s Thoughts

- February 5
  - Holly’s House
  - Holly’s House Holly’s Thoughts
  - Holly’s House Mousey’s Thoughts
  - Holly’s House Gina’s Thoughts

- February 6
  - Class 2
  - Class 2 Holly’s Thoughts
  - Class 2 Mousey’s Thoughts
  - Class 2 Gina’s Thoughts
Appendix B

Frame from Cognitive Flexibility Hypermedia Program of Video Vignette, “Library”
Appendix C

Frame from Cognitive Flexibility Hypermedia Program of Video Vignette,

“Library Mousey’s Thoughts”
JOHN CHARLES RUBISCH
331 Front Street
Marysville, Pa. 17053
(office) 717-834-3181
(home) 717-957-3758
jcr137@psu.edu
jcr1377@comcast.net

http://www.personal.psu.edu/jcr137

EDUCATION

DOCTORAL CANDIDATE
Penn State University 1995-
Graduate Student in Instructional Systems. Graduate Assistant for Department 1996-97. Courses at
University Park and Great Valley.
* Dissertation- Enhancing Social Perspective Taking In Delinquent Adolescents Through Cognitive
  Flexibility In A Hypermedia Program
* Developer of Web-based program for Affective Learning for youth
* Developed instruction for teacher use of the internet in science classrooms
* Taught graduate course in Multimedia Technologies
* Designed Web instruction with HPA professor
* Internship with WPSX Television

M.S. Community Counseling
Shippensburg University 1982
B.S. Community Development
Penn State University 1974
Secondary Guidance Certification
Shippensburg University 1985

EXPERIENCE

TEACHER/GUIDANCE COUNSELOR, Duncannon, Pa. 1986-Present
Susquenita Junior-Senior High School
Teacher of 7th and 8th grade Guidance Classes.
* Training of teachers to instruction on the Internet
* Member of Student Assistance Program

VIDEO PRODUCTIONS
2001- Mahnke First Place Award Winner- Video Magic
1998- Mahnke Merit Award Winner- Collaborative Rhapsody
1997- Mahnke Merit Award Winner- Susquenita High School- Meeting the Challenge with Success