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A STUDY OF THE DEVELOPMENT OF THE ABILITY TO PRODUCE
DECEPTIVE STRATEGIES

City University of New York

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A STUDY OF THE DEVELOPMENT OF THE ABILITY TO
PRODUCE DECEPTIVE STRATEGIES

by

RICHARD JAMES DANIELE

A dissertation submitted to the Graduate Faculty
in Educational Psychology in partial fulfillment
of the requirements for the degree of Doctor of
Philosophy, The City University of New York.

1985

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This manuscript has been read and accepted for the Graduate Faculty in Educational Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Abstract

A STUDY OF THE DEVELOPMENT OF THE ABILITY TO PRODUCE DECEPTIVE STRATEGIES

by

Richard James Daniele

Advisor: Professor Joseph Glick

The ability of children, 5 to 11 years of age, to produce and interpret deceptive strategies in card games of Old Maid was investigated. The purpose of the study was to determine how children learn to hold information private from others while cooperating in following the rules of the game. It considered Piaget's and Vygotsky's theories of development as models to explain deception, and Newman's model of the development of "shared" and "private" mental states.

The study was conducted in two experiments. In the first experiment, children played the games of Old Maid without interruption. The children played the games in pairs while, they were video tape recorded. Following the games, the children were interviewed about the game, and about the fairness of tricks and cheating.

The results indicated that the development of decep-

tion occurred from no use of secrecy in the game, to the use of concealment, to the use of deception. The interview data paralleled these findings and found that children showed increasing awareness of the importance of secrecy and deception in the games. Fairness questions also indicated that a development occurred, from absolute judgments that all tricks were unfair, to a recognition of the distinction between tricks and cheating.

In the second experiment, the ability of children, 5 to 11 years, to resist and recognize deception occurring in games of Old Maid was investigated. In this experiment, the children played the games with confederates trained to produce specific deceptive strategies. The purpose of the experiment was to determine whether or not the children could counteract the confederates' deception.

The results of this experiment indicated that increases in ability to resist deception occurred with increases in age. Interview data also indicated that this ability was related to the child's level of understanding of the game. Fairness data was found unrelated to age or the ability to resist deception.

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I would also like to express my appreciation to my friends and colleagues, my parents and my wife, Colleen Gaynor, for their support and encouragement throughout this entire project and my years at City University.

To my parents,

Sara and Salvatore Daniele

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Chapter I

Introduction

Despite ethical prohibitions, deception is widely used in social situations and often serves adaptive purposes. Goffman (1974) has described many different situations where deceptive strategies are employed and where the effects of deception are benign or necessary. For example, children and adults often play games of "bluff" where one player attempts to deceive another into believing a false state of affairs in order to enhance his/her chances of winning the game. Deception is often required in common competitive circumstances as well. For example, businessmen frequently use deception in attempt to mislead their competitors and increase their profits. Indeed, people from all walks of life often use deception to conceal negative feelings they have toward others in order to avoid offending them.

It is clear that deception is a wide spread social psychological phenomenon and as such deserves systematic exploration. One key issue is how children develop this capacity. To date, most of the theories and research on social development have focused mainly on how children learn to express their beliefs as clearly as possible. Specifically, the research has focused on how subtle

social cues, such as inflections of the voice or facial and bodily movements, are used to help the communicator convey thoughts to others. In contrast, the communicator of deception is required to conceal or misrepresent information about the meaning of an event.

In the section which follows a theoretical rationale is developed which links deception to social perspective taking. It considers both Piaget's (1965) and Vygotsky's (1962) theories as models to describe deception.

Theoretical Rationale

There are several theories of social development that have been discussed in the literature that may be used to describe the development of deception in children.

Piaget, for example, describes how children learn to take the perspective of others and interact cooperatively. According to his model, development begins with a stage of autistic, transductive thinking that displays little regard for context or logic. At this stage, thought is very egocentric. It is centered on the self, and it does not take into consideration the needs of the listener. The messages that the egocentric child produces are often inconsistent with the listener's perspective and incomprehensible to him/her.

At the stage of concrete operations, children begin to understand the laws of logic, and their thought becomes

adaptive to reality. At this stage, the child can take into consideration the needs of others and is capable of interacting socially. Rules of games, for example, are accepted as notions based upon mutual agreement and discriminated from the context in which they occur.

Piaget's theory, therefore, stresses the importance of cooperative kinds of interactions and describes development as a unilinear process starting from a personalized state to a social state of cooperation. What is left unexplained is how the child develops a growing sense of individuality, where his/her world is comprised not only of social knowledge but also of private knowledge and notions of competition.

Another theorist, Vygotsky, views social development somewhat differently from Piaget in that he considers development as multilinear. Vygotsky claims that development starts out from an undifferentiated, egocentric state that is comprised of both social and personal thoughts. Egocentric thoughts, for example, are social in that they are external and serve to maintain social contact, but they are personal in that they are on their way toward inner thoughts and operate to structure thought in a logical manner. Vygotsky claims that egocentric thought can be observed in the speech of the child, especially when social contact is interrupted due to some misunder-

standing. In such situations, egocentric speech increases and begins to serve a more personal function of organizing thought and reducing conflict.

Finally, when the child grows older and masters language, egocentric speech becomes fully internalized and reaches a state of inner thought. At this stage, the personal domain of thought is completely differentiated from the social and forms a separate domain of knowledge. In this sense, personal knowledge grows apart from the social but exists side-by-side and coordinated with it. In contrast, Piaget views social knowledge as growing out of and replacing the personal.

Piaget's notion of perspective taking clearly plays an important role in deceptive interactions, since the child must know what the other is thinking before he can deceive him/her. However, perspective taking alone does not explain fully how the child develops the private strategies used in deception. It seems that Vygotsky's theory is more appropriate in this context since it can be used to describe how private deceptive strategies are formed. This theoretical distinction is important for the study presented here, which seeks to describe the course of development of deceptive strategies in children aged 5 to 11.

Experiment I: Research Questions

In the present study, children's deceptive strategies in the competitive game of "Old Maid" were studied. In a first experiment, two children played the games in the usual manner without any influence by the experimenter or modification of the rules of the game. After one child won the game, both children were interviewed about the games and how they understood deception. The children's games and interviews sought to answer two questions:

1. What changes occur in the development of children's deceptive strategies between the ages of 5 and 11 years?

2. What is the relationship between children's use of deceptive strategies and their understanding of deceptive behavior?

Experiment II: Research Questions

A second experiment was conducted to determine how a child would respond to specific strategies produced by another child. In this experiment, children 5, 8, and 11 years played the Old Maid card games with 11 year-old confederates who were trained to deceive their opponents. Answers to two research questions were sought.

1. Do children between 5 and 11 years differ in their ability to resist their opponent's attempts to outwit them in the games?

2. What is the relationship between the children's ability to resist their opponent's attempts to deceive them and their understanding of the game activity.

Chapter II

Literature Review

The purpose of this review is to discover an empirical model that describes best the development of deceptive strategies in children. The chapter contains two sections concerned with: (1) Goffman's Frame Analysis and (2) The Literature on Perspective Taking Abilities. Goffman's sociological model of frame analysis is useful as a model in deriving a definition of deception for experimental purposes. However, it does not address the issue of how deception develops in children. Newman's stage theory on the development of strategic perspective taking, discussed in the section on perspective taking, is given special attention. It is a useful model for describing the development of deception, and fits closely within Vygotsky's theory of social development.

Goffman's Frame Analysis

Common social encounters of children with other youngsters or adults are often repetitive and often have an implicit set of rules, expectancies, and understandings. Goffman (1974) described the structure of these social events in terms of "frameworks". For Goffman, even momentary phenomena may be highly structured

and may play an important role in determining behavior.

Goffman cited many examples of frameworks that represent different aspects of people's daily lives. For instance, there are frameworks for social situations at one's job, recreational activities, or school that prescribe how an individual should talk and move physically. These social frameworks are assumed to determine how a person will behave in a given situation.

Elkind (1979) has suggested how a child-adult frame at bedtime might be structured and how it may regulate social behavior. Suppose a mother suggests to her child that it is time for bed. She may assume that her child will be likely to resist this instruction. She may also be prepared to deal with that resistance by manipulating her child into entering the bedroom and going to sleep. On the other hand, the child may learn that it is alright to disobey up to a point and delay going to bed. He/she may also know when his/her mother is in no mood for disobedience.

Thus, the mother's framework given at a particular moment determines her emotional tone and determines what behavior is expected. However, if the child violates these expectations, the framework is invalidated and a new one must be formed. For example, suppose the child goes to bed without any protest or delay. The mother who is

prepared to deal with some rebellion may wonder whether something is disturbing her child and then seek alternative "cues" indicative of another framework to draw meaning to the situation.

Transformations. Goffman (1974) provided an extensive analysis of how various frameworks are transformed by an individual into a new experience with a different organization and meaning. He identified two basic forms of transformations: "keyings" and "fabrications". Keyings are defined as "real" or "literal" activity transformed into something completely different that acts as a model for the original framework. "Real" events are used in this sense as activities that can not be reduced to further transformations, but instead are events that are "typical" or "usual" to the activity under consideration. For example, play acting a "real" fight is a model of a less serious version of an actual fight. A competitive game represents a less serious version of competition that occurs in business or professional sports.

Fabrications also refer to transformations of "real" events, but they differ from keyings in that they represent a deceptive situation. In deception, the creator of a fabrication attempts to construct a "plan" (Newman, 1981) not known to the other in order to induce him/her

into misframing the event. One form of deception in competitive games that Goffman discussed is called a "strategic fabrication". It is defined as a form of deception where the deceiver strategically misdirects the other's perception of the situation to enhance his/her own position in the activity.

The management of subtle forms of communication is one special feature of strategic fabrications. According to Goffman (1974), it involves the control and manipulation of specific verbal and nonverbal cues that are indicative of particular frameworks. For instance, a player in a card game may not want to reveal to his/her opponent that he/she has received a poor "hand", since this information may aid his/her opponent in deciding how to place his/her "bets" and what cards to exchange or withhold. Therefore, the player may conceal that knowledge by attempting either to suppress verbal or facial expressions of disappointment or feign pleasure over the cards he/she holds.

In conclusion, the ability to draw meaning from social frames and construct one's own social reality is particularly important in the child's socialization. It allows the child to develop the social competence to gain praise and recognition as well as to control and regulate the outcomes of his/her experiences. However, one issue

which Goffman's frame analysis does not address, is the question of how the child learns the meaning of different frameworks. Therefore, the author will present a review of the literature on perspective taking in search of a model that may be used to explore the development of frameworks and strategic fabrications in children's deceptive games of "Old Maid".

The Literature on Perspective Taking Abilities

The notion of "perspective taking"* has been discussed by several theorists as a distinguishing feature of social cognition (Damon, 1977; Feffer, 1970; Kohlberg, 1976; Mead, 1934; Piaget, 1965). Generally, perspective taking involves the ability to appreciate what a person is thinking, feeling, intending and seeing (Shantz, 1976). Furthermore, many theorists have argued that children's development of perspective taking goes through a similar sequence of stage transitions as their intelligence. For example, Piaget has claimed that during the preoperational stage, the child is essentially egocentric in his/her orientation towards others and can not recognize that other people can hold viewpoints that differ from his/her own. However, during the concrete operational stage, children begin to distinguish different perspectives and

*The term perspective taking and role-taking will be used interchangeably throughout the study.

can coordinate their own viewpoint with those of others. This ability to coordinate perspectives is assumed to develop until the formal operational stage when intelligence reaches full maturity.

Flapan (1968) and Liversley and Bromley (1973) have used Piaget's model of development to explain how children show the ability to make increasingly more complex, abstract social inferences. According to these theorists, the preschool child often explains other people's actions based on perceivable features of the situation, such as the person's actions and dialogue. In describing what people are like, the preschooler also relies heavily upon the qualities of others he/she can perceive directly, such as their physical appearances or the situations they are apart of. However, as the child develops into middle childhood, at around the concrete operational stage, he/she begins to describe others in terms of covert, psychological factors, such as the other's motives and intentions. He/she is less influenced by obvious dimensions of the situation and can focus more on subtle, abstract aspects of the event.

Feffer and Gourevitch (1960) also employed Piaget's developmental framework to investigate the ability of children to coordinate different social perspectives of characters in verbal stories. They found that in stories

the children invented themselves, a series of stages emerged, from no perspective taking to the ability to coordinate several perspectives sequentially, to a stage of complete coordination of the characters' internal psychological state with their external behaviors. Specifically, in early childhood, the stories the children created were comprised of a series of unrelated events. The characters held different perspectives but there was no consistency between their perspectives. During middle childhood, the children started to show an ability to coordinate the perspectives of the characters in a consistent, sequential manner. Finally, during late childhood or young adolescence, the children started to elaborate on the feelings and motives of the characters relative to their behaviors.

In another form of perspective taking, Miller, Kessel and Flavell (1970) found that recursive thought also continued to develop into young adolescence. Recursive thinking was defined as a process of thinking reflectively about the thoughts, feelings and intentions of others and oneself in social interactions. The authors designed cartoon stories of characters engaged in interpersonal situations to trace the development of recursive thinking. Four complexity levels of recursive processes were contained in the cartoons: (1) thinking about people (The

boy is thinking about the girl); (2) thinking about the actions between people (The boy is thinking that he is talking to the girl; (3) one loop recursive thought (The boy is thinking that the girl is thinking of her father); and (4) two loop recursive thought (The boy is thinking that the girl is thinking of him thinking of her).

The results indicated that approximately sixty percent of fifth and sixth graders understood the first three levels of thinking processes, including one loop recursive thought. However, less than thirty percent of the children in the same grade levels understood the two loop recursive processes. Therefore, the authors concluded that the process of recursive thought must continue to develop into adolescence.

The notion of the recursive quality of perspective taking was also examined and used to explain how children learn to think recursively in strategic interactions. For example, Flavell, Botkin, Fry, Wright & Jarvin, 1968) used a simple game strategy to examine how children employ recursive processes in a game which requires them to guess which of two cups has money under it. The game employed two cups, one with a nickel glued on top and one with two nickels glued on top. Each cup also had coins beneath.

The cup with one nickel on top initially had one nickel beneath it. Also, the cup with two nickels on top initially had two nickels beneath. Subjects were shown how many nickels were beneath each cup at the start. Then with the subjects not looking, the experimenter removed the coins from beneath one of the 2 cups. The subject was required to guess which cup still had coins.

Following each subject's choice, the experimenter questioned the subject about the rationale used in making a decision on which cup still had coins. At the lowest level, the subjects removed the coin(s) from the cup that had the most coins on top, because they felt that it would be the cup their opponents would choose. The second level was comprised of subjects that believed their opponents would think that they would remove the coins from the cup representing the most coins. Therefore, the subjects chose the cup that contained one coin. At the highest level, the subjects based their choice on one or more recursive steps further than the previous level of what their opponents would do. The subjects who tended to reach the highest level of recursive thought were mostly the oldest of the children, while the youngest subjects tended to base their strategies on levels 1 or 2. However, the authors reasoned that this task may have underestimated the children's ability to employ recursive

processes, because of the complexity of the verbal abilities it required.

In another study, DeVries (1970) used a game strategy similar to that employed by Flavell. DeVries' paradigm did not demand verbal explanations. In this study, children ranging in age from 3 to 7 years were asked to play a guessing game with an experimenter that involved taking turns hiding and guessing which hand a player hid a penny. The author was able to infer the child's strategy of hiding and of guessing where the penny was since he employed a number of trials per subject.

The results suggested that a 5-stage sequence of development occurred, from a total lack of recognition of the need for secrecy and deceptiveness in the first stage, to the utilization of irregular, shifting strategies in attempt to outwit their opponent in the fifth stage. It should also be noted that over half of the first graders were able to use strategies which involved some form of perspective taking. This finding suggests that deceptive perspective taking occurs earlier than Flavell et al. (1968) had discovered in his study. In addition, DeVries also found that deceptive hiding occurred before the development of deceptive guessing. Deceptive guessing was witnessed when the child guessed in an unrecognizable pattern so as to prevent his/her opponent from hiding the

penny effectively.

Selman and Byrne (1974; Byrne, 1973; Selman, 1973) have presented a sequence of general stages of role-taking similar to Feffer's et al. (1960) model, but different from the models of recursive role-taking presented by Flavell et al. (1968) and Miller et al. (1970). For example, Flavell's and Miller's models of role-taking tended to address the issue of development in terms of the number of recursive loops children are able to understand at different ages, while Selman's and Byrne's model as well as Feffer's et al.'s (1960) model tended to view development as a sequence of qualitative stages.

Selman and Byrne (1974) presented children, 4 through 10 years of age, with moral dilemmas similar to those used by Kohlberg (1969) but modified for use with children. The children were interviewed about the sequence of events that took place and about the relationships that occurred between the characters. From the analysis of the children's responses, four levels of role-taking emerged: Level 0 (egocentric role-taking) was characterized by the child's inability to make a distinction between a personal interpretation of social actions and what he/she considered to be a correct perspective. Although the child could differentiate self from other as entities, he/she could not differentiate their viewpoints, or relate their

perspectives.

Level 1 (subjective role-taking) children could see themselves and the other with potentially different points of view, but they were unable to maintain their own view while simultaneously putting themselves in the other's perspective. They were also unable to judge their own actions from the other's viewpoint or to consider that their view might influence another's perspective.

At level 2, the child was aware of the different perspectives people hold and understood that he/she may have a unique perspective because of his/her own set of values and needs. The child was also able to recognize and anticipate another's actions based on his/her own perspective.

Finally, at level 3, the child was able to remove himself/herself from the situation and view himself/herself and the other simultaneously as a third person participant. This last stage of development is an achievement over the prior stage in that the child could now process two perspectives concurrently and could conceive of a "spectator" point of view, while the level 2 child could only coordinate two perspectives in a sequential fashion.

The levels of role-taking discovered by Selman and Byrne may be summarized in terms of three general stages, from no perspective taking, to sequential perspective

taking, to a final stage of simultaneous perspective taking where the individual is able to remove himself/herself from a situation and view the event as an objective observer. This last stage of development is also described by Mead (1934) as the highest stage of development of the self, where the individual is able to generalize his/her attitudes into group attitudes shared by other members of a given society.

Other theorists have used similar notions of shared ideas in their analysis of social experience. Durkheim (1964), for example, coined the concept of "social facts" to refer to ideas that have become "common" knowledge through their widespread acceptance and use. Schiffer (1972) and Grice (1975) also used the idea of "mutual belief" to explain the organization of social interactions that involve cooperative kinds of experiences, such as in informal conversations. These authors make the point that once mutual knowledge is accepted by the participants in an interaction, they seem to infer the experience of the other person spontaneously without having to go through a process of recursive thinking or perspective taking coordinations.

Clark and Marshall (in press) also present a clear illustration of the critical role of "mutual knowledge" in attempt to address certain questions about how a speaker

and listener implicitly understand each other while making reference to specific objects and events. They argue that once the speaker and listener assume mutual belief about the events they are referring to, they do not have to go through a process of inference testing of the meaning of the other's statements. Instead, both the speaker and the listener simultaneously assume that the other is a rational being and will make the same inferences and conclusions as he/she does.

In a study by Newman (1981), the author used the notion of "mutual knowledge" to re-examine the development of perspective taking presented by Selman et al. (1974), Flavell et al. (1968) and Miller et al. (1970). According to Newman, mental states of mutual knowledge represent a basic structure of cognitive functioning rather than a final stage of social development. He demonstrated this idea in the study of the development of the child's understanding of strategic interactions. In his model, the child's understanding of deception may best be described as a growth in the capacity to represent information outside of mutual knowledge through a process of "strategic perspective taking".

Newman presented children in the first, third and sixth grades, and college students with televised skits of Muppet characters, Bert and Ernie of Sesame Street. Bert

and Ernie are often shown engaged in social interactions where Ernie tries to intentionally deceive Bert in order to manipulate the situation to fit his own needs, or simply to make Bert appear foolish. For example, in the "cookie" skit, Bert was seen holding a cookie that Ernie wanted half of. In order to get the cookie, Ernie convinced Bert to allow him to prove that if he (Ernie) had the cookie, he would share it with him. As the story unfolded, Ernie got the cookie from Bert to demonstrate how to share, and before Bert could realize it, Ernie ate half of it. Bert then walked away appearing very befuddled.

Following the presentations, the subjects were interviewed about different features of the skits related to Bert's and Ernie's perception of each other, about Ernie's overall deceptive strategy and about the potential outcomes of the interactions. In addition, the subjects were asked to judge the fairness of Ernie's strategies. The subjects' responses were tape recorded and coded according to the complexity of their understanding of the deception and according to the level of sophistication of their judgments of fairness. Complexity of interpretation was viewed in terms of the amount of information the subjects identified that was (1) held by the deceiver and (2) contradicted the information held by the deceived

(i.e., information contained outside of mutual belief). Levels of judgments of fairness were viewed in terms of Piaget's (1965) stages of moral development and Kohlberg's (1976) stages of moral thought.

The results indicated that the subjects' interpretations of the skit changed over age from interpretations based upon "share" plans to those based upon "trick" and "con" plans. Subjects who showed share plans indicated that Ernie was being sincere and truly wanted to demonstrate to Bert the notion of sharing. They viewed Bert and Ernie as holding similar perspectives of the situation, and no knowledge of deception in the skits was revealed. Subjects, however, who used trick plans indicated that Ernie was attempting to trick Bert into sharing, and that Bert was suspicious of Ernie's intentions. This plan suggests that deception was detected and the characters were viewed as holding somewhat different perspectives. In the con plan, the subjects viewed the characters as holding entirely different perspectives. Not only was Ernie seen as trying to deceive, but Bert was viewed as convinced of Ernie's desire to share. A con plan, therefore, was considered in this study to be more complex than a trick in that the perspectives of the characters were viewed as more discrepant.

Another major finding was that judgments of fairness

were found to be only partially related to the complexity of interpretations of deception. For example, in the cookie skit, it was expected that subjects who showed share plans would feel that Ernie was being fair, while subjects with trick or con plans would feel that Ernie was unfair to Bert. While this was the case with some of the subjects, it was not the case for others. This finding suggests that fairness judgments were not "moral" but instead involved another form of perspective taking ability. This view of social cognition is consistent with other theorists, such as Turiel (1978) and Feldman (1980) who consider moral thought as one of several types of social knowledge.

In conclusion, it seems that Newman's model of development of mental belief states inside and outside of mutual knowledge, is especially amenable to the study of the production of deception in children. It maintains the qualitative features of theories of stage development that are lost in models which describe development in terms of increasing amounts of recursive processes ; and is more specific than simultaneous perspective taking development, since it deals more directly with deception.

In the following chapter, Newman's model of development will be applied to the children's game of Old Maid. Various kinds of game activity will be described in

terms of mutual belief and private belief states, and several levels of the development of deception will be described. The levels described, moreover, fit closely within Vygotsky's model of development in that development is seen as shifts in development from "shared" mental states to private states that involve fabrications.

Chapter III

An Analysis of the Mental States in the Game of "Old Maid" and Research Hypotheses

Game Selection

The children's game of Old Maid was selected to investigate children's strategies in deception. It was selected for the following reasons. First, Old Maid is an activity that children often play and experience as entertaining. Second, it is a game that can be played by a wide age range of children. Since it does not involve complex verbal abilities to be understood, children as young as 4 and 5 years of age can play. Yet, it can be challenging for 11 year-olds to play if their opponent is well matched. Finally, the rules and procedures of Old Maid are flexible enough to allow the investigator to alter the way the game is played without destroying its basic structure. This will allow the experimenter to modify the game to make it suitable for experimental purposes.

The game of Old Maid was played in the following manner. Only two players participated in each game. Both were asked to select in sequence 6 cards from a deck placed face down on a table. Each player alternatively chose cards from their opponent or from the remaining

cards in the deck. In order to win the game, a player had to find matches for all of his/her cards before his/her opponent did. There is no match for the Old Maid card, so the holder of this card could not win the game. Therefore, in order to win the game, the player had to get rid of the Old Maid card. This could occur only if the other player selects it from the first player's hand.

"Mental States in the Game of Old Maid"

Strategies that the children use during the game may be described in terms of both mutual beliefs and private beliefs (Newman, 1981). In the game of Old Maid, mutual beliefs assume two general forms: (a) the rules of the game and (b) knowledge of social cues. The rules of the game refer to specific rules of Old Maid and to general card game rules for sharing and competing. A player, for example, may assume that his/her opponent will follow the rules by sharing and exchanging cards with him/her without trying to see his/her cards. More generally, the player may also mutually assume that the other player wants to win the game and that the game involves competition.

Knowledge of social cues refers to the understanding of verbal and nonverbal cues indicative of a player's perspective in the game, such as in facial expressions of

satisfaction or dissatisfaction with the cards in his/her hand. Players may also use insincere social expressions to deceive their opponent or determine their line of strategy. For example, players may observe their opponents' facial expressions in order to determine whether or not they are attempting to deceive them, or whether or not they are pleased with the cards they hold. The meaning of the social cues a player interprets may be acquired through the frequent occurrence of those cues in different situations (i.e., Goffman's frameworks) which eventually become common knowledge to him/her. A player may assume that his/her opponent also shares the same knowledge about the meaning of social cues as he/she does and that this knowledge represents a kind of shared knowledge.

Private belief states may also have specific meaning in the game of Old Maid. They may include, for example, information held secret from an opponent about the identity of the cards possessed, or about the plans or strategies meant to deceive.

The way in which mutual and private belief states are formed in the game may be dependent upon the situation a player is engaged in. For example, if a player selects the Old Maid card at the beginning of the game, he/she may

want to conceal that information from his/her opponent. This may be done by holding that information in private mental states and by inhibiting the expression of disappointment over the possession of the Old Maid card. To inhibit the expression of disappointment, the player must be able to take his/her opponent's viewpoint of what he/she (his/her opponent) may infer if he/she were to observe certain commonly known cues of disappointment, and then censor those cues from expression. In this sense, the player is using his/her knowledge of mutually understood social cues in a strategic manner to conceal important information about his/her situation from his/her opponent.

A similar situation occurs when the Old Maid card is possessed. Players may try to deceive their opponent by trying to induce them to pick the Old Maid card from their hand by saying, "Take this card" (i.e., the Old Maid). This strategy requires that the players pretend to be helping their opponent while secretly planning to put them at a disadvantage. Although exchanging cards is mutually understood to be part of the rules of the game, it also may be used strategically to try to deceive the other player.

In perhaps a more subtle version of the above decep-

tive strategy, the player with the Old Maid card may also try to trick his/her opponent into picking the Old Maid card by fabricating commonly known social cues indicative of a pleased mental state, such as by smiling, or simply pretending to be pleased over the cards he/she possesses. This may be done by inducing the opponent into believing that he/she does not possess the Old Maid card and that it is safe to select cards from his/her hand. The player again is using mutually understood social cues to strategically deceive his/her opponent.

A player may also use mutually understood social cues to determine where the Old Maid card is. For example, players may scan their opponents' facial expressions or eye movements to determine whether or not they possess the Old Maid card and where it might be in their hand. To do this, the players must place themselves in their opponents' position to determine what they (the players) might do if they possessed the Old Maid card and then adjust their own behavior accordingly.

There is also the possibility that the players will not recognize the importance of concealing the identity of their cards or the use of deceptive strategies. Instead, they may approach the game as if it were simply a cooperative activity based upon shared information. In this

case, the players may not attempt to use concealment or try to employ mutual belief in a strategic fashion, but rather will express their perspective in the game in a straight forward manner.

A Developmental theory of Deceptive Strategies

The above analysis of the game of Old Maid demonstrates how some of Newman's ideas on mutual and private belief states can be used to describe how deception is used in children's games of Old Maid. It demonstrates how deceptive strategies are formed and how mutual belief states are used in that process. For example, in the cookie skit described earlier, it was demonstrated that Ernie's attempts to deceive Bert were based upon the strategic use of mutual belief states. Ernie, for instance, got Bert to believe (i.e., mutually believe) that he was demonstrating the notion of sharing, but instead he was secretly plotting to get some of the cookie from him. Similarly, when a player in the game of Old Maid pretends to be helping his/her opponent, but instead hands him/her the Old Maid card, he/she is actually using mutual belief in the idea of sharing strategically. Secondly, Newman claimed that the development of strategic perspective taking occurred with age and was characterized

by an increasing ability to distinguish between the perspectives of the characters. For example, there was a gradual shift with age from the use of "share" interpretations, indicating that Bert's and Ernie's perspectives in the skit were viewed as similar, to "trick" and "con" interpretations, indicating that the characters' perspectives were viewed as discrepant.

In a similar way, the strategies used in the games of Old Maid also involve varying degrees to which the perspectives of the players are differentiated and made separate. For example, a player who shows shared approaches in the games, by displaying his/her cards to his/her opponent without regard for secrecy, suggests that the player does not view his/her opponent as holding separate needs in the game or is trying to outwit him/her. The player is simply approaching the game with mutual belief states in mind, without holding essential information about his/her game perspective in private mental states. Concealment, however, indicates that the player is aware of the opposing perspective of his/her opponent and will try to keep it separate from him/her. It suggests that the player knows what information should be held private and what may be shared with the opponent, such as in following the rules of the game.

When the player, finally, is capable of producing fabrications, an even greater attempt to produce a discrepancy between the players is observed. It suggests that the player is using mutual belief in a strategic fashion to influence the perspective of his/her opponent in such a way that his/her opponent is led to misframe the situation.

This analysis indicates that there are three levels of deceptive strategies. These levels, referred to as shared knowledge, concealment, and strategic fabrications, are summarized below:

(1) Shared Knowledge. Shared knowledge approaches represent the lowest level indicating no discrepancy between the players' perspectives or between mutual and private mental states. Players who use this approach will display their cards openly to their opponents without showing any attempt to hide them.

(2) Concealment. This level represents an advancement over shared knowledge, since it represents a player's attempt to hold opposing perspectives. The players who use concealment will hold their cards separate from their opponents and will not allow them to see their cards.

(3) Strategic fabrications. This level represents the highest level of deception. It involves more active attempts to defeat the opponent than concealment, since it often involves tricks or strategies to influence the opponent's perspective of the game.

The development of these levels in the production of deceptive strategies should occur with increases in age as discovered by Newman (1981). Five year-old children should show more shared knowledge approaches to the game than 8 and 11 year-age children who should show more concealment and strategic fabrications.

Based upon the above analysis of the development of deception and private mental states, the following hypotheses were examined:

Hypothesis 1. With increases in the age of the players, there will be a shift from shared knowledge, to concealment, to covert strategies in the beginning phase of the games.

Hypothesis 2. With increases in the age of the players, there will be a shift from shared knowledge, to concealment, to covert strategies in the middle phase of the games.

Where covert strategies are referred to in this paper, it includes the notion of strategic fabrications as defined by Goffman.

The Children's Interpretation of Game Activity

It is assumed that children's deception is based upon the ability to form strategies based on shared and private mental states. This would imply that once the child is capable of strategic perspective taking, he/she should be able to interpret game activity in a strategic manner. Therefore, there should also occur a similar line of development in the child's ability to deceive and recognize deception when it occurs in the games.

The children's interpretations of game activity were derived from answers to a series of interview questions coded according to one of three levels of interpretations:

(1) Level 1 interpretations reflect no awareness of the importance of secrecy in the game. The child views the game as social, that is, involving sharing and rules of cooperative play.

(2) Level 2 interpretations indicate that the child recognizes the importance of secrecy in the game. Descriptions of overt game activity are also offered. For example, the children might say, "I selected cards from the deck when my opponent had the Old Maid card." However, a player would simply describe his/her overt

actions while no activity would be identified that involved any degree of inference.

(3) Level 3 interpretations reflect that the child recognizes the importance of secrecy in the game and the value of deceptive strategies. A child would explain subtle and covert activity that indicate some form of deception. For example, the player may try to describe a strategic fabrication in the following way: "I smiled when I picked a card in order to make my opponent believe I selected the Old Maid card, even though I did not." He/she might also say, "I thought that the other player had the Old Maid card when he/she smiled after picking a card from the deck."

Based upon these three levels of game interpretations, the following hypotheses were examined:

Hypothesis 3. Higher levels of game interpretations will be offered by older compared to younger subjects.

Hypothesis 4. There will be a positive relationship between game interpretations made by the subjects and the game behaviors they produce.

In addition to the above hypotheses, the author examined the children's judgments of fairness regarding various strategies in the game. For example, the children were asked whether they thought it was fair when their

opponent tried to trick them into picking the Old Maid card, and whether they thought it was fair to look directly at their opponent's cards to see what cards they held. The children's responses to these questions were then assigned to one of three levels of judgments: absolute judgments of fairness, relative judgments of fairness, relative judgments of fairness with elaborated explanations. Definitions of each level are provided below:

Level 1: This reflects absolute judgments of fairness where the subject's judgment is unrelated to the rules of the game. For example, the player might say that tricks are unfair in any situation, including games. Such judgments are viewed as independent of the nature of the activity or the rules of the activity.

Level 2: This reflects an understanding that fairness judgments depend on the specific context. That is, the child displays awareness that general rules regarding proper social interactions may be suspended in the context of this particular game. The child may also indicate that there is a difference between tricks and cheating in the

games. However, little or no explanation is offered regarding the basis for the judgment. The level 2 child would simply base his/her judgment on an intuitive feeling about how the game is played without explaining why.

Level 3: This judgment indicates that the child views tricks as fair and as related to the way the game is played. The judgments made are logically related to the rules of the game, and tricks are distinguished from activities that might be considered cheating, such as looking at the opponent's cards. When asked for a reason for their judgments, the level 3 child offers elaborated explanations distinguishing between tricks and cheating. That is, the child would indicate that tricks or deception in this activity are acceptable, while cheating is a violation of the rules.

In light of these levels of fairness judgments, the following hypotheses were tested:

Hypothesis 5. With increases in age, there will be a shift in the subjects' understanding of issues of fairness of deception in the game from absolute judgments that deception is unfair, to an intuitive understanding of the fairness of tricks, to an elaborated understanding of the difference between a trick and cheating.

Hypothesis 6. There will be a positive relationship between levels of interpretations of game activity and levels of fairness judgments.

Chapter IV
Method
(Experiment I)

Subjects

A sample of 96 elementary school children (48 male and 48 females), from two New York City public schools within primarily Hispanic and Black neighborhoods were selected. All were selected from regular classrooms, and none were identified by their teachers as having learning disabilities.

The subjects were separated into two equal groups. The first group, group A children, were from three age groups: (1) 5 year-olds, (2) 8 year-olds, and (3) 11 year-olds. The mean age of the children in each group was 5 years, 7 months; 8 years, 3 months; and 11 years, 4 months. All of the 5 year-old subjects were selected from kindergarten and all the 8 year-olds came from third grade classes. Ninety-five percent of the 11 year-old group A subjects were from fifth grade classes and 5 percent were from sixth grade classes.

The second group of subjects, group B children, had a mean age of 11 years, 5 months. Ninety percent of

the subjects were drawn from the fifth grade while the remaining ten percent were selected from the sixth grade. The author believed that pairing three age groups of children with only one group of 11 year-olds would reduce the complexity of the design of the experiment and permit closer examination of developmental changes.

The ethnicity of the subjects was determined informally by asking the children what country they were from or what country their parents were from, and what languages they or their parents spoke. It was found that 80 percent of the subjects were Hispanic, while 15 percent were Black. The remaining subjects were White.

Procedures

A total of 144 games were played, with each pair of subjects playing 3 games. In condition A, a group A subject received the Old Maid card. In condition B, a B group subject received it and in condition C, the Old Maid card remained in the deck placed on the table until one of the players picked it.

All of the cards in each deck were prearranged by the experimenter. In conditions A and B, the children received the Old Maid card after selecting 2 out of their first 6 cards. The cards were also arranged in a

manner that precluded the possibility of the subjects making any duplicates upon the initial selection of their first 6 cards.

In condition C, the Old Maid was placed in the fifth position from the bottom of the deck, leaving 4 cards below and 4 on top. Two of the bottom cards were duplicates of one of the cards each player held. This was true in all three conditions. The reason for placing two cards at the bottom of the deck was to increase the difficulty of matching the cards, thus extending the length of the games.

Instructions and Practice Sessions. The experimenter randomly selected one subject at a time to receive the instructions and practice games. However, no child was taken out of the classroom during periods when the teacher felt the child's school work would be disrupted seriously.

Each child was met by the experimenter outside of the classroom and accompanied to the game room. Every effort was made by the experimenter to comfort the child and assure him/her that he/she would not be taking an examination of any kind. When the child and the experimenter arrived, they sat across from one another at the table and the child was asked if he/she would play Old Maid card games with him/her. The experimenter told the

child that he was only interested in finding out how well children were able to play card games and whether or not Old Maid was a good game for children like himself/herself. The experimenter then asked the child some questions about his/her ethnicity, social class, grade level, age and the number of times he/she played the game (i.e., familiarity). The cards were then placed on the table where they could be reached, and the child and the experimenter took turns choosing cards until both of them had six cards each. The experimenter showed the child how to hold the cards and informed the child on the object and rules to the game.

The child and the experimenter took turns selecting cards from either the remaining cards in the deck or from the opponent's "hand". The child and experimenter tried to match these cards with their own. If the child was able to match any of his/her cards, he/she placed them face-up on the table. Unmatched cards remained in the child's possession until they were matched or selected. The experimenter and the child played only one game together for approximately 10 to 15 minutes unless the child was clearly having difficulty understanding the rules. However, all of the children were able to follow the rules, and no child had to be omitted from the study.

Game Procedures. After the child completed the practice sessions and was ready to play, the experimenter asked the child to wait momentarily while he escorted the opponent to the game room. When the experimenter arrived with the second child, the experimenter introduced him/her to the first child and then asked the first child to sit outside of the room in a chair until his/her opponent was ready to play. The order in which the children (i.e., the A and B groups) were given the instructions and practice sessions was randomly determined.

When the second subject completed the practice sessions, the first subject was asked to return to the room to begin the games. The experimenter reminded the players of the basic rules of the game. The players were told the goal of the game, and they were told that the player who won the most games would win a prize. However, all of the children received a gift (e.g., a comic book or a colorful school folder) for participating.

For each game, the experimenter picked up a deck of playing cards that corresponded to the game condition that was being played and placed them on the table. A video camera was focused directly on the players while they were sitting across from each other. The camera was focused

on the table and the children from profile positions at approximately 45 degree angles. The experimenter then asked the group A subject to start the game by picking a card. In the second game, the group B subject was asked to select first. In the third game, the group A subject was asked to pick first again. The order in which the conditions (A, B and C) were followed was randomly determined.

The children both took turns selecting six cards. The experimenter remained silent while they played the games, unless a child broke the rules. When this occurred, the experimenter intervened and corrected the child.

The experimenter also indicated on the recordings, by scratching the microphone without the children's knowledge, when the Old Maid card exchanged hands. In this way, the coders of the tapes would be able to determine which player had the Old Maid card at any point during the game. When a subject matched all of his/her cards, the game ended and the winner was announced. This was followed by the second game and finally by the third.

After the third game was completed, the experimenter randomly selected one of the children to interview on how he/she played the game, while the other child was asked to sit outside of the room. During the interviews, the

experimenter asked the child a series of questions and reworded them if it seemed that the child did not understand. When a child's response was unclear or unrelated to a question, it was presented again or the child was asked to explain his/her answer differently.

After the first child completed the interview, the second child was interviewed. All of the children's responses were recorded on a cassette player.

After the second child was interviewed, the first child was brought back into the room. Both children were then given their gift for playing and escorted back to their rooms. The children, however, were told not to discuss the game with any of their schoolmates. The experimenter then selected two more children for the games which were conducted in the same manner as described above.

Materials

Audio Visual Equipment. The experimenter used audio and video equipment to record all of the subjects' verbal and nonverbal behavior in the games. This included a video camera and accessories, a tape machine and a monitor. A recorder was also used to tape interviews conducted with the children.

Game Room and "Old Maid" Cards. The Old Maid games and interviews were conducted in a separate room in a school building. The furniture used by the experimenter included a small round table, approximately 2 feet in diameter, and two chairs. The chairs were placed together so that the audio and video recordings could be made readily of the children.

The experimenter used 3 identical decks of Old Maid each containing 21 cards, including 10 identical pairs and 1 Old Maid card. The cards depicted cartoon figures, such as clowns, dancers, and an illustration of a grey haired old lady as the Old Maid. All of the cards were easy for the children to recognize and match.

Tape Preparations

After all of the games were completed, the experimenter reviewed the tapes to determine their suitability. It was found that all of the interactions were acceptable, since the recordings were clear and scorable.

After the audio and video tapes were reviewed and ready for presentation, the experimenter described the children's responses according to the coding system. A second observer, a 31 year-old female graduate student, was used for reliability purposes. She was first given the

instructions to the game and asked to code several games with the aide of the experimenter. She then scored 33 games randomly selected across the age groups and game conditions within both the subject A and B groups.

Behavioral Coding System

Below is a list of categories representing game behaviors derived from the descriptive analysis of the game of Old Maid presented in chapter III, from pilot observations of children in Old Maid card games, and from the proposed theory of development. The game behaviors that were coded in the games were obtained from two separate but related phases of the game: (I) The Beginning Phase and (II) The Middle Phase. In the beginning phase in each game, a child received only one category describing his/her behavior. The coder simply indicated the game behavior that corresponded to the child's actions in the game. The total number of game behaviors scored in the beginning phase was equalled to the total number of games played by each child.

In the middle phase of the games, the coder reviewed each child's behavior and indicated each category of behaviors that were observed. A category of behaviors, however, could be scored only one time in a game for each child.

It should be noted also that the same categories of behaviors applied to both the beginning and middle phases of the game, except for a few that could only occur within the middle phase of the game when the children were exchanging cards. In that case, an asterisk (*) was placed before the specific behavior under the category indicating that it applied to the middle phase only.

Beginning and Middle Phases

1. Shared Knowledge. This category of game activity was coded when a subject showed any of the behaviors (a to e) below:

- a. Placed all of cards face up on table;
- b. Showed all of cards to opponent;
- c. Stated verbally that Old Maid is possessed;
- d. Stated verbally that the Old Maid is not possessed; or
- e. Held cards in opponent's view (e.g., held cards facing opponent).

These behaviors were assumed to indicate that the player did not see the need for secrecy in the game or show any tendency to conceal essential information regarding the identity of his/her cards.

2. Combined Sharing-Concealment. This category was coded when a subject showed any of the behaviors below:

- a. Held cards private (e.g., in a fan-like manner) but in a way that the opponent could see;
- b. Held some cards away from opponent's view and placed others face-up on the table; or
- c. Placed cards face up on the table and then picked them up away from opponent's view.

These behaviors were assumed to indicate that the child sought to conceal the cards he/she held, but also exposed the identity of the cards he/she possessed, intentional or otherwise.

3. Overt Strategies. This category was coded if the subject tried to determine overtly what cards his/her opponent held or which cards his/her opponent picked. It was coded with any of the behaviors below:

- a. Stretched (or moved) over to see opponent's cards;
- b. Told opponent that he/she wanted to see his cards; or
- c. Asked opponent if he/she possessed the Old Maid card.

4. Nonverbal Communications. This category was coded when a subject revealed the possession of the Old Maid card in the following nonverbal channels:

- a. Showed disappointment over cards possessed through nonverbal cues (e.g., by frowning);
- b. Vocal utterance indicating disappointment in cards possessed (e.g., a groan); or
- c. Sharp and rapid glance.

5. Concealment. This category was coded when a subject

concealed entirely the identity of his/her cards by one of the methods indicated below, but made no attempt to deceive the opponent. In an effort to conceal, the subject may have:

- a. Held cards away from opponent's view (e.g., by placing them in a fan-like position);
- b. Held cards away from opponent's view by placing them face down on the table; or
- c. Held cards away from opponent's view in any other manner not listed above.

These behaviors were assumed to indicate that the subject recognized the importance of secrecy in the game.

6. Shuffling. This category was included since it was expected to occur frequently in the games. It indicated that the subject was trying to influence the opponent's selection of cards. It was coded with the occurrence of the behaviors below:

- a. Moved cards around in hand (i.e., shuffles cards); or
- b. Moved cards around by shuffling them around on the table face down.

7. Covert Strategies. This category was coded with the occurrence of any of the behaviors below:

- a. Leaned over subtly to look at opponent's cards;
- b. Scanned back of opponent's cards through eye movements;
- c. Focused on opponent's face for extended period of time (approximately 5 seconds);
- * d. Extended hand to pick from opponent but shifted to pick from stack; or extended hand to pick from stack but shifted to pick from opponent;

- * e. Lifted card (e.g. the Old Maid) up in hand;
- * f. Handed card to opponent or told opponent to pick a specific card without him/her knowing the card's identity; or
- g. Told opponent that Old Maid card was not possessed when in fact it was possessed.

These behaviors suggested that the subject was trying to influence his/her opponent's approach to the game in a more subtle way than used with overt strategies.

7. Other Behaviors. This category represented any additional behaviors that the coders identified that were not included in the categories listed above.

Coding of Interview Questions

The responses offered by each subject to the interview questions were coded in terms of the three levels of interpretations defined earlier (see pg. 34-37). For questions 1 through 6, the coder listened carefully to the subject's entire response including extended justifications and assigned that response to one of three levels of game interpretations. If the subject's answer to a given question was scorable in more than one level, the coder assigned that answer to the level that seemed to reflect the thrust of the subject's understanding.

The first six questions that the subjects were asked during the interview are included in the list below.

Also, examples of responses that were coded within each of the levels are included. It should be noted that the levels used to code interview responses were similar to the categories used for the coding of game behaviors. This was done purposely, in order to examine the relationship between game behaviors and comprehension of strategies.

1. When you first picked your cards, did you want the other player to know which card you picked or did you want to keep it a secret? Why did you feel that way?

Level 1: I wanted him/her to know the cards I picked so that he/she could match his/her cards better.

Level 2: I wanted to keep it a secret but I'm not sure why... it's just the way to play.

Level 3: I wanted to keep it a secret ..then he/she wouldn't know when I had the Old Maid.

2. Did you do anything to try to get the other player to pick the Old Maid card when you had it? If so, what did you do to try to trick him/her?

Level 1: I didn't do anything.

Level 2: I handed the card to him/her.

Level 3: I shuffled my cards around in my hand and lifted the Old Maid card up.

3. Did you do anything to find out whether or not the other player had the Old Maid card? If so, what did you do?

Level 1: I didn't know what to do.

Level 2: I looked at his/her cards.

Level 3: I looked at his/her face and his/her eyes to see whether or not he/she was happy with his/her cards.

4. How did you know whether or not he/she had the Old Maid card?

- Level 1: I never knew when he/she had it.
- Level 2: I saw it in his/her hand.
- Level 3: I saw him/her frown and look away
..then I knew he/she had it.

5. Did you do anything to avoid picking the Old Maid card from the other player when you knew he/she had it? If so, what did you do to avoid picking it?

- Level 1: I didn't do anything.
- Level 2: I picked from the deck instead.
- Level 3: I looked at his/her eyes to see whether or not he/she was looking at it, and if so, I looked somewhere else.

6. Did you notice or see your opponent try to trick you in any way? If so, what did he/she do?

- Level 1: I didn't see him/her try to trick me.
- Level 2: He/she wouldn't let me see his/her cards.
- Level 3: He/she shuffled his/her cards around so that I wouldn't know where it was.

Questions 7 and 8 in the interview were scored differently from questions 1 through 6, since they pertained specifically to judgments of fairness of game activity. They did not refer to the subject's level of understanding of what actually occurred in the game but referred to how these games should be played. Therefore, the following coding system was employed for these questions:

Children were scored in level 1 when they argued that notions of fairness were absolute; that is, when a player claimed that any kind of trickery in the game was unfair. When a subject was unable to make a judgment or his/her explanation seemed unrelated to the question, it was also assigned to level 1.

A response that indicated that a trick was fair but that looking at the other player's cards was unfair, was assigned to level 2. However, at this level, a clear explanation of the judgment was lacking. The subject might simply say, for example, that "It's just the way the game is played." No conceptual understanding that cheating is a breaking of the rules, while tricks are socially acceptable in games, would be revealed.

Level 3 interpretations were given to children who judged tricks as fair, but "looking at the other person's cards", as unfair. The level 3 child, however, differed from the level 2 child in that he/she offered a logical and consistent argument for his/her answer. That is, the level 3 child was able to describe how tricks and cheating in the games were different and why tricks were fair while looking at another player's cards was unfair.

The list below includes the three levels of fairness interpretations along with examples of each.

7. Do you think it's fair to try to trick a player into picking the Old Maid card? Why do you feel that way?

Level 1: It's not fair it's like cheating.

Level 2: It's fair but I don't know why... it's just the way it is.

Level 3: Because that's the way the game is played... it's the object of the game and the way the game is won.

8. Do you think it's fair to try to look at the other player's cards or sneak over to see what cards he/she holds? Why do you think that? Is there any difference between just trying to trick the other player in the game and trying to cheat or look at the other player's cards.

Level 1: Because I want to win.

Level 2: It's not fair but I don't know why.

Level 3: That's not fair because that's breaking the rules. It's different from tricks because the other player knows that you will do that.. it's part of the rules, but looking at the other player's cards is cheating.

Chapter V
Analysis of the Results
(Experiment I)

The analysis of the results are presented below under six general headings: (1) Descriptive analysis of demographic data, which includes social class, grade level, and familiarity with the game; (2) Descriptive analysis of game procedures, such as training order and game condition order (i.e., possession of Old Maid conditions); (3) Reliability measures of the behavioral observations; (4) Beginning phase analysis, (5) Middle phase analysis and (6) Interview analysis, including reliability measures.

Descriptive Analysis of Demographic Data

Social Class. The social class of the subjects was determined by asking the children what type of work their father's did for a living (Hollinghead, 1957) . Subjects whose fathers were professionals, such as doctors, lawyers, or scientists were considered "upper class", while subjects whose fathers were in business or some other field where some degree of college was required were considered "middle class". "Lower class" subjects included fathers of subjects who were blue collar workers or unemployed .

The results presented in Table 1 indicated that

82 subjects of the total sample were from lower class backgrounds, 11 were from middle class backgrounds and 3 came from the upper class. A chi square analysis was also performed on the data and showed that there were no differences between group A and B subjects or between age on social class. For this analysis, middle and upper classes were combined in a larger category, since the upper class category contained only a small number of subjects.

Table 1
Frequencies of Social Class Levels for Groups A
and B for each Age Group

Subjects	Social Class		
	Lower	Middle	Upper
Group A			
5 yr-olds	13	2	1
8 yr-olds	14	1	1
11 yr-olds	12	4	0
Group B			
11 yr-olds	43	4	1

Familiarity. Subjects were asked to estimate the number of times that they had played the game of Old Maid

previously. Subjects who claimed that they played the game more than 10 times were assigned to level III, while subjects who claimed that they played the game no more than 10 times but at least 1 time were assigned to level II. Those who claimed that they never played the game before were assigned level I.

The results indicated that 74 subjects of the total sample had no experience playing Old Maid games whatsoever, 16 played the game between 1 and 10 times and only 6 played the game more than 10 times. Chi square statistical tests performed on the children's familiarity ratings revealed no significant differences in familiarity between group A and B or between the age groups within group A. Therefore, no further analyses were performed on this variable. For this analysis, levels II and III were combined in a larger category, since level III (more than 10 times) contained only a small number of subjects. Table 2 includes the frequencies of subjects within each familiarity level.

Table 2
 Frequencies of Familiarity Levels for Groups A
 and B for each Age Group

Subjects	Familiarity Levels		
	Level I	Level II	Level III
<hr/>			
Group A			
5 yr-olds	13	2	0
8 yr-olds	11	5	0
11 yr-olds	15	1	1
Group B			
11 yr-olds	35	8	5
<hr/>			

Game Procedures

Training Order. The order in which group A and B were trained to play the games was randomly determined. For both A and B groups, 20 children were trained first, while 28 were trained second.

Game Condition Order. All subjects in each group played the games under each of three different conditions: (A) Possession of Old Maid card by group A, (B) Possession by group B, and (C) Stack possession of Old

Maid card (see Methods section for definitions of possession conditions). Six possible game order conditions could occur. The percentage of group A and B subjects contained within these conditions are presented in Table 3 below.

Table 3
Frequencies and Percentages of
Game Condition Order Played

Condition Order	Frequency	Percent
ABC	10	20.8
ACB	6	12.5
BAC	8	16.7
BCA	10	20.8
CAB	8	16.7
CBA	6	12.5
Total	48	100

Reliability Measures for Observations

A reliability check was conducted on the behavioral ratings. For group A data, percentages were obtained of the agreement between two observers coding 27 games randomly selected; 3 games for each of 3 subjects within each of the age groups. The percentages reflected the degree to which the observers agreed on whether or not a strategy

occurred in the beginning and middle phases of the game, separately, for each subject.

An additional reliability measure was made for the B group of subjects based on 6 games, two within each game condition (i.e., Possession of the Old Maid (A), Opponent possession (B), and Stack possession (C)).

The results of the reliability check on group A indicated that 90 percent agreement in the beginning phase and 88 percent agreement in the middle phase existed between the coders. Also, no differences were found between the reliability measures based upon the age of the players. The reliabilities ranged from 84.4 percent to 93.2 percent for the different age groups.

The reliability measure obtained for the B group was nearly the same as that found for the A group. The coders agreed 87 percent in the beginning phase and 89 percent of the time for the middle phase of the game.

Analyses of Beginning Phase of Game

Group A Subjects. Each player was coded for only 1 strategy for each game played in the beginning of the game. A total of 5 different strategies were displayed: (1) Shared knowledge; (2) Combined sharing-concealment; (3) Nonverbal communications; (4) Concealment; and (5) Covert strategies. Overt and shuffling strategies were not observed for group A in the beginning phase. The total

number of occurrences (i.e., number of games in which the strategies occurred) of each of the strategies are presented in Table 4, along with a breakdown of the strategies into specific behaviors.

Table 4

Frequency of Strategies and
Specific Behaviors Coded for Group A

Strategies	Totals
1. Shared Knowledge	9
a. Placed all of cards face-up on table	
b. Stated verbally that Old Maid was possessed	
2. Combined Sharing-Concealment	16
a. Held cards private (e.g., in a fan-like position) but in a way that the opponent could see	
b. Held some cards away from opponent's view and placed others face-up on the table	
3. Nonverbal Communications	9
a. Showed disappointment over cards possessed through nonverbal cues (i.e., by frowning)	
4. Concealment	109
a. Held cards away from opponent's view (e.g., by placing them in fan-like position)	
5. Covert Strategies	1
a. Leaned over subtly to look at opponent's cards	
<hr/> Total	<hr/> 144

Several preliminary analyses were conducted on the data for the beginning phase of the game. First, due to the small frequencies of occurrence for some of the strategies, adjacent categories were combined forming two summary categories: (I) Shared knowledge, nonverbal communications and the combined sharing-concealment strategies; and (II) The concealment, covert and shuffling strategies. These categories were ordered into 2 developmental levels. The first level represented those strategies which contained actions that revealed information about a player's cards, either through verbal or nonverbal channels. The second level contained strategies in which no information was revealed and strategies in which covert deceptive activity was displayed.

Second, for both the A and B groups, preliminary corrected chi squares were performed on the effects of sex on strategy level in all three conditions. Since no significant results were discovered, sex was eliminated from the analyses for the beginning of the game.

Based upon the 2 levels of strategies, a series of chi square analyses were performed to test the relationship between age and strategy level. A chi square analysis was selected, since it was an appropriate model (Siegel, 1956) for analysing categorical data (i.e., game strategies). Where expected cell frequencies

for a game condition were small (less than 5), a Fisher exact test was used, and/or two adjacent age groups were combined forming a larger group. Also, when a 2 by 2 design was used to test the effects of age on strategy level, Yate's corrected chi square was used. These procedures were used with each game condition separately to test hypothesis 1, which stated:

With increases in age of the players, there will be a shift from shared knowledge, to concealment, to covert strategies in the beginning phase of the games.

For game condition A (group A possession of the Old Maid), a significant age by strategy level relationship was found ($\chi^2(2) = 16.10, p < .001$). Further analysis also revealed that the significant findings were due to a shift in the use of level I to level II strategies between the 5 and 8 year-old groups ($\chi^2(1) = 8.6, p < .01$). The 8 and 11 year-old groups were similar with respect to strategies. For condition B (group B possession), the 8 and 11 year-olds were combined into a larger category and compared to the 5 year-olds. This analysis revealed a significant age by strategy level relationship (Fisher test, $p < .001$). That is, a shift in the use of level I to level II strategies occurred with increases in age.

In condition C, 8 and 11 year-olds were combined and compared to the 5 year-old subjects. A Fisher exact test was used to test age differences in strategy level usage

and a significant relationship was found ($p < .001$). The results in this analysis also indicated that older subjects tended to use level II strategies more often than the 5 year-old subjects. The results of all three game conditions, moreover, lend support to the first hypothesis.

Table 5 represents the frequencies for strategy levels I and II by age in each condition. It is clear from the table that the shift toward level II strategies occurred between 5 and 8, rather than between 8 and 11 year-olds.

Table 5
Strategy Level Frequencies by Age
by Condition

	Age Groups		
	5 yr-olds	8 yr-olds	11 yr-olds
Condition A			
Level I	12	4	2
Level II	4	12	14
Condition B			
Level I	9	1	0
Level II	7	15	16
Condition C			
Level I	6	0	0
Level II	10	16	16

Group B Subjects. Forty-eight subjects, all 11 years of age, were scored according to the kinds of strategies they produced in the beginning phase of the game. The categories of strategies included in this analysis were the following: (1) Shared knowledge; (2) Combined sharing-concealment; (3) Nonverbal communications, ; (4) Concealment; (5) Shuffling; and (6) Covert strategies. Table 6 includes the frequencies and the specific behaviors representing each of the strategy categories.

It should be noted that the analysis of the B group did not pertain to any of the hypotheses examined in the study. However, it was included in the study to determine whether or not the differences found in the use of the strategies by the A group was influenced by different strategies used by the B group.

Table 6
Frequency of Strategies and
Specific Behaviors Coded for Group B

Strategies	Totals
1. Shared Knowledge	1
a. Stated verbally that the Old Maid card was possessed	
2. Combined Sharing-Concealment	2
a. Held cards private (e.g., in a fan-like position) but in a way that the opponent could see	

3. Nonverbal Communications	9
a. Showed disappointment over cards possessed through nonverbal cues (e.g., by frowning)	
b. Sharp and rapid glance	
4. Concealment	122
a. Held cards private away from opponent's view (e.g., by placing them in a fan-like position)	
5. Shuffling	3
a. Moved cards around in hand (i.e., shuffles cards)	
6. Covert Strategies	7
a. Leaned over subtly to look at opponent's cards	
<hr/>	
Total	144

Subjects in this analysis were grouped according to the same high and low level strategies as those analyzed for group A. Opponent's age by strategy level chi square analyses were conducted in order to determine whether or not the strategies used by the 11 year-old B group were related to the age level of their opponents. Fisher tests were used and/or opponent age groups were collapsed when expected cell frequencies were less than 5.

The results discovered within each of the game conditions showed no significant relationships. In each condition, the B group did not differ in the kinds of

strategies they used, based upon the age of the A group (i.e., 5, 8 and 11 year-olds opponents). Table 7 includes the frequencies for the strategy levels by opponent's age within each game condition.

Table 7
 Strategy Level Frequencies
 by Age of Opponent by
 Condition

	Opponent's Age Groups		
	5 yr-olds	8 yr-olds	11 yr-olds
Condition A			
Level I	0	1	0
Level II	16	15	16
Condition B			
Level I	3	5	3
Level II	13	11	13
Condition C			
Level I	0	0	0
Level II	16	16	16

Analysis of Middle Phase of the Game

Seven categories of strategies were included in this analysis. They were identical to those used in the beginning phase but each category encompassed a larger number of specific behaviors within them. The categories and corresponding behaviors are presented below. It should be noted, however, that the asterisked (*) behaviors listed under several of the categories represented behaviors that were initially included under the category labelled "Other". They were subsequently grouped into the category to which they seemed most logically related. The statistical analyses that follow were based upon the general categories with reference to the specific behaviors for descriptive purposes only.

1. Shared Knowledge

- a. Placed all of cards face-up on table
- b. Showed all of cards to opponent
- c. Stated verbally that Old Maid was possessed
- d. Held cards in opponent's view (e.g., held cards facing opponent)

2. Combined Sharing-Concealment

- a. Held cards private (e.g., in a fan-like position) but in a way that opponent could see
- b. Held cards private and placed others face-up on table
- c. Placed cards face-up on table and then concealed them

3. Overt Strategies
 - a. Stretched (or moved) over to see opponent's cards
 - b. Told opponent that he/she wants to see his/her cards
 - * c. Told opponent that he/she did not want a particular card after selecting it
4. Nonverbal Communications
 - a. Showed disappointment over cards possessed through nonverbal cues (e.g., by frowning)
 - b. Vocal utterance indicating disappointment over cards possessed (e.g., a groan)
5. Concealment
 - a. Held cards away from opponent's view (e.g., by holding cards in a fan-like manner)
 - * b. Pulled back from opponent's view
6. Shuffling
 - a. Moved cards around in hand
7. Covert Strategies
 - a. Leaned over subtly to look at opponent's cards
 - b. Scanned back of opponent's cards through eye movements
 - * c. Shifted card preference after hesitation with stretched out hand.
 - d. Focused on opponent's face for extended period of time (approximately 5 seconds)
 - * e. Selected card that opponent selected from stack immediately following opponent's turn to pick
 - * f. Subtly lifted up card in stack to see what card it was

Analysis of Length of Games. The length of the games was determined by the frequency of card exchanges that took place between the subjects in the games. Table 8

presents the mean number of exchanges and standard deviations that occurred for each of the game conditions and age groups represented in the A group. Averaging across the three game conditions, the means were 16.37 for the 5 year-old subjects, 20.52 for the 8 year-olds, and 21.88 for the 11 year-old subjects. These figures are the same for the B group, since they played the same games.

Analyses of variance were performed on game length by: (1) age, (2) sex, and (3) game condition. However, no differences were found for the effects of sex or game condition. Therefore, they were collapsed into larger categories and the effects of age on the length of the games were examined.

The results of this analysis are presented in Table 9. They indicated that the length of the games increased steadily with age ($F(2,45) = 9.96$ $p < .0003$). Scheffe' paired comparisons revealed significant differences between the 5 and 8 year-old subjects, and between the 5 and 11 year-olds. No differences, however, were found between the 8 and 11 year-old groups.

Table 8
Means and Standard Deviations for
Age and Game Conditions

Game Cond	Age Groups					
	5 yr-olds (n=16)		8 yr-olds (n=16)		11 yr-olds (n=16)	
	Means	<u>SD</u>	Means	<u>SD</u>	Means	<u>SD</u>
A	15.56	3.6	20.06	3.9	21.82	4.2
D	16.06	5.4	21.30	6.1	21.94	6.6
C	17.50	5.9	20.19	3.9	21.88	3.8
Mean	16.37	5.0	20.52	4.6	21.88	4.9

Table 9
Analysis of Variance
Game Length by Age of Subjects

SOURCE	<u>DF</u>	SUM OF SQUARES	MEAN SQUARES	<u>F</u> -RATIO	<u>F</u> PROB
BETWEEN GROUPS	2	2359.50	1179.75	9.961	0.0003 **
WITHIN GROUPS	45	5329.50	118.43		
TOTAL	47	7689.00			

* P<.05
** P<.01

Analysis of Strategies

Group A Subjects.

The strategies displayed by the A group in the middle phase of the game were analyzed by separate designs for each of the strategies, with high-low strategy usage as one of the variables and age as the other. Chi square statistical tests were used to analyse the results, since the strategies represented categorical data. Yate's correction formula was also used for the 2 by 2 designs. Where expected cell frequencies were too small for chi-square tests, Fisher exact tests were used. In some of the analyses of small cell frequencies, age groups were collapsed into larger groups.

Finally, due to the number of zero frequencies observed for some the strategies, the initial 7 categories of strategies were reduced to: (I) Shared knowledge, combined sharing-concealment, the nonverbal communications and overt strategies; (II) Concealment and; (III) Covert and the shuffling strategies. These three groups formed three developmental levels. The first level was comprised of strategies which involved actions that exposed entirely or partially information to an opponent about the cards held. Level II was comprised of strategies that effectively concealed information about the cards held. When expression of affect indicative of

feelings a player had about his/her cards was concealed, it was included in level II. The third level of strategies consisted of concealment but also fabrications indicative of a player's active role in attempting to manipulate his/her opponent's beliefs about the game situation. A preliminary chi square analysis performed on the data yielded no significant sex differences. Therefore, sex was collapsed, and a strategy by age analysis for each game condition was used to test hypothesis 2, which stated:

With increases in age of the players, there will be a shift from shared knowledge, to concealment, to covert strategies in the middle phase of the games.

Level I Strategies. In all three game conditions (possession of Old Maid conditions A, B and C), subjects were divided into two groups: those who showed the strategy one or more times and those who did not show it at all. Separate analyses for each condition were conducted. However, since in conditions A and B the cell frequencies were identical, they are discussed together. Condition C analyses are discussed separately.

Conditions A and B showed significant relationships between age and strategy usage. That is, the 5 year-olds showed more frequency use of level I strategies than the 8 and 11 year-olds combined ($\chi^2(1) = 30.63, p < .001$). In condition C, a significant relationship was also found

between the occurrence of level I strategies and age ($\chi^2(2) = 21.56, p < .001$) These differences were due to a greater use of the strategies with the 5 year-olds than with the older subjects, 8 and 11 years ($\chi^2(1) = 7.71, p < .01$). The older subjects consisted of the 8 and 11 year-olds. No differences, however, were found between 8 and 11 years. The frequencies of level I strategies by age are included in Table 10 below.

Table 10

Frequency of Level I Strategies by Age by Condition

Age Group	Condition							
	A		B		C			
	Yes	No	Yes	No	Yes	No	Yes	No
5 yr-olds	12	4	12	4	12	4		
8 yr-olds	1	15	1	15	7	9		
11 yr-olds	0	16	0	16	2	14		
Totals	13	35	13	35	21	27		

Level II Strategies. In this analysis, the median number of occurrences of concealment strategies were used to divide the subjects into high and low concealers.

The median scores were: 17 for condition A, 18 for condition B and 17 for condition C.

The results for conditions A and C indicated that a significant increase in level II strategy usage with age when the 8 and 11 year-olds were combined and compared to the 5 year-old group. For condition A, $\chi^2(1) = 14.43$, $p < .001$, while for condition C, $\chi^2(1) = 12.09$, $p < .001$.

In condition B, a significant increase in strategy usage also occurred with age when the 5 and 8 year-olds were combined into a larger category and compared to the 11 year-old group ($\chi^2(1) = 4.67$, $p < .05$).

Table 11 includes the frequencies for high and low usage of level II strategies (concealers) by age and game condition.

Table 11
Frequency of Level II Strategies by Age
by Condition

Age Group	Condition					
	A		B		C	
	High	Low	High	Low	High	Low
5 yr-olds	1	15	4	12	0	16
8 yr-olds	11	5	6	10	7	9
11 yr-olds	11	5	11	5	11	5
Totals	23	25	21	27	18	30

Level III Strategies. In this analysis, subjects were divided into those who showed covert strategies 1 or more times and those who did not show such strategies at all. In conditions A and C, significant increases of level III strategies were found with increases in age when 5 and 8 year-olds were combined and compared to the 11 year-olds. For condition A, $\chi^2(1) = 6.63, p < .01$. For condition C, $\chi^2(1) = 6.63, p < .01$.

In condition B, a significant increase in strategy usage occurred with age when the 8 and 11 year-olds were collapsed into one larger category and compared to the 5 year-old group. This analysis revealed an $\chi^2(1) = 7.60, p < .01$. Table 12 includes the strategy frequencies by age in all three conditions.

Table 12
Frequency of Level III Strategies by Age
by Condition

Age Group	Condition					
	A		B		C	
	Yes	No	Yes	No	Yes	No
5 yr-olds	4	12	3	13	5	11
8 yr-olds	8	8	7	9	7	9
11 yr-olds	13	3	14	2	13	3
Totals	25	23	24	24	25	23

Additional Analyses

Group B Subjects.

In this analysis, the initial 7 strategies discussed in the study were also reduced to the same 3 strategy levels used in the analysis of the A group and divided into two groups: high and low users. The purpose of the analysis was to determine whether or not the B group may have used different strategies with different age levels of opponents.

For the level I strategies, subjects were divided into those who showed the strategies one or more times and those who did not show it at all. For the level II and III strategies, subjects were divided into high and low users based on median scores for the B group within each game condition. The strategies used by the B group were analyzed using separate chi square analyses for each strategy level and game condition. Two levels represented the strategies and 3 levels represented the age of the B group's opponents (i.e., the group A competitors). Where expected cell frequencies were too small to warrant a chi square analysis, a Fisher exact test was used, and/or the B group playing with two age groups of opponents were collapsed. When a 2 by 2 design was used in any of the analyses, Yate's correction formula was used.

The results of these analyses revealed no significant

findings for level I or the level III strategies, indicating that the age of the opponent did not influence the usage of these strategies by the B group. However, significant findings were discovered with level II strategies. In this analysis, the 8 and 11 year-old groups combined showed greater level II strategy usage than 5 year-old subjects in conditions A and B. For condition A, $\chi^2(1) = 13.99, p < .001$. For condition B, $\chi^2(1) = 5.45, p < .05$. No significant findings were discovered for condition C.

Table 13, 14 and 15 includes the frequencies for level I, II and III strategies.

Table 13
Frequency of Level I Strategies by
Opponent's Age by Condition

Opponent's Age	Condition					
	A		B		C	
	Yes	No	Yes	No	Yes	No
5 yr-olds	3	13	3	13	5	11
8 yr-olds	1	15	0	16	4	12
11 yr-olds	2	14	1	15	2	14
Totals	6	42	4	44	11	37

Table 14
 Frequency of Level II Strategies by
 Opponent's Age by Condition

Opponent's Age	Condition					
	A		B		C	
	High	Low	High	Low	High	Low
5 yr-olds	0	16	3	13	5	11
8 yr-olds	11	5	9	7	6	10
11 yr-olds	8	8	10	6	9	7
Totals	19	29	22	26	20	28

Table 15
 Frequency of Strategy Level III by
 Opponent's Age by Condition

Opponent's Age	Condition					
	A		B		C	
	Yes	No	Yes	No	Yes	No
5 yr-olds	8	8	7	9	7	9
8 yr-olds	6	10	9	7	9	7
11 yr-olds	5	11	10	6	7	9
Totals	19	29	26	22	23	25

Analysis of Beginning Phase Strategies
by Middle Phase Strategies

The purpose of this analysis was to determine whether or not the strategies displayed by the subjects were consistent throughout the game. In this analysis, the strategies displayed by group A in the beginning phase were compared to the strategies they used in the middle phase of the game in each game condition. The analysis was not used to test any of the hypotheses in the study.

For the beginning phase, subjects who showed either shared knowledge, combined sharing-concealment and/or nonverbal communications formed level I. Subjects who showed either concealment or covert strategies formed level II.

The strategies used in the middle phase were the same 3 levels of strategies used in the analysis of strategies by age in the middle phase of the game with the subject A group. These included high and low usage of strategy levels: (1) Shared knowledge, nonverbal communications, and combined sharing-concealment; (2) Concealment; and (3) Covert strategies.

Chi square analyses with Yate's correction formula were performed on the beginning phase strategies (levels I and II) by each of the high-low middle phase strategies (levels I, II, and II). Where expected cell frequencies were low (less than 5), Fisher exact tests were used.

Only the A group was included in this analysis, since so few of the B group subjects produced level I strategies making comparisons between the levels meaningless.

The results showed several significant differences between strategy levels (I and II) displayed in the beginning of the game and strategies displayed in the middle phase in all three game conditions. The findings are discussed in the sections below.

Beginning Phase by Level I Middle Phase Strategies.

The analysis of high-low strategy level usage in the beginning phase and in the middle phase of the game revealed positive relationships in game conditions A and B. That is, in condition A, $\chi^2(1) = 11.86, p < .001$, while for condition B, $\chi^2(1) = 12.8, p < .001$. In both conditions, high strategy usage in the beginning phase of the game was positively related to high strategy usage in the middle phase of the game.

In condition C, middle phase strategies showed all high users of level I strategies. Therefore, no statistical tests were performed.

Beginning Phase by Level II Middle Phase Strategies.

This analysis revealed positive relationships in strategy usage in the beginning and middle phases in all three game conditions. For condition A, $\chi^2(1) = 5.35, p < .05$, while for condition B, $\chi^2(1) = 7.58, p < .01$. In condition C, a

Fisher test yielded a probability of .006.

Beginning Phase by Level III Middle Phase Strategies.

This analysis revealed positive relationships in high strategy usage in the beginning and middle phases of the game in game conditions B and C only. In condition B, $\chi^2(1) = 6.19, p < .05$, while in conditions C, a Fisher exact test revealed a probability of .008. In condition A, the chi square showed a probability level of above .05. Taken together, these findings suggest that there is a strong relationship between the strategies used in the beginning and middle phases of the game. Tables 16, 17 and 18 below include the frequencies of occurrence of both the beginning and middle phases strategies in all three game conditions.

Table 16

Frequency of Beginning Phase Strategy Levels
by Level I Middle Phase Strategies

Middle Phase Level I	High	Low
Beginning Phase Strategies		
Condition A		
Level I	11	7
Level II	3	27
Condition B		
Level I	8	2
Level II	6	32
Condition C		
Level I	6	0
Level II	42	0

Table 17

Frequency of Beginning Phase Strategy Levels
by Level II Middle Phase Strategies

Middle Phase Level II	High	Low
Beginning Phase Strategies		
Condition A		
Level I	5	13
Level II	20	10
Condition B		
Level I	2	8
Level II	28	10
Condition C		
Level I	0	6
Level II	26	16

Table 18
 Frequency of Beginning Phase Strategy Levels
 by Level III Middle Phase Strategies

Middle Phase Level III	High	Low
<hr/>		
Beginning Phase Strategies		
Condition A		
Level I	7	11
Level II	12	18
Condition B		
Level I	1	9
Level II	23	15
Condition C		
Level I	0	6
Level II	25	17
<hr/>		

Latent Class Analysis

This analysis examined whether or not a pattern existed in the four strategies displayed by the A group in the middle phase of the game. For the shared knowledge, combined sharing- concealment, and covert strategies, subjects were divided into those who showed the strategy at least one time, and those who did not show it at all.

For the concealment category, the median score was used to divide the subjects into high and low users. High and low users on the four strategies, produced 16 possible patterns of high-low combinations within each game condition (e.g., low-low-low-low; low-low-low-high; low-low-high-high; etc.)

The first analysis performed on the 16 combinations determined whether or not there was independence between the high-low responders on the four strategies. The chi squares for the independence model for each game condition were rejected at the .05 level of significance, indicating that a relationship existed between the strategies. The chi squares found were 42.2 for condition A, 37.1 for condition B and 34.5 for condition C.

A two class model, therefore, of high and low level strategies was examined and goodness-of-fit likelihood chi squares were derived. Class 1 represented the high level strategies which included the concealment and covert strategies. Class 2 represented the low level strategies which included the shared knowledge and combined sharing-concealment strategies.

The likelihood chi squares for conditions A and B were significant indicating that two groups of subjects existed: those who tended to show high level strategies and those who tended to show low level strategies. For

condition A, $\chi^2 (9) = 1.51, p > .9$, while for condition B, $\chi^2 (8) = 4.98 p > .8$. For condition C, however, $\chi^2 (7) = 13.54 p < .05$, indicating that the two class model did not fit the data.

Table 19 presents the latent class reliabilities for both the high and low class strategies. The probabilities indicated the degree to which each of the strategies were associated with each latent class of strategies.

Table 19
Latent Class Probabilities

Condition A ($\pi^{\bar{x}} = \pi(\text{High} | \text{Class})$)

Class	$\pi^{\bar{x}}$	$\pi^{\bar{x}_A}$	$\pi^{\bar{x}_B}$	$\pi^{\bar{x}_C}$	$\pi^{\bar{x}_D}$
1	.69	.00	.00	.69	.66
2	.31	.40	.87	.00	.22

Condition B ($\pi^{\bar{x}} = \pi(\text{High} | \text{Class})$)

Class	$\pi^{\bar{x}}$	$\pi^{\bar{x}_A}$	$\pi^{\bar{x}_B}$	$\pi^{\bar{x}_C}$	$\pi^{\bar{x}_D}$
1	.73	.00	.05	.61	.68
2	.27	.39	.87	.12	.00

Condition C ($\pi^{\bar{x}} = \pi(\text{High} | \text{Class})$)

Class	$\pi^{\bar{x}}$	$\pi^{\bar{x}_A}$	$\pi^{\bar{x}_B}$	$\pi^{\bar{x}_C}$	$\pi^{\bar{x}_D}$
1	.62	.00	.27	.77	.67
2	.38	.44	.72	.00	.28

Where

- = Probability of class membership;
- = Probability (High on Strategy A | membership in class);
- = Probability (High on Strategy B | membership in class);
- = Probability (High on Strategy C | membership in class);
- = Probability (High on Strategy D | membership in class).

Strategy A. Shared knowledge
 Strategy B. Combined sharing-concealment
 Strategy C. Concealment
 Strategy D. Covert strategies

Analysis of the Number of Games Won

Chi square analyses revealed significant effects for the number of games won by age, but not for sex. Significant age effects were found within game conditions A and B but not within condition C. These findings indicated that the number of games won by the subjects increased steadily from 5 to 8 to 11 years of age. The total numbers of games won across all of the game conditions were: 3 for the 5 year-olds; 19 for the 8 year-olds; and 24 for the 11 year-olds. The chi squares reported were: $\chi^2(2) = 12.2, p < .02$ for condition A; $\chi^2(2) = 4.1, p > .05$ for condition B; $\chi^2(2) = 9.2, p < .01$ for condition C.

Interview Analysis

The results for all of the interview questions are presented below for the game strategy judgments (questions 1 to 6) and the fairness judgments (questions 7 and 8) for both A and B group subjects. Reliability measures are also presented. Various other analyses were performed to determine the relationship between the strategies produced and the judgments made by the subjects during the interviews.

Reliability Measures

A second rater coded the responses of 6 randomly selected subjects chosen equally from each of the age categories from group A of the study. The percentage of agreement between the ratings of the two coders was then derived. The first coder was the experimenter, who scored all of the subjects' responses used in the statistical analyses. The second coder, a 31 year-old female graduate student, scored the subjects selected for the reliability measures. A random sample of responses produced by 6 group B subjects was also used to determine the reliability measures for that group.

The percentage of agreement of the two raters for all three age groups for the A and B group subjects were all above 80 percent. Specifically, the following percentages

of agreement were obtained: (1) 88 for the 5 year-olds; (2) 83 for the 8 year-olds and (3) 80 for the 11 year-olds. The B group showed 82 percent agreement between the raters.

It should also be noted that none of the ratings differed by more than one level between the two coders.

Analysis of Game Strategy Judgments

Group A Subjects. In this analysis, a one-way analysis of variance was performed on the subjects' responses with age as the independent variable and mean score summed across questions 1 through 6 as the dependent variable. Males and females were combined in the analysis since a preliminary t-test analysis found no differences as a function of the subjects' sex. The effects of age on game strategy judgments were obtained to test hypothesis 3, which stated:

Higher levels of game interpretations will be offered by older compared to younger subjects.

As expected, a significant main effect for age level on game strategy judgments was found ($F(2,45) = 9.78, p < .001$). Scheffe' paired comparisons indicated significant differences between the 5 and 8 year-olds and the 5 and 11 year-olds, but no differences were found between the 8 and 11 year-old groups. Mean scores for the age

groups were: 9.38 for the 5 year-olds with a SD of 2.6; 12.06 for the 8 year-olds with a SD of 2.7; and 13.00 for the 11 year-olds with a SD of 1.75. The results of this analysis of variance are presented in Table 20 below.

Table 20
Analysis of Variance
Age by Game Strategy Judgments Effects

SOURCE	<u>DF</u>	SUM OF SQUARES	MEAN SQUARE	<u>F</u> -RATIO	<u>F</u> PROB
BETWEEN GROUPS	2	113.29	56.65	9.78	0.000 **
WITHIN GROUPS	45	260.69	5.79		
TOTALS	47	373.98			

* p<.05

** p<.01

Group B Subjects. The analysis of the game strategy judgments for the B group subjects was based upon mean scores summed across questions 1 through 6 for each age group they competed against (i.e., the 5, 8 and 11 year-

old subjects). An analysis of variance was then performed to determine whether or not there were any differences between the groups. The analysis was not used to test any of the hypotheses of the study, but rather to determine whether or not the age of the B group's opponents influenced their game judgments.

A preliminary t-test analysis on sex yielded no significant effects. Therefore, sex was collapsed, and a one-way analysis of variance by age of opponent was conducted. This analysis found a significant effect for age of opponent at the .05 level. Scheffe' paired comparisons revealed that differences occurred between the B group playing with 5 and 8 year-old opponents. No differences were found between the 8 and 11 year-old opponent groups. Mean scores and SD for the groups were as follows: 10.56 with a SD of 1.9 for the 5 year-old opponent group; 12.19 with a SD of 2.5 for the 8 year-old opponent group; and 12.88 with a SD of 2.99 for the 11 year-old opponent group. Table 21 below includes the results for this analysis of variance.

Table 21
 Analysis of Variance
 Age of Opponent by Game Strategy Judgments

SOURCE	<u>D F</u>	SUM OF SQUARES	MEAN SQUARES	<u>F</u> -RATIO	<u>F</u> PROB
BETWEEN GROUPS	2	45.13	22.56	3.6	0.04*
WITHIN GROUPS	45	282.12	6.27		
TOTAL	47	327.25			

* P<.05
 ** P<.01

Game Strategy Judgments by Game Strategies

The relationship between the strategies used by the subjects and the interpretations they made of the game activity was examined. This was done through the use of two separate designs: (1) Beginning phase strategies by game strategy judgments, and (2) Middle phase strategies by game strategy judgments. Both designs were used to test hypothesis 4, which stated:

There will be a positive relationship between game interpretations made by the subjects and the game behaviors they produce.

(1) Beginning Phase Strategies by Game Strategy

Judgments. In this analysis, subjects were grouped into one of two categories based upon the strategies they displayed in the beginning phase of the game. One group represented all of the subjects who revealed through either verbal or nonverbal channels their game perspectives. This group contained subjects who showed either shared knowledge, combined sharing-concealment, or nonverbal communications during any of the games within any of the game conditions. Subjects who did not reveal their game perspective in any of the game conditions comprised the second group. These subjects showed only strategies within the concealment or covert categories of responses. The total number of subjects was 19 within group I and 29 within group II. Only the A group was included in this analysis, since almost all of the B group subjects showed concealment or covert strategies. Mean score for group I on the interview questions was 14.95 with a SD of 4.17, while for group II, the mean was 17.03 and the SD was 3.29. A one way analysis of covariance performed on the data indicated no significant differences for the effects of beginning phase strategies on the interview questions ($F(1,46) = .175, p > .05$). The age variable was the covariate in this analysis. For the

beginning phase strategies, therefore, the fourth hypothesis was not supported.

(2)Middle Phase Strategies by Game Strategy Judgments.

In this analysis , the A group's judgments of game strategies were compared to the same three levels of middle phase strategies analysed in the middle phase: Level I (shared knowledge, combined sharing-concealment, nonverbal communications); Level II (Concealment); and Level III (covert strategies). The strategy levels were divided into high and low users based upon the same criteria used for the middle phase.

Two levels of responses were also defined for the game strategy judgments, with level I representing all of those subjects ($n=26$) who scored at or below the mean (11.5) on the game strategy questions (1 through 6) and level II representing all those ($n=22$) who scored above the mean. Based upon these 2 levels of game strategy judgments and high-low strategy usage, the relationship between game strategy judgment and strategy level was examined for each strategy level separately. Chi square statistical tests with Yate's correction formula, were used for this analysis.

For the level I middle phase strategies, significant relationships between game strategy judgments and game

strategies emerged in game conditions A and B. For conditions A and B the findings were identical: $\chi^2(1) = 9.82$, $p < .001$. In both conditions, high level strategy judgments were associated with low occurrences of the strategy.

For condition C, no statistical analysis was performed, since only high occurrence of level I strategies were found for both levels of game strategy judgments.

For level II middle phase strategies, a significant relationship between game judgments and strategy usage occurred in game condition A only ($\chi^2(1) = 5.49$, $p < .01$). In this condition, high usage of level II middle phase strategies were associated with high levels of game strategy judgments.

For level III middle phase strategies, significant relationships were found in condition B only ($\chi^2(1) = 6.79$, $p < .01$). The findings indicated that high levels of strategy judgments were associated with high usage of the strategy.

The results for this analysis of the relationship between game strategy judgments and game strategies displayed in the middle phase indicated there was partial agreement between high level strategies and high level game judgments, thus offering limited support to

hypothesis 4. Tables 22, 23 and 24 presented the frequencies used in this analysis.

Table 22

Frequency of Level I Middle Phase Strategies by
Game Strategy Judgments

Game Strategy Judgments	Above Mean	Below Mean
Middle Phase Level I Strategies		
Condition A		
High Usage	1	13
Low Usage	21	13
Condition B		
High Usage	1	13
Low Usage	21	13
Condition C		
High Usage	22	26
Low Usage	0	0

Table 23

Frequency of Level II Middle Phase Strategies by
Game Strategy Judgments

Game Strategy Judgments	Above Mean	Below Mean
Middle Phase Level II Strategies		
Condition A		
High Usage	16	9
Low Usage	6	17
Condition B		
High Usage	16	14
Low Usage	6	12
Condition C		
High Usage	15	11
Low Usage	7	15

Table 24

Frequency of Level III Middle Phase Strategies by
Game Strategy Judgments

Game Strategy Judgments	Above Mean	Below Mean
Middle Phase Level III Strategies		
Condition A		
High Usage	14	11
Low Usage	8	15
Condition B		
High Usage	16	8
Low Usage	6	18
Condition C		
High Usage	15	10
Low Usage	7	16

Analysis of Fairness Judgments

This analysis included questions 7 and 8, pertaining to how the subjects understood notions of fairness regarding tricks and cheating in the games. The scores on both questions for each subject were combined and summed for each subject, forming the basis of the analyses that were conducted. For the A and B group subjects, these analyses again were discussed separately.

The analysis of the effects of age of the A group on fairness judgments were used to test hypothesis 5, which stated:

With increases in age, there will be a shift in the subjects' understanding of issues of fairness of deception in the game from absolute judgments that deception is unfair, to an intuitive understanding of the fairness of tricks, to an elaborated understanding of the difference between a trick and cheating.

Group A Subjects. For the A group, a preliminary t-test analysis revealed no differences based on sex. Therefore, scores on sex were collapsed and a oneway analysis of variance fairness judgment by age was conducted.

As expected, significant age main effects were found ($F(2,45) = 13.31$ $P < .001$) on the fairness judgments. Scheffe' paired comparisons indicated that differences occurred between 5 and 8 years, while no differences were found between 8 and 11 years. Mean scores and SD's for the age groups included the following: 3.63 with a SD of 1.26 for the 5 year-olds; 5.19 with a SD of .83 for the 8 year-olds; and 5.38 with a SD of 1.02 for the 11 year-old subjects.

Group B Subjects. An analysis of the effects of the age group of the B subjects' opponents on the game strategy judgments was investigated. This analysis was not used to test any of the hypotheses. Rather, it was conducted to determine whether or not the opponent's age influenced

the subject's interpretations of the game.

A preliminary t-test analysis was first performed and revealed no sex differences on game strategy judgments. Therefore, males and females were collapsed, forming a larger category. An analysis of variance was then performed. This analysis, however, also revealed no significant differences ($F(2,45) = .77$ $p > .05$). Mean scores reported were 5.1 for the 5 year-old opponents; 5.6 for the 8 year-old opponents; and 5.2 for the 11 year-old group.

Fairness Judgments by Strategy Analysis

In the following analyses, the relationships between strategies used in the games and fairness judgments were examined. They were examined through two separate designs: (1) Beginning phase strategies by fairness judgments; and (2) Middle phase strategies by fairness judgments. These designs are discussed below and were used to test hypothesis 6, which stated:

There will be a positive relationship between levels of interpretations of game activity and levels of fairness judgments.

(1) Beginning Phase Strategies by Fairness Judgments

In the beginning phase strategies by fairness design,

two levels (I and II) of the beginning strategies were used. Subjects who revealed their game perspective through either verbal or nonverbal channels in any of the game conditions were grouped into level I, while subjects who showed concealment or covert strategies in all of the conditions were grouped into level II.

The dependent variable in this analysis was defined as the total score across fairness questions 7 and 8. Based upon these variables, a one way analysis of covariance with age as the covariate, found no significant main effects for beginning strategies on fairness judgments ($F(1,47) = .83$ $p > .05$). The mean score for level I subjects was 4.37 with a SD of 1.47. The mean score for level II subjects was 4.97 with a SD of 1.45.

(2)Middle Phase by Fairness Judgments. In this analysis, strategies displayed in the middle phase of the game were compared to the fairness judgments. For the middle phase strategies, the subjects were divided into high and low categories on each strategy, using the same criteria employed in the age by middle phase strategy analyses (i.e., high-low level I, level II and level III strategy usage). For the fairness judgments, the subjects were also divided into high and low groups, with

those receiving a maximum score (6 points) falling into the high scoring group ($n=20$) and those ($n=28$) scoring less than the maximum (5 points or less) falling into the low fairness group. Based upon these high-low levels of fairness judgments and strategy usage, the relationship between fairness judgments and strategy level was examined. Chi square statistical tests with Yate's correction formula were used in this analysis.

For level I middle phase strategies, significant relationships between fairness judgments and strategy usage occurred in game conditions A and B. For condition A; $\chi^2(1) = 4.61$, $p < .05$. For condition B; $\chi^2(1) = 11.80$, $p < .001$. In both conditions high level judgments were associated with low usage of the level I strategy.

In condition C, only high usage of the strategy was displayed, although there were fewer occurrences of the strategy with high level fairness judgments.

For level II middle phase strategies, no significant relationships occurred between fairness judgments and strategy usage. For level III strategies, however, significant relationships occurred in game conditions B and C but not with condition A at the .05 level of significance. For condition B; $\chi^2(1) = 4.2$, $p < .05$. For conditions C; $\chi^2(1) = 8.87$, $p < .01$. In both of these conditions high

strategy usage was associated with high fairness judgments.

The findings in this analysis taken together offer partial support of hypothesis 6. Tables 25, 26 and 27 contain the frequencies used in this analysis.

Table 25

Frequency of Level I Middle Phase Strategies by Fairness Judgments

Fairness Judgments	Above Mean	Below Mean
Middle Phase Level I Strategies		
Condition A		
High Usage	2	12
Low Usage	18	16
Condition B		
High Usage	0	14
Low Usage	20	14
Condition C		
High Usage	20	28
Low Usage	0	0

Table 26

Frequency of Level II Middle Phase Strategies by
Fairness Judgments

Game Strategy Judgments	Above Mean	Below Mean
Middle Phase Level II Strategies		
Condition A		
High Usage	12	13
Low Usage	8	15
Condition B		
High Usage	14	16
Low Usage	6	12
Condition C		
High Usage	14	12
Low Usage	6	16

Table 27

Frequency of Level III Middle Phase Strategies by
Fairness Judgments

Fairness Judgments	Above Mean	Below Mean
Middle Phase Level III Strategies		
Condition A		
High Usage	13	12
Low Usage	7	16
Condition B		
High Usage	14	10
Low Usage	6	18
Condition C		
High Usage	16	9
Low Usage	4	19

Additional Analysis: Game Strategy Judgments
by Fairness Judgments

This analysis involved a fairness judgment by game strategy judgment bivariate analysis, with scores on the fairness questions as one variable, and scores on the game strategy questions as the second variable. This analysis was performed on group A only. It was not used to test any of the hypotheses of the study.

This analysis revealed a significant relationship between the fairness judgments and game strategy judgments ($p < .001$). The Pearson correlation between the variables was .61.

Chapter VI
Discussion
(Experiment I)

As mentioned in the introduction, the purpose of the study was to determine the changes that occur in the development of children's deceptive strategies and the relationship that exists between those changes and the children's understanding of deceptive interactions. Several hypotheses were derived to address these issues in children's card games of Old Maid.

In this section, the results of Experiment I will be discussed in reference to developmental changes in the use of deceptive strategies that were stated in the hypotheses. This will include a discussion of the findings discovered during the beginning phase and middle phase of the game and during the game interviews. Reference will also be made to the developmental theory proposed earlier in this paper regarding the development of mutual belief and private belief states.

Developmental Changes in Strategy Level Usage

The first findings that will be discussed pertain to the developmental changes that were found in the beginning phase of the game. This issue is related to

hypothesis 1, which states that:

(1) With increases in the age of the players, there will be a shift from shared knowledge, to concealment, to covert strategies in the beginning of the game.

This hypothesis was tested through the coding of two levels of strategies: (I) Shared knowledge and combined sharing-concealment strategies, and (II) Concealment and covert strategies. The results indicated that a relationship was found between strategy level and the age of the subjects in all three game conditions, with the strongest differences found between the 5 and 8 year-old children. These findings suggest that a two level model of development of deceptive strategies seems to fit the data best. For example, 5 year-old children showed either no ability or partial ability to filter out information that should be held private, while 8 and 11 year-olds showed full control over the distribution of information in private and shared mental states.

It should be noted that the above results were uncontaminated by sex or the strategies (levels I and II) used by the subjects' opponents. That is, no differences were discovered between the B group subjects who played against subjects 5, 8 or 11 years.

The second hypothesis pertained to the middle phase of the game and stated that:

(2) With increases in age of the players, there will be a shift from shared knowledge, to concealment, to covert strategies in the middle phase of the games.

For this hypothesis, level I strategies (shared knowledge and combined sharing-concealment) showed significant decreases in use with increases in age in all three conditions. The greatest differences occurred between the 5 and 8 year-old subjects. With level II and III strategies (concealment and covert strategies), significant increases occurred with increases in age. The greatest increases of level II strategies occurred between the 5 and the 8 year-olds in conditions A and C and between 8 and 11 years in condition C. For the level III strategies, the greatest increases in strategy use occurred between the 5 and 8 year-olds in condition A and between 8 and 11 years in conditions B and C. These findings indicate that the growth of higher level strategies may continue to develop through 11 years.

A latent class analysis performed on the data for group A subjects (i.e., the latent class analysis) suggested that there were basically two types of players: (1) those who tended to use both shared knowledge and combined sharing-concealment strategies and (2) those who used both concealment and covert strategies. These

findings support a two level model of development. That is, low level players tended to use more shared approaches to the game, while high level players used more concealment and fabrications.

The B group (i.e., the 11 year-old B subjects) was also examined for age of opponent effects on strategy usage. The only significant effects found were with the group B subjects who played the games with 5 year-olds. These subjects showed fewer level II (concealment) strategies than subjects who played against either 8 or 11 year-olds in games when either their opponent or they possessed the Old Maid card. It may be that the opponents were challenged more by playing against the older subjects and felt that they had to play the games more carefully in order to win.

An analysis of the relationship between the beginning phase and middle phase strategies also revealed that subjects who were defined as users of low level strategies in the beginning phase were also found to be users of low level strategies in the middle phase of the game. The same was true for subjects who tended to use higher level strategies. Furthermore, there was a great deal of consistency in the use of the strategies throughout all of the game conditions. These findings support the

notion that children have characteristic ways of playing card games of the kind described in this study.

Children's Game Strategy Judgments

The children's interpretations of game activity pertained to hypotheses 3 and 4 of the study. Hypothesis 3 stated that:

(3) Higher levels of game interpretations will be offered by older compared to younger subjects.

Support for this hypothesis was found on the scores obtained on the interview questions between the 5 and 8 year-olds. However, no differences were discovered between the 8 and 11 year-old subjects, suggesting that the game interpretations and the recognition of deception developed up until 8 years when it tended to level off.

Hypothesis 4 of the study stated that:

(4) There will be a positive relationship between game interpretations made by the subjects and the game behaviors they produce.

While hypothesis 4 did not receive support from the beginning phase strategies, it received partial support in the middle phase of the game. For example, level I strategies were associated with the use of low level interpretations in conditions A and B but not with condition C. Level II strategies were associated with high

level interpretations in condition A only. Level III strategies were associated with higher level interpretations in game condition B only. Therefore, out of 9 comparisons, only 4 supported the hypothesis.

An appreciation of the kinds of interpretations offered by the subjects regarding the interview questions may be found in some of the responses they produced. For example, many of the subjects responded to questions 3 and 4 regarding how the subjects knew whether or not the other player possessed the Old Maid card by replying: "I would pick it" (subject 5; 5 years-old); or "because she picked it and I saw it"(subject 4; 5 year-old). These interpretations indicated that the subjects did not make any inferences about the strategies that their opponent used. However, another subject (subject 62, 11 years-old) stated; "I knew cause she never touched it so I knew that it could be the Old Maidshe hardly looked at it." Subject 63 (11 years-old) stated; "I knew when she picked it when she smiled." In these cases, it was clear that the subjects had to make inferences based upon their observations of whether or not their opponents possessed the Old Maid card and what there perspective of the game was.

Similar responses were found on question 2 : Did you do anything to try to get the other player to pick the Old

Maid card from you?" Again, many of the subjects simply stated "No", while level 3 subjects claimed that they used specific strategies, such as: "I switched the cards around" (subject 19; 11 years-old); "I pretended that it wasn't the Old Maid card" (subject 33; 11 years-old); and, "I stuck it up in my hand" (subject 81; 11 years-old). In all of these cases, the subjects used strategies that were classified as covert. Very few of the subjects ever used level II strategies, such as "I told him to take the Old Maid card." These interpretations would have represented overt strategies which seldom occurred in the games.

Question 6 also showed results illustrating the kinds of interpretations made by the subjects and how they understood what actually occurred in the games. This question stated: Did you see the other player try to trick you in any way? Many of the level 1 respondents simply said they did not know, while the level 3 respondents answered by saying that they saw their opponent using specific strategies. For example, subject 17 (11 years-old) replied; "Yeh, he kept on moving it around in his hand... this side and then that side." Subject 23 (8 years-old) made an interesting reply that was unanticipated but which indicated he was scanning the cards very closely. That is, he stated: "I tried to look through

the cards.... cause the light I could see the grey hair on the Old lady."

Question 5 ("Did you do anything to avoid picking the Old Maid?") did not reveal any particularly interesting findings, since most of the subjects simply said no, or they said they would pick another card. Therefore, only levels 1 and 2 were indicated.

Question 1, regarding whether or not the subjects understood the importance of secrecy in the game and of concealing their cards, revealed one of the major differences between the game strategies and interpretations. With the exception of 1 child, all of the subjects claimed that they wanted to hold their cards secret from their opponents. They also offered reasonable explanations for it, such as; "I didn't want him to know which cards I picked"; or, "I didn't want him to know when I had the Old Maid card." This was true even in those cases where the subjects openly displaced their cards to their opponents, such as by placing them face-up on the table. This finding suggests that while the subjects were aware of the importance of concealing their cards, they often did not have the mental capacity to control it. This was true for the 5 year-old subjects only.

Fairness Judgments

There were two hypotheses that pertained to judgments of fairness. The first of these stated that:

(5) With increases in age, there will be a shift in the subjects' understanding of issues of fairness of deception in the game from absolute judgments that deception is unfair, to an intuitive understanding of the fairness of tricks, to an elaborated understanding of the differences between a trick and cheating.

This hypothesis received support in the study and found that major shifts occurred between 5 and 8 year-olds, with no significant shifts occurring between the 8 and 11 year-olds. This suggests that there was a development that took place in fairness judgments up until 8 years of age.

To illustrate differences that occurred in the children's judgments of fairness, segments of transcripts of the children's responses are represented below.

Subject 2, 11 years-old: (Interviewer: Question 7) Do you think it's fair to try to trick the other player into picking the Old Maid card? (Subject) No because the other player will lose and the other player will win and keep on winning..(score=1).

(Interviewer: Question 8) Do you think it's fair to look at the other player's cards? (Subject) That's cheating... if your doing a test and you look at the other person's answers... (Interviewer) How is that different from tricking the other player or is it the same thing? (Subject) I don't know...(score=3)

Subject 4, 5 years-old: (Interviewer: Question 7)
Do you think it's fair to try to trick the other
player...try to get him to pick the Old Maid card?
(Subject) No cause you would take it.... you would
lose...(score =1)

(Interviewer: Question 8) Do you think it's fair to
try to look at the other player's cards... to sneak over
to peak at his cards? (Subject) No because you will know
which cards to pick...(score=3)

Subject 9, 11 years-old: (Interviewer: Question 7)
Do you think it's fair to try to trick the other player
into picking the Old Maid card? (Subject) Yes because
that's the way the game is played... you try to fool the
other player (score=3)

(Interviewer: Question 8) Do you think it's fair to
look at the other player's cards or sneak over to peak at
his cards? (Subject) It's cheating ... a trick you don't
know anything but cheating you try to look at the other
player's cards when they aren't looking.
(score=3)

Subject 50, 8 years-old: (Interviewer: Question 7)
Do you think it's fair to try to trick the other player
into picking the Old Maid card? (Subject) Yes cause that's
the object of the game..(score=3).

(Interviewer: Question 8) Do you think it's fair to
try to look at the other player's cards or sneak over to
peak at his cards? (Subject) No cause sometimes you don't
like them peaking at your cards... they'll still going to
do it(Interviewer) What's the difference between that
and trying to trick the other player or are they the same
thing? (Subject) cause a trick your playing without
cheating.... your just suppose to play the
game...(score=3)

The responses offered by subjects 2 and 4 on question
7 suggested that they did not feel that tricks in the game
or the use of deceptive strategies were fair. Their
responses suggested instead that issues of fairness were
absolute and did not differ in terms of the rules or

object of the game. Furthermore, these subjects indicated that winning was unfair, suggesting that cooperation was the guiding principle of their notions of fairness and that notions of fair competition were underdeveloped. Therefore, these subjects received a score of 1 for that question.

On question 8, however, these same subjects received scores of 3, since their responses suggested that they had a basic notion of cheating in the game. They acknowledged, for example, that looking at a player's cards was like looking at another person's test paper.

Subjects 9 and 50 received scores of 3 on both questions 7 and 8, since in these cases the subjects seemed to know that tricks or deceptive strategies were part of the game and the object was to defeat the opponent. This was apparent when the subjects stated that a trick "was the object of the game", or that "you want the other player to get the Old Maid card, otherwise, you will lose." However, to look at the other player's cards, was clearly unfair to these subjects and was something that was not permitted within the rules of the game.

It should also be noted that a number of the subjects who thought it was fair to trick your opponent could not

offer an explanation as to why it was unfair. These subjects were given scores of 2, while subjects who thought it was unfair or offered no response were given a score of 1 for the question. The same procedure was also used on question 8 pertaining to notions of cheating.

Several other significant findings were discovered on the interview questions. One of these findings was that there was a relationship between the game strategy judgments and fairness judgments, suggesting that perspective taking as related to the detection of deception and judgments of fairness are interrelated and may involve similar forms of cognitive activity. These findings support hypothesis 6, which stated:

There will be a positive relationship between levels of interpretations of game activity and levels of fairness judgments.

Fairness judgments, however, were not all related to the strategies used in the beginning phase of the game, and they were only partially related to the kinds of strategies used in the middle phase of the game. Level I strategies were associated with low level interpretations (in conditions A and B only) and level III strategies were associated with high level judgments (in conditions B and C). No such relationship was found between level II strategies and fairness judgments in any of the game

conditions. These findings suggest that that there may be different skills or perspective taking abilities involved in producing deceptive strategies and interpretations about the fairness of those strategies.

Chapter VII
Experiment II
Introduction

In this experiment , the researcher examined the kinds of strategies children from 5 to 11 years of age produced in response to specific strategies used by their opponents in games of Old Maid. One group of subjects (the confederate , 11 year-olds), were trained to produce several kinds of strategies during games when they possessed the Old Maid and in games when their opponents possessed the Old Maid. The opponents (in this case the experimental subjects consisting of 5 , 8 and 11 year-old children) were observed concerning whether or not they resisted the attempts by the trained subjects to trick them. The purpose of Experiment II was to determine the ages at which the subjects recognized their opponents' strategies and resisted or countered those strategies by concealing their cards or by producing some other form of counterattack. Following the games, the experimenter interviewed the subjects to determine how they understood the games and whether they noticed their opponents trying to trick them.

Experiment II was included in the study because the

strategies investigated in Experiment I were examined in an uncontrolled situation. That is, the strategies produced by the children in the games of Old Maid were examined in naturalistic settings. The experimenter did not attempt to elicit any strategies on the part of the players nor try to control the setting in which the strategies were examined. The experiment was designed to examine more closely "performance" factors, such as the kinds of strategies children are likely to produce in a given situation, rather than "competance" factors indicating the kinds of strategies children are capable of producing.

Although the first experiment certainly has value in describing what strategies children are able to produce in games of deception, the conclusions drawn still need further support from a more controlled experimental situation. Therefore, the second experiment was incorporated in the study to validate the findings discovered and the theory of deception examined in the first experiment.

In light of Newman's research on the development of strategic perspective taking, and the theory of deception examined in Experiment I, the present author expected a line of development similar to that found in the first

experiment. That is, there should be a gradual increase with age in the ability of the players to recognize and counteract attempts by their opponents to outwit them in the games. This led to the following hypotheses:

Hypothesis 1. There will be an increase with age in the number of times the subjects will resist the strategies produced by their opponents.

Hypothesis 2. There will be an increase with age in the level of interpretations offered by the subjects in the games.

Hypothesis 3. There will be an increase with age in the level of fairness judgments offered by the subjects in the games.

Method

Subjects

Forty subjects, equal in number of males and females, participated in the games. Thirty of the subjects, representing the experimental group, were selected equally from three age groups: (1) 5 year-olds; (2) 8 year-olds; and (3) 11 year-olds. The remaining 10 subjects represented the confederate subjects and were all within 11 years of age. The average age in months was 66 for the 5 year-olds,

102 for the 8 year-olds, and 138 for the 11 year-olds. All of subjects were from lower social economic families and most had little experience with the game of Old Maid. Seventy-seven percent of the subjects had no experience whatsoever, 16 percent played the game between 1 and 10 times and only 5 percent played more than 10 times. No children were included in the experiment who were labelled by the teachers as "learning disabled" or a "behavioral problem". The same two coders who participated in the first experiment were used in this experiment.

General Procedures and Equipment

The equipment and procedures used in this experiment were nearly the same as those used in Experiment I. That is, the children were randomly selected from each age group, matched according to sex, and given the instructions and practice sessions in a randomly assigned order. Instead of playing 3 games each as in Experiment I, each subject played 4 games : two when the experimental subjects possessed the Old Maid card at the onset of the game; and two when the confederates possessed the Old Maid card. Unlike Experiment I, the Old Maid card did not remain in the stack on the table during the beginning of the game.

Special Instructions and Training Sessions

Each confederate subject was told that he/she would be playing 4 games each with 3 different players of different ages. He/She was also told that in two games he/she would receive the Old Maid card, while in the other two his/her opponent would receive it. The experimenter then told the confederate that he/she would be directed secretly to produce certain strategies described on cue cards during specific moments during the beginning phase of the game. The cue cards were shown to the confederate without the experimental subject's knowledge immediately following the selection of the opponent's sixth card. The cards consisted of descriptions of the strategies within each of the 4 games. They included the following:

1. The confederate was told to lean over subtly while asking the opponent if he/she could see his/her cards. These instructions were given only when the experimental subject possessed the Old Maid card.
2. The subject was told to ask his/her opponent whether or not he/she possessed the Old Maid card. This occurred only when the experimental subject possessed the Old Maid card.
3. The subject was told to say to his/her opponent "take my cards", while holding the cards in a fan-like position with the Old Maid protruding upward over the other cards. The confederate was also instructed to lean forward while making the request of his/her opponent so that his/her opponent could reach his/her cards easily. This strategy occurred only when the Old Maid card was possessed by the confederate.

4. The confederate was told to hand the Old Maid card over to his/her opponent while saying to him/her, "Here take this card"(i.e., the Old Maid card). The identity of the Old Maid card was concealed during this time.

Coding of Resistant Behavior

(A) When the confederates tried to look directly at the experimental subjects' cards while saying "can I see your cards", the experimental subjects were coded as showing resistant behavior if they showed both of the following responses:

1. Tried to stop opponent from looking, by using either verbal commands, such as "You can't do that"; or through nonverbal messages, such as shaking head indicating disapproval; and

2. Held cards away from opponent's view immediately following opponent's request.

(B) When the experimental subjects possessed the Old Maid card and the confederates tried to get them to acknowledge that they possessed it, the experimental subjects were coded as showing resistant behaviors when they demonstrated both of the following behaviors:

1. Refused the opponent's request through verbal channels, such as "No, I'm not telling you", or through nonverbal channels, such as by shaking head indicating that he/she will not tell; and

2. Held cards away from opponent's view immediately following request.

(C) When the confederates possessed the Old Maid card and tried to give their opponents the Old Maid, the experimental subjects were coded as showing resistant behavior if they demonstrated one of the following responses:

1. Refused opponent's offer verbally, such as by saying "I don't want that one"; or "I'll take another one"; or

2. Refused opponent's offer nonverbally, such as by simply taking another card from opponent's hand or from the stack on the table.

(D) When the confederates told the experimental subjects to take cards from their hand rather than the stack while positioning the Old Maid card upward in their hand, the experimental subjects were coded as showing resistant behavior by showing one of the following responses:

1. Selected a card from the stack on the table; or

2. Selected a card from opponent's hand but a different one than the the card protruding upward.

It should be noted that a subject was coded as demonstrating a resistant behavior if the coder observed any other form of behavior he/she considered a resistant response even if it was not listed in the responses above.

Coding of Interview Questions

After the games were played, each experimental subject was interviewed regarding the game activity. The questions that were asked were the same as those asked of

the subject in Experiment I. However, only the experimental subjects were interviewed, since the confederates were trained by the experimenter and were aware of the experimental manipulations. All of the experimental subjects' responses were recorded and scored in the same manner as those obtained in the first experiment.

Reliability Measures

Behavioral Observations. A second rater coded the resistant behaviors displayed by a 10 percent random sample of experimental subjects within each age group. The two coders used in this experiment were the same coders used in the first experiment. The reliability measures obtained represented the percentage of agreement between the coders on whether or not the subject resisted the confederate's attempts to deceive him/her in the game.

The mean percentage of agreement between the coders for all three age groups was 93.3.

Interview Questions. The method and coders used to obtain the reliability measures for the interview questions in this experiment were the same as those used in the first experiment. Two coders scored a 10 percent

random sample of the responses produced by the experimental subjects within each age group. The percentage of agreement between the coders represented the reliability measures.

The percentages of agreement between the coders for all three age groups were all above 82 percent. Specifically, the following percentages of agreement were obtained: (1) 86 for the 5 year-olds; (2) 84 for the 8 year-olds; and (3) 82 for the 11 year-olds. Where the ratings differed, none were more than one level apart.

Results

Analysis of Game Behavior

Age. Subjects in this analysis were divided into two groups: (1) those who resisted the confederates 2 or fewer games and (2) those who resisted the confederates on 3 or more games. The first group, therefore, represented low resisters, while group two represented high resisters. The relationship between the three age groups and level of resistance was then examined using a chi square analysis.

The results indicated that there was a significant age effect found on the level of resistance demonstrated

by the subjects ($\chi^2 (2) = 15.2, p < .001$). Only 1 of the 5 year-old subjects, for example, resisted the confederates 3 or more times (high resisters), while 3 out of 10 of the 8 year-old subjects resisted 3 or more times. Ten of the 11 year-olds subjects, however, were high resisters. Separate chi square analyses also found that the differences were between the 8 and 11 year-olds ($\chi^2 (1) = 15.00, p < .001$).

Sex. The relationship between high and low resisters on the sex of the subjects was also examined. High resisters were those who resisted on 3 or more attempts, while low resisters were those who resisted on 2 or fewer attempts. The results indicated no significant sex differences ($\chi^2 (1) = 2.26, p > .05$).

Analysis of Interview Questions

Game Strategy Judgments. A oneway analysis of variance of the effects of age on the subjects' total sum scores on questions 1 through 6 revealed significant differences ($F(2,27) = 6.28, p < .01$). The mean scores and SD found for each of the age groups were: (1) 8.9 with a SD of 2.3 for the 5 year-old subjects; (2) 12.0 with a SD of 2.1 for the 8 year-old subjects; and (3) 12.4 with a SD of 2.6 for the 11 year-old subjects. Scheffe' pair-wise comparisons also indicated that the age differences

were between the 5 and 8 year-olds, and the 5 and 11 year-old subjects.

A t -test was also conducted for the effects of sex on the subjects' game strategy judgments and showed no significant effects ($t(28) = .65, p > .05$). Mean score for the males was 9.87 with a SD of 2.83, while for females mean score was 12.33 with a SD of 2.09.

Fairness Judgments. An analysis of variance and a t -test were also conducted on the effects of age and sex, respectively, on the subjects' responses to fairness questions (7 and 8). However, neither age nor sex showed significant effects ($F(2,27) = 1.67, p > .05$ for age effects; $t(28) = -1.59, p > .05$ for sex effects). Mean scores and standard deviations for age groups were: (1) 3.3 with a SD of 1.34 for 5 year-olds; (2) 4.1 with a SD of 1.2 for 8 year-olds; and (3) 4.4 with a SD of 1.57 for 11 year-olds. For males the mean score was 3.53 with a SD of 1.36, while for females the mean score was 4.33 with a SD of 1.40.

Resistant Behavior By Interview Questions Analyses

The ability of the subjects to resist their opponents' attempts to deceive them was examined in relationship to their ability to make game strategy and

fairness judgments. In this analysis, the subjects were divided into two levels of resisters. One level was considered high resisters who showed 3 or 4 resistant responses in 4 games. Low level resisters were those who showed 2 or fewer attempts at resistance. T-tests were then performed on the data to examine the effects of level of resisting on the subjects' scores on game strategy judgments and fairness judgments.

The analysis found a significant relationship between ability to resist and game strategy judgments (t (28) = -2.72, p<.05 for game strategy judgments). Mean scores were 9.86 with a SD of 2.83 for the low resister group and 12.33 with a SD of 2.09 for high resisters. The resister by fairness judgment analysis was nonsignificant (t (28) = -1.31, p>.05). The mean score for the low resisters was 3.60 with a SD of 1.35, while the mean score for the high resisters was 4.26 with a SD of 1.44.

Discussion

(Experiment II)

As indicated in the introduction to Experiment I, the purpose of this experiment was to determine whether or not

there were any age differences in the children's ability to resist the attempts by confederate subjects to trick them in the game. Four types of strategies were produced by the confederates during which time the experimental subjects were observed in terms of whether or not they counteracted the confederates' actions. Based upon observations made of the children and the interviews, the following three hypotheses were examined:

Hypothesis 1. There will be an increase with age in the number of times the subjects will resist the strategies produced by their opponents.

Hypothesis 2. There will be an increase with age in the level of game interpretations offered by the subjects in the games.

Hypothesis 3. There will be an increase with age in the level of fairness judgments offered by the subjects in the games.

The first hypothesis, concerned with resisting opponents' strategies, was supported by the findings. There was a strong relationship between the age of the subjects and the ability of the subjects to resist the attempts by their opponents' to trick them in the games. The results also indicated that the age effects occurred between 8 and 11 years. It is still unknown, however, why this occurred. For example, it was not determined whether or not this ability was related to an increasing

ability to recognize the deceptive strategies used by the opponent or some other factor, such as the degree to which children are susceptible to the influences of other children in deceptive games. However, there was evidence indicating that game interpretation and level of resistance was related. This finding suggests that the ability to recognize the deception occurring in the games may be a factor in the ability to resist the deception.

The second and third hypotheses examined whether or not there was a relationship between the subjects' age and their level of game strategy judgments and fairness judgments. These hypotheses were identical to the hypotheses examined in the first experiment pertaining to the interview segment of the study where strong relationships between age and game strategy and between age and game strategy judgments were discovered. In this experiment, however, only the effects of age on game interpretations were discovered. The reason why no age effects on the fairness judgments were found is unclear. One possible explanation was that the specific experimentally manipulated tricks of the confederates, such as trying to look at the other player's cards or asking the player whether he/she possessed the Old Maid,

were clearly viewed as a form of cheating. A trick employed naturalistically in Experiment I may have been viewed as part of the way the game is played.

Chapter VIII

General Discussion

In this section, the results of Experiments I and II and the implications of those findings toward a developmental theory of deception will be discussed. Various theorists will also be referred to in terms of how the findings either support or conflict with their theoretical perspectives. Finally, limitations of the study, recommendations for future research and educational implications will be mentioned.

A Summary of the Research Findings

Experiment I

The results found in Experiment I in the beginning and middle phases of the game suggested that there existed two levels or possibly three levels in the development of deceptive strategies. For example, shifts in the use of level I strategies (sharing and combined sharing-concealment) to level II strategies (concealment) occurred in the beginning phase of the game between 5 and 8 years. Similarly, decreases in the use of level I strategies and increases in level II strategies occurred between 5 and 8 years in the middle phase. Increases in the use of level III strategies (covert strategies) were also observed in the middle phase between between 8 and 11

years. These findings suggest that between 5 and 8 years of age there is a clear development from shared to concealed forms of knowledge. From approximately 8 years to 11 years, children begin to display fabrications (covert strategies) in their game activity.

The latent class analysis, however, indicated that there were only two kinds of players in the games: (1) those who used shared knowledge and combined sharing-concealment and (2) those who used concealment and covert strategies. Thus, although there may exist three levels in the development of deceptive strategies, in this analysis, the results suggested that there were only two levels.

It should also be mentioned that there was a positive relationship between the strategies used in the beginning and the middle phases of the game. These findings add further support to the notion that the children showed characteristic ways of playing the game. Furthermore, these findings suggest that the children were consistent in the strategies they used throughout the games.

The results found on the interview part of Experiment I also had several implications for a theory of development in deceptive strategies. First, there emerged two levels in the development of social cognition related to

deceptive interactions occurring between 5 and 8 years. The first level was characterized by an inability on the part of the 5 year-olds to recognize deception occurring in the games. Although they could understand that there were situations where information should be held secret and where the other player would probably try to get them to pick the Old Maid card, they were unable to identify any deception occurring in the games. Descriptions of the game were based simply upon overt, concrete events and no inferences were made about subtle nonverbal or verbal expressions made in the games. There was no recognition of deceptive play whatsoever.

The second level of deceptive thinking was characterized by recognition of deception occurring in the games. The level 2 children's descriptions of the game activity included inferences regarding the strategic use of subtle nonverbal and verbal behaviors, and the recognition of the tricks used by their opponents. Level 2 was used mostly by the 8 and 11 year-olds.

A similar line of development was also observed in judgments of fairness. In the first level, subjects viewed tricks and deception in the game in an absolute sense, in that, they viewed tricks as unfair regardless of the situation in which it took place. These subjects could

not understand that deception was part of the rules of the game and was different from cheating.

The second level child, however, viewed tricks and deception in the games as a relative event. They viewed tricks as fair, as part of the way the game is played and as something separate from cheating which should not take place in the game.

One interesting observation made informally by the experimenter was that some of the subjects who displayed deceptive strategies during the game did not acknowledge it spontaneously but revealed that information after repeated questioning or reassurance by the experimenter that they would not be criticized for it. This suggested that some subjects may have concealed their full understanding of the game activity for fear of being disapproved of by the experimenter.

It should be noted that both the game strategy judgments and fairness judgments were related to the strategies used throughout the games. This suggests that there may be a unitary process underlying both game interpretations and strategy productions.

It should be mentioned also that the age changes that were observed with both the game interpretations and the

game strategies represented changes in level rather than in stages. The notion of stage-like changes implies that shifts in development are sudden and involve changes in organization (Kessen, 1970). The notion of levels used in this study implies gradual, quantitative changes. The differences that occurred between the age groups resembled gradual increases in the use of higher level strategies and interpretations.

Experiment II

Regarding the second experiment, the major findings were that with increases in age there was a shift in the ability of the subjects to resist influences of the confederates to outwit them in the games. One possible explanation of these findings was that the younger subjects did not think that their opponents were trying to trick them, while the older subjects perceived that they were. This finding may have been due to age differences discovered during the interviews in the child's ability to detect deception in the games. An alternative explanation is that the younger subjects were more susceptible to the influences and the approval of the confederates and therefore were more likely to comply.

Piaget's and Vygotsky's Developmental Theories

Two theories of social development were discussed in

the introduction of this study in connection with deception: (1) Piaget's theory of development and (2) Vygotsky's theory of development. Piaget's theory describes how the child develops the capacity to take the other's perspective and to interact cooperatively. The child is seen as developing from a highly personalized state of egocentrism to a social state characteristic of cooperative activity. This ability, moreover, represents one aspect of deception which involves the ability to know what the other person is thinking and planning.

Vygotsky, however, views social development differently. Vygotsky maintains that development starts out from an undifferentiated state of social and personal knowledge, which gradually becomes separate, thus, forming two distinct but related forms of knowledge. This view of social development takes into consideration an aspect of development that is especially important in the use of deception. This aspect represents private forms of knowledge, which may be manifested in the form of covert strategies or plans.

Although the research on perspective taking abilities may be explained from a Piagetian position, the results found in this study seems to fit more closely within Vygotsky's model of development. For example, in the study, all of the children were capable of following the

rules of the game, exchanging cards and playing cooperatively. The children did not seem to have difficulty taking turns picking cards, matching identical pairs and placing matched pairs on the table. However, it was discovered that the youngest children had difficulty separating what information should be shared and should be held private. These children tended to place all of their cards face-up on the table regardless of whether or not their opponent's could see. This was true even with children who revealed during the interviews that it was to their advantage to conceal their cards from their opponents and not to tell them when they possessed the Old Maid card. They seemed to approach the game as if it were simply a cooperative activity.

In some cases it was observed that some of the children used combined sharing-concealment strategies; in that, they tended to conceal some of their cards while exposing others. It seemed that these children were showing a budding awareness of the existence of personal knowledge but could not coordinate it with shared knowledge. In other words, they could not consider entirely their own perspective simultaneously with the perspective of their opponent. This may suggest the existence of an egocentric state where personal knowledge is only partially developed and differentiated from the social.

Finally, when the child was older, 8 and 11 years of age, deceptive activity started to emerge in the form of tricks and covert strategies. The child was able to cooperate with his/her opponent sharing and exchanging cards but was also able to keep certain information from him/her and try to outwit him/her in the games. When the child was capable of concealing his/her cards and manipulating his/her opponent's cognitive frame, he/she was fully capable of playing competitively but within a social framework.

Thus the development of deceptive strategies involves two forms of knowledge: private and shared. In deceptive interactions there must be an understanding and a display of shared knowledge demonstrated in the form of cooperative activity, such as in the following of the rules of the game. Also, there must be an understanding of private information that may be used in the construction of strategic fabrications.

Educational Implications

The ability to determine what information should be shared and held private in deceptive interactions is important in many areas of the child's socialization. The child must acquire this ability in order to compete effectively with others and to know how to withhold information from other's in order to avoid conflict. This

ability may also be enhanced in the child through various activities with other children. Such activities may be games similar to Old Maid. Through these activities, the child may learn how to compete with other children, while still interacting cooperatively. Activities that involve deceptive play, therefore, may be useful in the curriculum of young children. Developmentally appropriate behaviors may be enhanced and the child may acquire strategic abilities in a natural fashion.

The interpretation and manipulation of subtle verbal and nonverbal cues emerged in the present study as a significant feature of deceptive strategies. It was found, for example, that children used facial and vocal cues to determine what their opponents were planning and how to counteract their strategies. Through such deceptive games as Old Maid, the child may learn the meaning of subtle social cues. He/she may learn how to apply them across a wide range of situations where subtle expressions of affect are displayed.

Children who show difficulty in competitive situations may also benefit from games that involve deception. It may help them to recognize what the other is thinking or feeling, and help them compete cooperatively.

Finally, young children were found in the study to have considerable difficulty differentiating between notions of fairness and cheating. Not until approximately

8 years was the child able to make such a distinction. Such games as Old Maid, however, may help the child distinguish between notions of fairness and cheating. The child may learn that notions of fairness are not absolute, but instead are related to the situation in which they are associated with. The distinction between fairness and cheating may also be applied to a variety of games and sports.

There are many situations aside from the few mentioned here, where deceptive activity may be incorporated into the education of young children. Teachers and educators who recognize the importance of deceptive play in children may include games like Old Maid in the classroom.

Limitations and Research Recommendations

There were several short-comings of this study that have implications regarding the generalizability of the findings. Most of the subjects, for example, were from lower class backgrounds. They were from minority group families who acquired English as a second language. They had little exposure to card games of the type played in this study. Children from middle class backgrounds, however, may have been better able to respond to the interviewer's questions, may be more accustomed to playing deceptive games of the type used in this experi-

ment, and may have revealed a broader range of deceptive strategies than the children in the present sample.

The experimenter may also wish to broaden the range of the deceptive strategies investigated, by including other types of children's games involving deception that require a broader range of skills and abilities. This would allow the experimenter to examine more closely whether or not the level discovered are consolidated, form a common structure and apply over a range of situations.

Another problem faced by the experimenter was related to the taping of the subjects. During a pilot study, the researcher used a split-screen device which permitted both players to be taped simultaneously in close proximity. However, it was found that a player's body and hand movements were often excluded and sometimes moved entirely out of the scope of the camera. As a result, one camera was used to tape the profiles of the children playing on a round table. Although this permitted the researcher to tape all of the activity that occurred between the players, close examination of facial expressions and eye movements was not possible. This may have been particularly important in the recording of non-verbal expressions of affect. In future studies of this

type, the author may wish to investigate bodily movements, such as movements of the arms, hands and legs in one study and facial and eye movements in a separate study.

In this study two different experiments were included: one which involved few control variables in that the study was conducted in naturalistic conditions, and another which included the use of trained confederates. In both cases, information is gained as well as lost. One of the advantages, for example, in using a naturalistic situation is that the researcher may investigate children's behavior without the extraneous effects of an experimenter. However, one of the limitations of such a design is that it is not possible to discover cause-and-effect relationships. For example, it was not possible in Experiment I to determine whether or not the strategies produced by the A subjects were a result of their age or some correlated characteristic (e.g., the strategies produced by their opponents, the B group). If the researcher was able to control such factors more fully and eliminate the effects of extraneous variables, stronger support for age differences may have emerged.

In Experiment II the author investigated the effects of age on the strategies used by the subjects while con-

trolling for the kinds of strategies used by the opponents. Although this study controlled for extraneous variables, the setting in which the subjects played the game in the latter was artificial. This limited the generalizability of the findings.

Another issue of concern was related to the interview segment of the study. It was discovered, for example, that several of the questions could not be answered by the subjects due to either the difficulty of the questions or the way the questions were worded. For instance, question 5; "Did you do anything to avoid picking the Old Maid card", seemed to evoke very simplistic responses, such as "I picked from the stack instead of from the other player." Richer kinds of responses may have been elicited if the experimenter asked more open-ended kinds of questions, such as pivotal questions which required extended responses.

Finally, another area that may be investigated in future studies is related to the effects of the age of a player's opponent on the strategies used. For example, it was discovered that the B group in Experiment I who played with 8 and 11 year-old players displayed more level II strategies (concealment) than those who played with 5 year-old subjects. The interpretation offered for these

findings was that the B group may have used more sophisticated strategies with older opponents because they may have considered them to be more sophisticated strategizers. It would be interesting to find out whether or not the 5 year-old subjects were able to take into consideration the age level of their opponents and whether that information would have influenced their strategies in any way.

The above limitations to the study and research suggestions included those that the author felt were important and that may produce other studies of significance. The reader may have other issues that are equally important and research suggestions of even greater significance. In any event, it is hoped that this study will create new ideas on the subject of the development of deceptive strategies and expand the knowledge in this area of investigation.

Appendix A

Parent Consent Form

Dear Parent:

I am writing to ask your permission to include your child in a study of children's social skills in the game of Old Maid. Old Maid is a card game that children often play and find fun and challenging. It involves matching a series of identical cards before the other player, while avoiding the Old Maid card. The purpose of this study is to learn about the kinds of social strategies children use at different ages. It may help educators and scientists learn more about the kinds of activities children can play that will help them compete and play cooperatively with others. All of the children who participate will be video tape recorded for approximately 15 minutes and interviewed about the game. They will also be given a gift for playing.

In order to conduct this study, we need your permission for your child to participate. The study has been approved by the Office of Evaluation of the Board of Education of New York City as well as the principal of your child's school. Please check one of the boxes below

indicating that you either approve or do not approve your child's participation in this project. Also, please sign this form and have your child return it to his/her teacher. The project will be conducted in the school building. Thank you.

_____ Approved

_____ Do not approve

Date_____ Signature_____

Sincerely yours,

Richard Daniele, City
University of New York

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