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COGNITIVE AND DEVELOPMENTAL ASPECTS OF VIEWING TELEVISION

by

ILANA REICH

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

1977

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

5/17/77
date

Chairman of Examining Committee

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Executive Officer

Supervisory Committee

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ABSTRACT

COGNITIVE AND DEVELOPMENTAL ASPECTS OF VIEWING TELEVISION

by

Ilana Reich

Adviser: Professor Harry Beilin

This study documents the role of cognitive level in the child's understanding of televised thematic material.

The 200 public school and private nursery school children used as subjects in this study, were divided into three groups; 40 nursery school children (ages 3-4), 120 kindergarten children (ages 5-6), and 40 second grade children (ages 7-8). Each child was classified into one of four cognitive levels (preoperational, low transitional, high transitional and operational) according to their performance on specific conservation and imagery tasks, prior to viewing five minute experimental videotapes. There were four treatment groups that varied in videotape content: prosocial or aggressive solution with male or female model performing the solution. Assignment to a treatment group was random. Each situation presented exactly the same social interaction (children fighting over a swing in a playground) with only the final solution (last thirty seconds) varying.

Viewing of the film was followed by an interview, with each child, which consisted of both a structured and unstructured portion. The unstructured interview allowed for the children to "tell about the story" freely, whereas,

the structured interview forced the child to choose one of three pictures that represented the best answer to 30 specific questions regarding the videotape content or the child's own attitude or ideas.

The results showed strong age and cognitive level effects in almost all areas considered. The childrens' cognitive level was particularly significant in questions that involved direct information, cognitive, moral or social aspects.

The quantity and quality of responses made during the unstructured interview showed only age effects with the older children providing more abstract and explanatory statements, as well as generally more verbalization, than the younger children (who predominantly responded with reporting statements) in their summaries of the videotape content. In the structured interview, cognitive level, as well as age, was a significant factor in the amount of higher level responses given, with the operational children giving more relevant and more complex, abstract responses than the preoperational or intermediate children.

An interesting finding was the significant interaction between sex of subject and type of film; there were generally more responses in <u>all</u> categories when the female model was carrying out the prosocial action or the male model was engaged in the aggressive action. This confirms the prediction that children would be more willing to respond, when speaking freely and without incentives, when the action was more socially acceptable.

Cognitive level proved to be significantly related to many of the specific areas explored by the structured interview questions. There was a linear relationship between cognitive level and 1) ability to sequence and generalize, 2) ability to understand the delay of gratification for future gain in accordance with societal values, 3) ability to define "sharing", and 4) ability to choose the better behaving model despite same-sexed model preference.

Consistent with prior research and Piaget's theory there was evidence that children understand and report more higher level responses on questions that concern consequences to the model, rather than on intentions.

The type of film was a significant effect and, contray to our prediction, children performed at a higher level in answering specific questions (structured interview) when they saw the prosocial solution than when they viewed the aggressive solution.

Sex-of-actor and sex of the subject were generally not significantly related to the childrens performance, though there was a tendency for the girls to perform at a higher level in some aspects of the structured interview.

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CHAPTER I

INTRODUCTION

From both a practical and a theoretical point of view, research into the consequences of media exposure has been accorded increasing emphasis. On the one hand, the extent of exposure to the media, especially television, has been recognized as taking up considerable amounts of time in the lives of young children. 95% of the households in the United States have at least one television set (Leifer, 1972). Surveys have shown that both here and in Britain, 5 to 11 year-olds, of all socioeconomic groups, watch more than two hours a day (Lyle & Hoffman, 1972), and that sets are often on during six hours of the day, providing a constant background for any child in the vicinity. 78% of American families report the use of television as an "electronic babysitter" (Johnson, 1967) and encourage viewing by their children.

There has been a concurrent development of interest in the forms of learning that are particularly potent for young children. The evidence is very strong that young people can and do learn significantly with respect to social behaviors as well as the direct acquiring of information under conditions that may only accidentally involve the planned presentation of information or instruction, as in the case of television.

The conjoint recognition of the amount of exposure to seemingly passive visual forms of symbolization, via the media, and that a great deal of a child's socialization may actually be learned from those models, has practical significance as well. This is evidenced by the growing body of literature and new techniques and methods that relate to television, as well as recognition of this type of research as a legitimate subject for investigation. We will consider this research within the theoretical or conventional research categories in which they are treated, and their bearing on the present study.

Observational Learning

For the most part, traditional learning theories explain behavior as the consequence of direct action. Newer ideas about the ability to learn by observation (with or without vicarious reinforcements) consider the possibility of acquiring large, organized units of behavior without such action. In reality, most behaviors are not controlled by immediate reinforcement, but are learned by example. It is evident that viewers learn a great deal of the content of movie and television programs, without the viewed responses actually occurring. There are numerous reports of increased bank robberies, or hijackings for example, following televised material that gives instruction in such acts or possible successful outcomes (Liebert, Neale and Davidson, 1973).

With the child's increasing capacity to handle the information of dramatic presentations, the possibilities of acquiring new, unusual or advanced behaviors are a reality to those interested in children's behavior and its origins. Under consideration is the ability to organize new behavioral responses following a model's example through observational learning and not just the direct imitation of previously acquired responses.

Bandura's formulation (Bandura, 1971) of observational learning outlines the following processes in the child's ability to perform modeled behaviors. While the child is exposed to the model, perceptual responses become centrally integrated through imaginal and/or verbal representations that are retrievable at a later time. The coded observations can activate the image in conjunction with certain environmental cues. The image then acts as a guide or template for the modeled behavior, that may or may not be performed. Characteristics of the model may act as discriminative stimuli for responding to other models, other situations, or different behaviors, through generalization. This provides the child with the possibility of no-trial-learning.

Bandura proposes a social learning theory explanation of observational learning that differs from traditional and contemporary learning theories in its interpretation

of the 1) locus of response integration, 2) manner in which reinforcement influences observational learning and 3) the role played by cognitive functions (Bandura, 1971).

It is with respect to the last point that this paper is primarily concerned, though the other aspects are briefly mentioned. In terms of increased cognitive ability, it is expected that children will learn different amounts, probably in different ways from the observation of models. The cognitive functions that are involved in modeling or observational learning according to Bandura are the following:

Attentional Processes - It is clear that nothing can be learned from observation if the model is not attended to. The mere fact that the television set is on an increased number of hours, does not mean that the child is attending. Adults are reported to be watching less then half the time that the set is on (Bechtel et al. 1971); but, as adults can "watch" and still do other activities at the same time, young children are less able to do that (Foulkes et al. 1971). Thus attentional processes differ with age, especially with respect to attending during a television show.

Selective Attention - There are varying associational and saliency preferences that may account for the selection of material to be perceived and processed. Some researchers

have found that children attend to certain parts of a television show. As a consequence, Sesame Street concentrates on rapid transitions that catch the child's attention between presented sequences rather than long intervals of the same presentation. It is not clear exactly what or which materials or models command more attention and are therefore more effective for learning. The television industry itself bases its entire financial structure on the fact that people, and for a good part of the day, children, are directly influenced by the presented materials. They are very interested in those aspects of the presented material that have attentional "pull" and it is clear from the programming that they recognize the strong pull of violence, while at the same time disregarding its influence upon a viewer's life.

Retentional Processes - As the child develops, his ability to retain information about the model's behavior increases. The child has an increasing ability to store meaning extracted from the viewed occurrence for retrieval at a future date: the motivations, consequences and explanations of the actions as well as the actions themselves. This is due to his increasing facility with language and the ability to manipulate verbal and imaginal coding. It has been shown that adults (Bandura & Jeffery, 1971) and children (Bandura, Grusec & Menlove, 1966) retain observed behaviors better

if the information is coded. The child's performance over time changes as a function of his or her facility to transform observed behavior into a representation that can be organized and decoded verbally, imaginally or motorically. The interest of this study is primarily in the verbal rather than motoric processes that represent the child's knowledge. However, if a child understands and can symbolically represent the observed behaviors, one would never know this unless the child has developed sufficiently to actually reproduce the observed behavior, if it is not verbalized.

Reinforcement and Motivational Processes - These processes have the major control of the actual performance when the child observes a model's behavior, according to Bandura. The child might be subject to direct rewards and punishments, such as praise for imitating a pro-social action seen on television, or a facilitative effect that focuses attention and vicariously reinforces the behavior to be learned.

From the well-known Bandura experiment (1965) in which nursery school children saw a film of a model on television being rewarded, punished or receiving no consequences of aggression toward a Bobo doll, it was shown that children imitate and are affected by the vicarious reinforcement observed. The children who saw the model rewarded, performed

more aggressive actions than children who saw the model punished. However, when properly motivated, all the children were able to show they had learned the observed behaviors.

There are about twenty subsequent published reports that demonstrate that young children can and do imitate what they observe on a television or movie screen (Surgeon General's Advisory Committee, 1972).

An example of a study that provides evidence in the acquisition of prosocial as well as aggressive behaviors from modeling, though in reality the children's opportunities from watching actual television are very limited, given the great amount of "violent" programming, is a study by Walters and Parke (1964) that looked at resistance to temptation. The children were exposed to a three minute film of a child touching toys that had been forbidden. The consequences to the model were 1) reward 2) punishment and 3) no consequences, and it was shown that these outcomes had an effect on the observing child when this child was placed in the same situation.

It is probable that children will acquire certain behaviors due to the salience of the actions at the time and in the specific context, without any visible reinforcement, but choose not to perform these learned behaviors for many reasons.

Bandura (1971) elaborates on the direct reinforcement of behavior by postulating other roles for reinforcement as well. Reinforcement, as a facilitative condition, affects attentional, organizational and rehearsal processes by informing observers, in advance, of the reward value of the modeled behavior. Reinforcement is also operative vicariously, as mentioned above, and through self-reinforcement. Thus, within a social context, what the child sees on television can be learned or not learned, performed or not performed according to the value this learning or action has for the particular child. Piaget who also stresses the cognitive factors in learning would undoubtedly differ from Bandura in his explanation of the role of reinforcement. According to Piaget (1965) unless the child has all of the necessary cognitive elements to assimilate the newly viewed information, no reinforcement, either direct or vicarious, would enable the child to really "know" or understand what he views. The child would not pay attention to the relevant material, observe or interact with the situation, or make efforts to repeat the observed behavior unless he had already developed, or came close to having, the necessary cognitive schemas for dealing with the particular environment If one can conceive of television as a kind of training, as it is so often repetitive in plot development, show construction, commercial messages, etc. then Piaget might predict that watching television can affect the rate of learning certain

kinds of concepts, but only within the limits of the child's own abilities.

In The Early Window (1973), Liebert et al. extend Bandura's social learning theory regarding observational learning (1971) by specifying three necessary stages that must occur during the observational learning process:

1) Exposure - which includes the observation of live or symbolic models.
2) Acquisition - which includes the learning or recalling of modeled cues.
3) Acceptance - which includes the direct imitation, disinhibition, direct counterimitation or inhibition of the act.

Liebert, in agreement with Bandura, stresses the importance of special factors that influence the observer, such as, the status of the model, consequences to the model, sex of the model and the observer's sex. In addition, Liebert points out the need to look further at some additional aspects of observational learning, such as learning the appropriate time to perform the acquired behavior while adapting it to a new situation. These aspects concern cognitive capabilities and though they are not specified, their importance is acknowledged.

It becomes evident then, that we need to know more about the cognitive components of observational learning in order to understand what children learn from television

before we can predict what or why they are imitating. In terms of Liebert's stages, it is necessary to explore the processes of "Acquisition" before any predictions can be made about the child's "Acceptance". The differential performance of children of varying ages to viewing television might be due to one or more of the cognitive deficits or abilities present in the Acquisition stage.

Most research thus far, has concentrated on the third or Acceptance stage. Implicit in some of these studies that measure actual behaviors following exposure to a televised stimulus, e.g., Sprafkin, Liebert and Poulos (1975), is the idea that children understand the stimulus to the same degree and in the same way, and that the differences in their responses are due to external factors, i.e., prior experience with television (Feshbach, 1972), racial identification (Clark, 1972), or personality variables, i.e., personal aggression (McLeod, et al. 1972), amount of self esteem (Baran, 1974) and image definition (Cruickshank, 1974). This research therefore was based on the intention to explore the conditions under which young children extract information or meaning from a television presentation, rather than how they perform following modeling.

Cognitive Developmental Learning

There seems to be agreement as to the increasing abilities of children, over time, to imitate by observational learning and thus perform new behaviors. There is

controversy however, as to the factors and processes that operate within the child to permit this imitation to occur. As already stated, Bandura stresses attentional, retentional and motivational processes in the observational learning situation.

Piaget, however, describes the unfolding of invariant developmental stages, which we predict would affect the child's ability to learn through observational methods. These observational methods are based intrinsically on the particular stage of the child's development. Thus, the child's abilities increase progressively as information is assimilated to developing cognitive structures. Thus viewing a television program, the child with more advanced cognitive structures, would learn and retain more than a child with less cognitive ability. The ability to follow a logical story line, and to make inferences sufficient enough to apply outcomes and actions to real life situations, would thus vary according to the cognitive level of the child. A preoperational child, for example, would not be able to decenter from a focus on the perceptually dominant, but not necessarily relevant, material or bring to the TV program enough verbal or imaginal, representational or manipulative ability to follow the story line in a logical way.

Other researchers findings have substantiated some of these assertions. For example, Leifer, et al. (1971)

found that four-year-olds cannot follow a simple story line. Collins (1970) found that third graders (8-to-9-years old) find it difficult to retell a plot including minimal amounts of essential information. Bryan and Walbeck (1970) found eight-year-olds could not sufficiently define the inconsistencies in a model's words and deeds.

A number of experimenters have talked of "age-related variables," avoiding the stage issue, yet drawing on a number of Piaget's original conceptualizations.

It is not a surprising finding that older children understand a presented theme better than younger children, especially in television where the usual fare is quite complicated. It has been proposed that the reason young children do not perform as well in the understanding of this type of material is that they are unable to form the most effective (usually verbal) mediators (Flavell, 1970). Between the ages of four and seven (corresponding to Piaget's preoperational stage) children begin to use verbally mediated responses that facilitate their understanding and recall of a sequential pattern and thus increase their ability to learn by observation (Coates & Hartup, 1969).

Additionally, Collins et al (1973) points to the complexity of a child's having to relate the various aspects of the plot (i.e., the reason for the consequence is the motive and the actor's action), and the need for well-developed

abilities to perform abstract inference. Kendler and Kendler (1962) characterize the preoperational learner as a rigid, rote learner, without the ability to use spontaneous verbal labels or make a direct statement that involves an inferential solution.

Young children likewise have difficulty attending to a specific portion of the thematic material (Collins, 1970) and their inability to distinguish between essential and incidental material makes their chances of receiving enough relevant information to make a logical statement about the theme almost impossible. Hale, Miller and Stevenson (1968) speak of an increasing ability to handle this latter kind of distinction and there is a suggestion of different developmental patterns for learning central versus peripheral content. These facts are of interest considering the complexity of children's programs now being aired on television, not to mention the adult fare children sample regularly. If the child cannot focus on the main point of the plot, the viewed situation can have no internal logic for him and is not likely to contribute to any learning or even full enjoyment. Most research seems to support Piaget in that the abilities discussed above are rarely seen in young children under eight years of age.

Moral Development

In studying developing cognitive capacities, re-

searchers have paid considerable attention to children's moral development, particularly their judgments regarding justice or their ideas regarding motives for behavior and their subsequent consequences. These aspects of a social interaction are particularly relevant to television content and indeed have been found to affect actual behavior in both children and adults (Bandura, Ross & Ross, 1963). How the child understands a given viewed situation is thus a consequence of the interactions between motives and consequences and a fundamental aspect of logical thought development.

From the Piagetian viewpoint, which is often in agreement with other authors, there is an increase in the ability to reason and judge in a more "moral" way as the child develops. Piaget (1965) distinguishes two stages of the development of moral reasoning that concern the child's understanding of motives and consequences. In the first stage of objective responsibility or moral realism, prior to about seven years and comparable to the preoperational period, the child's judgment of a deviant act is based on an assessment of the amount of damage done and disregards the intentions of the actor. In the second stage, of subjective responsibility or autonomous morality, the intent of the actor is considered and less emphasis is placed on the actual consequences. The progression in stages is associated

with the diminution of the child's egocentricity and an increase in autonomy that provides the child with mutually reciprocal relationships and a view toward cooperation. The increasing ability to hold some elements of a long chain of events constant, enables the child to look at the action and its consequences with the motivation of the actor in mind (Piaget, 1962). Both maturation and experience play a role in the transitional process from stage to stage, as the child progressively constructs a new moral position.

Though Piaget stresses interaction with peers as an important element in the development of reciprocity, one cannot ignore the present-day influence of television as an ongoing environmental input in the child's development. The child's television fare might make a great difference in the rate of development and the speed of stage transition in moral reasoning. Television does not afford the child an opportunity to share in making decisions as in directly interacting with peers or to take alternate or reciprocal roles. Television, however, may expose children to those activities involving judgments based on intentions rather than the overt aspects of actions.

On the other hand, viewing television may provide the child with situations whose outcomes do not necessarily make logical sense within the child's existing

cognitive structure and thus the child might accept these solutions to problems as authoritative and unalterable. One way of trying to sort out this possible confounding would be to discover what children of different cognitive levels understand about some very simple televised themes. It is clear that even within the stages postulated by Piaget, children would vary in their abilities depending on the complexity of the situation or context and that certain décalages might be present.

Research generally provides evidence that morality increases with age but questions exist as to the demarcation of the sequential stages of moral development, whether the increases are saltatory rather than gradual, and whether moral judgment is trainable.

Costanzo et al. (1973) imply that children have the ability to regulate their evaluations of moral judgments. They report that young children rely on the nature of the consequences regarding their evaluations. If the consequences are negative, motives affect evaluations less than when consequences are positive. This necessitates not only distinguishing consequences from motivations, but making inferences about them and having the ability to organize a thoughtful response. Thus, a child who evaluated the situation in a particular way, might be termed "premoral" or not understanding how important intentions are when, in fact, there is no under-

standing of the nature of the consequences.

Bandura and MacDonald (1963) support the theory that subjective morality increases with age (their sample ranged from 5 to 11) but demonstrated that moral responses are less age-or stage-specific than Piaget has claimed and that training can alter children's moral judgments. A child acquires the adult moral standards by a gradual process of imitating the observable values and behaviors of others. His or her moral orientation is alterable and even reversible by manipulation of the response, reinforcement contingencies and by the provision of an appropriate social model.

Turiel (1966) shows that with specific training a change to a higher stage is possible, though regression, to an earlier stage did not occur. However, it might be interesting to explore his findings in relation to television viewing and to document whether it is also not true that a child's cognitive stage can be lowered with heavy television exposure below or inconsistent with his or her present operational level.

Though most authors agree that children progress in an upward fashion in the maturity of their responses. there is some controversy regarding the universality of the child's understanding of consequences prior to the understanding of intentions. Chandler et al. (1973) for example, have shown that in material presented

audiovisually, responses from young children (6-to 7-years-old) were based on intentions, rather than consequences, very much earlier than in the same material presented visually. Chandler claims that Piaget's finding was a "methodological artifact or a particular assessment strategy" which inadvertently highlights the perceptual salience of the consequences of such actions and dilutes the significance of the intentions which prompted them.

Leifer and Roberts (1972) reported, in contradiction to Chandler's point, that middle-aged children understand motivations better than they understand consequences (third and sixth graders); but, there is no indication that younger children (kindergarteners) understand consequences better than motivations. Older children seem to understand both equally well. So, in their study, young children performed equally poorly on multiple choice items about motives and consequences. Generally, it appears as if age-related cognitive abilities control the amount of understanding for all aspects of the thematic material, regardless of the aspect investigated.

Leifer and Roberts (1972) report that the amount the children understood about motivations and consequences depended greatly on the specific program tested. The categorization of the children's programs, whether western or adult crime made no difference in how well

the children understood the varying aspects of the program.

In addition to Chandler's point regarding the effect of presentation medium, there are questions regarding the format of the stimulus and whether results are affected by experimental design. For the most part, children have to make judgments regarding the relative guilt of two children (often presented in pairs) where one child causes a great deal of damage accidentally, and another causes a small amount of damage with the intentions not always stated clearly (Armsby, 1971). Gutkin (1972), using a paradigm of varying intentions (bad and good) and consequences (harsh or weak), supported the view that young children have a developing awareness of the role that intentions play in moral situations and that it isn't until the 5th grade (or about 10 years old) that the child can focus on the intention alone, regardless of consequences. He implies that these stages refer to the child's ability to coordinate understanding of motives and consequences but he does not specify 1) in what way these systematic variations have a different effect from the standard research paradigm, or 2) in what way (or at what point) there is a developmental effect in the child's learning of the material. Armsby (1971) in an attempt to show the differences in results as a function of stimulus format, presented, in addition to some of Piaget's standard story pairs, pairs that more clearly

and strikingly differentiated the accidental from the purposive behaviors, and systematically varied the amount of damage. His results supported the hypothesis that children consider intentions rather than amount of damage earlier than Piaget suggests and that these findings can be manipulated by stressing the differences mentioned above. In other words, Armsby recognizes the same trend as Piaget, with the younger children making fewer judgments based on intentionality than their older counterparts, but he minimizes the contribution of developing cognitive ability by showing that the children's judgments can be changed by increasing the amount of damage.

From a practical point of view, trainability of moral judgment responses, or judgments regarding social interactions, is most crucial. If four-year-olds cannot follow a simple story line (Leifer & Roberts, 1972); if eight-year-olds have difficulty in perceiving behaviors in terms of motivational cues and consequences that accompany them, especially when these are separated in time as on television (Collins, 1973(a); Leifer et al. 1971; Leifer, 1972); if children's attention is sporadic (Foulkes et al. 1971); if children do acquire new ideas very readily from television and if they are definitely affected by observed consequences (Bandura, 1971), then, they are possibly learning social judgments that are distorted or incomplete, and not necessarily of a "higher" cognitive level, regard-

less of the intentions of the television producer.

For example, a usual plot concerns subject A hurting subject B followed by subject C hurting A in retaliation for B. If the child does not understand the relationship of B and C, or the idea of retaliation (the motive comes from A hurting B; the consequence is C hurting A), or the meaning of the sequences of events (i.e., the child just retains two aggressive actions) or the judgment that A's hurting of B is not moral, but C's hurting of A is socially acceptable, then the child can only conclude that adults hurting each other is socially acceptable. This does contradict what the child has been told by his parents, but might occur so often in his television diet that this latter training can override or at least undermine the "rule" that was presented by the parents. Indeed, the Eisenhower Commission found that nearly half of the leading characters who commit violence on television achieved a "happy ending" and that both "good guys and bad guys" alike use violence to solve problems and achieve goals (Endsley & Osborn, 1970). Often the "bad guy" is successful over a series of aggressive exploits and receives only one punishment at the end. The young child with limited cognitive skills might focus more on the frequent earlier successes rather than the implications of the final punishment.

In terms of what the child learns, either the child

rejects an aggressive action as an act of moral judgment, or because the action is not assimilable to the child's cognitive structure. The child could then accept the aggressive actions as isolated bits of learned behavior; but they would not be integrated within a schema and thus advance the child's social judgments.

Learning of Aggression from Television

Generally, the main thrust of the literature that has been associated with television has been on violence portrayed on the television screen. Endsley and Osborn (1970) summarized some of the survey studies of violence portrayed on television and concluded that there was an excessive amount of violence (i.e., 8 out of 10 dramatic programs contained some violence; 1 human killing per hour and 1 violent act every 26 minutes). With regard to children's shows particularly, violent methods are notably evident (47% of the prime viewing time of Saturday 10 A.M. to 12 noon showed either illegal or violent methods of obtaining goals)(Larsen et al. 1968). Some of these studies led to and some grew out of the Surgeon General's Committee that provided funding for this type of research. The typical study presents a televised program with aggressive actions and uses a behavioral measure to assess the effect of the violence. The original Bandura and Walters studies (Bandura & Walters, 1963)

presented a movie of aggression, varying reinforcement or punishment of the model, sex of the model, status, cartoon or human adult characters, etc. and used a behavioral response such as hitting a Bobo doll, or directly imitated behaviors performed in a free play situation. In some studies (Walters & Thomas, 1963; Hanratty, O'Neal & Sulzer, 1972) aggressive or neutral filmed material was followed by an opportunity to shock a confederate, relating the imitated aggressive response closer to the model by hurting a (dummy) human.

Closely related are studies in which the filmed aggression is presented as a real or simulated television show, followed by behavioral measures documenting short and long term changes in behavior. An example of this type of study is found in the Surgeon General's Report (Liebert & Baron, 1972) where young children viewed a television program and then were given the opportunity to help or hurt a peer in another room. Their results, as with most of these studies (with the exception of Feshbach, 1972; Feshbach & Singer, 1971) show that children who view aggressive material are significantly more willing to hurt another child, or show more interpersonal aggression (Friedrich & Stein, 1973) than those who viewed a more neutral show.

Of course, all these behavioral measures of children's aggression are constrained by attitudes of the society-at-

large or by the nature of the interpersonal behaviors. It is quite possible that the task variables themselves mask the child's real understanding of the aggressive behaviors and/or these behaviors are intrinsically more related to the child's cognitive abilities than is realized (Voyat, in press).

In their research on aggressive behaviors resulting from modeled stimuli, Leifer and Roberts (1972) recognized the importance of dealing with cognitive factors by postulating an aggressive behavior "hierarchy." They assumed that each child has in his repertoire a hierarchy of aggressive responses that are associated with the evaluation of the situation. Thus, after viewing a violent television production, it is possible that a child may change the position of a particular aggressive response if the child has been exposed to this response or evaluated the program in such a way as to elicit more or less aggressive responses. In this way, some of the changes might play a large role in the way the next sequence of presented materials is viewed.

Collins (1973) has been interested in children's abilities to recognize and relate motivations and consequences to the relevant elements of a situation. He has shown that children's abilities to identify what is relevant in a dramatic plot improve with age (1970), while other authors have shown that children

increase in their ability to know specifically the motivations of characters (Leifer et al. 1971) and to understand motivations and consequences for televised aggression (Leifer & Roberts, 1972).

Piaget's theory (1965) suggests that these increases might have something to do with the increase in opportunities to have interpersonal relationships, as the child shifts from parallel play to more cooperative play. The greater opportunity for conflict and self assertion provides the child with a need for reorganizing some of his ways of dealing with the environment and might be the time when other abilities of a more cognitive nature enable him to manage more effectively with the balance between aggressive and prosocial responses.

Learning of Prosocial Behaviors from Television

Although the effects of violence on the performance of observationally learned behaviors has been relatively well studied, little attention has been given to prosocial behaviors. One reason for this is that there is so little television that can be termed "prosocial" - especially in the so-called children's programs. At this time few programs include the straight presentation of prosocial material directed to young children, though there are some that include an occasional prosocial or neutral lesson or sample of positive behavior.

Prosocial behavior, as currently defined, includes many different components, usually tied together as "a behavior that is done out of concern for someone else" (Poulos, Harvey, Liebert, 1976). This might include such notions as self-control, delay of gratification, sympathy, achievement orientations, control of aggressive impluses and resistance to temptation, as well as the more accepted and researched "altruism."

Few researchers have been involved in exploring the nature of the child's understanding of prosocial lessons as presented on television, and there has been virtually no research comparing the understanding of prosocial and aggressive thematic material. This brings up an interesting question - do children understand prosocial sequences earlier or better than aggressive ones?

There is the possibility that children develop differently regarding their understanding of prosocial and aggressive events. From a Piagetian point of view, children should understand both sequences equally, provided they are comparable in inherent intellectual difficulty. That is, if the child needs to perform the same kind and number of operations on each sequence, then there should be no reason for any differences. However, in many situations, the social interaction of this present study being no exception, the prosocial action involves if not a higher level operation than at least an additional

operation (to be explained in Chapter II) that requires the child to perform a more complex task. For this reason, it is suggested that the aggressive actions might more often be understood, and imitated than televised prosocial messages. In addition, there are décalages within each area of competence and it might be possible, because of a larger amount of prosocial or aggressive exposure, that children understand or judge differently according to the type of material.

One study (Stein & Friedrich, 1972) concerns itself with these comparisons but examined actual behaviors rather than comprehension. They showed preschoolers aggressive, prosocial and neutral films of an interpersonal nature. The study included observations and ratings of children in a free play situation both before and after viewing the different kinds of films. Aside from the findings in the expected directions (i.e., aggressive television produced effects increasing aggression in the viewers, prosocial programs produced positive changes toward play behavior, etc.) there was a measurable influence upon self-regulatory behaviors from the different groups. The reduction of self control after viewing Batman is interesting because it is not a directly imitated behavior, but an abstraction from the show, and suggests the need for looking at the effects from a broader point of view.

Voyat (in press) points out that the stages of social development correspond generally to the cognitive developmental stages and thus, what the child brings to these situations will be highly influential in the level and amount of acceptance of the televised content. The particular prosocial behaviors that were of interest in this study include deferment of gratification, where the child tolerates temporary frustration for pleasure in the future and is approved of by his peers, sharing, and increasing self control. A child who can understand the concept of delay of gratification, needs to be able to "decenter" for a time from the desired object, while holding in mind the idea of future gain. It is possible that these behaviors require different cognitive abilities and organization than direct aggressive action.

On the other hand, theories based more on instinctive drives (Freud, 1925) would support the notion that aggressive impluses occur earlier, due to survival needs rather than their intrinsic cognitive ease and that these behaviors would be more likely to be acceptable into the child's behavioral repertoire than more altruistic social behaviors.

Sex Differences

One of the main areas of research regarding sex-typed activities is in respect to aggression, where early

differences between the sexes have been noted. Generally, with young children, boys have been shown to be more physically aggressive, antisocial, show negative behaviors and negative attention seeking behaviors than girls (Mischel, 1970). Corroborating these findings are many studies using direct observational techniques, ratings, cross-cultural evaluations, projective tests and children's own evaluations.

Maccoby (1966) reports studies of parental distinctions made at a very early age between girls and boys regarding aggression training. Boys are expected to be more aggressive and indeed do appear to be so, even at two-years-old and continue to be so, with the exception of a few studies of verbal or indirect forms of aggression. It is possible that females are as aggressive but in a less physical, obvious way. For example, Sears (1961) found that girls are higher in socially acceptable forms of aggression. Some authors have tried to show that there are biological determinants of sex differences in human aggression, minimizing the effects of cultural, individual, experiential, cognitive, etc. factors.

In some studies (i.e., Bandura, Ross & Ross, 1963), boys responded with more actual imitated aggression but this finding has been contradicted in other studies (Mussen & Rutherford, 1961). Friedrich & Stein (1973) found differences in their initial baseline measurements

of some behavioral categories between the sexes, but little difference in the amount of change produced by television viewing. Collins (1973) also found that raw physical aggression scores were higher for boys but no differences were shown in the amount of change in the female and male subjects.

From the pilot data, there is some suggestion that boys and girls reported different content from the same exposure, especially with reference to the aggressive material. However, this was not a statistically significant result.

The question of the cognitive aspects of these behaviors and their relationship to children's personal identifications provides an additional focus of interest in this study. It was thought that the boys and girls would understand televised situations equally but that external factors (i.e., expectations, repressions, and cultural factors such as stereotypes, attention, role-taking, etc.) would lead to performance showing that the boys might be absorbed more in the aggressive model's behaviors than the girls. It was hoped that an in-depth interview would help differentiate how young male and female subjects understand a social interaction from the specific or generic identifications, experiences and stereotypic role models that subsequently effect their thinking and action. However, this would be difficult

to explore, even with the simple stimulus used in this experiment, if the child acquired values consistent with its cognitive judgments about the self at as early an age as Kohlberg (1969) proposes.

Sex of the subject and sex of the model

In discussing the performance aspects of imitation, it has been assumed that the nature of the content a viewer imitates is in part determined by the choice of the character the subject puts himself in place of in his fantasy for the moment (Maccoby & Wilson, 1957). This is usually characterized as identification and this process, through which a child emulates a model, has been reported on extensively in the literature. The aspect of the identification issue that is relevant to this study concerns the sex of the model related to the sex of the child (though it is recognized that other factors are just as important, i.e., status, motivation, age, social class, race, amount of vicarious enjoyment of non-socially acceptable behaviors, self-esteem, etc.)

Maccoby & Wilson (1957) working with seventh graders found that viewers identified more with same-sexed leading characters, and later recalled more of the actions and verbalizations of this model. Furthermore, the children seemed to learn the same-sexed model's behaviors

better when these behaviors were stereotypically correct (i.e., boys viewing boys performing aggressively). However, it is difficult to know whether the subjects' differences in recall reflected differences in learning or merely what they chose to report, as the reports were analyzed from an open ended report, with no motivational incentives.

Leifer et al. (1972) however, did not find differences in understanding of motivations and feelings between same and different-sexed models. Bandura, Ross and Ross (1963) show that an aggressive male model is a more powerful stimulus than an aggressive female model for both girls and boys, though these models were adults and there is evidence that there are differences if the models are peers. Hicks (1965) reports that the male peer model, in an imitation and retention study, had the most immediate influence in shaping the children's behaviors (all aggressive) though the male adult model had the most lasting effects. This is an interesting result since for the most part models on television are adult males. In addition, the differences might vary according to the amount of power that each model had (Bandura, Ross & Ross, 1963).

There is some evidence (Gewirtz & Baer, 1958) that children of both sexes under the age of six prefer female experimenters and then divide in their preferences for

the same-sexed model. Feshbach & Roe (1968) report that children of six and over understand the emotions of the same-sexed character better.

Generally then, the literature, though contradictory, does favor an increasing development toward imitating the same-sexed model, especially after the preschool years. This may be due to stronger identification or to greater attention to the same-sexed model. In any case, the implications regarding the effects of the sex of the model are important and relevant to any research concerning televised interpersonal actions. As a consequence, in the present study models of both sexes were used.

It was expected that the male and female subjects in this experiment would understand the varying films equally. That is, there would be no differences by sex in <u>understanding</u> of the prosocial and aggressive interactions despite the fact that most of researchers find differences in the children's modeled <u>behaviors</u> according to their sex.

CHAPTER II

RATIONALE FOR THE PRESENT STUDY

This study's general thesis is that the child's cognitive abilities affect the way thematic material is observed, imitated, reported and learned. Specifically, the research proposed to examine the understanding of televised sequences that include two models in conflict over a swing in a playground as a function of the child's cognitive level as postulated by Piaget. The child's task was to verbalize, both in an open-ended question and by responding to specific questions, the understanding of this conflict situation that encompassed at least six elements; 1) a swing is present in the park and free, 2) two children want to swing, 3) only one child can swing at a time, 4) there are a number of solutions, 5) one solution is perhaps better than the others, and 6) the consequences of the choice of solution. The solution to the problem constituted the experimental variable and was varied in four ways: 1) the female model grabs the swing, (female aggressive) 2) the male model grabs the swing, (male aggressive) 3) the female model shares by giving the swing up first, (female prosocial) 4) the male model shares by giving the swing up first, (male prosocial).

Piaget's description of the unfolding of invariant developmental stages when combined with Bandura's description of learning processes that include cognitive skills, can enhance the researcher's ability to predict

the child's progressively increasing performance. From the Piagetian view, as more knowledge becomes assimilated to existing cognitive structure, more imitation can occur. Thus the child brings to the watching of television an existing body of knowledge and a level of ability that enables him to deal with new, incoming information. The prediction follows that children of varying cognitive stage will perform differently at their tasks. That is, children of a preoperational level should understand and explain in a less sophisticated or complete manner television sequences than operational level children who have the ability to deal with complex interactions. Preoperational children also, are less likely to be able to "imitate" as well or consistently as operational children.

An attempt was made in this study to coordinate some of the major ideas emerging from the new and growing literature on television as well as the extensive literature on cognitive development in children.

The rationale for the present study can be best understood by specifying the kinds of thought processes that underlie the child's functioning and how these processes and structures change with age. Following will be a specification of the thought processes needed to understand the social and moral aspects of videotaped situations.

General Cognitive Development

The children studied were between the ages of three

and eight, which places them in either the preoperational, or concrete operational stages in the Piagetian system. All the children were thus beyond the sensori-motor level, that is, they had some ability with symbolic functions including a fairly fluent use of language. These children should then exhibit differing levels of ability in ordering, classifying and assembling information that would constitute the basis for differing performance in understanding the experimentally produced thematic material. Of the many developing constructions of the concrete operational stage (i.e., conservation, seriation, classification, number, space, etc.) a few are especially relevant to the experimental task.

Causality is a primary notion that develops late in the sensori-motor period, and would be an incomplete construction for the younger children. Starting with magical-phenomenalist notions, the child develops ideas regarding the effects of his own actions on the world and the possibilities regarding the causal relationships between two objects or their actions.

In order to be truly able to process the experimental materials, the child would have to be able to deal with a sequence of events in an interlocking or coherent manner. Thus, understanding the significance of separate segments of a stimulus would not be sufficient to explain the relationship between them (Piaget, 1974). For example, the younger child who may understand the

experimental model's desire to swing, or the grabbing away of the swing by another child, would not comprehend a sequence of such events taken as a whole. The very young child might be able to classify the elements in the sequence but not infer correctly regarding the cause of the perceived actions.

Many of the studies previously cited use imitated action as a way of testing the child's learning. In the present study, we are looking at the construction of understanding of a whole situation and not merely the making of inferences from a single performed action. Indeed, if the child is unable to attribute causality based on understanding a sequence as a whole (that is, explain for example, why the one child offered the swing to another or grabbed the swing away forcefully) then the child's later imitation of the perceived grabbing could only be interpreted as a rudimentary level response, centered on the action itself and of limited value in terms of understanding what the child knows.

Many of the operations necessary for deriving causality (i.e., transitivity, reversibility, additivity, etc.) as described by Piaget (1974) are more easily demonstrated in relation to physical tasks than social tasks. In exploring the nature of deferred imitation, language, changes from parallel to interactive play etc., the need to further specify the stages of socialized thought has long been felt. The basis for the

specification can be the operational structures involved in relation to physical objects (Voyat,in press).

The present task for the child was to verbalize his understanding of a situation that encompassed at least the six elements previously mentioned: 1) a swing is present in the park and free, 2) two children want to swing, 3) only one child can swing at a time, 4) there are a number of solutions, 5) one solution is perhaps better than the others, and 6) the consequences of the choice of solution. In order to respond "correctly", the child had to classify, coordinate and abstract the knowledge of these elements as well as recognize them as separate or additive components. In this situation there was directionality in the sequence that required the child to have a sense of the problem building up, parallel to operational transitivity or seriation that is needed to deal with the transmission of movements. The preoperational child would be confusing its own influence, the attribution of the model's desires, or the fact that the events occur together within a short amount of time, as the cause of the progression of events. The correctness of the responses had to be looked at both by their social acceptability and their level of logical determination. The child's responses in the interviews concerning the model's intentions, motivations and their consequences could or could not coordinate the necessary operations to fully understand the causal relations in the depicted

materials.

Object permanence should have been fully developed in the children of this age range. Even the youngest of our subjects should have known that the object continues to exist though it is out of sight, and that an action or actions could be performed on the same object without its basic identity being changed. Constancies that began to develop in conjunction with object permanence, would enable the child, by making increased use of references and directions, to perceive the usual form of the object regardless of the apparent form distorted by perspective.

The children in this study should have been at an even more advanced level of object permanence, in order to understand that giving up a turn on the swing for the moment does not mean that the swing is forever lost. The notion of object permanence then, at a more advanced level is manifest in the form of delay of immediate gratification, at least in its cognitive aspect. Nevertheless, the three-year-old or preoperational child should have had more difficulty in advancing this notion than older children in the sample. Older children should have been more able to deal with postponed gratification and therefore understood and accepted giving up a turn as either a practical or a socially rewarding kind of action.

Decentration reflects a process that begins during sensorimotor development, and continues into later development. In the transition from preoperative to operative

thought the child "centers" less on his own body and actions and assumes a more objective view of the relationships between objects, actions and his self. This is a most important accomplishment regarding the interpersonal relations in a social universe. Thus, the operative subjects in this experiment should have been able to view, understand and report the cooperative nature of the theme and how the model came to a realization or decision to engage in a plan that is mutually advantageous to both models.

The semiotic function which emerges in the period of representational thought from age about two years and on under the guidance of developing intellectual structures, proceeds so that by the third year the child has the ability to represent, by means of symbols (images) or signs (language), objects, events, or concepts that are not present. Obviously, this kind of ability makes extended thought possible by releasing the child from the restricted boundaries of sensorimotor actions and perceptions. Starting with deferred imitation, symbolic play, drawing, mental imagery and verbal evocation of events that are not occurring at the time, the child becomes increasingly able to imitate or represent symbolically in the fullest sense of the word. There is a need for this kind of functioning in order for the child to imitate and/or to understand the kinds of concepts our thematic material implicity suggests,

(that is, deferred gratification). So, in order to actually imitate, or manifest knowledge of the stimulus presented here, the child's imagery must be not just static and reproductive but also anticipatory. This anticipatory imagery that the older child characteristically is endowed with, facilitates the process of understanding and predicting or imagining future possibilities, but they are not in and of themselves the key to understanding. This facilitation occurs only in correspondence with the operations necessary for this understanding.

In summary, the most advanced subjects in this experiment were expected to have sufficient cognitive ability to understand the causal relations among stimulus elements, in order to properly verbalize and explain what was viewed. The ability to handle components by adding one after another, problems of directionality, abstractions from existing facts, and the coordination of many different components, should have resulted in turn in a clear explanation by these subjects of the motives and behaviors of the experimental models.

The preoperational child in turn should not have been able to adequately explain the causal situation or abstract enough information to anticipate the consequences of the model's actions. The younger subject, with only the beginnings of representational thought, should have been limited in his ability to understand and explain successful goal

directed behavior.

Between these extremes there should have been a tentative or slightly distorted explanation, perhaps not having enough of the operativity necessary to assimilate the viewed material but at least enough not to be making general errors in coordination, compensations or attributions that would result in an illogical explanation with no differentiation between the possible solutions. These intermediate subjects could be an interesting group as the processes involved in the construction of social cognition should become evident in their behavior. Through them it would become clear as to how the child begins to develop an understanding of the experimentally modelled behavior. The transition toward concrete operational thought should enable these children to exhibit more flexible, mobile, decentered and reversible structures in situations where the content is not so complex. It was expected that the experimental stimuli presented on the television screen would be sufficiently simple to allow variations in the transitional children's performances to emerge. In some instances, the transitional child might seem more unsure of himself than the pre-operational subject, as more possibilities would be under consideration. For example, a younger child might be very quick to understand and explain the grabbing of a swing, whereas the transitional subject might become confused with the moral judgment and not respond as

fluently in defense of the grabbing response. However, the general trend should be toward a more integrated response with some elements of uncertainty present.

In his discussion of the differentiation between the active and the passive roles, Piaget (1974) indicates that operational subjects can distinguish "what we can do" from "what we do". Though he was referring to the physical concept of energy, the notion is applicable to the operational child's behavior in all problems. In this experiment, with limited solutions possible the operational subject can see the possibilities of what can be done (i.e., grabbing the swing, taking turns, leaving the playground, pushing or hitting the other child, etc.), only after fully examining all the facts. The choice of what actually to do, or reporting what the model did do, should appear as the most logical solution in questioning of the concrete operational child. It was expected that both the internalization of values and the greater operativity of these subjects would favor the model who decided to take turns.

Social Development

Many of the studies that concern themselves with the child's understanding of or attention to aggressive or prosocial televised material, confound the amount and pace of action with the content of the material presented. It is known the children are more attentive to a rapidly

paced, active show (personal communication, Children's Television Workshop) that is often associated with aggression. Whether children attend more due to this increased pace or to the nature of the material - either prosocial or aggressive, is not clear.

In the present experiment, an attempt has been made to control for the physical actions of the models so that neither the prosocial nor the aggressive experimental situation is more salient. Models perform the same number of movements and the same number of words in each segment, so that aggressive behavior is not made more salient by being associated with greater activity.

The prosocial behaviors that are of interest in this study include deferment of gratification, where the child tolerates temporary frustration for pleasure in the future, sharing, and increased self-control. The aggresssive behavior depicted in this study was that of "grabbing," after an agreement had been made to share. The following is an exploration of thought structures hypothesized to underly the performance of these social actions.

Action toward a goal: It is hypothesized that, a child in order to achieve understanding of getting to swing has to be able to coordinate understanding of a desire with action toward a known goal. It is expected that the subjects were sufficiently advanced beyond the

the sensorimotor level to comprehend the model's stated goal and method of acting towards it. These actions toward the goal were the same for both the prosocial and aggressive situations up until the solution of the conflict. At that point, the preoperational children might not be able to understand the prosocial situation as well as the aggressive grabbing of the swing inasmuch as it is not the quickest path to the goal. The operational children on the other hand should be able to comprehend a plan that includes a future change that would stop the fighting so that at least one person could swing and them the other.

Language or representational ability: The subjects in this experiment had to be able to understand language enough to follow the model's interactions. This would include a valid intellectual interchange using common verbal terms, a definition of the problem and the possibilities for solution.

It was expected that some of the younger preoperational children would not be sufficiently able to deal with the language expressed by the models and thus could not show understanding of the prosocial or aggressive situations themselves. As the words used are the same in all four videotapes, except in the final phrase, the hypothesized variation between children of differing levels would be due to differences in comprehension, and not to differences in the intrinsic variations of the

filmed episodes.

In addition, the preoperational child, linguistically less advanced than the operational child, is not as well equipped to reason symbolically so as to make inferences from the perceived prosocial behaviors. In most prosocial behaviors, especially those of interest in this study, the ability to manipulate symbols, and communicate within a common framework is a required ability. Within the aggressive tasks, the lack of ability to communicate linguistically often provides the extra impetus for action. That is, the preoperational child, aware of his inability to discuss and solve the problem, especially after trying might perform aggressively because no other action seems possible. It was hoped that within the unstructured part of the interview, [1] different-aged children would show varying linguistic abilities in terms of the quality as well quantity of their responses. These data would provide a test of Flapan's (1968) findings of age differences in spontaneous verbalization regarding a social interaction film.

The cooperative act and the aggressive act: The cooperative act is hypothesized to be a more complex

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[1] Each subject was interviewed concerning the content of the film and also asked to respond to specific questions to sample their understanding of what they saw. For a more detailed discussion of the interview see Chapter III.

experimental task than that involving aggressive action as it requires coordination and extension of more than the child's own point of view. Though Piaget deals mainly with the development of individual thought, it must be recognized that such thought is also developing within an interactional sphere. We may hypothesize that the progression through Piagetian stages is in correspondence (and not necessarily causally related to) the development of affective states - such as cooperation. This can be seen in examination of some of the specific operations needed to perform adequately:

a) The sharing of a common value system: In a preoperational child, the main thrust of attention is on the self and self interests. Piaget (1965) likens the development of decentration to those stages of Freud, where the focus of affectivity is first on certain regions of the body, then on activity in general and the fixation of affectivity on the mother progresses to include others. Parallel to this, the child's cognitive development moves from self to the environment, from the here and now to the more abstract, and is characterized by the ability to progress in dealing with objects, time, space and causality in an operative way. The preoperational child cannot share a common system of any kind (except perhaps a very simple, concrete one) with another person, as there is a lack of constancy of concepts, communications skills, etc.

Later, however, and moving on to the concrete operational stage, the child is able to share parts of the environment and perceptions with others. Thus the operational child can conserve in his values - especially with reference to moral values and the acceptance of reality of the partner's future obligation. Similar to the knowledge that the amount of water in a conservation experiment beaker, looks different but is the same in the taller beaker, the operational child can see that the obligation to give another child a turn is as good as the actual swinging.

Preoperational children can only focus on themselves. We would expect that grabbing the swing for one's self would be the dominant choice among the solutions available to these subjects. It was expected that the more advanced and the operational children would be able to understand and communicate the common despair in the experimental situation and discuss the possible solutions that take into account the mutual interest in swinging. Operational children would then more effectively understand and predict the promise or obligation of the other child to fulfill the agreement so that everyone would have a turn sooner or later. The prosocial solution would be as real a solution as the aggressive one.

In this study, then, children of the lowest stage would understand that both children want to swing, that while fighting no one can swing and that a solution is

necessary. However, as their verbal and other cognitive structures are not complete, the ability to push one step further and share the reference point of the solution would not be fully operable. Once the child has achieved a higher cognitive level, decentration is further advanced and is evidenced by a reduced pull to the immediate and the self. A sharing of concepts, values and obligations with other human beings becomes possible. One is then able to accept another's definition of values in order to construct a common system.

b) Reciprocity: In any cooperative act there is an assumption of reciprocity which enables the child to hold constantly in mind the concept of future gain. In interpersonal situations there is an aggreement, whether articulated or not, that relates the actions to the partners rather than to a written law. As was seen in the discussion of moral judgment learning, the young child accepts an authoritarian or universal interpretation of a moral viewpoint. As the child progresses toward an operational level the universal viewpoint is abandoned and the child develops a concept of reciprocity that is related to the current situation and relationship. Children begin to share or cooperate because of their relationships with each other and the consequences of these actions, rather than because of a stated principle or imitation.

In a sense this is parallel to the development of

operational conservation, with social rules remaining constant and the appearance of the situation undergoing change.

For the preoperational child, the reciprocal arrangement of the "let's take turns" of the experimental film is not an assimilated structure; it is not really an agreement between two people. The reciprocity that is needed for the prosocial solution requires the same kind of coordination of two elements that is needed to coordinate the height and width of the container in a conservation of liquid experiment.

The operational child on the contrary should be able to understand cooperative effort inasmuch as it is based on the coordination of a number of schemas. Specifically, it was expected that the preoperational children would not be able to understand or express reciprocal agreement as well as the operational children, and they would only see grabbing (the aggressive response) as an efficient means of attaining their goal.

c) Delay of gratification: This is required for a mutually satisfactory solution. It also requires the child to anticipate elements not present in the experimental situation. The preoperational child, not totally stabilized in respect to the permanence of object might not be fully satisfied that the video swing will still be present when it is the next turn. The surety of the permanence of the agreement can only come with the ability to project and

manipulate future expectations. Such an inability would probably prevent the youngest children from understanding the prosocial content fully. The aggressive action might thus be the surest way the goal is obtained and would thus be the preferred solution, especially as their predictions of the consequences of their aggressive actions would also not be as salient as for older children. The preoperational child confronted with the need to understand future transformation, such as the problems of the two children wanting to swing at the same time, would respond in the form of taking the swing oneself now, unable to anticipate that it could have its turn later. This child only reasons within the here and now, and not within the future.

The operational child, and to some extent the older preoperational child, can manipulate more effectively abstract or future ideas presented in the solution of the swing argument and thus, can understand and express agreement to a delay of the immediate gratification. These children understand both situations though are more likely to choose the prosocial solution due to either greater understanding, or to external social pressure already in their thinking.

d) Role playing: For the preoperational child, who plays alone or in a parallel fashion most of the time, the opportunity for dealing with conflict and/or exhibiting assertive behavior is more limited than for older

children who engage in more social play. Though there are instances of aggressive behavior evident very early, these preoperational actions reflect only the present situation, and are not likely to be generalized or conceived of in terms of the consequences of the aggressive action. A child of four or five years of age however, begins to sense a need to reorganize some of his ways of dealing with the environment in order to achieve ongoing social relationships with others. These others are peers, authority figures and family, who begin to react to the child's assertiveness with aggression, hostility, punishments, etc. of their own. Newly assimilated schemas appearing in the operational stage enable the child to have some kind of balance between aggressive and prosocial responses in the achievement of goals, or at least to start making some attempts at appropriate behavior. It is at this time that an awareness of a reversibility of a social nature takes place. The child realizes that one's actions lead to certain consequences and that by reversing these actions, the consequences can be changed as well.

One of the methods by which children learn to deal effectively with each other is in role playing. When the child is sufficiently decentered to see the situation from another's point of view, the child is able to cooperate and perform other prosocial functions. Indeed, one of the strong deterrents to performing an aggressive act is

the knowledge of what it feels like to "have the shoe on the other foot". Thus the ability to control oneself, as well as to perform positive social actions, requires an ability to separate one's thoughts and feelings from the situations themselves and to perceive and attribute them correctly to another.

The preoperational child, unable to wholly differentiate himself from others, unable to attribute causality in a logical way and unable to view things from a different perspective, would not be expected to fully understand the nature of cooperation. When one sees children taking turns at a young age it is in the form of an imitative, repetitive game and differs from taking turns as a form of sharing as it relates to others and self. Primarily concerned with the self, these children focus on their own point of view which is very limited regarding concern for the other role.

In the experimental video presentation, the consequences of aggressive action were not indicated; it was expected that the older preoperational and operational children would be able to generalize either from their own feeling or their experiences, what can happen if one grabs (is aggressive). The younger children were not expected to be able to coordinate the actions of the prosocial situation as readily as with aggressive consequences.

In summary, we have postulated and detailed how the learning of prosocial and aggressive behaviors,

as specific examples of social interaction, follow the general developmental pattern that Piaget proposes for non-social cognitive development.

Theoretically, prosocial behaviors seem to require more cognitive ability than unsocial behaviors as they are often more abstract, more idealistic, less egocentric and require more self-control than for example aggressive behaviors. Thus, the child must grow from a preoperational egocentric, self-centered individual, to one who can deal with situations outside of one's self or the immediate present. In addition, the operational abilities to manipulate language, define goals, participate in agreements and understand the role of a partner, have to be present prior to complete understanding of the prosocial situation.

Aggressive behaviors are mainly characterized by the need for immediate gratification, lack of regard for others and self-centeredness. Though there is need for some of the same kinds of cognitive abilities to understand aggressive behaviors as there is for prosocial situations, there are differences in the choice of solutions that involve aggression towards others. That is, children need to have the aforementioned operational abilities with language, definition of goals, and value of the goal in order to fully understand the situation. However, preoperational children, subject to the limitations of their self-centeredness, need for immediate

gratification, inability to engage in reciprocal behaviors with others and lack of ability to predict or be concerned with consequences of their actions, are more likely to choose and thus understand the most direct, albeit aggressive, action to achieve their goals.

Theoretically, there is the same cognitive development from preoperational to operational understanding of aggressive situations as there is for prosocial situations; but, there is a time lag (or décalage) when it comes to the solutions of parallel problems. An operational child might choose an aggressive solution while being fully aware of the other choices and the consequences of all the choices. A preoperational child makes the choice of the solution within his cognitive limit.

Moral Development

The thematic material used in this study represents a situation which Piaget (1965), Kohlberg (1964) and others refer to as a moral question. The social interaction of the two models in the playground set up a video scene that can be thought of in different social levels. For example, one viewing subject might be more knowledgeable of socially acceptable and rewarded sharing and this subject might be able to understand enough of the viewing situation to logically anticipate the future turn of the model on the swing. Another subject, less advanced operationally, would be unable to decenter or symbolically represent the future action of the model and would need

to satisfy the present urge to swing, regardless of the consequences (social non-acceptance, censure, etc.).

It is our hypothesis that the child's judgment regarding what is happening in these video scenes and what to do (or what to imitate) would be reflective of the child's cognitive level at the time. In the ability to discriminate or assimilate the presented video information, the child's level of operativity would influence the level of sophistication, or abstractness of the judgments. Cognitive development leads to a growth of "moral" reasoning in that external rules and sanctions become internal principles. It is expected that changes over age occur as the child develops more advanced cognitive abilities in the following areas that relate specifically to moral judgment (Kohlberg, 1964).

Intentionality in judgment: Younger preoperative children are less able to consider the actual intentions of the model and regard physical consequences as indicators of the seriousness of an action. At a more advanced stage, children understand and express reasons and intentions while also looking at the consequences, they make judgments that are more reflective of societal "moral standards".

Drawing on the previous discussion regarding causality, it is clear that the child could not accurately discuss or give a reasonable explanation of a viewed

situation unless all the elements necessary for correctly attributing reasons for the actions are present. The experimental video stimulus presents two models with different intentions - one with more immediate goals (taking the swing) and one with more long range goals (postponing gratification). The younger child it is proposed, would be unable to order the sequence of events even if all the elements of the set were known.

Ability to anticipate future events: Younger children initially confuse the successions of events and have little awareness of temporal intervals so that the prospect of waiting for the video stimulus swing becomes one of unknown proportions. The effect of being able to construct a "homogeneous time" (Flavell, 1970), which provides a common measurement for all actions or movements enables the child to hold constant the objective (to swing) and to know that it is assured that the child will get a chance to swing himself. The operative child, able to generate game rules, would be able to agree on the amount of time for each turn so that the wait is a known factor.

Relativism in judgment: Younger children can only consider an action totally right or totally wrong and they assume that their judgments are universal. These children view rules as absolutes, and adults as all-knowing, perfect and sacred. They would not be expected to be able to deal with the possible contingencies that might make

sharing the "wrong" solution, or grabbing the "right" solution. Nor could their judgments of the models' behaviors result from an understanding of all the factors involved.

At a later stage of development, analogous to Piaget's discussion regarding the understanding of rules of a game (Piaget, 1965), children develop a more flexible attitude regarding the practice of rules, as they can assimilate more variables of the situation that might be applicable. They also develop a consciousness of rules when they become aware that certain behaviors are universally accepted and approved of. In the experimental televised sequence, the younger children, acting from the dictates of personal egocentric desire and motor habits, should understand the grabbing of the swing (or approve of this method and therefore imitate it), and perhaps be aware of non-ritualized "playground etiquette". But for the most part, not only will these children not have the necessary cognitive structures to deal with the higher level of reasoning necessary to share, but this would show up in their play, which is usually alone or parallel and where cooperative rules do not apply.

We would expect that our older subjects, after having developed some of the necessary operations regarding causality, reversibility, higher level symbolic representations, etc., could understand and enter into

cooperative play where their own rules and society influences can come together within a reasonable solution (i.e., giving someone else a turn first, then you follow).

Independence of sanctions: Younger children regard the type of extent of punishment as a measure of how good or bad an action is. An older child would consider other factors as well, such as, violation of rules, harm to others, etc. In this experiment, the model child who grabs the swing does not get punished visibly and it might seem to the younger children, as happens so often in actual television shows, that the model's behavior is therefore permissible.

This is an important factor with reference to the effects of televised models in the child's daily life. Often the theme is such that the "villian" does not get punished or the hero is not punished for the same crime that the villain commits. Also, the punishment is often not commensurate with the crime. Added to the fact that younger children, without the adequate cognitive abilities discussed previously, exhibit an inability to correctly assess an infraction of a social rule, there must be a great deal of difficulty in assimilating televised material to the already existing cognitive structure. Thus, the behaviors (often aggressive) that stem from the imitation of models on television have to be "illogical" in the sense that they are not properly integrated into a well-functioning system that

reflects accurate or complete reasoning.

Naturalistic views of misfortune or immanent justice: Young children find it difficult to comprehend the nature of "control" in negative situations. Their limited ability to recognize causal relationships prevents them from distinguishing the source of the punishment as well as assessing the "crime" accurately. As mentioned earlier, the concept of punishment is well known at an early age; but, the logic of the relationships between natural misfortunes, crimes and imposed human actions is not clear. Thus, the child with fewer cognitive abilities progresses through the stages outlined by Kohlberg (1964) in a sequence that starts with immanent justice and ends with an understanding of the ways in which the child himself can avoid punishment, taking into account "moral values" and why certain punishments fit certain crimes.

Older children distinguish natural misfortunes from punishments and can better coordinate their behaviors or understandings of a model's behavior in terms of a broader perspective. The operational children's behavior or evaluation of the model's grabbing or giving up the swing, would be based on thoughts, motivations or principles that were reflective of an internalized conscience that developed as a result of an increased knowledge and ability, as well as experience to deal with these kinds of problems.

Role taking: Younger children find it difficult to think of how they would feel in the other person's role in order to understand or decide about the on going actions. They are more egocentric and tend to rely on their limited anticpation of retaliation or productive returns in making their judgments.

As outlined earlier within the social development section the ability to take a role implies that the child has the cognitive capacity to define situations in terms of rights and duties, reciprocity and the perspective of other selves. The older children should show in their responses this developing concern for cooperation and equality between individuals, as well as the ability to distinguish and judge one's own perspective from that of another and the differences between subjective and objective aspects of experience. Thus, the operative, less egocentric subjects, able to reflect the anticipation of reciprocity and able to attribute to others their own feelings, would not only share the swing (or understand the model's motivations) but would be able to explain why and feel that it was a satisfactory and reasonable plan.

In summary, though it is difficult to separate the processes that one might call moral from those that are termed social, an artifical dichotomy has been made so that a clearer look at the child's development might be attempted. It seems evident that the same kinds of

abilities that are postulated in the Piagetian developmental sequence for non-social cognitive development affect the kind of understanding children have of moral aspects of a viewed situation.

The preoperational child, while not able to coordinate the actual intentions or consequences of an action, not able to anticipate future events, and not sure of the implications of actions, could not be expected to perform as well as the older or concrete operational child. The ability of role taking or the ability to view a situation in another perspective, which is helpful to the higher cognitive level children in assessing a viewed situation, is not available to the preoperational child who is still primarily egocentric and responds more readily to immediate gratification.

Special Aspects of This Study

The present study was designed to explore the development of children's understanding of thematic material of a prosocial or aggressive nature, as it relates to their cognitive levels. It is evident from the previously discussed literature that children learn and sometimes perform novel actions initially viewed on television, and that viewing often disinhibits aggressive responses, or results in the child's willingness to inflict hurt on others. It has been suggested that the process of observational learning, as a way of expanding knowledge, depends a great deal on the child's cognitive

capacities at any given time. In order to follow the development of these capacities, especially with reference to observational learning in an interpersonal situation presented on television, a careful investigation must be made with younger children and simpler situations than has been presented in the literature so far.

Usual television fare contains so many varied elements that it is often difficult to generalize from such presentations because of this confounding. In some experiments (e.g., Bandura, 1965) films have been made which are quite definable in terms of content, actions, characters, etc.; but these are rather far afield from the ordinary television show in terms of complexity, i.e., interruptions, language and relevant content. In other experiments (e.g., Friedrich & Stein, 1973) regular television shows, edited or not, have been used, making it difficult to make statements about causality due to the large number of intervening factors (e.g., was it the aggression that caused the change in attitudes or behaviors, or the music, color, familiarity with the show or format, etc.)? At present two scales are available to compare different shows on various aspects. Gerbner (1972) has developed a content analysis scale to be used with violent action shows, and Poulos, Rubinstein and Liebert (1975) have developed a similar scale to analyze a program with reference to prosocial activities. Unfortunately, these two scales have not

been coordinated and it would be difficult to use them in connection with separate shows and be sure that the content and action is the same and that the shows only varied on the dimension being investigated.

Other investigators have been exploring the influence of some other factors on subjects' television behavior, such as socioeconomic status (Maccoby & Wilson, 1957); emotional status (Ekman et al. 1972); character traits (McLeod et al. 1972), etc.; these aspects will be held constant for this experiment, as we are more interested in studying the relevant developmental aspects.

This research used a videotape, produced by a videotape film company that was controlled as much as possible for equal content and action for each experimental group. The film simulated a television show (with music, action, etc.) in every aspect but length but it was devoid of a familiar show format or characters. For financial reasons and for reasons of attention, the film was shorter than the average TV show.

In addition, the videotape was specifically designed to include a completed social interaction unlike other experimental films that have been adapted or edited from a regular television show, and are seen out of context. The presented videotape was short in length to minimize attentional loss and, unlike the normal viewing situation, the subjects would not be engaged in any other kinds of

activities. If the child's attentiveness to the screen is unknown, then it is not possible to determine whether the lack of performance following a viewing is due to the lack of understanding or lack of exposure. In this research, the child's attentiveness was monitored by an observer, who watched the child's eyes at 20-second intervals to obtain a representative sampling of his attention. It was felt that an elaborate rating system (i.e., that of Ekman et al., 1972) was not necessary due to the brevity of the film and the fact that during the pilot studies, with a very similar film, the children scored as 100% attending during the viewing.

One method that might elucidate more clearly the effects of television on the development of moral judgment, would be to examine very young children's understanding and judgments of a very simple plot, rather than examining their limited behaviors and this we have done.

In this experimental presentation, the cues to indicate the actors' motivations and their consequences were made very explicit, unlike television which is much more complex and is often clearer only in regard to the consequences of actions rather than the actors' motivations. Indeed, it might be an inherent characteristic of motivations, that unless special attempts are made, they are less explicit or more subtle than direct actions and consequences.

If younger children were able to follow a story line, including the motivations of the actor and subsequent

consequences, and there were little improvement over age, there would be evidence then for early abilities in the cognitive areas that have been discussed previously.

If very young children were not able to follow the simple story line, or had unequal abilities in understanding motivations and consequences, while older children could perform adequately, then the Piagetian theory applied to this development would be confirmed. It is possible that young children understand the elements of a story equally well, but choose, for some reason, to base their evaluations on the consequences of the action rather than the actor's motivations, or to coordinate elements in a random way. These different alternatives should become evident in the questioning of the child considered in relation to other factors (i.e., amount of verbalization, generalization, etc.). They provide valuable information regarding the development of logical thought.

General Hypotheses

In terms of the major effects, the following general hypotheses were proposed:

1) Age: It was expected that children would show increasing knowledge and increasing amounts of verbalization regarding all aspects of the thematic material with the increase in age. As the scene is familiar and simple, it should not be too difficult for all subjects to recall and report the basic problem. Older children, it

was predicted, would coordinate motives and consequences equal to one another, and in a more sophisticated fashion than would the younger children. From the research previously cited, and the pilot data, it was predicted that younger children would understand motives less well than consequences (as predicted by Piaget and contradicted by Chandler et al. 1973) due to the fact that the consequences in this study were not evident and would have to be inferred. However, due to the fact that this is a simple stimulus situation, the differences might appear in the four-year-old group only and be equalized before the children reach the age of eight years.

2) Aggressive versus prosocial material: It was predicted that in this simple situation there would be a minor increase in the younger subject understanding of the aggressive over the prosocial solutions in general. This might not be the case with more complex situations or real television show content.

3) Sex of the subject and sex of the subject related to the sex of the model: It was difficult to predict the cross-sex effects, especially for prosocial behaviors. It has been reported that the sexes do not differ in the extent to which they reproduce a model's verbal aggression, but that boys show more imitative aggression regardless of the sex of the model (Bandura, Ross & Ross, 1961; Johnson, 1962). In addition, it has been shown that an aggressive male model is a more powerful stimulus for aggression for either

sexed children than an aggressive female model (Bandura, Ross & Ross, 1963). The Leifer et al. study (1972) reported no differences in understanding of motivations and feelings of the same-sexed rather than the opposite-sexed model. There was a suggestion that the child might pay more attention to the same-sexed model but this did not show up in their results. It was thought that although there are differences in performance based upon the sex of the model and the sex of the child, these are performance variables and would probably not show up in this study when the children were intensively questioned. Boys viewing a boy being aggressive should report or remember this more accurately than boys viewing a boy giving up the first turn and sharing; girls viewing a girl being aggressive might not report this as accurately as the boys in the aggressive situation, but probably would be able to report understanding as accurately as a girl sharing. In other words, it was predicted that the results would follow the stereotypic pattern of boys being encouraged to perform aggressively and feel freer to express such feelings. Girls would understand the situation as well as the boys of the same age, but would not express their knowledge as readily. When questioned in the more structured part of the interview, and pushed to respond, it was predicted that both girls and boys of the same age would understand the situations equally well.

CHAPTER III

METHOD

Experimental Design: The 200 children used as subjects (Ss) in this study were divided into three age groups: 3-4, 5-6, 7-8 and four treatment groups: Prosocial versus aggressive, female versus male model. Pretesting consisted of an assessment of each child's cognitive level according to his or her performance on specific conservation and imagery tasks. Each child was then shown one of the four experimental films. The treatment groups varied as to the content of the film shown: either prosocial or aggressive action, female or male model. Of the forty children in the nursery and second grade groups, five males and five females were assigned randomly to one of each of the treatment groups. Of the 120 kindergarten subjects, fifteen males and fifteen females were assigned randomly to each of the treatment groups. That means, for example, that there were five male four-year-olds, fifteen male six-year-olds and five male eight-year-olds viewing Film A (which is the Prosocial Action film with the female model).

	AGE GROUPS		
	3-4	5-6	7-8
Film A	5F 5M	15F 15M	5F 5M
Film B	5F 5M	15F 15M	5F 5M
Film C	5F 5M	15F 15M	5F 5M

	3-4	5-6	7-8
Film D	5F 5M	15F 15M	5F 5M
Number of Ss	40	120	40

The viewing of the film was followed by the Interview part of the study, which consisted of both a structured and an unstructured session.

Subjects: The sample of children used in this experiment were taken from a public school and a private nursery school in Queens, New York, which is a predominantly white, middle to upper-middle socio-economic status suburban community, which is a part of metropolitan New York City. The sample included 200 children; 20 males and 20 females from each of the following age groups: nursery school 3-4 year olds and second grade 7-8 year olds; and 30 males and 30 females from the kindergarten 5-6 year old group. The mean ages for the three groups are as follows: nursery school $\bar{X}$ = 49.2 months (S.D. = 6.54), kindergarten $\bar{X}$ = 70.8 (S.D. =3.37), and second grade $\bar{X}$ = 94.3 (S.D. =3.90). The relatively high cost of the private residences in the Public School District and the private nursery school's high tuition minimized the chance of any wide variations in socioeconomic status of the subjects. In addition, no children from out of the immediate neighborhood were taken as subjects from the public schools.

As I.Q. scores from standardized tests were not available, the teachers were asked to evaluate informally each subject's achievement as below grade level, at grade level or above grade level. Children who did not fall within the average or above average levels were dropped from the study. Other than this restriction the Ss were chosen randomly from all of the classes representative of the three grade levels (nursery, kindergarten, second grade.) Two Ss (nursery group) were dropped from the study as they could not complete the tasks.

Apparatus: The basic apparatus used was a Sony video-tape monitor that appears as a standard television set. It was set up in a spare classroom in a way that minimized the "classroom" look though it was clearly not a simulation of a home environment. A tape recorder was used during the unstructured portion of the Interview.

Materials:

For the Conservation tasks:	10 red checkers 10 black checkers 1 ball of red playdough 1 ball of blue playdough
For the imagery tasks:	A straw of about 4 inches in length fixed to a 5 by 7 inch card to a paper fastener so that it was movable, as the hand of a clock.

For the television presentation: The stimulus was a three minute, black and white video-tape of animals in their natural habitat. The scenes were accompanied by lively music and followed by two minutes of the experimental film. All the children saw exactly the same film,

but viewed different experimental portions of the film depending on their experimental treatment assignments.

The experimental film was in four parts: the first minute presented the problem situation, of a boy and girl of about the same age (8 years old) running toward three swings in a playground. When they arrived at the swings, two of the swings were occupied and one was unoccupied. Both the boy and girl expressed the desire to swing and began to fight over the swing, i.e., to push and pull physically. The solution to the problem (the last half minute) constituted the experimental variable and was varied in four ways:

Film A - Problem (Motivation)
Girl gives swing to boy (Action)
Girl has to wait for turn (Consequence)

Film B - Problem
Girl grabs swing
Boy has to wait for turn

Film C - Problem
Boy gives swing to girl
Boy waits for turn

Film D - Problem
Boy grabs swing
Girl has to wait for turn

The pictures presented for the multiple choice part of the interview were 5" X 7" glossy photographs taken during the time of the filming of the videotape. They were presented in groups of three (with the exception of the sequencing questions which utilized 4 cards) and placed randomly in front of the child.

The interview instrument used to assess the child's knowledge and evaluation of the videotapes was constructed to deal specifically with the content of the situation presented (see Appendix A).

Procedure: Each subject was seen in the viewing room by one of three female testers, for the five minutes of the "show" which followed the pretesting session in which cognitive level was evaluated. After a short introduction, the children were given two of the standard Piagetian conservation tasks, number and substance, as well as a simple imagery task. The purpose of the Piagetian tasks was to establish in which of the following groups the child should be placed:

1) Nonconservation - Preoperational
2) Intermediate Low - Transitional
3) Intermediate High - Transitional
4) Conservation - Operational

(see Appendix B)

In addition, a kinetic reproductive imagery task was administered as an added evaluation of cognitive level and was included in the overall evaluation in terms of the above categories.

The tasks were as follows and presented in a counterbalanced order.

1) Conservation of Substance - the E showed the child two lumps of playdough of different colors and asked the child to make it so that the two lumps possessed the same amount of clay (the actual instructions referred to the clay as candy - see Appendix A). The E then rolled one

lump into a sausage shape and asked the child to indicate if the lumps contained equal or different amounts. If the child answered correctly the E questioned the S further, utilizing specific questions to confirm this response. If the S answered incorrectly, the E tried to elicit the correct response and further explanations by calling attention to the initial equality in the amounts of material and/or the aspect of the problem that the child was not attending to. Finally, a question was asked regarding the return of the clay to its original shape, which suggested the corrected response. Two additional conservation of matter tasks, namely where the E flattened the clay into a pancake shape and divided the clay into seven approximately equal bits, were presented to each S and were followed by similiar procedures and questions.

2) Conservation of Number - The E asked the child to put out as many red checkers as black ones that the E had placed before the child (seven checkers were used out of the group of ten). Once the E was certain that the child agreed that there were the same number of checkers in each array (even though the E might have had to help the child place them at first), E then moved the original row of checkers close together and asked the child if there were the same number of red and black checkers. The same questioning and probing was done for the number of conservation tasks as with

the substance tasks. The final procedure in this segment entailed E forming a circle with seven checkers and then pushing them together. The questioning and probing were repeated.

3) Kinetic Reproductive Imagery Task - the E showed the child the card with the rod in the vertical position, moving the rod very slightly to indicate that it was not fixed, and then asked the S to imagine what would happen if the rod started to fall and move in a clock-like fashion. The child was asked to draw the rod at its original starting point, at an intermediate point and at the final position. If the child did not respond correctly, the E showed the child the rod moving around the card and then asked for a repeat drawing. If the child still did not respond accurately, the E presented the child with three alternative drawings for responding to the three positions, and the child was asked to indicate, by pointing, the three positions described.

The children's responses to all of these tasks were classified according to the criteria set by Inhelder, Sinclair and Bovet (1974) and Piaget and Inhelder (1971) so that each child's cognitive level was established within one of the four classifications.

The children were then informed that they were going to see a new show on television and that their opinions regarding the film would be elicited at the end of the presentation. It was stressed that the child was help-

ing E to understand and evaluate the new show and that there are no right or wrong answers. They were told that E would be watching along with them.

During the showing of the 5 minute videotape, the E observed each child's attention to the screen at 20 second intervals, adapted from a procedure by Stein & Friedrich (1972), and noted on the observation sheet any unusual behavior. Immediately after viewing the tape, the E interviewed the child. The majority of children were administered the tasks by two female graduate students, though a female college student also participated in the testing procedures with fifteen of the public school children. All three Es were trained with children who were not used in the study and by rating and observing each other.

Interview: The interview was conducted in two parts. During the first part, which was recorded on tape and later transcribed, the child responded freely. In the second part, specific questions were asked.

Part I - Unstructured

The child was asked to tell E all about the television show that was just seen. If there was no response, the child was encouraged to "say something". However, no other suggestions or comments were made. In most cases, after the child responded freely, the E asked if there was anything else that the child wished to say, while noting responses following the probe.

This part of the interview allowed the E to examine which aspects of the social interaction the children would spontaneously report, and whether these reports would change in quantity or quality between different age groups.

The children's unstructured data were evaluated according to the categories specified, and using the instructions found in Appendix C, by two independent raters, at two different times, one week apart.

In order to measure interjudge agreement, the two judges rated the first responses of the first ten children of each of the three age groups. The percentage of agreement for the first ratings ranged between 100 percent (mainly for the reporting categories and the children who didn't respond at all) to 63 percent. Agreement between the ratings of the next ten children in each age group was higher, ranging from 100 to 75 percent. The overall percentage of agreement including all statements was 98 percent.

The following week the raters categorized all the statements made by the children (rather than only the first statement or clause) which included those statements following the probe question ("Is there anything else you remember?"). There was 100 percent agreement between the raters' first and second ratings on those children who only had one response.

Part II - Structured

The child was asked specific questions regarding the content of the films, interpretations of the model's intentions as well as their own explanation what occurred in the film sequence. This structured part of the interview was to insure maximum information of the child's understanding of the videotape and minimize the child's nonresponsiveness due to verbal inadequacies, lack of understanding of the task, judgment of what is important, etc. It was hoped that this forced-choice probing would expose the child's true understanding, rather than indicating the stereotypic responses such as, "It is okay for boys, but not for girls to grab the swing".

Three alternative pictures were presented to each S and each child was encouraged to respond by pointing to one of them.

These data were given a rating of 1 to 3 for each child's choice for each group of three alternatives. Thus, a score of three was given for a correct choice or the best possible answer, a two if the choice was incorrect or not as accurate an answer, and a one if the choice was irrelevant or the least accurate.

The thirty questions of the standard questionnaire, asked of all Ss, covered areas of content, moral and social aspects, and required judgmental or opinion responses. (Appendix A).

In some sense, the categories that were chosen for analysis represent an artificial separation between specific aspects of an area. However, an attempt was made to follow the traditional lines of thought as they appear in the literature. For example, role playing, though clearly a "social" aspect of development, is also included in Koglberg's (1964) discussion of moral judgment development. Language clearly permeates all interactions and situations and is usually dealt with in the "social" development area, when not looked at on it's own. Thus, it can be seen that these categories are not mutually exclusive. While moral development implies elements of a social aspect, social development does not necessarily imply aspects of a moral nature.

The final question regarding the child's favorite TV shows was used as a conversational way of ending the interview, and was not rated in any way.

CHAPTER IV

RESULTS

The purpose of this study was to examine the relationships between age, cognitive level and other significant variables to the response to audiovisual presentations on television. The other significant variables were sex of the subject, sex of the actor and type of film presented, i.e., prosocial or aggressive. In order to assess the subjects' knowledge of the presented material, both a structured and an unstructured interview were conducted. It was thought that the two types of interviews would maximize the opportunity to express knowledge extracted from the video presentations and thus, a better assessment of developmental trends and significant relations would be possible.

Unstructured Interview:

Children's spontaneously produced responses were recorded and a content analysis was performed following Flapan (1968). Subjects' statements were rated and classified for presence or absence of reporting, explanatory and inferential remarks. In addition, totals were obtained for the number of linguistic elements, or clauses, and the number of irrelevant remarks. (see Appendix C). The total number of remarks minus the number of irrelevant remarks was designated as a separate score called "relevant" remarks. Though ratings were obtained for all of the remarks produced in the unstructured part of the interview, including those following the probe, only ratings for the first remarks obtained spontaneously were used for this

analysis.[2]

It was predicted that the number of reporting, explaining and inferring responses as well as the total number of remarks, would increase with age as well as with cognitive level. Means of responses for each age group and cognitive level are shown in Table 1. It can be seen that there is a trend (though not significant) toward Ss with higher cognitive levels responding with more responses, in each category, and giving more responses generally (see Table 2).

Table 2 summarized the 5-way ANOVA and Pearson correlation coefficients, for each category of the unstructured interview. The ANOVA is a 2x2x2x3x4 design; with two levels of sex (male and female) two levels of sex-of-actor (male and female), two levels of type of film (prosocial and aggressive), three levels of age (nursery

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2 Ratings were obtained for both the first (or pre-probe) utterances and the total utterances including those following the probe. It was felt that more information would be available, that personality differences might be reduced, etc., if we looked at the total output of the subjects. However, the decision not to utilize this second way of analyzing the data at this time was made for the following reasons: 1) the probe question was not standardized so that the analysis would not be as accurate as it could be, 2) the different number of remarks made in the total would be difficult to deal with statistically, and 3) the effects when looked at by correlation analysis, and the analysis of variance did not show major significant differences, i.e., the correlations ranged from .47 to .77 for all of the categories. This does represent, however, a loss of data, and it is suggested that perhaps future research could include a more standardized form and thus provide additional data.

school, kindergarten and second grade) and four cognitive levels (preoperational, low transitional, high transitional and operational.)[3] There is a low positive correlation for the reporting, explaining and inference scores and the total number of responses with age and cognitive level, though none of the other factors are significantly correlated and ANOVA results show Age as a significant factor for Reporting ($F(2,141)=5.03$, $p < .05$) and Inferring scores ($F(2,141)=8.95$, $p < .001$), with age approaching significance in the Total number of relevant response scores ($F(2,141)=2.92$, $p= .056$). Neither Cognitive level nor any other of the main factors were significant at the .05 level in the ANOVA results. In addition, there is a positive, but weak, correlation between Age and the subjects' response (r=.17 to .31).

In two similar ANOVAs, (Table 2) Relevant and Irrelevant remarks were examined for the factors that would relate to these responses. For the Total number of relevant responses, Age approached significance ($F(2,141)=2.92$, $p= .056$) as well as two interactions; Sex by Type of film ($F(1,141)=5.79$, $p < .05$) and Cognitive level by Type of film ($F(3,141)=2.58$, $p < .01$). With respect to Irrelevant data, only Cognitive level was significant ($F(3,141)=3.70$, $p < .05$) with Age group by Sex approaching significance ($F(2,141)= 2.81$, $p=.062$). These results held up in 2x2x2x4 (sex-of-

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3 All of the ANOVAS in the following discussion will be of this type unless otherwise specified.

actor, type-of-film, and cognitive level) ANCOVAs, with age partialled out, where Cognitive level was a significant effect in the number of Irrelevant remarks ($F(3,180)=3.39$, $p < .05$). The two interactions were significant. In an ANCOVA performed on the Relevant remarks, Cognitive level by Type of film ($F(3,180)=3.66$, $p < .05$) and Sex by Type of Film ($F(1,180)=5.74$, $p < .05$). In the 2x2x2x3 (sex, sex-of-actor, type of film and age) ANCOVAs, with cognitive level partialled out, none of the main effects were significant for either Irrelevant or Relevant data.

Thus, Cognitive level seems to be an important factor in determining the number of Irrelevant remarks the Ss made. It can be seen from Table 1 that mainly the operational level group (group 4) is responsible for this result. In a planned test for differences of the means, only this group differed significantly from the others. This is an unusual result that was not predicted and does not seem consistent with the rest of the data. Visual inspection of Table 1, shows an increasing age and cognitive level effect for each category other than the one previously discussed, with both Relevant and Total number of remarks following this pattern.

Thus, whether looked at by Number of responses in the relevant category, or by the presence or absence of responses in the increasingly difficult categories; i.e., reporting, explaining and inferring, there was a trend toward more relevant responses given by older children. This was true for each response category as well as for the totals (see Table 1).

The ANOVAs for each category of the unstructured data show no significant main effects, other than age. However, there were some significant interactions, as can be seen in Table 2. An interesting finding is that in the Reporting, Inferring and Total relevant categories, Sex of the subject and the Type of film significantly interact; all following the same pattern (see Table 3). There are generally more roles in all categories when the female actor carries out the prosocial action or the male model is acting aggressively. This is evidence for the willingness of the children to respond when the film presents socially acceptable responses, at least when the actor is a female.

The significant Type of film by Cognitive level interaction in the Inference and Total relevant categories (see Table 4) shows a tendency for cognitive level 3 Ss to provide more responses in these categories after having seen the aggressive film; whereas, the operational Ss respond more to the prosocial film. As the means of the first two cognitive groups do not differ significantly, this is not a trend or a linear pattern.

In summary, the unstructured interview showed a significant increase in the extent of higher level responding with age. There were no significant differences in levels of responding between males and females, prosocial or aggressive videotapes or the male or female actors' influence. Cognitive level showed a low positive correlation

with the various categories of responding, with an expected increase in performance with cognitive level.

Structured Interview:

The children's answers to the three-choice-questions were rated: 1 - irrelevant answer, 2 - wrong answer, and 3 - the higher level or correct answer. Thus, the higher the S's total score, the higher the level of responses or the more correct responses. This rating method was used with some of the probe questions as well, though in the analyses the open-ended questions of the structured interview were collapsed into a 1 - 2 rating scale.[4]

It was hypothesized that the Total number of informationally correct responses of all the questions that did not involve opinions or ratings, called the developmental total, (see Appendix D) would increase with age and cognitive level.[5] Means and standard deviations for the main effects of the structured interview development total can be found in Table 5. The data were subjected to a 5-way ANOVA in order to ascertain the effects of increasing age and increasing cognitive level on a more general performance measure. Age and Cognitive level were both found to be

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4 Though the individual questions that were open ended in the structured portion of the interview were originally scored in the 1 to 3 rating system following the pattern of the multiple choice questions (1=irrelevant, 2=misperception or wrong and 3=highest level or correct), in order to facilitate statistical analysis, these questions were rescored into a dichotomous score (1=irrelevant or misperception and 2=correct), where it was appropriate.

5 For any total that reflects the S's overall performance on the structured portion of the interview, the developmental total score will be used as it reflects all of the information questions and does not include questions involving opinions or sequencing.

significant ($F(2,141)=22.02$, $p < .001$ and $F(3,141)=52.53$, $p < .001$ respectively) (see Appendix E1) with age however, accounting for more of the variance than cognitive level (12% for age and 5% for cognitive level). Two ANCOVAs for the developmental total were performed. In an ANCOVA with the cognitive level[6] partialled out (see Appendix E2) Age was significant ($F(2,184)=11.58$, $p < .001$). In the ANCOVA with Age[7] partialled out (see Appendix E3) Cognitive total remains significant, ($F(3,180)=4.78$, $p=.003$). Thus, both effects are significant and it is clear that children with higher cognitive levels, regardless of age, do perform at a higher level when asked to report information from a television show. Age, however, is a slightly better predictor of level of performance. This result is understandable because of the relatively high correlation between age and cognitive level ($r=.67$).

In support of this analysis are the data of the first two questions of the questionnaire that asked for a direct identification of the place, as well as the specific models

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6 Wherever possible the sum of the cognitive subtasks was used in the statistical analyses as it seemed to be more accurate a measure of the S's performance than the means of the means of the subtasks. These measures were highly correlated with one another however ($r=.91$, $p < .001$), thus it was felt that they could be used interchangeably depending on the need for a continuous rather than a discrete variable.

7 Though the children were originally classified and chosen by age group (nursery school, kindergarten and second grade) for some of the analyses, age in months, as a continuous variable was used. This is indicated by the term age in months.

on the videotape. The score for these two questions, called the information total (see Appendix E), when subjected to a 5-way ANOVA, showed Age as not a significant factor ($F(1,141)=.96$), with Cognitive level significant ($F(3,141)=3.87$, $p=.011$). In an ANCOVA, with cognitive level partialled out (see Appendix E4), Age is significant, ($F(3,180)=3.32$);$p=.021$.[8] Thus, with a smaller total number of responses, that limits the amount of direct reporting, the cognitive level is somewhat more salient than the child's age (in months) in predicting performance.

A second hypothesis predicted that the number of Reporting, Explaining and Inferring responses on the structured data, as well as the unstructured, would increase with age and cognitive level. The questionnaire items were so classified in those categories (see Appendix E) and examined individually.

Means and standard deviations for the three categories with reference to age and cognitive level for the structured interview can be found in Table 6. A Scheffé test for significant differences of the means, established that there is an increase in the number of higher level responses on the reporting, explaining and inference questions as age levels

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8 This reduced level of significance is explained by the fact that the ANCOVA as opposed to ANOVA, is more sensitive to real differences, i.e., more likely to "pick-up" significant differences between means. This is in addition to its ability to control for initial differences between means (Huck, 1972).

increase. Cognitive level shows the same tendency, with children of higher levels performing more accurately as the questions get more abstract. The main exception to these significant developmental relations was in the explaining total where the kindergarten and second graders and the level 3 and operational level Ss did not differ significantly.

Though we are only interested in the age and cognitive level effects at this time, all of the main effects of the 5-way ANOVA will be listed so that future reference can be made to them. For all three categories, reporting, explaining and inferring both Age and Cognitive level were significant, ($p=.05$ (see Appendix E5) except for the explaining category). In an ANCOVA with age partialled out, cognitive level remained significant in the same two categories and was not significant again in the explaining category. In the ANCOVA with cognitive level partialled out, age remained significant ($p < .001$) in the explaining and inferring categories but not in the reporting category. Thus, there is evidence for a strong age and cognitive level effect in the categories we are looking at in this study.

Regarding the sex of the subjects, it was thought that regardless of the kind of actions being performed and/or cognitive or age level, that Ss would prefer their same-sexed model. It was found that almost twice as many females as males out of the total of 129 children chose their same-sexed model as the person "they liked best" (Table 7).

This percentage was the same in the two younger groups where females tended to choose the same-sexed model more often than the nursery school or kindergarten males. The second grade girls, however, chose their same-sexed model about as frequently as the males of their age (see Table 7). These data do not support those studies which report that younger children of both sexes identify with a female model. Nor do they support the notion of early development of self identity and the ability to identify with the same-sexed model. There is a trend for the males to increase their number of same-sexed preferences as their age increases (see Table 7). Only 8.7% of the total number of children responding chose an irrelevant person (a character of their own sex but not in the film) as their favorite person. 78% of these irrelevant responses were made by male subjects, with 77.8% of these "misperceptions" made by kindergarten males. 41% of the 200 children chose the opposite-sexed character as their preferred person, regardless of the models' actions. 77% of the males chose opposite-sexed models, whereas, only 11% of the female Ss did so.

The main interest in the follow-up probe as to why the children preferred the model they chose was to ascertain whether the Ss chose the model because he or she was the same sex or because of the actions in the film. From Table 8, it can be seen that there is an inverse relationship between the number of irrelevant responses and age group, and a direct relationship between number of

correct responses and age group. 17 (or 70%) out of the 24 Ss who responded that they preferred the same-sexed model because he or she was the same as themselves were female Ss, mostly from the kindergarten and second grade groups.

Moral development

An overall score was computed for the questions that involved aspects of moral development, as described in Chapter II (see Appendix D) as this was felt to be a more broad based measure than the individual scores for specific questions. The moral total was the sum of all the questions that dealt with aspects of relative judgments of the models actions, and consequences of actions, and attribution of guilt. Table 9 shows the means and standard deviations of the main effects for the moral total scores.

A 5-way ANOVA showed a significant relationship between this moral total score and Age group ($F(2,141)=38.94$, $p < .001$), Type of film ($F(1,141)=4.28$, $p < .028$), and Cognitive level ($F(3,141)=3.40$, $p=.029$). In an ANCOVA with age partialled out, the significant effects were Cognitive level ($F(3,180)=2.79$, $p < .05$), Type of film ($F(1,180)=4.55$ $p < .05$) and an interaction between these two effects ($F(3,180)=2.98$, $p < .05$). In the ANCOVA with cognitive level as the covariate, Age group ($F(2,184)=8.32$ $p < .001$) and Type of film ($F(1, 184)=5.51$, $p < .05$) were significant. Thus, the type of film, age group and cognitive level significantly effect the scores of the Ss in answering

questions regarding moral aspects, whereas Sex of the subject or Sex of the actor are not significant in any of the analyses (see Appendix E6).

Response to the moral questions total was correlated with each of the 5 main factors studied in the ANOVAS. Pearson correlation coefficients show age (in months) correlates at about the same moderate positive level as cognitive level (r=+.54, $p < .001$ and r=+.53, $p < .001$), with type of film showing a low negative correlation (r=-.13, $p < .05$). The last finding, plus inspection of the means, indicates a tendency for Ss to give higher level responses on the moral questions when they are shown the prosocial film. Thus, the prediction that age and/or cognitive level would be an effective predictor of scores on questions that involve moral aspects was confirmed. There is no indication from these data that cognitive level was a significantly better predictor than age. The finding that there was a significant difference in how the Ss responded depending on the type of film (prosocial or aggressive) confirms our prediction regarding the effects of varying the content, but is in an unexpected direction. It has been thought that the children, especially the younger group, would perform better on the film that showed aggressive material.

Visual inspection of the Pearson correlation coefficients for responses to each of the specific "moral" questions (see Table 10) confirms the ANOVA results and indicates that cognitive level and age relate to performance on many of the specific questions, though sex of the subject

and sex-of-the actor do not. Type of film shows only a low negative correlation. It is possible that the inclusion in the total moral score of the questions regarding explanations for when it would be "OK to hit", "grab" or "not share", (questions 14a, 14a', 14b, 14b', 14c, 14c'), that were answered by few children, lowered the number of significant correlations on the questions involving the more direct aspects of moral development.

In addressing these more direct measurements, it was hypothesized that the children would become better able to understand and express the models' intentions and the consequences of their actions as their age and cognitive level increased. It was thought also, that there might be some differences in the understanding of the distinction between intentions and consequences of action (see Chapter I). These relationships were looked at in two ways here. First, the major questions involving the models' intentions (Question #3) and the consequences to the model (Question #4) were examined separately. Secondly, composites (total scores) of all the questions involving major and minor intentions and all the major and minor consequences were calculated (see Appendix E).

From an examination of the Pearson correlation coefficients (see Table 11) it can be seen that there is a low positive correlation between the major intention question and age only ($\underline{r}$=.17, $\underline{p} < .01$) whereas, for the major consequence question, both age and cognitive level show low positive correlations ($\underline{r}$=.29, $\underline{p} < .001$; and

r=.21, $p < .003$). Inspection of the means for response to the moral questions (see Table 12) shows these effects, with the means for age and cognitive level increasing (though not significantly) for the main consequence and intention questions, as well as for all the questions. The increases in means for each question are not as great across cognitive levels as across age groups, especially in the case of Question #5. Thus from the two relevant questions, it would seem that cognitive level is more highly correlated with the consequence responses whereas age is fairly related to both intention and consequence responses.

Viewing the composite measures, age in months and cognitive level are fairly correlated with the total intention score (r=.25 and r=.24) and moderately correlated with the total consequence score (r=.53 and r=.46), all at the p=.001 level of significance. Thus, age reflects a slightly higher relationship to both intentions and consequences, but, age and cognitive level are better predictors of consequence scores than intention scores. The mean scores for the intention and consequences total (see Table 12) show higher correct responses across all variables in the consequence questions with males performing slightly better than females in the intention questions. Also, the reverse is true for the consequence questions; prosocial film material eliciting slightly better responses for intentions, and the reverse for consequence (though none of these relationships was significant), and the means for the female and male actors did not reflect any differences.

Table 13 shows the means for each age and cognitive level. It is interesting to note that the cognitive level 3 Ss in each group for the two types of responses scored higher than, or the same as, the operational level Ss except for the second graders responding on the consequence questions. However, even if the Ss reached their maximum ability at level 3 and the differences then did not achieve significance, there is a general trend toward increasing ability with cognitive level, as well as age, and evidence that the Ss performed better in all age groups in the consequence questions than the intention questions.

A 5-way ANOVA showed Age as a significant factor only in the Consequence scores ($F(2,141)=16.08$, $p = .001$) in the ANOVA or the ANCOVA analyses (see Appendix E7).

It was anticipated that the older Ss or those of a higher cognitive level would be better able to understand the concept of postponement of gratification for a future goal. The Pearson correlation coefficients supported this prediction as the correlation between Question 8 (see Appendix A) that required the Ss to anticipate the future event not seen in the video presentation (the second child swinging) and age in months was a moderately positive one ($r=.46, p < .001$) as was cognitive level ($r=.42, p < .001$). The means for each age group show an increase (nursery $\bar{X}=1.83$; kindergarten $\bar{X}=2.47$ and second grade $\bar{X}=2.93$) as do cognitive level (level 1 $\bar{X}=2.00$; level 2 $\bar{X}=2.26$; level 3 $\bar{X}=2.74$ and level 4 $\bar{X}=2.92$). There were no significant differences between the sexes ($r=.01, p = .87$); between prosocial or aggressive films ($r=.03, p= .60$) or sex of

actors (r=-.12, p = .08).

It was hypothesised that children would become progressively more able to make relative judgments so that their responses would increase with age and cognitive level as a function of their increased ability to balance various situational elements and societal values. Though the absolute numbers of responses to the questions that concern themselves with this issue (14, A',B,B',C,C') are limited and not significantly different in statistical terms, it is worthwhile to note some trends of the data as they support or detract from other data. Question 14 and its sub-questions measure the willingness of the child to deviate from the societal "rules" and express flexibility in dealing with situations in which it would be appropriate to hit, grab or not share. It is interesting that so few children responded to the opportunity to justify "aggressive" behaviors and from the meager data, it seems that these opportunities are taken in the same order as societal approval. That is, it is usually considered worse to grab or hit than to not share. Out of 200 Ss, 13 tried to justify "grabbing", 15 "hitting" and 21 "not sharing" (see Table 14).

Exactly the same number of male and female Ss (15) responded with correct justifications as to when it was permissable to perform aggressive behaviors in all three situations, and essentially the same number of males (10) and females (9) responded with either irrelevant or incorrect justifications.

With one notable exception (second grade girls), who had a larger number of incorrect or poor justifications for why not to share, there was a positive relationship between age and number of correct or higher level responses and an inverse relationship with age and number of irrelevant or misperceived remarks.

It was predicted that children would be more attuned to societal sanctions and values as they progress in age and cognitive ability. As measured by Question 13 (see Appendix A), it was thought that the Ss in this study would show an increasing ability to choose the "good" child according to the behaviors viewed on the television screen rather than their personal identification choices. For the group as a whole, the correlations between the choice of a "good" child and age (r=.22 $p < .002$) and cognitive level (r=.25 $p < .001$) were fairly related and significant. In the explanation for why these choices were made, two additional correlations were significant; that of sex of the subject (r=-.14, $p < .044$) and type of film (r=-.35, $p < .001$). Age and cognitive level remained significant at the p=.001 level (r=.25 and r=.26 respectively). Thus, it can be seen from Table 15, that of all the 200 responses to the "good" child question, 112 Ss or 56% gave the higher level response, namely, that the good child was one who shared or the child who did not aggress in the aggressive situation. 32% of the Ss responded with the opposite choice and 12% gave irrelevant responses. In the explanation of the choices, 87 of the 200 Ss (43%) gave irrelevant responses, 27% gave

incorrect responses or responses that reflected misperceptions and only 29% could give a relevant or higher level response. The trend toward less high level responding in the more abstract question is clear.

It was hypothesized that there would be a positive correlation between age and cognitive level and the S's ability to view problems realistically; i.e., identify the feelings of the models and the reasons underlying these feelings. It can be seen from Table 16 that there are low positive correlations (most at $p < .001$ level) between age (in months), cognitive levels and the questions that involve attribution of feelings to the models. From inspection of the total means, it can be seen that the Ss are better able to give higher level responses in identifying the models' feelings than in explaining why they felt the way they did (similar to the results of the preceding section that showed the Ss better able to identify the "good" child than explain their choice). These questions, along with two others (Questions 6 and 8) were included in the analysis of the total inference scores, and generally followed the same pattern (see Table 6). None of the other main effects showed significant correlations and thus were not considered for further analysis.

The prediction was made that there would be a positive correlation between the Ss' increasing age and cognitive level and their ability to see things from another's point of view, and make a decision regarding what they would do re-

gardless of the consequence to the model in the videotape viewed. This was measured by presenting the Ss with three choices as if they were in the same situation as the model (see Question 15, Appendix A). The prediction was somewhat supported as the means for age group show increases (nursery $\bar{X}$=2.58; kindergarten $\bar{X}$=2.66; second grade $\bar{X}$=3.00); as do cognitive levels (level 1 $\bar{X}$=2.32; level 2 $\bar{X}$=2.52; level 3 $\bar{X}$=2.70 and level 4 $\bar{X}$=2.73). In addition, there is a low negative correlation between the sex of actor and the quality of the response (r=.14, p = .04); i.e., there is a slight tendency for Ss viewing males to give the higher level acceptable responses and Ss viewing females to give less socially acceptable responses. There were no significant correlations between type of film or sex differences. Unfortunately this is the only question dealing with the stated issue and so is limited in generality.

Social Development

An overall score of the questions that involved social aspects of development as defined in Chapter II was composed in hopes of basing our findings on a broader range of Ss behaviors (see Appendix D).

From the Pearson correlation coefficients (see Table 17), it appears that age and cognitive level are both fairly correlated in a positive direction (with one exception) with the questions included in the social total in 12 out of the 14 cases, at least at the p=.05 level.

Means and standard deviations for the social development total for the main effects can be found in Table 18. In a 5-way ANOVA, cognitive level approaches significance, (see

Appendix E8) but Age is a significant effect both for the 5-way ANOVA ($F(2,141)=11.61$, $p < .001$) and for the ANCOVA ($F(2,184)=9.18$, $p < .001$). Thus age seems to be a stronger factor affecting the ability to answer questions that relate to social aspects as defined in Chapter II.

Type of film is a significant effect for all analyses, at the $p=.05$ level (ANOVA $F(1,141)=5.11$; ANCOVA with age partialled out $F(1,180)=4.73$; and ANCOVA with cognitive level partialled out $F(1,184)=5.01$). From Table 19, which examines the direction of this finding, as well as those of the significant and near significant interactions, one can see that the Ss performed better on the prosocial content than on the aggressive. In a three way interaction, Sex by Sex-of-actor by Type of film was significant ($F(1,141)=5.92$, $p=.016$). It is concluded that the Ss perform best while viewing a same-sexed model doing a prosocial behavior. The other two interactions of interest that approach significance are Cognitive level by Type of film ($F(3,141)=2.44$, $p=.065$) and Sex by Cognitive level by Type of film ($F(3,141)=2.57$, $p=.056$). In these interactions, the males perform less well on the aggressive content and show more improvement in the prosocial content with increasing cognitive level. Female Ss, also improve more in the prosocial type of film with increasing cognitive level and the scores are increasingly higher on the prosocial content with the exception of the nonconservers (female non-conservers do better on aggressive content than prosocial).

It was thought that the younger children, less cognitively able, would be unable to conjointly sequence and generalize pictures from the videotape material as well as the second grade or higher level Ss. This was measured by Question 10 and Question 11 (see Appendix A), that required the Ss to arrange four pictures in an order that "tells a story like the one we just saw".[9]

There appears to be the same general trend (see Tables 20 and 21) for sequencing the actions directly depicted (swings sequence) from the video tape as with the sequencing of data that was parallel in dynamics but not directly viewed (cake sequence). For example, though there was a slight developmental difference between the nursery school and kindergarten grade overall performance (28% to 26%) in not changing the random presentation of the pictures, none of the second graders responded in this manner in either sequence. There is a moderate positive correlation for the first task (r=.32), and (r=.42) for the second task, both $p < .001$, between age and ability to sequence properly and an inverse relationship between age and number of errors made in sequencing. The slightly higher correlations between the sequencing task and cognitive level (r=.41 for the first task, r=.52 for the second task, both at $p < .001$) points to the somewhat more important role that the cognitive abilities play in this kind of task.

9 A technique adapted from the Wechsler Intelligence Scale for Children - Revised, 1974.

The second sequencing task, involved four pictures from the recently viewed video material, thus, it is not surprising that more children were able to perform this task. 32% of the children were able to respond correctly in the sequencing of the cake episode and 41% of the children performed at a higher level in the second sequencing of the swings episode. (See Table 21, for the percentage of children who responded correctly by age group.) Thus, the children showed improvement with more correct responses and fewer wrong (or the same as presented) responses in the second sequencing task with the directly relevant material.

Generally, there were no differences in male and female performance on these two tasks.

It was thought that the ability to use and understand language would increase with age and be indicative of higher cognitive functioning. This was looked at by examining the responses to Question 16, which provided the Ss with three alternative definitions to the concept "one child swings now and then the other child swings later". Table 22 indicates that with this ability, both age and cognitive level showed fair correlations ($r=.24$, $p < .001$ and $r=.31$, $p < .001$ respectively). Thus, the older and more able the S is to perform the cognitive tasks, the more likely "sharing" will be correctly defined. As this pattern is similar to that of Question 8, (see Appendix A), which measures the ability of the child to utilize the concept sharing (see Table 22), it can be concluded that age and cognitive level significantly effect the use and understanding of the main concepts

(linguistically represented) in the videotape content. None of the other main effects were significantly correlated to these measures.

Another measure of ability to manipulate labels and concepts can be found in Question 9 (see Appendix A) which required the Ss to generalize and organize a situation similar to one that they just saw on the screen. The Ss are required to respond to children fighting over a cake in a similar fashion to the swings. Table 22 shows that age and cognitive level have a low positive correlation with this question (r=.15, $p < .033$ and r=.14, $p < .042$) with none of the other effects significantly correlated.

Inspection of the means for all three of these questions, (see Table 23) show increasing age and cognitive effects for all but Question #9 where cognitive level does not seem to follow the general linear pattern.

The hypotheses that predicted increasing ability with age and cognitive level were examined with those questions that involved the 1) recognition of a common value system (Question 5a, 7, 7a, 7b and 7c), 2) reciprocity (Question 8) and 3) understanding of delay of gratification (Question 7 and 8), (see Appendix A for Questions). Table 24 shows that the correlations among the age and cognitive variables and the above mentioned questions were all low positive, with the other effects mainly having no significant correlations. Thus, there is mild support for the increasing ability to understand and express that the difficulties in the viewed playground sequence stem from a common desire of both models

to swing and that the common value is to swing first; that the reciprocal relationship between models is not a perfect solution for both children but it enables them both to swing, if not sooner, then later.

In summary, as can be seen in Table 25, both cognitive level and age were significant effects across all the composite scores from the structured interview data, with only one exception. For the information composite, which derived from only two questions, and pertained to the identification of specific persons and places, the Ss Cognitive level was significantly related, but not Age. This exception is not surprising as most of the children were able to identify the place and the models without too much difficulty, though careful attention had to be paid to small details in giving the best answer - comparable to the kind of process needed for performing conservation tasks.

The questions that involve some aspects of direct cognitive abilities, i.e., concepts of space, sequencing events, generalization, etc., show some relationship to Sex ($F(1,141)=4.66$, $p=.031$), Sex-of-actor ($F(1,141=4.97$, $p=.026$), and Age by Sex-of-actor ($F(2,141)=3.08$, $p=.048$). This means that in answering questions that are based on cognitive aspects, females perform significantly better than males, all Ss perform significantly better when there is a male model, and nursery school and second grade Ss perform significantly better when there is a male model (with no difference in the kindergarten group).

The Sex of subject effect was also seen in the information and developmental score totals where females performed significantly better than males, ($F(1,141)=12.82$, $p < .001$ and $F(1,141)=4.18$, $p < .041$).

Sex-of-actor was a significant factor only in the case of the cognitive questions as mentioned above, and in one interaction that had effects in the moral, social and developmental totals analyses; i.e., Sex of subject by Type of film by Sex-of-actor. Thus, in all these composites, the highest level of responding was when the female Ss were responding to a female actor in a prosocial film or when the male Ss were responding to a male actor in the prosocial film (see Table 26). It would seem that children can respond better in questions that involve moral and social aspects or in an overall way (developmental total) when they are watching their same-sexed model performing a prosocial task. This would confirm some of the data regarding youngsters identification with same-sexed models but presents an interesting result regarding the learning of prosocial behaviors. If sex of the child and sex of the model have a more facilitating effect on responding to prosocial actions than aggressive actions, then it is sad to note the preponderance of male, aggressive models presently dominating television programming.

One other significant interaction is the Cognitive level by Type of film when it related to the moral and developmental composite totals. In both cases, in the highest level or operational group, there are significantly higher level

responses to the prosocial film than to the aggressive. This is true generally for all the stages, but the differences between the types of film are not as striking as for the operational group.

Results Relating to Both the Structured & Unstructured Interviews

The prediction was made that increasing age and cognitive level would affect overall performance as well as individual responses of the interviews. This was examined by a 5-way ANOVA that combined the total number of Reporting, Explaining and Inferring statements in both the unstructured and structured interviews, now called overall total,[10] and compared it to the main effects of sex, type of film, cognitive level, age and sex-of-actor.

Significant main effects in this analysis (see Appendix E9) were Cognitive level ($F(3,141)=3.76, p=.012$); Age group ($F(2,141)=15.12, p=.001$) and Type of film ($F(1,141)=5.76, p=.017$). The significant interactions were Cognitive level by Type of film ($F(3,141)=5.06, p=.002$); Sex by Type of film ($F(1,141)=4.27, p=.049$) and Sex of subject by Type of film ($F(1,141)=3.84, p=.049$).

Thus, both age and cognitive level were significant effects in a combined score for both interviews, as well as, independently.

In addition, Type of film seems to be significantly related to the quality and quantity of the Ss responses, with Ss giving higher level responses on the prosocial film.

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10 The corrected score for the overall total is the developmental total divided by the standard deviation plus the relevant remarks total divided by the standard deviation, thus equally weighting the two scores despite their unequal number of responses.

It was anticipated that there would be no differences between the sexes in the total number of responses (from both parts of the interview) or total numbers of higher versus lower level responses. There is support for the fact that males and females of four to eight years of age perform equally well in the combined situations presented in this study. It can be seen however, that sex-of-subject, in interaction with other variables can become a significant effect regarding how much of how well the child can report what is seen. When looked at individually (see Table 27), it can be seen that means of the Sex by Type of film by Sex-of-actor groups differ, somewhat with females doing better than males, except when the female Ss respond to the female actor performing an aggressive act.

Other examples of this effect appear throughout the data; e.g., though none of the individual scores of reporting, explaining or inferring of the unstructured interview show a significant difference between male and female Ss, there is a significant Sex by Type of film effect in reporting ($F(1,141)=4.99$, $p=.026$) and inferring totals ($F(1,141=4.85$, $p=.028$). Overall, one can conclude, however, that the effect of sex is relatively weak in these data.

Other Results

The sample, when looked at with respect to cognitive performance did not differ as a function of anyone of the treatment conditions. Therefore, whatever results are obtained in the responses to the interviews, they are not

a function of sample differences with respect to the cognitive level or the components that enter into the cognitive measures.

However, Age (in months and by group) nursery school, kindergarten and second grade) correlated highly with all the subtasks and totals, as did Overall cognitive level and the sum of all the subtasks scores. In the 5-way ANOVA, Cognitive level ($\underline{F}(3,141)=199.25$, $\underline{p} < .001$) accounted for 40% of the variance, whereas Age group ($\underline{F}(2,141)=17.39$, $\underline{p} < .001$) accounted for only 23% of the variance. Needless to say, the Age by Cognitive level interaction was highly significant ($\underline{F}(5,141)=7.79$; $\underline{p} < .001$).

Individual means for each subtask (see Table 28) show slightly higher means within each task, with imagery appearing to be easier ($\bar{X}=2.95$), followed by number conservation ($\bar{X}=2.55$) and conservation of matter ($\bar{X}=2.45$). This corresponds with Piaget's findings.

Taken individually, the highest correlation between the tasks or subtasks and the total cognitive level score, occurs

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11 The mean age in months of the four cognitive levels are as follows; Nonconservers (n=34) $\bar{X}=58.41$ months; low transitional (n-87) $\bar{X}=67.88$ months; high transitional (n=87) $\bar{X}=67.88$ months; high transitional (n=53) $\bar{X}=76.49$ months and conservers (n=26) $\bar{X}=89.08$ months.

for the combination of the two number subtasks (r=.85, p<.001) with the first imagery subtask (that of drawing the hands position without viewing the model) following (r=.81,p<.001).

Thus, though we did have one measure that predicted cognitive level quite well on it's own, it can be seen that when taken in concert, the additional measurement brought the correlation to .91(p<.001) and increased reliability of the measure.

Of the 200 Ss, 34 (17%) were preoperational; 87 (44% were low transitional; 53 (26%) were high transitional and 26 (13%) were rated as operational (see Table 29).

No specific analyses were performed regarding the attentional data, as the children were attentive very close to 100% of the time. With one minor exception,i.e., an interruption of a fire drill, all of the children watched the screen for the full viewing time, showing no differences by age in attention.

CHAPTER V

DISCUSSION AND CONCLUSIONS

In considering the relationship between cognitive level and age and some aspects of a social interaction presented on television, the results of this study have provided some interesting information. It is difficult to support the theory that cognitive level is more related to the amount of information that the children can verbalize, than age, as they have been shown to be so highly correlated. However, it is clear from the results, that cognitive level, as well as age, plays a very important role in the way children view, report and understand social interactions.

It is interesting to note that cognitive level had less of an effect in the unstructured part of the interview, where the children were free to respond at will, than the structured part, where they were forced to provide information about what they had seen. However, when looked at together (Overall Total) cognitive level was a significant part of the children's higher level responding.

In the structured part of the interview, cognitive effects were seen in those questions that involved social, cognitive, moral and information aspects, as well as the total developmental scores. These results were all in the expected direction; i.e., the higher the child's cognitive level as measured by the cognitive tasks, the higher the

level of responding to the various questions. This is true of almost all the individual questions on this part of the interview for cognitive level, as well as for age.

Perhaps some examples of these specific questions, that involve specific abilities, would lend further support to the findings. In Question 10 (see Appendix A), which measures the ability of the children to sequence a series of pictures and generalize to a similar task, there was a direct relation between level of response, age and cognitive level, with the nonconserving and the low transitional children performing more alike and less well than the high transitional and operational childen. This supports Noble's (1975) finding in which five-year-olds were able to correctly sequence only two pictures directly taken from a film, whereas, seven-year-olds could sequence four to seven pictures. It can be suggested that this increasing ability to sequence and comprehend plot development leads to the formation of children's preferences based on their familiarity with the plot designs. Thus, children at the operational level are able to feel comfortable, and therefore enjoy, a program in which they can predict the ending. The low transitional children performed less well than the high transitional children in tasks such as coordinating the elements of a story, arranging them in a logical fashion, and being able to utilize the viewed material as a model for a similar type of situation.

Another example of this kind of development was

Question 15, which asked the children to specify what they would do in a similar situation to that viewed (see Appendix A). The higher level response made by the operational (and older) children required the ability to separate what they could do from what they would do, keeping in mind the rewards after the delay of gratification and the societal "rules" against grabbing or hitting. Lower cognitive level children(and the younger) were less able to share the common value system or understand reciprocity in relations and thus chose the more aggressive response as the basis for action (or the passive response) in order to use the swing. This was true despite the fact that the models themselves suggested sharing as a proper solution to the problem. The less cognitively able children were unable to integrate that suggestion into their plans and instead chose the aggressive or passive responses rather than active sharing.

Questions 16, which asks for the definition of sharing also shows a developmental pattern, with the operational child able to define the concept more readily than the non-conservers or transitional Ss. Thus, while these children could imitate a viewed action as an isolated act,they could not define, understand or generalize the concept underlying what they were doing.

Further support for the cognitive control thesis is to be seen in the performance of the kindergarten group, where with age constant, cognitive level remains an important

factor in almost all areas looked at. Thus, there is a strong case for looking at the transitional children very carefully, and redefining some of our notions of "age-related variables". Due to the high correlation between age and cognitive level, age, of necessity, must be related. However, the pervasiveness of the cognitive level effect in these data emphasizes the need to go beyond age in accounting for the performance of older and transitional children.

This is especially important for kindergarten children, as these are beginning to attend school, with its emphasis on formal presentation of material, and a standardized curriculum. In addition, there is new emphasis on educational television, particularly aimed at the pre-school or beginning-school children, that yields to the same constraints imposed by the cognitive capacities of the child. What the child brings to the school and television viewing situation will have a great deal to do with what he or she derives from the material presented, as evidenced by the data presented here. It is necessary therefore to establish a match between the material presented on television as well as in school and the level of comprehension the child is capable of, as indicated by his cognitive level.

Data from the unstructured part of the interview, confirm Flapan's (1968) findings and support the application of Piagetian concepts to social interactions. That is, children generally developed, with increasing age and increasing

cognitive development, from the simple to the complex, from the concrete to the abstract, from the discrete to the organized and from the irrelevant to the relevant. This can be seen in the rise in mean levels for the reporting, explaining and inferring responses as well as for the total number of statements with age and cognitive level. Though Flapan's work was with slightly older children (six to twelve-year old girls), the developmental trends that she reported were confirmed for even younger children (i.e., three and four-year-olds). Many of our nursery school children were reluctant to speak, shy and fearful and had to be encouraged to perform. However, when they did express themselves, there was a predominance of reporting responses, that included descriptions of the setting, the number or kind of children viewed and/or what they said. It was also clear that the nursery school children spoke less in all categories, with the older and more cognitively able children responding more frequently in all categories.

As age was a significant factor in the reporting and inferring categories, and approached significance in the explaining category, it can be seen that the older children were providing more abstract and complex reports of the material viewed.

This finding was confirmed in the structured portion of the interview where age again was significant in all

three categories. As was reported, older children gave many more correct or higher level responses in the forced-choice situation than the younger children. Thus, in questions that required answers that could be rated as reporting, explaining or inferential statements, the developmental trend was evident. One of the ways in which children show greater cognitive ability was in eliminating irrelevant details from their attention and on focusing on the relevant, though not necessarily salient, aspects of the viewed video presentations. As Collins points out (1970), young children have difficulty in focusing on essential information and find it impossible to make a logical statement about the theme. Our research gave support to this notion, as the number of relevant statements increased with age, though the number of irrelevant statements also increased slightly, though not significantly.

In addition, cognitive level was significantly related to the number of irrelevant responses, with higher cognitive level associated with fewer irrelevant remarks, with the reverse true for the relevant responses, though this relation was not significant. Thus, even in the brief summaries they provided of what they saw, children who could take advantage of some higher level processes, were able to assimilate and report more relevant aspects of the

social interaction viewed and separated out those features that were irrelevant. This supports the findings of Hale, Miller and Stevenson (1968) and again emphasizes the need for further research regarding information input from television viewing on children of varying cognitive levels.

In this work, utilizing a fairly simple plot, differences between groups were found. It is clear that in usual television programs where there is increased complexity of the plot, there would be greater differences in the children's understanding.

The sex of the subject proved not to be significant in the unstructured part of the interview, for the overall total of the children's performance and for two out of the four composite totals (moral and social questions). However, in those questions that bore upon identifying information, on cognitive aspects and in the developmental total, females scored higher than the males. The girls gave higher level answers to the reporting, explaining and inferring questions when they were forced to reply, whereas when producing spontaneously, there were no differences between the male and female children. Thus, there is some evidence that the female subjects did understand certain aspects of the stimulus situation better than the males though this is by no means a consistent finding. Indeed, sex of the child alone was not a significant factor in the overall total, which takes into account both parts of the interview.

The interaction effects are interesting as they support

the stereotypic societal values for even our youngest subjects, those of the three-to four-year-old group. For the unstructured part of the interview, when the children were responding spontaneously, the male children responded in all categories much more often when the ending of the film was aggressive, and the female children when the action was prosocial.

In overall total, however, both males and females responded more, or at a higher level, in the prosocial film.

It is interesting that almost twice as many girls as boys chose their same-sexed model as "the person they liked best" in the nursery school and kindergarten groups, whereas the second grade girls, chose their same-sexed model about as frequently as the boys. Though these preferences were made, they did not seem to interfere with the acceptance of information, as sex of the subject was generally not significant as a predictor of performance.

The results of this study lend support to the application of Piagetian theory to the development of understanding of motives and consequences. The data provide evidence that the children understand and report more higher level responses on questions that concern the consequences of the model's actions than the motives. However, age appears to be more related to this effect than cognitive level. Thus, in our sample of children from three to eight years of age, the older the child the more sophisticated response to 'consequence" questions despite the fact that 50% of the second graders are operational.

The context or complexity of the viewed material may account for this effect. As discussed in Chapter I, various authors suggest variables that might be relevant in determining children's viewing performance. Chandler et al. (1973) found that audio-visual rather than solely visual stimuli have a tendency to elicit responses based on intention earlier than consequences. Armsby (1971) suggested that the stimulus format, i.e., the saliency between intentions and consequences, might be the reason children judge or report differences. The final consequence in the present study's presentation, however, that of "getting the swing", is no more salient a point of the film than the fight which underlies the "intention" to swing. Thus, in this audiovisual stimulus, where the major intention of the model is active and articulated, the children still perform at a higher level in response to the consequence questions.

The data here show children's increasing ability to deal with intentions and consequences with increasing age and greater cognitive ability, but there is no evidence that the children are beginning to understand or respond to the intentions presented as well as to the consequences. Thus, the Piaget finding, (also Gutkin, 1972), that until ten years of age children cannot focus on intentions alone, was supported. Nevertheless, it is surprising that the younger children in this study did as well as they did in respect to intentions and consequences. This may have been due to the familiarity of the viewed situation and the fact that the playground setting

and the sharing of swings is particularly relevant to most children's lives. In addition, the forced-choice structured interview method encouraged even the younger subjects to make some kind of response, while reminding them of the situation that they had just viewed.

Sex-of-actor was not a major effect in this research. In the reporting, explaining and inference totals for both structured and unstructured parts of the interview, sex of actor was not an important factor in the children's responding. In the structured part of the interview, only within the questions concerning aspects of cognitive development was the sex of actor a significant main effect. However, there were some interesting interaction effects that seemed to reflect culturally stereotypic responses.

For example, in the unstructured part of the interview, when combined with cognitive level, sex-of-actor became more important, with the children giving many more explaining responses when the prosocial action was performed by the female actor and when the aggressive action was done by the male actor. This trend was also evident in the other two categories, but did not achieve statistical significance. In this, as well as other areas, we have evidence of the early effects of sex stereotypic responses.

Another example of this type of interaction is in the structured part of the interview, where sex-of-actor effects, when combined with the age level of the children, becomes significant in the questions that involve the cognitive

aspects, as well in the developmental total (see Table 30). The nursery and second grade children respond on a higher level, or more often correctly, when the model is a male; whereas, the kindergarten children seem to respond equally regardless of the sex of the model.

Thus, it can be seen that sex-of-actor, in combination with other factors can become significant, but for these data, is not a major factor in and of itself. Because the sex of subject was a limited factor and sex-of-actor was not a significant effect for the most part, it can be concluded that the children in this study when asked to report or forced to give information regarding the televised stimulus did not give more responses or higher level responses to their same-sexed model. For the most part, the literature has reported this significant interaction with adult models (i.e., Bandura, Ross & Ross, 1963), or with imitative behaviors (i.e, Hicks, 1965). Our data provide some support for the Leifer et al. (1972) finding that there is little difference in the understanding of the same or different sexed peer model in young children, when examined directly. When combined with the effects of age, however, there seem to be some differences in the reactions to male versus the female model.

Children's performance was affected by whether the film ended with a prosocial or an aggressive solution. This was particularly true in the structured part of the interview for the moral, social and total developmental scores, as well

as for the overall total which encompassed both parts of the interview. The type of film ending did not have an effect on those questions that involved information or more cognitive factors (such as sequencing, or identifying the model, etc). This is to be expected as these aspects have much less to do with the solution of the problem than the questions that involve social or moral aspects. Though the developmental and overall totals showed a significant type of film effect, none of the categories of the unstructured interview showed significant differences, nor did the reporting or inferring categories of the structured interview. In addition, some of the interaction effects indicated that the type of film was an important factor in the children's responses overall.

It is difficult to give a definitive explanation as to why the children, in general, performed at a higher level or more correctly on the prosocial film than the aggressive film, in fact, contrary to the prediction originally made. The original prediction was that the children's performance would be higher in the aggressive film and was based on the notion that the aggressive action is easier due to the lesser number of cognitive operations necessary for understanding. Clearly this basis for the prediction is not confirmed. An alternative explanation might be that the use of a middle class sample, favored the higher level performance on the prosocial film, as this is consistent with middle class parental values. It might be found, for example, that a lower socioeconomic class sample would perform less well on the prosocial film as the prosocial sharing activity and lesson is less within

their environment.

Another possibility for explaining differences in performance between prosocial and aggressive type films is that they are not unequal in cognitive complexity when looked at within a total context. That is, though it appears that higher level cognitive processes are required in performing or understanding prosocial tasks, that within a given situation, when a child has to project the possibilities of retribution and future consequences, the necessary abilities are of the same complexity. Thus, the ability to postpone gratification and hold the future goal constant might very well involve similar processes of abstraction as the defining of future punishment and the weighing of its value in terms of present desires.

Nevertheless, many of the interaction effects that involve the type of film supported the prediction regarding sterotypic responses consistent with our cultural expectations. For example in the spontaneous reporting by the children in the unstructured part of the interview, the sex of the subject combined with either the prosocial or aggressive type of film made a significant difference in the number of verbalizations in the reporting, inferring and total relevant remarks; i.e., there were more responses in all categories when the female actor was doing the prosocial action or when the male actor was doing an aggressive action.

In sum, this study represents an effort to document more carefully, the role of cognitive abilities in the child's

understanding of television thematic representation. It underlines the importance of considering the child's ability, not his age alone, in describing the effects of televised material. Researchers, in increasing numbers, are considering the various effects of television content on younger children who are just beginning active participation in social relationships. These preschoolers, attempting to use verbal or imaginal processes effectively in order to facilitate their social interactions, are spending four to six hours a day engaged in the passive, nonreciprocal activity of television viewing.

Given all we know about the pre-operational child's limited and inflexible way of viewing the world, it seems clear that this group of children understand and relate to thematic material differently from the less egocentric, more cognitively able, operational child. Indeed, the present results support this theory in that cognitive level proved to be a significant factor in almost all the areas studied. For example, operational children were able to answer questions regarding the viewed material significantly better than the preoperational children, regardless of age, when responding about direct information, social or moral aspects and cognitive aspects. Thus, special attention should be paid in programming to the cognitive levels of the television audience if the best possible learning atmosphere is to be facilitated. In addition, the results of this study, stress the need to specify further parameters so that the results might be of more generalized value. It has been suggested

that social class, amount of regular viewing, type of context varying (punishment and reward) the sex of model in concert with the type of action, etc. are all relevant factors in what the child viewer might report or understand.

Thus, many questions need to be asked and answered regarding the outcome of television viewing on the child's development. Some issues that might be considered are: in what way and in what areas is the usual sequence of cognitive development altered as a result of television viewing; in what way do play or fantasy portrayals change; how are heavy viewer attitudes regarding stereotypic behaviors and roles affected, given the fact that the preoperational children have difficulty spearating reality from fantasy; and lastly, once we know that children of different cognitive abilities understand material differently, how can we take advantage of that fact so that our children can learn most effectively from television?

TABLE 1

MEANS AND (STANDARD DEVIATIONS) FOR THE NUMBER OF LINGUISTIC ELEMENTS FOR UNSTRUCTURED INTERVIEW SUBCATEGORIES BY AGE AND COGNITIVE LEVEL

	AGE GROUP			COGNITIVE LEVEL			
	NURSERY	KINDERGARTEN	SECOND	1	2	3	4
Reporting	.75 (.90)	1.28 (1.19)	1.88 (1.45)	.94 (.98)	1.17 (1.13)	1.47 (1.35)	1.81 (1.50)
Explaining	.10 (.30)	.24 (.65)	.40 (.71)	.06 (.24)	.24 (.63)	.32 (.75)	.35 (.56)
Inferring	.03 (.16)	.14 (.55)	.65 (.89)	0.00 (.00)	.11 (.54)	.43 (.87)	.42 (.58)
Irrelevant	.53 (.82)	.69 (.91)	.85 (1.27)	.65 (1.07)	.59 (.76)	.58 (.69)	1.31 (.64)
Total Remarks	1.40 (1.10)	2.28 (1.89)	3.33 (3.06)	1.76 (1.56)	1.98 (1.57)	2.38 (1.92)	4.00 (3.64)
Relevant Remarks	.88 (1.16)	1.58 (1.71)	2.48 (2.35)	1.12 (1.15)	1.39 (1.59)	1.79 (1.94)	2.69 (2.60)

TABLE 2

ANOVA SUMMARY TABLE, WITH PEARSON CORRELATION COEFFICIENTS FOR INTERVIEW RESPONSES

SOURCE	REPORTING	EXPLAINING	INFERRING	TOTAL RELEVANT	TOTAL NUMBER OF RESPONSES
Age	F(2,141)=5.03* r=.31**	r=.17*	F(2,141)=8.95** r=.32**	F(2,141)=2.92* r=.27**	r=.28**
Cognitive Level	r=.26**	r-.18*	r=.28**	r=.27**	F(3,141)=2.89* r=.28**
Sex					
Type of Film					
Sex-of-Actor					
Age X Cognitive Level	F(5,141)=3.24*				
Sex X Type of Film	F(1,141)=4.99*		F(1,141)=4.85*	F(1.141)=5.79*	
Sex-of-Actor X Type of Film		F(1,141)=5.78*			
Sex-of-Actor X Age X Cognitive Level		F(4,141)=2.80*	F(4,141)=2.77*		
Cognitive Level X Type of Film			F(3,141)=2.87*	F(3,141)=2.58*	
Cognitive Level X Type of Film X Sex-of-Actor			F(3,141)=4.23*		

*p < .05
**p < .001

TABLE 3

MEANS FOR UNSTRUCTURED INTERVIEW CATEGORIES

BY SEX OF SUBJECT AND TYPE OF FILM

TYPE OF FILM	REPORTING		EXPLAINING		INFERENCE		TOTAL RELEVANT	
	M	F	M	F	M	F	M	F
Prosocial	1.14	1.58	.20	.34	.12	.30	1.46	2.08
Aggressive	1.34	1.12	.22	.22	.30	.16	1.72	1.22

TABLE 4

MEANS FOR INFERENCE AND TOTAL RELEVANT CATEGORIES

IN UNSTRUCTURED INTERVIEW BY TYPE OF FILM AND COGNITIVE LEVEL

	COGNITIVE LEVEL PROSOCIAL				COGNITIVE LEVEL AGGRESSIVE			
	1	2	3	4	1	2	3	4
Inference	0.00	.10	.26	.71	0.00	.12	.62	.08
Total Relevant	1.47	1.18	1.89	3.64	.67	1.57	1.69	1.58

TABLE 5

MEANS AND STANDARD DEVIATIONS OF DEVELOPMENTAL SCORES

MAIN EFFECT	MEAN	STANDARD DEVIATION	N
COGNITIVE LEVEL			
1	25.71	3.71	34
2	27.15	3.82	87
3	30.09	3.14	53
4	31.54	3.58	26
AGE			
Nursery School	24.38	3.60	40
Kindergarten	28.48	3.56	120
Second Grade	31.48	2.77	40
SEX			
Male	27.85	4.37	100
Female	28.66	3.76	100
SEX-OF-ACTOR			
Male	28.48	3.82	100
Female	28.03	4.35	100
TYPE OF FILM			
Prosocial	28.87	4.38	100
Aggressive	27.64	3.71	100

TABLE 6

MEANS AND (STANDARD DEVIATIONS) OF REPORTING, EXPLAINING AND INFERENCE TOTALS IN STRUCTURED INTERVIEW BY AGE AND COGNITIVE LEVEL

	AGE			COGNITIVE LEVEL			
	Nursery	Kindergarten	Second	1(n=34)	2(n=87)	3(n=53)	4(n=26)
REPORTING	14.75 (1.68)	15.58 (1.85)	16.48* (1.38)	15.24 (1.58)	15.22 (1.81)	15.85* (1.73)	16.77* (1.73)
EXPLAINING	2.58 (1.08)	3.96* (1.49)	4.38* (1.27)	3.29 (1.47)	3.44 (1.55)	4.28* (1.20)	4.42* (1.45)
INFERENCE	7.05 (2.26)	8.94 (1.93)	10.63* (1.48)	7.18 (2.02)	8.49* (2.06)	9.96* (1.72)	10.35* (2.04)

* Scheffé test for means significant at $p < .05$

TABLE 7

NUMBER OF CHILDREN WHO CHOSE SAME-SEXED MODEL BY AGE GROUP (QUESTION #12)

	SAME-SEXED CHOICE			
	MALE	FEMALE	TOTAL	%
Nursery School n=40	6	15	21	16.3
Kindergarten n=120	25 (8.3) [a]	53 (17.7)	78 (26)	60.5 (20.02)
Second Grade n=40	14	16	30	23.3
TOTAL	45	84	129 Ss	
%	34.9	65.1		

a) Corrected for unequal number of Ss

TABLE 8

NUMBER OF CHILDREN WHO IDENTIFIED WITH THE MODEL BY AGE AND SEX (QUESTION #12)

AGE GROUP	RESPONSE a)	MALE	FEMALE
Nursery School (n=40)	1.	15	16
	2.	3	2
	3.	0	1
	4.	2	1
		b)	
Kindergarten (n=120)	1.	41(13.7)	34 (11.3)
	2.	10(3.3)	5 (1.7)
	3.	6(2)	8 (2.7)
	4.	3(1)	13 (4.3)
Second Grade (n=40)	1.	8	5
	2.	3	2
	3.	7	10
	4.	2	3

a) 1 = irrelevant response
2 = incorrect informationally, e.g. she shared when he had grabbed
3 = correct, e.g. she shared
4 = same sex response, e.g. "because he/she is same as me"

b) Corrected for unequal number of Ss

TABLE 9

MEANS AND STANDARD DEVIATIONS OF MORAL TOTAL SCORES

MAIN EFFECT	MEAN	STANDARD DEVIATION	N
COGNITIVE LEVEL			
1	50.66	2.07	34
2	51.52	1.83	87
3	52.72	2.09	53
4	54.00	2.33	26
AGE			
Nursery School	50.17	1.69	40
Kindergarten	51.99	1.97	120
Second Grade	53.92	1.87	40
SEX			
Male	51.88	2.38	100
Female	52.15	2.13	100
SEX-OF-ACTOR			
Male	51.94	1.92	100
Female	52.09	2.20	100
TYPE OF FILM			
Prosocial	52.31	2.31	100
Aggressive	51.72	1.75	100

TABLE 10

CORRELATIONS BETWEEN SCORES ON MORAL QUESTIONS AND

AGE, SEX, TYPE OF FILM, SEX-OF-ACTOR AND COGNITIVE LEVEL

MORAL QUESTION	AGE (MONTHS)	SEX	TYPE OF FILM	SEX OF ACTOR	COGNITIVE LEVEL
Q 5 What happened-giving or getting?	0.06	-0.05	-0.04	-0.01	0.07
Q 7 How did model feel?	0.35**	0.02	0.10	0.08	0.31**
Q 8 What will happen next?	0.46**	0.01	-0.04	-0.12	0.42**
Q 12 Who did you like best?	0.11	0.38**	-0.04	0.00	0.09
Q 13 Who is a good child?	0.22*	-0.01	-0.10	0.03	0.25**
Q 13a Why?	0.25**	-0.14	-0.36**	0.00	0.26**
Q 14 Which is most bad?	0.07	0.06	-0.03	0.06	0.21*
Q 14a Ok to hit?	0.13	-0.08	-0.08	0.12	0.12
Q 14a' When?	0.43	.18	-0.12	-0.02	0.35

Continued

TABLE 10 con't.

MEAN QUESTION	AGE MONTHS	SEX	TYPE OF FILM	SEX OF ACTOR	COGNITIVE LEVEL
Q 14B Ok to grab?	0.14*	-0.04	0.0	0.04	0.09
Q 14B' When?	0.54	0.24	-0.24	-0.41	0.62*
Q 14C Ok to not share?	0.25**	0.03	0.03	0.0	0.25**
Q 14C' When?	0.11	-0.20	0.25	0.14	0.19

*$p < .05$
**$p < .001$

TABLE 11

CORRELATIONS FOR CONSEQUENCE AND INTENTION QUESTIONS AND SEX, TYPE OF FILM, SEX-OF-ACTOR, AGE IN MONTHS AND COGNITIVE LEVEL

QUESTIONS	SEX	TYPE OF FILM	SEX OF ACTOR	AGE (IN MONTHS)	COGNITIVE LEVEL
INTENTIONS:					
Q 3 Why running?	0.15	-0.02	-0.07	0.17*	0.08
Q 5 Giving or getting swing?	-0.05	-0.04	-0.01	0.06	0.07
Q 7A Why felt angry/happy?	-0.35	0.00	0.10	0.32**	0.42**
TOTAL For Intention Questions	-0.01	-0.06	0.01	0.25**	0.24**
CONSEQUENCES:					
Q 4 What happened after running?	0.11	0.08	0.03	0.29**	0.21*
Q 7 How did model feel?	0.02	0.10	0.08	0.35**	0.31**
Q 8 What will happen next?	0.01	-0.04	-0.12	0.46**	0.42**
TOTAL For Consequence Questions	0.06	0.05	-0.02	0.53**	0.46**

*$p < .05$ **$p < .001$

TABLE 12

MEANS AND (STANDARD DEVIATIONS) FOR INTENTION AND CONSEQUENCE

RESPONSES BY SEX, AGE, TYPE OF FILM, SEX-OF-ACTOR, AND COGNITIVE LEVEL BY AGE

MAIN EFFECTS	INTENTION	CONSEQUENCE	N	N
SEX				
	a)			
Male	5.69 (1.08)	7.51 (1.53)	100	
Female	5.66 (1.02)	7.68 (1.33)	100	
AGE				
Nursery School	5.30 (.85)	6.35 (1.39)**		40
Cognitive Level 1	5.26 (1.02)	6.11 (1.41)	19	
2	5.22 (.73)	6.39 (1.38)	18	
3	6.00 (1.00)	7.67 (.58)	3	
4	0.00 (0.0)	0.00 (0.0)	0	
Kindergarten	5.67 (1.11)	7.67 (1.34)		120
Cognitive Level 1	5.43 (1.09)	7.29 (1.14)	14	
2	5.63 (1.08)	7.54 (1.39)	65	
3	5.83 (1.15)	8.08 (1.26)	35	
4	5.67 (1.37)	7.67 (1.51)	6	
Second Grade	6.08 (.89)	8.63 (.63)		40
Cognitive Level 1	7.00 (0.00)	9.00 (.00)	1	
2	6.00 (.82)	8.75 (.50)	4	
3	6.00 (.85)	8.40 (.83)	15	
4	6.10 (.97)	8.75 (.44)	20	
TYPE OF FILM				
Prosocial	5.74 (1.06)	7.52 (1.57)	100	
Aggressive	5.61 (1.03)	7.67 (1.29)	100	

Continued.....

TABLE 12 con't.

MAIN EFFECTS	INTENTIONS	CONSEQUENCE	N
SEX-OF-ACTOR			
Male	5.67 (1.03)	7.63 (1.46)	100
Female	5.68 (1.07)	7.56 (1.42)	100

a) Maximum score = 9
** $p < .001$

TABLE 13

MEANS AND (STANDARD DEVIATIONS) FOR INTENTION AND CONSEQUENCE QUESTIONS

BY AGE AND COGNITIVE LEVEL

QUESTIONS	AGE GROUP NURSERY (n= 40)	KINDERGARTEN (n=120)	SECOND (n=40)	COGNITIVE LEVEL 1(n=34)	2(n=87)	3(n=53)	4(n=26)
INTENTION							
Q3 Why running?	2.80 a) (.46)	2.87 (.45)	3.00 (0.0)	2.82 (.46)	2.87 (.40)	2.91 (.41)	2.92 (.39)
Q 5 Giving or getting swing?	2.38 (.54)	2.46 (.79)	2.50 (.78)	2.44 (.61)	2.43 (.73)	2.49 (.80)	2.46 (.86)
Q 7A Why felt angry/ happy?	1.50 (.72)	1.98 (.85)	2.33 (.86)	1.41 (.70)	1.83 (.82)	2.25 (.83)	2.46 (.76)
CONSEQUENCE							
Q 4 What happened after running	2.43 (.75)	2.81 (.54)	2.98 (.16)	2.59 (.70)	2.71 (.63)	2.89 (.42)	2.92 (.27)
Q 7 How did model feel?	2.10 (.78)	2.39 (.57)	2.73 (.45)	2.09 (.75)	2.38 (.60)	2.51 (.54)	2.65 (.56)

Continued.....

TABLE 13 con't.

QUESTIONS	AGE GROUP NURSERY (n= 40)	KINDERGARTEN (n=120)	SECOND (n=40)	COGNITIVE LEVEL 1(n=34)	2(n=87)	3(n=53)	4(n=26)
Q 8 What will happen next?	1.83 (.90)	2.47 (.77)	2.93 (.35)	2.00 (.89)	2.26 (.87)	2.74 (.56)	2.92 (.39)

a) Maximum $\bar{X}$ = 3.00

TABLE 14

NUMBER OF SUBJECTS ANSWERING CORRECTLY OR INCORRECTLY BY AGE AND SEX ON RULE FLEXIBILITY

(QUESTIONS 14a',b', c')

		WHEN OK TO HIT			WHEN OK TO GRAB			WHEN OK TO NOT SHARE		
	[a]	MALES	FEMALES		MALES	FEMALES		MALES	FEMALES	
NURSERY SCHOOL	1	1	1	2	2	1	3	0	1	1
	2	1	1	2	0	0	0	0	0	0
KINDERGARTEN	1	2(.67)[b]	0(0)	2(.67)	2(.67)	0(0)	2(.67)	2(.67)	1(.33)	3
	2	1(.33)	2(.67)	3(1)	1(.33)	2(.67)	3(1)	2(.67)	3(1)	5
SECOND GRADE	1	0	0	0	0	1	1	1	4	5
	2	4	2	6	2	2	4	4	3	7

a) 1= Irrelevant or incorrect
2= Correct or higher level response

b) Kindergarten numbers corrected for unequal Ss

TABLE 15

NUMBERS RESPONDING TO (QUESTIONS (13 AND 13a)

REGARDING "GOOD CHILD", AND WHY BY SEX AND AGE GROUP

	WHICH IS THE GOOD CHILD? MALES	FEMALES	TOTALS	WHY IS HE/SHE A GOOD CHILD? MALES	FEMALES	TOTALS
	a)					
	1. 4	3	7	1. 12	13	25
NURSERY SCHOOL	2. 12	11	23	2. 8	6	14
	3. 4	6	10	3. 0	1	1
	b					
	1. 7(2.3)	8(2.7)	15 (5)	1. 17(5.7)	31(10.3)	48 (16)
KINDERGARTEN	2. 17(5.7)	16(5.3)	33 (11)	2. 20(6.7)	12(4)	32 (10.7)
	3. 36(12)	36(12)	72 (24)	3. 23(7.7)	17(5.7)	40 (13.3)
	1. 0	2	2	1. 6	8	14
SECOND GRADE	2. 4	4	8	2. 4	4	8
	3. 16	14	30	3. 10	8	18
			200			200

	Good Child	Why
a) 1= Irrelevant response	24 Ss	87 Ss
2= Misperceptions or wrong response	64 Ss	54 Ss
3= Relevant or correct response i.e. child who shared or did not aggress or relevant explanation why child is good	112 Ss	59 Ss

b) Kindergarten scores corrected for number of Ss

TABLE 16

CORRELATIONS BETWEEN RESPONSE TO QUESTIONS INVOLVING MODELS' FEELINGS AND AGE, SEX, TYPE OF FILM, SEX-OF-ACTOR AND COGNITIVE LEVEL

QUESTION	AGE (IN MONTHS)	SEX	TYPE OF FILM	SEX -OF- ACTOR	COGNITIVE LEVEL	MEAN
Q 7A How model felt?	.35**	.02	.10	.08	.31**	2.40
Q 7a Why? [a]	.31**	-.07	-.05	.10	.36**	1.95 [b]
Q 7B How other child felt? [a]	.20*	-.04	-.10	.00	.15*	2.44 [b]
Q 7C Why? [a]	.34**	-.06	-.20*	.06	.33**	2.21 [b]

a) After recoding into a 1-2 score.
b) Before recoding into a 1-2 score.

*$p < .05$ **$p < .001$

TABLE 17

CORRELATIONS AMONG QUESTIONS INVOLVING SOCIAL COGNITIVE ASPECTS

AND AGE, SEX, TYPE OF FILM, SEX-OF-ACTOR AND COGNITIVE LEVEL

QUESTION	AGE (IN MONTHS)	SEX	TYPE OF FILM	SEX-OF-ACTOR	COGNITIVE LEVEL
Q3 Where running to?	.17*	.15*	-.02	-.07	.08
Q4 What happened?	.29**	.11	.08	.03	.21*
Q 5A Why fighting?	.22**	.11	.03	-.15*	.31**
Q 5B Why give up swing?	.05**	-.16*	-.52**	.06	.00
Q 7B How did other child feel?	.20*	-.04	-.10	0.00	.15*
Q 15 What would you do?	.28**	-.04	-.12	-.14*	.19*
Q 16 Definition of sharing	2.40**	0.00	.09	0.00	.31**

*$p < .05$
**$p < .001$

TABLE 18

MEANS AND STANDARD DEVIATIONS OF SOCIAL DEVELOPMENT SCORES

MAIN EFFECT	MEAN	STANDARD DEVIATION	N
COGNITIVE LEVEL			
1	11.21	1.98	34
2	12.07	1.84	87
3	13.02	1.15	53
4	13.15	1.31	26
AGE			
Nursery School	10.90	1.93	40
Kindergarten	12.43	1.60	120
Second Grade	13.38	1.08	40
SEX			
Male	12.25	1.87	100
Female	12.38	1.67	100
SEX-OF-ACTOR			
Male	12.48	1.65	100
Female	12.15	1.87	100
TYPE OF FILM			
Prosocial	12.56	1.87	100
Aggressive	12.07	1.64	100

TABLE 19

MEANS AND (STANDARD DEVIATIONS) FOR SOCIAL COMPOSITE SCORES FOR THE PROSOCIAL AND AGGRESSIVE TYPE OF FILM BY COGNITIVE LEVEL, SEX OF SUBJECT AND TYPE OF FILM (A) AND TYPE OF FILM, SEX OF SUBJECT AND SEX-OF-ACTOR (B)

COGNITIVE LEVEL	A: PROSOCIAL / SEX OF SUBJECT	A: AGGRESSIVE
1	M 10.92 n=12 (2.02)	10.71 n=7 (2.75)
	F 11.00 n= 7 (1.63)	12.25 n=8 (1.28)
2	M 12.47 n=15 (2.39)	12.12 n=25 (1.45)
	F 12.40 n=25 (1.66)	11.36 n=22 (1.92)
3	M 13.06 n=16 (1.29)	12.55 n=11 (1.37)
	F 13.54 n=11 (1.04)	12.93 n=15 (0.80)
4	M 13.57 n= 7 (1.13)	12.43 n= 7 (1.27)
	F 14.00 n= 7 (1.15)	12.40 n= 5 (1.14)
TOTAL $\bar{X}$	12.56	12.07

SEX OF ACTOR	B: PROSOCIAL / SEX OF SUBJECT	B: AGGRESSIVE
MALE	M 13.00 n=25 (1.53)	12.12 n=25 (1.62)
	F 12.48 n=25 (1.78)	12.32 n=25 (1.65)
FEMALE	M 11.88 n=25 (2.32)	12.00 n=25 (1.80)
	F 12.88 n=25 (1.64)	11.84 n=25 (1.55)
	12.56	12.07

TABLE 20 A & B

PERFORMANCE ON TWO SEQUENCING QUESTIONS (QUESTIONS 10 AND 11)

BY AGE AND SEX MEASURED BY NUMBER OF CHILDREN RESPONDING

A
CAKE SEQUENCE

		MALES	FEMALES	TOTALS
Nursery	(1)	4	3	7
School	(2)	12	13	25
n=40	(3)	4	4	8
		b		
	(1)	14(4.7)	9(3.0)	23(7.7)
Kindergarten	(2)	32(10.7)	37(12.3)	69(23.0)
n=120	(3)	14(4.7)	14(4.7)	28(9.4)
Second	(1)	0	0	0
Grade	(2)	9	4	13
n=40	(3)	11	16	27
				200

B
SWINGS SEQUENCE

MALES	FEMALES	TOTALS
2	2	4
16	16	32
2	2	4
b		
13 (4.3)	8(2.7)	21 (7.0)
27 (9.0)	31(10.3)	58 (19.3)
20 (6.7)	21(7.0)	41 (13.7)
0	0	0
2	1	3
18	19	37
		200

a) 1=Same order as presented
2=Incorrect sequencing
3=Correct sequencing

b) Kindergarten scores corrected for number of Ss

TABLE 21

PERCENTAGE CORRECT PERFORMANCE ON TWO SEQUENCING TASKS BY AGE GROUP

	CAKE SEQUENCE	SWINGS SEQUENCE
Nursery School (n= 40)	20	10
Kindergarten (n=120)	23	34
Second Grade (n=40)	68	93

TABLE 22

CORRELATIONS BETWEEN RESPONSE TO SPECIFIC CONCEPTS (AND LABELS)

AND AGE, SEX, TYPE OF FILM, SEX-OF-ACTOR AND COGNITIVE LEVEL

QUESTION	AGE (IN MONTHS)	SEX	TYPE OF FILM	SEX--OF-ACTOR	COGNITIVE LEVEL	TOTAL MEAN
Q8 What will happen next?	0.46**	0.01	-0.04	-0.12	0.42**	2.4
Q9 The same with swing as cake	.14*	.01	.01	-0.08	0.14	2.1
Q16 Definition of sharing	0.24**	0.0	.09	0.00	0.31**	2.7

*$p < .05$
**$p < .001$

TABLE 23

MEANS AND (STANDARD DEVIATIONS) FOR RESPONSE TO SPECIFIC CONCEPTS AND LABELS IN EACH AGE GROUP AND COGNITIVE LEVEL

	AGE GROUP			COGNITIVE LEVEL			
QUESTION	NURSERY	KINDERGARTEN	SECOND	1	2	3	4
Q8 What will happen next?	1.83* (.90)	2.47 (.77)	2.93 (.35)	2.00 (.89)	2.26 (.87)	2.74 (.56)	2.92 (.39)
Q9 Acting the same way?	1.83 (.81)	2.13 (.83)	2.28 (.88)	2.06 (.81)	1.99 (.84)	2.28 (.82)	2.15 (.92)
Q16 Definition of sharing	2.58 (.68)	2.66 (.60)	3.00 (0.00)	2.50 (.71)	2.61 (.62)	2.87 (.44)	3.00 (0.00)

* Maximum total = 3

TABLE 24

CORRELATIONS BETWEEN RESPONSE TO VALUE QUESTIONS AND AGE, SEX, TYPE OF FILM, SEX-OF-ACTOR AND COGNITIVE LEVEL

QUESTION	AGE (IN MONTHS)	SEX	TYPE OF FILM	SEX OF ACTOR	COGNITIVE LEVEL
Q5A What happened next?	.22**	.11	.03	-.15*	.31**
Q7 How model felt?	.35**	.02	.10	.08	.31**
Q7A Why?	.31**	-.07	-.05	.10	.36**
Q7B How other model felt?	.20*	-.04	-.10	.00	.15*
Q7C Why?	.34**	-.06	-.20*	.06	.33**
Q8 What happen next?	.46**	.01	-.04	-.12	.42**

*$p < .05$
**$p < .001$

TABLE 25

ANOVA SUMMARY TABLE OF COMPOSITE CATEGORIES OF STRUCTURED INTERVIEW

MAIN EFFECTS	INFORMATION	COGNITIVE	MORAL	SOCIAL	TOTAL DEVELOPMENTAL
COGNITIVE LEVEL	F(3,141)= 3.87 *	F(3,141)= 8.88 **	F(3,141)= 3.08 *	F(3,141)= 2.57 *	F(3,141)= 5.78 **
AGE		F(2,141)=11.23 **	F(2,141)=15.17 **	F(2,141)=11.61 **	F(2,141)=22.02 **
SEX	F(1,141=12.82 **	F(1,141)= 4.66 *			F(1,141)= 4.18 *
TYPE OF FILM			F(1,141)= 5.01 *	F(1,141)= 5.11 *	F(1,141)= 7.43 *
SEX-OF-ACTOR		F(1,141)= 4.97 *			
INTERACTIONS:					
Age x Sex-of-Actor		F(2,141)= 3.08 *			F(2,141)= 3.02 *
Cognitive Level x Type of Film			F(3,141)= 3.25 *		F(3,141)= 6.17 **
Sex x Type of Film x Sex-of-Actor			F(1,141)= 7.15 *	F(1,141)= 5.92 *	F(1,141)= 6.68 *
Cognitive Level x Type of Film x Sex					F(3,141)= 3.22 *

*$p < .05$
**$p < .001$

TABLE 26 A,B & C

SUMMARY MEANS FOR THE (A) SOCIAL, (B) MORAL AND (C) DEVELOPMENTAL COMPOSITE SCORES FOR THE SIGNIFICANT INTERACTION: SEX BY TYPE OF FILM BY SEX-OF-ACTOR

A
SOCIAL

	MALE SUBJECTS		FEMALE SUBJECTS	
ACTOR	PROSOCIAL	AGGRESSIVE	PROSOCIAL	AGGRESSIVE
Male	13.00	12.12	12.48	12.32
Female	11.88	12.88	11.84	11.84

B
MORAL

	MALE SUBJECTS		FEMALE SUBJECTS	
ACTOR	PROSOCIAL	AGGRESSIVE	PROSOCIAL	AGGRESSIVE
Male	52.44	51.28	51.96	52.08
Female	51.88	51.92	52.96	51.60

C
TOTAL DEVELOPMENTAL SCORES

	MALE		FEMALE	
ACTOR	PROSOCIAL	AGGRESSIVE	PROSOCIAL	AGGRESSIVE
Male	29.20	27.24	29.04	28.44
Female	27.76	27.20	29.48	27.68

TABLE 27

MEANS AND (STANDARD DEVIATIONS) FOR THE OVERALL TOTAL SCORE

BY SEX-OF-ACTOR, SEX OF SUBJECT AND TYPE OF FILM

	PROSOCIAL		AGGRESSIVE	
SEX OF SUBJECT	MALE ACTOR	FEMALE ACTOR	MALE ACTOR	FEMALE ACTOR
MALE	8.03 (1.80)	7.48 (1.63)	7.75 (1.67)	7.43* (1.11)
FEMALE	8.15 (1.91)	8.43 (2.07)	7.76 (1.15)	7.29 (1.26)

* Significant Scheffé Test at $p < .05$

TABLE 28

MEANS AND (STANDARD DEVIATIONS) FOR EACH SUBTASK OF THE CONSERVATION AND IMAGERY TASKS

	MEANS	TOTAL MEANS
MATTER		2.45 (.84)
#1	2.56 (.89)	
#2	2.63 (.88)	
#3	2.80 (.85)	
NUMBER		2.55 (1.15)
#1	2.64 (1.12)	
#2	2.81 (1.21)	
IMAGERY		2.95 (1.04)
#1	2.77 (1.20)	
#2	3.10 (1.25)	
#3	3.62 (.86)	
OVERALL		2.36 (.91)

TABLE 29

NUMBER OF CHILDREN (AND PERCENTAGE) OF EACH AGE GROUP IN THE FOUR COGNITIVE LEVELS

	LEVEL 1 PREOPERATIONAL	LEVEL 2 LOW TRANSITIONAL	LEVEL 3 HIGH TRANSITIONAL	LEVEL 4 OPERATIONAL
Nursery School Group n= 40	19 (48)	18 (45)	3 (7)	0 (0)
Kindergarten Group n=120	14 (12)	65 (54)	35 (29)	6 (5)
Second Grade Group n= 40	1 (2)	4 (10)	15(38)	20 (50)
TOTAL	34 (17)	87 (44)	53 (26)	26 (13)

TABLE 30

MEANS FOR COGNITIVE AND DEVELOPMENTAL TOTALS IN THE STRUCTURED INTERVIEW FOR AGE AND SEX-OF-ACTOR

	COGNITIVE TOTAL		SEX-OF-ACTOR	DEVELOPMENTAL TOTAL	
	MALE	FEMALE		MALE	FEMALE
AGE					
Nursery	5.15	4.00		25.60	23.15
Kindergarten	5.30	5.30		28.37	28.58
Second	7.15	6.60		31.70	31.25

Appendix A
Structured Interview

conservation order ____-

Name_____ Class_____ Group_____
Birthdate_____ Date_____
Age_____

---

1) Which picture shows the place where the boys and girls were most of the time?
   a) picture with one swing available
   b) two swings available
   c) climbing cube _____

2) Who are the children in the show? Which picture shows them?
   a) male and female models
   b) 2 girls other than the models
   c) 1 male and 1 female other than the models _____

3) Which picture shows where the children were running to?
   a) male and female models running toward swing
   b) male and female models running toward the slide
   c) two other children running toward slide _____

4) What happened? Which picture shows it?
   a) male and female models fighting over swing
   b) male and female models fighting over slide
   c) the other children fighting over slide _____

5) Then what happened in the T.V. show we just saw?
   a) female model giving swing
   b) male model giving swing (either a,c & e
   c) female model grabbing swing or
   d) male model grabbing swing b,d, & e)
   e) both models standing next to swing _____

B) For prosocial group only

A) Why were the children fighting?_____

B) Why did the child (boy or girl) give up the swing? _____

6) Which picture looks silly to you?
   a) female model swinging
   b) male model swinging
   c) both models half on and half off the swing

_____

7) Which picture shows how the girl/boy in the show felt?
   a) female model happy
   b) female model unhappy
   c) male model happy
   d) male model unhappy
   e) other child, male with neutral expression
   f) other child, female with neutral expression

(either a,b,f or c,d,e)

_____

A) Why did the child feel that way?_____

B) How did the <u>other</u> child (model) feel?_____

_____

C) What made the other child feel that way?_____

_____

8) Which picture shows what <u>will</u> happen <u>next?</u> (show child swinging second)
   a) male model swinging
   b) female model swinging
   c) male model walking away from swing
   d) female model walking away from swing
   e) two models fighting

(either a,c, e or b,d,e)

_____

9) Which picture shows the children acting the same way with the cake as they did in the show with the swing?
   a) female model sharing cake
   b) male model sharing cake
   c) female model not sharing cake
   d) male model not sharing cake
   e) both models doing nothing with cake

(a,c,e or b,d,e)

10) Remember we just saw the show with the 2 kids and a swing? Make these pictures tell the same kind of story about the cake as we just saw about the swing.
   a) both models fighting over cake
   b) female model sharing cake
   c) male model sharing cake
   d) female model grabbing cake
   e) male model grabbing cake
   f) both models doing nothing with cake. _____

(a,b,f
a,c,f
a,d,f
or a,e,f)

11) Make these pictures to tell the story of the show we just saw.
   a) male and female models running toward swing
   b) both models fighting at the swing
   c) female model grabbing swing
   d) male model grabbing swing
   e) female model offering swing
   f) male model offering swing
   g) male model swinging
   h) female model swinging

(either: a,b,c,h / a,b,d,g / a,b,e,g / a,b,f,h) _____

12) Which child did you like best?
   a) female model
   b) male model
   c) other male child
   d) other female child

_____

A) Why did you like him/her best? _____

_____

13) Which person is a good child?
   a) male model
   b) female model
   c) other female
   d) other male

_____

A) Why? _____

_____

14) Which picture shows the children being bad -the most bad?
   a) grabbing swing
   b) pushing down
   c) standing doing nothing

_____

A) Is it ever OK to hit?_____

When?_____

B) Is it ever OK to grab?_____

When?_____

C) Is it ever OK to not share?_____

When?_____

D) Can you think of a time when it is OK not to share?___

_____

15) Which would you do if you were the boy/girl on the TV show?

a) male model grabbing swing
b) female model grabbing swing
c) male model giving swing
d) female model giving swing
e) female model walking away
f) male model walking away

(a,c,f or b,d,f same sex as child tested) _____

16) What is it called when one child swings now and then the other child swings later?

a) playing
b) sharing
c) helping

(give opportunity for open answer before presenting choices) _____

17) What are your favorite T.V. programs?

_____

_____

ORDER

_____ Conservation of Quantity of Matter - two balls of different colored clay

"You see these two balls. I want there to be the same amount of clay in each ball. Let's pretend they are candy. Make it so that if we each ate one of them, we would both have the same amount of candy. Make sure that there's exactly the same amount of candy in each (no more, no less)."

(mold one ball into sausage shape)

"Now, is there the same amount to eat in the ball and in the sausage, or is there more in the ball or, more in the sausage?"

IF CHILD SAYS THE SAME:
"Are you sure that they are the same?" Yes No
"How do you know that they are the same?" _____

"Look at this piece, it's very long. Don't you think that there's more to eat here than in the ball?" Yes No

IF CHILD SAYS DIFFERENT:
"How do you know that they are not the same?" _____

"But this one is fatter/thinner than the other one. Don't you think that they are the same? Yes No

"If I make this sausage one back into a ball, will there be the same to eat or not?" Yes No

(mold sausage one back into a ball)

"Now, are they the same?" Yes No

(mold one ball into a pancake)

"Now, is there the same amount to eat in the ball and in the pancake, or is there more in the ball or more in the pancake?" _____

IF CHILD SAYS THE SAME:
"Are you sure that they are the same?" Yes No
"How do you know that they are the same?" _____

"Look at this piece. It's very flat/fat. Don't you think that there's more to eat here than in the ball?" Yes No

IF CHILD SAYS DIFFERENT:
"How do you know that they are not the same?" _____

ORDER

"But this one is fatter/flatter than the pancake. Don't you think that they are the same?" Yes No

"If I make this pancake back into a ball, will there be the same to eat or not?" Same No

(mold pancake back into ball)

"Now, are they the same?" Yes No

(break up ball into 9 bits)

"Now, is there the same amount to eat in the ball and in these bits, or is there more in the ball or more in all these pieces?" _____

IF CHILD SAYS THE SAME:
"Are you sure that they are the same?" Yes No

"How do you know that they are the same?" _____

"Look at these pieces. There are a lot of them. Don't you think that there's more to eat here than in the ball? Yes No

IF CHILD SAYS DIFFERENT:
"How do you know that they are not the same?" _____

"But these pieces are very small. Don't you think that all together they are the same as the ball? Yes No

"If I put them all together in a ball, will they be the same amount to eat as this ball?" Yes No

(put pieces together -mold into ball)

"Now are they the same amount to eat?" Yes No

Elementary Number Conservation- twenty checkers of two colors

"Put out as many of your red checkers as I have, ok?" (7 out) # placed

"Be sure there are just the same amount, no more and no less." (Push one row closer together)

ORDER

"Now, are there as many red checkers as there are black? Or are there more in this group or more in this group?" _____

IF CHILD SAYS THE SAME:
"Are you sure that they are the same?" Yes No

"How do you know that they are the same?" _____

"Look how long this line is. Aren't there more checkers here?" Yes No

IF THE CHILD SAYS DIFFERENT:
"How do you know that they are not the same?" _____

"But this line has checkers that are all pushed together. Don't you think that they are the same in both groups?" Yes No

"Count the red checkers." _____

"How many black checkers are there? Just tell me by guessing." _____

"How do you know?" _____

"Now, are there the same number of red checkers as black?" Yes No

(take 7 black checkers and arrange in a circle)

"Now, put out as many of your red checkers as I have, ok? Be sure there are the same amount - no more and no less." # placed _____

(help child place exact number)
(push one group closer together)

"Now, are there as many red checkers as there are black? Or are there more in this group or more in this group?" _____

IF CHILD SAYS THE SAME:
"Are you sure that they are the same?" Yes No

"How do you know that they are the same?" _____

ORDER

"Look how much bigger this circle looks. Aren't there more checkers here than there?" Yes No

IF CHILD SAYS DIFFERENT:
"How do you know that they are not the same?"

"But this circle has checkers that are pushed together. Don't you think that they are the same in both circles?" Yes No

"Count the red checkers." #red

"Guess how many black checkers there are." #black

"How do you know?"

"Now, are there the same number of red checkers as black?" Yes No

Imagery Task - Moving Rod

(show hand in 12 o'clock position, then turn face down)

"Here is a thing that looks like a clock. I want you to show me with this pencil and paper how it would move.

"First draw the hand at the beginning."

"Then draw it after it has been moving for a while."

"And now, draw the hand as it would finish going around."

IF CHILD CAN'T ANSWER:
"Maybe it would help if I showed you how it moves."

"Now can you draw what you saw before the hand moved?" Yes No

"Now show me what it looked like after it had been moving for a while."

"Now, at the end, where would the hand be?"

IF CHILD STILL CAN'T ANSWER:
"Here are some pictures that show how the hand moves. Which one shows how the hand was in the beginning before

ORDER	it moved at all?"	_____
	"Which picture shows how it was in the middle of moving?"	_____
	"Which picture shows the hand near or at the end?"	_____

APPENDIX B
Cognitive Scoring

In order to insure that the child was truly operational and was able to conserve, it was necessary to rule out the possibility of correct solutions based on lower order strategies or perceptual mechanisms. Children's justifications of their responses can reveal the level at which they are dealing with the problems and therefore, it was necessary to set the criteria high in order to classify subjects as "conservers". In the case of these conservation tasks presented, three justifications are possible: 1) identity, 2) reversibility by cancellation; and 3) compensation. However, recognition of only one of these does not indicate a total coordination of the operative schemes.

During the early stages the children focus on either the action carried out (i.e. pushing of clay) or the resulting appearance of the material and neglect the coordination of the action with the final appearance of the material. Even justifications such as "it's always the same liquid", or "Nothing has been added", or "if you pour it back in the glass it will be the same", that lead to the "correct" answer, do not include an operable system that coordinates the actions.

Thus the criteria used for judging a child for each part of each conservation task was as follows:

1) Nonconservation or preoperational (score 1) All incorrect responses.

2) Low intermediate or transitional (score 2) If the correct response is given for one of the three questions, or

if the child is at quotity (where the child counts number of checkers as equal but the child still claims the groups are different) or if the child repeatedly changes his mind.

3) High intermediate or transitional (score 3) If the correct response is given for two of the three questions within each group.

4) Conservation or operational (score 4) If the child can give the correct answer to all the questions, not change his mind and can give more than one of the three possible justifications (identity, reversibility by inversion or compensation).

The child's total score for each type of conservation was the mean of the parts within each task.

In a sense, the kinetic reproductive imagery task that was given is also a conservation task as the child must hold constant the focus on the center and ignore the spontaneous tendency to neglect the starting and intermediary points and focus on the finishing point. Also, some of the same operations are necessary to properly complete this task (i.e., reversibility) so it serves as a further indication of the cognitive level of the child. Anticipatory images that involve the prior imaging of a future process do not develop until the level of concrete operations, unlike the reproductive images that are found at the preoperational level. Here again, the correct answer may only be a reproductive image or not indicative of the operational ability of the child. It is

necessary to explore the transition states that indicate the correct anticipation of the process, not just the anticipation of the product, to classify the child as operational. Though Piaget & Inhelder (1971) state the belief that the reason that children under seven do not give adequate responses is because of the inadequacy of visualization by means of mental images and not the difficulty of drawing, this research included a forced choice situation, from prepared drawings.

The criteria used for rating the child in the three parts of the imagery task are as follows (Piaget, 1971):

1) preoperational (score 1) if the child does not respond at all, or responds in a random fashion to all three presentations.

2) low transitional (score 2) if the child can respond correctly to one of the three questions by drawing or choosing the beginning, middle or end point of the position of the rod, disregarding length and direction.

3) high transitional (score 3) if the child can respond to two out of three questions in the section given.

4) operational (score 4) if the child can respond correctly to all questions by indicating the beginning, end and transitional points of the changing position of the rod by drawing or choosing.

The child's total score for each type of the imagery task was the mean score of the three questions asked, at each level of difficulty.

The summary of the evaluation of the individual tasks appears in the following table for each child:

	Levels*				
task	preoperational (1)	low transitional (2)	high transitional (3)	operational (4)	Mean
number conservation 2 tasks					
conservation of matter 3 tasks					
imagery task 3 tasks					

*ratings of 1-4 possible

Thus, each child received a summary score for each kind of task, and for the total cognitive level. Analyses comparing these scores with the other factors being looked at in this research included both the summary scores, which is a mean of the task means, as well as the direct total on all tasks.

INSTRUCTIONS FOR CATEGORIZING SUBJECT RESPONSES IN UNSTRUCTURED INTERVIEW

The child's complete account of what happened in the videotape is to be considered. Read the response in its entirety and evaluate it as to the presence or absence of each of the categories below. For each category represented in the response, place a one on the appropriate line of the categorization sheet, if a response appears in that category and a zero if there is no response. The last tally is the total number of phrases that the child uttered. The next to the last tally is the number of irrelevant or incomplete phrases uttered. Any linguistic element that contains an idea or object which in and of itself is codable, and which if it appeared alone could be coded, is to be tallied. The categories fall within three main headings - reporting and describing, inferring and interpreting, and explaining. A given response may consist entirely of statements that report and describe; it may contain statements that report and describe and statements that infer and interpret; or it may include statements that report-describe, statements that infer-interpret, and statements that explain.

REPORTING AND DESCRIBING

The child may report on anything that was observed in the film, or report observations of the situation or the overt action, observations of the verbal communication, or observations of expressive behavior. Or, the child may

describe feelings that are obviously presented in the dialogue, action, or expressive behavior. Such a statement would then be credited within the category of reporting-describing, and a tally placed on the line of the appropriate sub-heading.

1) Identification of place - any empirical statement about the setting- i.e., park, swings or slide as a place. Not acceptable-objects mentioned alone.

2) Identification of characters - both children must be mentioned - i.e., boy and girl, kids, children. Not acceptable - people, this girl.

3) Identification of actions - any empirical statement about the behavior or overt action of any of the actors specifically regarding the relevant portion of the videotape - i.e., running toward swings, fighting, playing, swinging.

4) Identification of feelings - any statement that identifies or names a feeling of the actors, either pleasant-positive or unpleasant-negative - i.e., boy was unhappy, angry, nice to her so she felt good.

5) Verbal labels of the main concept regarding situation - naming of the concept of the solution - i.e., sharing, taking turns, cooperation.

6) Total Reporting Score is the total for Questions 1-5.

EXPLAINING

The child may make a statement trying to account for the overt action, verbal communication or why the problem occurred. Any phrase which is trying to connect or expand on a situation from the video tape is considered an explanation.

7) Statements regarding the models' intentions - this would include any statement regarding why or what the plan will be; i.e., they will share, they took turns, he will go first, she will give up the swing.

8) A statement of the problem - includes reasons for the fighting - i.e., they were fighting about the swing, both want to swing.

9) Concept of space and how it relates - any notion indicating that two people can't occupy the same space - i.e., both kids can't swing at the same time, there is just one swing free.

10) Realistic explanation of why the problem occurred- one or more of the possible reasons why the fight about the swing occurred; i.e. both children arrived there at the same time, kids like to be first.

11) Total Explaining Score is the total for Questions 7 - 10.

INFERENCE

12) Statement that anticipates future events - any projection into what will happen - i.e., other kid will get a turn, girl (boy) goes next. Not acceptable - they took turns.

13) Identification of consequences of actions - more general statement regarding future events not shown in the video tape but specific to the relevant portion - i.e., the kids found a good solution, everyone will get a turn.

14) Statement that attributes causality - any relational concept having to do with the relevant material - i.e., he gave up the swing so that she could go first, the boy was nice because he let her go first.

15) Statement that expresses feelings about the models- any statement by the subject that refers to expressive behavior - i.e., I would feel angry if someone did that to me, I bet he feels good about sharing because I would feel that way.

16) Statement that shows ability to extend the concept of sharing - any statements that go beyond the dialogue or simple explanation of sharing. This includes abstract concepts of evaluation of sharing and any further applications; i.e., it's really nice to share, I share my toys with my sister, sharing means taking turns and everyone gets a chance.

17) Ability to follow story line in a logical sequence - child has to include at least three of the six steps describing the video tape; - 1. children's presence in a park or at the swing where the swing is free, 2. both children want to swing first, 3. only one child can swing at the same time, 4. there are a number of solutions, 5. one solution is chosen (sharing, grabbing), 6. what will happen to the other child, i.e., a. this boy and girl were fighting because they couldn't

swing at the same time. They they decided to share. b. Kids in the playground fighting over a swing. The girl said ' take turns' so they shared.

18) Indication of identification with the model - any statement that includes the subject and one of the models - i.e., I like the girl/boy, I'd help the girl, he is like me and my sister.

19) Total Inference Score is the total for Questions 12-18.

IRRELEVANT OR INCOMPLETE

The child may make statements that are irrelevant, incomplete or indicate an error in reporting. These are all grouped together in one score for the purposes of this study. Irrelevant phrases include those that pertain to the first part of the tape as well as phrases that do not pertain to anything observed. Also included in this category are any half statements that are unscorable.

TOTAL NUMBER OF STATEMENTS

This is the total number of linguistic elements (usually clauses) in the child's total answer. This includes the three rated categories, reporting, explaining and inference, plus the number of irrelevant and non-rateable statements. This also includes words or phrases repeated.

APPENDIX D

QUESTIONS USED IN MAKING UP COMPOSITE SCORES

1) Moral total

   Questions: 5,7,8,13,13a,14,14a, 14a',14b,14b',14C,14c'

2) Social total

   Questions: 3,4,5a,5b,7b,15,16

3) Information total

   Questions: 1,2

4) Cognitive total

   Questions: 6,9,10,11

5) Intention total

   Questions: 3,5,7a

6) Consequence total

   Questions: 4,7,8

7) Reporting total

   Questions: 1,2,3,4,5,16

8) Explaining total

   Questions: 5a,5b,9,13,13a

9) Inferring total

   Questions: 6,7,7a,7b,7c,8

10) Developmental total

    Questions: reporting total + explaining total + inferring total

11) Overall total

    Developmental total + total number of relevant responses (unstructured interview) corrected"

APPENDIX E1

SUMMARY TABLE FOR ANALYSIS OF VARIANCE DEVELOPMENTAL TOTAL SCORES

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F
Main Effects	1298.880	8	162.360	17.879
Cognitive Level	157.584	3	52.528	5.784**
Age	399.992	2	199.961	22.019**
Sex	37.919	1	37.919	4.176*
Type of Film	67.506	1	67.506	7.434*
	11.525	1	11.525	1.269
2-Way Interactions	426.216	23	18.531	2.041*
Cognitive Level X Age	55.048	5	11.010	1.212
Cognitive Level X Sex	30.025	3	10.008	1.102
Cognitive Level X Type-of-Film	168.127	3	56.042	6.171**
Cognitive Level X Sex-of-Actor	18.781	3	6.260	0.689
Age X Sex	43.600	2	21.800	2.401
Age X Type-of-Film	33.500	2	16.750	1.844
Age X Sex-of-Actor	54.911	2	27.455	3.023*
Sex X Type-of-Film	3.265	1	3.265	0.360
Sex X Sex-of-Actor	3.301	1	3.301	0.363
Type of Film x Sex-of-Actor	0.140	1	0.140	0.015
EXPLAINED	2049.538	58	35.337	3.891
RESIDUAL	1280.436	141	9.061	
TOTAL	3329.974	199	16.734	

* $p < .05$
** $p < .001$

APPENDIX E2

ANCOVA OF DEVELOPMENTAL TOTAL WITH COGNITIVE LEVEL PARTIALLED OUT

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F
Covariates	992.625	1	992.625	95.685
COGTOT	992.625	1	992.625	95.685
Main Effects	344.779	5	68.956	6.647
AGEGP	240.196	2	120.098	11.577**
Sex	21.793	1	21.793	2.101
PROAGG	79.880	1	79.880	7.700*
Sex Actor	7.364	1	7.364	0.710
2-Way Interactions	83.782	9	9.309	0.897
AGEGP X Sex	13.065	2	6.533	0.630
AGEGP X PROAGG	31.379	2	15.690	1.512
AGEGP X SexActor	37.882	2	18.941	1.826
Sex X PROAGG	0.040	1	0.040	0.004
Sex X SexActor	1.618	1	1.618	0.156
PROAGG X SexActor	0.073	1	0.073	0.007
EXPLAINED	1421.187	15	94.746	9.133
RESIDUAL	1908.787	184	10.374	
TOTAL	3329.974	199	16.734	

* $p < .05$
** $p < .001$

APPENDIX E3

ANCOVA OF DEVELOPMENTAL TOTAL WITH AGE PARTIALLED OUT

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F
Covariates	974.026	1	974.026	92.213
AGEMO	974.026	1	974.026	92.213
Main Effects	271.625	6	45.271	4.286
Cognitive Level	151.353	3	50.451	4.776*
Sex	47.571	1	47.571	4.504*
PROAGG	64.221	1	64.221	6.080*
SexActor	6.606	1	6.606	0.625
2-Way Interactions	183.016	12	15.251	1.444
Cognitive Level x Sex	11.033	3	3.678	0.348
Cognitive Level x PROAGG	153.155	3	51.052	4.833*
Cognitive Level x SexActor	7.726	3	2.575	0.244
Sex x PROAGG	1.312	1	1.312	0.124
Sex x SexActor	1.974	1	1.974	0.187
PROAGG x SexActor	0.048	1	0.048	0.005
EXPLAINED	1428.667	19	75.193	7.119
RESIDUAL	1901.306	180	10.563	
TOTAL	3329.974	199	16.734	

* $p < .05$
** $p < .001$

APPENDIX E4

SUMMARY OF THE ANOVA AND ANCOVA RESULTS FOR THE INFORMATION TOTAL

MAIN EFFECT	5-WAY ANOVA	ANCOVA WITH AGE PARTIALLED OUT	ANCOVA WITH COGNITIVE LEVEL PARTIALLED OUT
COGNITIVE LEVEL	$F(3,141)=3.87$*	$F(3,180)=3.32$*	
AGE			$F(3,184)=3.32$*
TYPE OF FILM			
SEX	$F(1,141)=12.82$**	$F(1,180)=11.83$**	$F(1,184)=9.68$*
SEX-OF-ACTOR			

*$p < .05$
**$p < .001$

APPENDIX E5

ANOVA AND ANCOVA SUMMARY TABLE FOR THREE STRUCTURED INTERVIEW CATEGORIES

BY COGNITIVE LEVEL, AGE, SEX, TYPE-OF-FILM AND SEX-OF-ACTOR

MAIN EFFECTS		5-WAY ANOVA	ANCOVA WITH AGE PARTIALLED OUT	ANCOVA WITH COGNITIVE LEVEL PARTIALLED OUT
COGNITIVE LEVEL	Reporting			
	Explaining	$F(2,141)=2.89^{*}$	$F(3,180)=2.53^{*}$	
	Inferring	$F(3,141)=6.35^{**}$	$F(3,180)=5.08^{*}$	
AGE (in months)	Rep	$F(2,141)=4.36^{*}$		
	Ex	$F(2,141)=15.44^{**}$		$F(2,184)=9.43^{**}$
	In	$F(2,141)=14.06^{**}$		$F(2,184)=7.33^{**}$
SEX	Rep	$F(1,141)=12.77^{**}$	$F(1,180)=12.04^{**}$	$F(1,184)=8.58^{*}$
	Ex			
	In			
TYPE-OF-FILM	Rep			
	Ex	$F(1,141)=25.62^{**}$	$F(1,180)=2J.67^{**}$	$F(1,184)=25.82^{**}$
	In			
SEX-OF-ACTOR	Rep			
	Ex			
	In			
INTERACTIONS				
Reporting Cognitive Level X Sex		$F(3,141)=2.71^{*}$		
Cognitive Level X Type-of-Film		$F(3,141)=5.21^{*}$	$F(3,180)=5.44^{**}$	
Age X Sex		$F(2,141)=2.61^{*}$		
Cognitive Level X Age X Type-of-Film		$F(4,141)=3.13^{*}$		
Cognitive Level X Sex X Type-of-Film		$F(3,141)=4.43^{*}$		
Sex X Sex-of-Actor X Type of Film		$F(1,141)=6.54^{*}$		

Continued.....

APPENDIX E5 Con't.

MAIN EFFECTS	5-WAY ANOVA	ANCOVA WITH AGE PARTIALLED OUT	ANCOVA WITH COGNITIVE LEVEL PARTIALLED OUT
EXPLAINING			
Cognitive Level X Age	$F(5,141)=2.26$*		
Cognitive Level X Sex-of-Actor	$F(3,141)=2.58$*		
Type-of-Film X Sex-of-Actor	$F(1.141)=3.72$*	$F(1,180)=3.93$*	$F(1,184)=4.21$*
INFERENCE			
Cognitive Level X Age X Sex-of-Actor	$F(4,141)=2.80$*		
Cognitive Level X Sex X Sex-of-Actor	$F(3,141)=3.26$*		
Age X Sex X Sex-of-Actor	$F(2,141)=5.10$*		

*$p < .05$
**$p < .001$

APPENDIX E6

ANOVA AND ANCOVA SUMMARY TABLE FOR THE MORAL TOTAL

MAIN EFFECT	5-WAY ANOVA	ANCOVA WITH AGE PARTIALLED OUT	ANCOVA WITH COGNITIVE TOTAL PARTIALLED OUT
COGNITIVE LEVEL	$F(3,141)=3.08$*	$F(3,180)=2.79$*	
AGE GROUP	$F(2,141)=15.17$**		$F(2,184)=8.58$**
TYPE OF FILM	$F(1,141)=5.01$*	$F(1,180)=4.55$*	$F(1,184)=5.51$*
SEX			
SEX-OF-ACTOR			
INTERACTIONS			
COGNITIVE LEVEL x TYPE OF FILM	$F(3,141)=3.25$*	$F(3,180)=2.98$*	
SEX x TYPE OF FILM x SEX-OF-ACTOR	$F(1,141)=7.15$*		

*$p < .05$
**$p < .001$

APPENDIX E7

ANOVA AND ANCOVA SUMMARY TABLE FOR THE INTENTION AND CONSEQUENCE DATA

MAIN EFFECTS: INTENTION DATA	5-WAY ANOVA	ANCOVA WITH AGE PARTIALLED OUT	ANCOVA WITH COGNITIVE LEVEL PARTIALLED OUT
COGNITIVE LEVEL			
AGE GROUP			
TYPE OF FILM			
SEX			
SEX-OF-ACTOR			
INTERACTIONS:			
COGNITIVE LEVEL x TYPE-OF-FILM	$F(3,141)=3.22^{*}$	$F(3,180)=5.14^{*}$	
CONSEQUENCE DATA			
COGNITIVE LEVEL			
AGE GROUP	$F(2,141)=16.08^{**}$		$F(2,184)=10.94^{**}$
TYPE OF FILM			
SEX			
SEX-OF-ACTOR			
INTERACTIONS:			
AGE x TYPE OF FILM	$F(2,141)=5.74^{*}$		$F(2,184)=4.36^{*}$

$^{*}p < .05$ $^{**}p < .001$

APPENDIX E8

SUMMARY OF ANOVA AND ANCOVA RESULTS FOR THE SOCIAL TOTAL

MAIN EFFECTS	5-WAY ANOVA	ANCOVA WITH AGE PARTIALLED OUT	ANCOVA WITH COGNITIVE LEVEL PARTIALLED OUT
COGNITIVE LEVEL	$F(3,141)=2.57$ [b]		
AGE GROUP	$F(2,141)=11.61$**		$F(2,184)=9.18$**
TYPE OF FILM	$F(1,141)=5.11$*	$F(1,180)=4.73$*	$F(1,184)=5.01$*
SEX		$F(3,180)=2.62$*	
SEX-OF-ACTOR			
INTERACTIONS:			
COGNITIVE LEVEL X TYPE OF FILM	$F(3,141)=2.44$ [a]		
SEX x COGNITIVE LEVEL x TYPE OF FILM	$F(3,141)=2.57$ [b]		
SEX x SEX-OF-ACTOR- x TYPE OF FILM	$F(1,141)=5.92$*		

*$p < .05$
**$p < .001$
a) $p = .065$
b) $p = .056$

APPENDIX E9

5-WAY ANOVA OF OVERALL TOTAL BY COGNITIVE LEVEL, AGE, SEX, TYPE OF FILM AND SEX-OF-ACTOR

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F
Main Effects	172.003	8	21.500	12.942
Cognitive Level	18.732	3	6.244	3.759*
AGEGP	50.238	2	25.119	15.120**
Sex	3.250	1	3.250	1.956
Type of Film	9.573	1	9.573	5.763*
Sex-of-Actor	3.331	1	3.331	2.005
2-Way Interactions	68.226	23	2.966	1.786
Cognitive Level × AGEGP	11.478	5	2.296	1.382
Cognitive Level × Sex	3.576	3	1.192	0.718
Cognitive Level × PROAGG	25.227	3	8.409	5.062*
Cognitive Level × SexActor	0.691	3	0.230	0.139
AGEGP × Sex	0.446	2	0.223	0.134
AGEGP × PROAGG	1.979	2	0.989	0.596
AGEGP × SexActor	3.304	2	1.652	0.994
Sex × PROAGG	7.092	1	7.092	4.269*
Sex × SexActor	1.331	1	1.331	0.801
PROAGG × SexActor	1.176	1	1.176	0.708
EXPLAINED	291.723	58	5.030	3.028
RESIDUAL	234.238	141	1.661	
TOTAL	525.961	199	2.643	

*$p < .05$
**$p < .001$

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