

DEVELOPMENTAL CHANGES IN HOW CHILDREN UNDERSTAND TELEVISION¹

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The purpose of this research was to study how children understand scenes of social interaction that are portrayed on television and how their understanding changes as a function of age and cognitive development. Measures were obtained from children's spontaneous reconstructions of television scenes and also from their responses to a series of specific questions regarding the thoughts and feelings of particular television characters. It was found that younger and less cognitively mature viewers were more likely to structure televised social content in terms of overt descriptive features, action, and literal repetition of dialogue. Older children and adolescents were more likely to consider the inferential aspects of social interaction and to offer interpretations based on people's psychological qualities.

One of the presumed benefits of television is to broaden and enrich the experiences of children. Through television, children are exposed to events and places that they could never hope to personally experience in their own lifetimes. They view people who are very different from themselves and witness their reactions to a diverse and novel series of social encounters. Thus, television serves as a strong socializing agent for children (Friedrich and Stein, 1973). By seeing many different types of people reacting to many different types of social encounters, children acquire the beliefs, values, attitudes and social behaviors appropriate for particular persons (including the self) in particular social contexts. In this way, television provides children with models of social behavior.

Most of the studies of the socializing effects of television have focused on children's social and antisocial behavior. These studies found significant relationships between children's television viewing and their social behavior (Bandura & Walters, 1963; Friedrich and Stein, 1973; Liebert, et al., 1973; O'Connor, 1972).

The focus of the present study, however, was not on children's social behavior but the development of social concepts that could be expected to mediate their social behavior. We were interested in how children understand scenes of social interaction that are depicted on television and how their level of understanding changes as a function of their ages and stages of cognitive development. We were particularly in

¹Parts of this research were supported by a research grant to the senior author by the Research Foundation of the City University of New York.

interested children's ability to go beyond the appearance of social interaction and to make inferences regarding the feelings, thoughts, needs, and intentions of television characters and to interpret the dynamics of interpersonal relationships in terms of these covert, psychologically oriented, person attributes.

How children construct knowledge of people and social relations has become a topic of increasing interest among cognitive-development psychologists influenced by Piaget's model of development. According to Piaget (1963, 1965), social understanding among very young children is limited to the overt descriptive features of individuals. They fail to recognize that people's behavior is motivated by underlying perspectives which give meaning and direction to social exchanges. Failing to recognize that people can have perspectives different from their own, young children respond to everyone as if they shared their own intuitively derived point of view. With development there is a gradual and progressive shift from a focus on the immediately observable features of others to the inner psychological experiences of people and the social dialectics of human interaction. During middle childhood, they begin to understand what constitutes a perspective and how an individual's feelings, thoughts, needs, and intentions are constructed in interaction with others and how these inner states change as a function of social interaction. For example, at about eight or nine years children begin to understand that an individual can be thinking about another individual thinking about him (Miller et al., 1970).

During adolescence, the ability to infer psychological attributes in others and to use such information to interpret interpersonal relations continues to improve. Thus, there is a gradual progression with development in children's ability to shift from overt, concrete features to increasingly covert abstract features of social interaction. It has also been shown that as children become increasingly more capable of inferring the psychological states of others, they are able to use this knowledge to monitor their own interpersonal behavior. They become more adept at accommodating their behavior to the feelings, thoughts, needs and intentions of others. Thus, their social interactions become more and more reciprocal and mutually interactive (see Chandler, 1977).

According to Piaget (1963), these developmental shifts in children's social understanding are linked to a series of increasingly more complex forms of logical reasoning that represent underlying structures of cognitive development. Children's ability to reason logically at different stages of development sets limits on their capacity to understand others and social relations (Selman & Byrne, 1974). In the present study, Piaget's theory of cognitive development was used as a developmental framework to study changes in children's ability to analyze scenes of social interaction portrayed on television. Children were administered a series of tests to determine at which of three sequential stages of cognitive development they were functioning: preoperational, concrete operational and formal operational. Thinking at the preoperational stage is dominated by perceptual features of the environment. Some time between five and seven years most children advance from the preoperational to the concrete operational stage of cognition. They are now able to overcome the immediacy of their perception and to reason logically. However, at this stage children can only reason logically about events that they actually experience, hence the term "concrete". Between 11 and 12 years most children advance to the stage of formal operations. At this stage children and adolescents are able to logically reason not only about events that they actually experience but also about events that are purely abstract, that have no concrete existence. At the formal operational stage, children are able to logically deduce propositions based on abstract premises (Piaget, 1963).

It was expected, in the present study, that viewers at the preoperational stage of thinking would focus primarily on the immediately observable aspects of the characters and social interactions they view on television. Consistent with Piaget's model, they would describe television events primarily in terms of the physical aspects of the

setting and repetition of dialogue. Preoperational viewers' understanding of characters' covert psychological processes would be limited to the simple recognition that they have thoughts and feelings. Viewers at the concrete operational stage would be expected to place a greater emphasis on the nature of the social relations between characters, such as their understanding of mutual reciprocities when one character has thoughts and feelings about another character and behaves accordingly.

Viewers at the formal operational stage would be expected to understand social interaction as a dynamic process based on the covert psychological aspects of the television characters. Thus, there will be a shift with cognitive development from understanding televised social interaction in terms of overt descriptive features of individual characters to the covert psychological properties that determine the quality of their mutual interaction.

These hypothesis regarding changes in children's comprehension of television are generally consistent with previous findings regarding the development of person perception and social cognition based on children's responses to pictures of social interaction, film, and verbally presented social situations. Shantz (1965) and Chandler (1977) have reviewed studies in these areas and have reported that as children cognitively develop they become increasingly able to make inferences about the covert feelings, thoughts, and intentions of others and to understand social relationships in terms of the coordination of mutual perspectives (Barenboim, 1978; Flapan, 1968; Secourd & Peevers, 1974). Studies of children's social reasoning in which television has been the focal stimulus have been limited largely to children's recognition of motives underlying televised acts of aggression (Collins, 1973; Collins, Berndt, & Hess, 1974).

In choosing a television segment that would provide a rich enough depiction of social interaction to capture the hypothesized developmental changes, we were guided by several criteria. The segments could not exceed four minutes so as not to unduly tax the memories or attention spans of the youngest viewers. Within this brief time segment, scenes of social interaction had to have a natural beginning, middle, and resolution. Each episode had to make sense in terms of why the characters were interacting with one another without prior knowledge of the characters, dramatic plots, or settings. Furthermore, it would maximize the variability in the findings if viewers saw characters who were engaging in some sort of deception with one another. Recognition of interpersonal deception would require a viewer to distinguish between contradictory overt and covert social messages. Finally, it was important to choose television segments that provided a good representation of the kinds of social interaction that are typically portrayed on television. In order to meet these criteria, two segments from daytime television serials were chosen as stimuli. Children were asked both to freely describe what they had seen in each television segment and to answer a series of specific questions about the characters' thoughts and feelings at different times in the story.

The first segment (Story A) began with Mrs. Houghton, a woman in her mid-thirties, frantically packing a suitcase while repeating out loud to herself that "no one is going to take my child away . . ." She picks up her suitcase and walks into an adjacent room near a front entrance when she hears a knock at the door. Upon opening the door she is surprised to see Ellen, a teenager, who explains she has come to baby-sit. Mrs Houghton tells Ellen that she is not needed since the baby is staying at her grandmother's house but insists on paying Ellen what she would have earned. Mrs Houghton still appears very agitated and, as she is getting the money to give to Ellen, Ellen notices the suitcase and asks Mrs Houghton if she is going on a trip. Mrs Houghton pauses, looks at the suitcase then back at Ellen, and says in a high-pitched unnatural voice that she is only going to the laundry. The two women leave the room together.

In this story Mrs Houghton is deceiving Ellen by trying to conceal her fears for her child and by pretending that everything is as usual. It can be reasonably inferred that Mrs Houghton is lying to Ellen about the child's actual whereabouts, the reason for the suitcase, and her true destination.

The other television episode (Story B) involves two teenage girls, Greta and Kim, each simultaneously trying to deceive the other. The interaction takes place in Greta's bedroom. Kim is questioning Greta about her relationship with Billy, Greta's boyfriend and father of her new baby. Greta appears very uncomfortable about being questioned about the relationship and unenthusiastically keeps insisting that everything between her and Billy is wonderful. Kim picks up Greta's insincerity but, rather than directly confront her with it, Kim appears to accept Greta's statements on the surface while prying deeper and deeper into the relationship. Greta appears increasingly more anxious about answering Kim's questions but tries to conceal this until she slips in one of her answers and reveals that Billy did not spend last night with her. At this point, Kim confronts Greta with her assertions that everything is wonderful and Greta tries to recoup by offering a lame excuse why Billy was not with her.

Story A was two minutes long and Story B was four minutes. Both were video-taped without interruption or editing at the time they were commercially broadcast.

PROCEDURE

SUBJECTS

Eighty subjects participated in the study, twenty each in four different age groups: 5-6 years, 7-10 years, 11-14 years and adults older than 18 years. There was an equal number of males and females within each age group. The three groups of children were solicited from predominantly middle-class elementary schools. Most of the adults were graduate students at an urban university.

COGNITIVE ASSESSMENT

All of the subjects were individually tested to determine at which of Piaget's three stages of cognitive development they were functioning. Two conservation tasks and a combinatorial reasoning task were used to classify subjects. Subjects who failed the conservation tasks were classified as preoperational, those who passed the conservation tasks but failed the combinatorial reasoning task were classified as concrete operational and those who passed the combinatorial reasoning task were classified as formal operational. These tasks have been widely acknowledged in the cognitive development literature as reliable measures of reasoning at the concrete operational and formal operational stages (Flavelle, 1963).

In the first conservation task (conservation of number), subjects were shown a row of seven red blocks and were asked to create another row in one-to-one correspondence using an array of blue blocks. When the subjects acknowledged that there were the same number of red blocks as there were blue blocks in the rows, the experimenter extended one of the rows of blocks by increasing the distance between them. Subjects were then asked if the two rows contained the same number of blocks, or if one of the rows contained more blocks than the other row. On the second trial the experimenter reestablished one-to-one correspondence between the two rows of blocks and then transformed one row by contracting its length. Subjects were again asked if the two rows were quantitatively equivalent. On the third trial the two rows of blocks were initially unequal in number and, after either seeing the shorter row extended or the longer row contracted, subjects were asked if the two rows were quantitatively equivalent. This trial served as a check for the occurrence of false positive based on subjects' tendencies to assert equivalence regardless of the type of transformation.

The second conservation task (conservation of mass) followed the same general format as the conservation of number task. However, subjects compared two balls of clay one of which was transformed into the shape of a sausage on at least one of the three trials and the shape of a pancake on the other trials. Questions of equivalence

were phrased in terms of whether there was the same amount of clay to play with in the ball, sausage, or pancake. These tasks followed procedures reported by Inhelder et al., (1974).

Subjects were classified as being at the concrete operational stage if they were able to conserve number and mass and offer logical justifications for conservation on at least five of the six trials combined. Subjects who conserved on less than five trials were classified as preoperational. Subjects with five or more correct conservation responses and adult subjects were then administered the task of combinatorial reasoning. In this task, subjects were shown six stacks of different colored discs (ten discs in each stack) and asked to create as many possible pairs of different colored discs as possible. The greatest possible number of pairs was 15. Subjects who created 14 or more unique pairs were classified as being at the formal operational stage. Subjects who created 13 or less were classified at the concrete operational stage. This procedure was similar to that reported by Chandler, Paget, and Koch, (1978).

TELEVISION VIEWING

All subjects individually viewed the two television segments using a Sony video deck, half-inch video tapes, and monitor. Within each group, half of the subjects viewed Story A first, and the other half Story B first. The order of viewing was reversed for the other half of subjects. Nested within the viewing order conditions, half of the subjects viewed a segment without interruption first followed by a second viewing with interruptions while the other half saw interrupted segments first. In the uninterrupted (general response) condition, the characters were left on the screen in a stop-frame position at the end of the segment. The experimenter told the subjects the names of each character and then asked them to tell the experimenter "everything you can about what happened in the story". In the interrupted (specific response) condition, the video tape was stopped at predetermined intervals at which times subjects were asked specific questions regarding the thoughts and feelings of the characters appearing on the screen in the stop-frame positions. There were two interruptions with four specific questions for Story A and three interruptions with six questions for Story B. Some of the questions directly asked about what a character was thinking or feeling while other questions asked about what one character was thinking or feeling about the other character.

By giving half of the subjects the general response condition first and giving the other half the specific response condition first, it was possible to test whether initially directing the viewers to consider covert psychological cues would prompt them to freely recall the televised stories at a more complex inferential level in the general response conditions. All of the subjects' responses were audio-tape-recorded and later transcribed for scoring.

SCORING

Two scoring procedures were used, one for subjects' general responses and a slightly different procedure for responses to the specific questions. Transcripts of subjects' general responses were divided into subject-predicate statements. Each statement was then assigned a single score according to the following criteria. A statement was assigned a score of zero if it described some aspect of the scene that did not occur or if it was an obviously incorrect inference. Scorers gave subjects the benefit of the doubt in deciding an incorrect response. If an aspect of the story or an inference could be reasonably interpreted, even if it were an unlikely interpretation, it was not considered incorrect. Statements that described a character, the scene, a character's actions or dialogue were scored one. Examples of descriptive statements in this category included: "She was packing her suitcase", "She told her she was going to take some clothes to the cleaners", "... then there was a knock at the door", and "Ellen said, 'You going some place?'" The next level of statements was those that went beyond the overt, descriptive aspects of the scene and consisted of some type of simple

inference about the feelings, thoughts, needs, and/or intentions of the characters. Examples of simple inferential statements included: "She had to make an excuse for him sleeping outside", "...as if she is going someplace", "She's doing it deliberately", and "She couldn't be going to the laundry". The third level of statements consisted of a more complex form of social inference. These statements indicated that one of the characters was the object of another character's feelings, thought, needs, and/or intentions. Examples of complex inferential statements included: "Ellen knows that she couldn't be going to the laundry", "She was planning on taking her daughter away", "She's trying to find out what she's doing with the suitcase", and "She knows that Greta is not happy". Statements at this level often reflected some knowledge by the viewers of the deception in which either one or both characters were engaged. These scoring categories were generally consistent with those used by Feffer (1970) in a series of studies of children's ability to analyze interpersonal behavior.

The same categories that were used to score the general response statements were used to score the specific response statements with the addition that subjects who responded with "I don't know" to specific questions received a score of zero. Each statement in the general response condition and each answer in the specific response condition that was at level zero was assigned a score of zero. Statements classified at the first level (description) were assigned a score of one, those at the second level (simple inference) were assigned a score of four, and those at the third level (complex inference), a score of nine. In order to control for varying amounts of verbal production between subjects in the general response conditions, the sums of subjects' scores were divided by the number of statements scored. For example, if a subject had three descriptive statements, four simple inferential statements, and two complex inferential statements his score would be 2.1. In order to control for the difference in the number of questions asked regarding Story A and B (four and six, respectively), the sum of scores from Story A was divided by four and the sum of scores from Story B was divided by six. Thus, within any response by story condition, scores ranged from zero to nine.

Interscorer reliabilities were obtained by having two raters independently score 20 protocols, five at each age level. The percent of agreement for general responses ranged from 84 to 88 across age groups. For the specific responses, percentages ranged from 87 to 90.

RESULTS

Table I presents the distribution of subjects by cognitive stages and age groups. As expected most of the 5-6 year olds were at the preoperational stage (90%) and most of the adults were at the formal operational stage (90%). The 7-10-year olds and the 11-14-year olds were more evenly distributed across the three stages of cognitive development. Because age levels and cognitive stages were not isomorphic, three separate 4-way analyses of variance were used to analyze subjects' responses. On the first analysis, age level was included

TABLE 1: FREQUENCY OF SUBJECTS BY COGNITIVE STAGES AND AGE LEVELS

<i>Age Levels (years)</i>	<i>Cognitive Stage</i>		
	<i>Preoperational</i>	<i>Concrete Operational</i>	<i>Formal Operational</i>
5-6	18	2	0
7-10	7	8	5
11-14	4	6	10
Adults	0	2	18
Totals	29	18	33

as an independent variable. On the second analysis, cognitive stage replaced age level as an independent variable, and on the third analysis, cognitive stage was used with age as a continuous covariate. The other independent variables in all three analyses were: (1) the order of administration of the general and specific response conditions, (2) response type-general or specific and (3) the order of story administration. The last two variables were repeated measures. Males and females were combined on all analyses because preliminary analyses found no differences as a function of subjects' sex.

TABLE 2: MEAN SCORES AND STANDARD DEVIATIONS (SD) IN GENERAL AND SPECIFIC RESPONSE CONDITIONS BY AGE LEVELS

<i>Response condition</i>	5-6	<i>Age (years)</i>		<i>Adult</i>
		7-10	11-14	
General				
Mean	1.19	1.48	1.70	2.69
SD	1.34	0.65	0.74	1.31
Specific				
Mean	1.81	3.85	5.42	6.75
SD	0.81	1.42	1.57	1.29

Table 2 consists of mean scores at each age level to the general and specific questions across both story conditions. Table 3 presents the same data by cognitive stage instead of age level. Twenty-nine subjects were at the preoperational stage, 18 at the concrete operational stage, and 33 at the formal operational stage.

In the first analysis, age level was a significant main effect, $F(3,72) = 41.64$, $p < 0.001$. The mean scores of the age levels increased uniformly from 1.50 for the 5-6-year-olds to 4.72 for the adult group. Scheffe paired comparisons found significant differences between the 5-6-year-olds and 11-14-year olds, and the 5-6-year-olds and adults. Differences in mean scores between the 7-10-year-olds and adults were also significant; however, differences between 11-14-year-olds and adults were not significant.

There was a significant main effect for response condition. As expected, mean scores in the specific response conditions were significantly higher than mean scores in the general response conditions $F(1, 72) = 316.34$, $p < 0.001$. Scheffe paired comparisons of mean scores across age levels within each response condition found that within the general response condition only differences between the 5-6 year olds and the adults were significant. Within the specific response condition, significant mean score differences were found between the 5-6-year-olds and the 7-10-year-olds, between the 7-10-year-olds and 11-14-year-olds, and between the 11-14-year-olds and the adults. Thus, each one of the paired age comparisons was significant.

There was also a significant interaction effect between age level and response condition. The differences between mean scores in the general and specific response conditions increased significantly as a function of age levels. Differences in mean scores between general and specific response conditions were 0.62 at the 5-6-year level, 2.37 at the 7-10 year level, 3.72 at the 11-14 year level, and 4.06 at the adult level.

Consistent with the findings on the first analysis in which age level was the developmental index, cognitive stage was a significant main effect on the second analysis $F(2, 74) = 26.83$, $p < 0.001$. Mean scores for the preoperational, concrete operational and formal operational stages were 1.79, 3.44 and 4.09, respectively. These differences in mean scores remained significant on the third analysis when age was partialled out as a co-variate with cognitive stage $F(2, 73) = 13.26$ $p < 0.001$. Scheffe paired comparisons found significant increases in mean scores between the preoperational and concrete operational stages, and the preoperational and formal operational stages but not between the concrete and formal operational stages. These

differences remained significant with age partialled out. There was also a significant effect for response condition in the second and third analyses, $F(1, 74) = 249.0$, $p < 0.001$ (with age as covariate). Similar to the first analysis, mean scores in the specific response conditions were significantly higher than mean scores in the general response conditions. Scheffe paired comparisons of mean scores across cognitive stages within each response condition found that within the general response condition there were no significant stage differences; however, within the specific response condition, there were significant increases in mean scores between the preoperational and concrete operational stages and the concrete and formal operational stages.

TABLE 3: MEAN SCORES AND STANDARD DEVIATIONS (SD) IN GENERAL AND SPECIFIC RESPONSE CONDITIONS BY COGNITIVE STAGES

	Cognitive Stage		
	Preoperational (<i>n</i> = 29)	Concrete Operational (<i>n</i> = 18)	Formal Operational (<i>n</i> = 33)
Response Condition			
General			
Mean	1.29	2.11	2.08
SD	1.13	1.70	1.07
Specific			
Mean	2.28	4.78	6.11
SD	1.43	2.17	1.20

in the second and third analyses, similar to the first, there was also a significant interaction effect between cognitive stage and response condition, $F(2, 74) = 29.25$, $p < 0.001$ (with age as covariate). Difference between mean scores in the general and specific response conditions increased significantly as a function of cognitive stages. Difference in mean scores between general and specific response conditions were 0.99 at the preoperational stage, 2.67 at the concrete operational stage, and 4.04 at the formal operational stage.

In none of the three analyses of variance were there significant main effects for the order in which the general and specific response conditions were administered. Thus, asking subjects specific questions about the thoughts and feelings of the characters prior to asking them for general responses did not prompt them to offer more complex general responses compared to subjects who were not initially given the specific questions. Also, in none of the analyses were there significant differences in mean scores between Story A and Story B. The absence of significant effects due to story condition indicates that the findings were not specific to a particular television content and that, therefore, there is some generalizability of the findings.

DISCUSSION

In interpreting the findings of the present study, it should be recognized that we were interested in the general framework or structure that children use in making sense out of social relations and interpersonal behavior that they view on television rather than with the acquisition of particular bits of information. Thus, our aim was not to distinguish between correct and incorrect responses but to identify different levels of social analysis used by children at different ages to describe television contents and to test whether these levels of analysis change in a sequential and progressive pattern as a function of cognitive development. In seeking an adequate model by which we could index stages of cognitive development as well as define levels of social analysis, we were guided by Piaget's theory of cognitive and social cognitive development. According to Piaget, children's social understanding undergoes gradual developmental changes from an emphasis on the overt descriptive features of others and social relation

towards a greater appreciation of the covert, psychological aspects that serve to guide interpersonal behavior in a reciprocal and mutual fashion. It was, therefore, expected that there would be significant increases in the complexity of children's understanding of social interaction portrayed on television at each of Piaget's stages of cognitive development - preoperational, concrete operational and formal operational. Furthermore, it was expected that the statistical significance of these developmental changes would be maintained even with age, as covariate with cognitive stages, partialled out of the analysis. The findings, in general, have supported these expectations.

Just as previous studies of social cognition and person perception found changes in the structure of children's social percepts with age, so did the present study. The changes were ordered in a developmentally consistent way both in regard to children's free descriptions of what they had viewed on television and their replies to a series of questions designed specifically to elicit their knowledge of social inferences. The present findings indicated that younger children at the preoperational stage of cognition are more likely to structure televised social content in terms of overt descriptive features, action and literal repetition of dialogue. Children at the preoperational and formal operational stages are more likely to consider the inferential aspects of social interaction and, in addition to descriptive features, offer interpretations regarding the feelings, thoughts, needs and intentions of the characters and how these qualities influence their interpersonal relations. The findings also indicated that these developmental changes in structuring television content are not simply a function of the amount of experience children have had with the medium, as a significant age effect alone might imply, but is significantly associated with stages of cognitive reasoning independent of age.

A greater appreciation of the obtained differences in children's narratives of the television segments can be had by examining some of the actual transcripts. The following transcripts were in response to the question "tell me everything you can about what happened in the story". Two transcripts are from subjects at the preoperational stage and one from the formal operational stage. Both are in response to Story B concerning two characters, Greta and Kim. These transcripts were specifically selected to highlight the obtained group difference..

(Subject 29, 6 years, preoperational, score = 1.0) Kim was laying on the bed talking to Greta. And then Greta said that everything is fine. Then Kim said she looks like a sad housewife. Then when Greta said that one of the boys slept outside. Then they started to have a long face. Then they walked out of the door.

(Subject 32, 10 years, preoperational, score = 1.0) Kim told Greta that she was happy. Then she said it was OK. Then she said to tell her all about it. Then when she was telling her, she said she knew. She said you said everything is all right. And she said that he had just come late last night.

(Subject 5, 29 years, formal operational, score = 5) Kim put herself down on this chair and made herself arrogantly at home in this woman's house and started sort of interrogating her about her life, in a way, with a kinda jealousy hoping in fact that her friend was not happy, I think. She asked her all kinds of questions about her happiness or wanted to know about it. Greta felt very insecure about this and looked very timid and shy and really felt invaded by this woman's overbearing, um, um, whatever. Um, Kim physically, her body language was very aggressive, I think the way she sat down, the way she went over and made herself at home with the perfumes that were lying around, and sort of tried to catch Greta in any kind of uh thing that Greta might be trying to hide from her about difficulties in her new life style, etc. Um, Kim, I think, projected her own insecurities in being very hard on Greta. They seemed like two very opposed type of beings, um. Greta was very soft and um unassertive in a way as opposed to her friend, seeming friend.

These particular transcripts were chosen to represent the more extreme levels of performance relative to age and cognitive maturity. However, the differences between them represent dimensions of developmental change along which the other transcripts varied. One noticeable difference is that the older subject's transcript is considerably longer than those of the two younger subjects. This is consistent with the general findings. The mean number of statements by cognitive stages were: 4.34 for preoperational, 8.44 for concrete operational, and 12.24 for formal operational. In addition to length, the structures of the two sets of transcripts differ in systematic ways. Transcripts from subjects 29 and 32 (preoperational) consist primarily of statements of characters' actions and dialogue. There are no attempts to infer the psychological properties of the characters. There are no statements of a character's thoughts, feelings, needs, or intentions. Any references to a character's feelings are presented as dialogue rather than inference. There are also no statements reflecting the nature of the relationship in which the characters were mutually engaged. However, even the youngest subject's descriptions are essentially accurate and sequentially ordered correctly.

The transcript of the subject at the formal operational level also contains descriptive statements. However, there are also numerous inferential statements about the psychological qualities of the characters and their interpersonal relationship. Some of the inferences are recursive in that one character's thoughts or feelings are the subject of another character's thoughts or feelings. For example, the subject stated that Kim was trying to catch Greta in "any kind of thing that Greta might be trying to hide from her [Kim]". Thus, characters were described primarily in terms of their psychological effects on one another.

A subsidiary finding was that subjects at each cognitive level and age group, with the exception of the 5- 6-year-olds, obtained significantly higher social inference scores in the specific compared with the general response conditions. In the specific response condition, television viewing was interrupted at given intervals to ask subjects questions about the characters' thoughts and feelings. The general response condition, by comparison, offered a greater opportunity to study how children spontaneously organize and construct meaning from television contents. Since the specific response condition was designed to test the limits of children's capacity to make psychological inferences regarding television characters and their social relations, significantly higher scores in this condition, compared with the general response condition, were expected. However, it was also expected that there would be significant cognitive developmental stage increases in mean scores within both response conditions. This was not found. The developmental effects were much stronger in the specific than in the general response condition. When cognitive stages were used as the developmental index in the post hoc analyses or just general responses, there was not a significant increase in mean scores.

Mean scores for subjects at the formal and concrete operational stages were about equal and not significantly greater than scores from subjects at the preoperational stage. This finding is particularly surprising in light of previous studies that have reported consistent cognitive developmental effects using similar measures and response conditions but with stimuli other than television (Barenboim, 1978; Feffer, 1970; Flapan, 1968). This raises the question whether the meaning that children spontaneously attribute to television contents and the social knowledge that they construct from it differs in some systematic way from their cognition of other types of social perceptual stimuli. While there is no methodology that would allow for direct comparisons between the effects of television and other social agents, it is tempting to speculate about the effects of the relative passivity that viewers typically assume while watching television. It appears that viewers do not on their own attribute complex psychological qualities to television characters nor do they spontaneously infer how such qualities affect the kinds of social relations in which the characters engage.

In specific response condition, where clearly significant cognitive developmental effects were found, the interruptions and specific questions might have had the effect of more actively engaging the viewers, in a cognitive sense, in the social dynamics being portrayed. If these subsidiary findings regarding developmental differences as a function of response conditions are replicable, they would have important implications regarding how the pacing of social interaction can be structured in television formats in order to enhance viewers involvement and television's role as a significant socializing agent in children's development.

There appears to be a general increase in interest among social scientists in how television affects the social and cognitive development of young persons. In an extensive evaluation by the Rand Corporation of the state of scientific knowledge about the effects of television on human behavior (Comstock & Lindsey, 1975), it was concluded that the highest priority for further research be given to studies of "television and the socialization of young persons" (p. 6). However, before we will be able to systematically study how stimulus factors and environmental conditions affect the quality of television socialization, we will have to learn more about how underlying cognitive developmental processes influence viewers' understanding of what they see portrayed on television.

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