

Preschool and grade-school children's comprehension of typical commercial television dramatic programs has repeatedly been found to be poor, but few studies have assessed characteristics of children's representations of such shows. In the present research, second, fifth, and eighth graders' recognition errors and recall of an action-adventure drama were examined jointly to determine how children represented plots that they remembered inaccurately. Younger children's representations of the program were especially likely to reflect familiar actions and events sequences ("scripts"), cued by isolated, familiar occurrences in the televised portrayal. Their recognition errors were likely to be action stereotypes, while older viewers' errors were more often confusions about program-specific occurrences. Furthermore, common-knowledge scripts constituted significantly larger proportions of spontaneously cited plot events for younger than for older children. It was suggested that younger and older viewers may differ both in (1) the number and variety of action/event scripts for comprehending typical plots and in (2) the flexibility with which such scripts are applied in comprehending new instances of program content.

SOCIAL SCRIPTS AND DEVELOPMENTAL PATTERNS IN COMPREHENSION OF TELEVISED NARRATIVES

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Comprehension of the narratives portrayed in film and television dramatic plots has repeatedly been found to be markedly poorer for children in the early primary grades than for preadolescent and adolescent viewers (Collins,

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1970; Collins et al., 1974, 1978; Flapan, 1968; Leifer and Roberts, 1972; Newcomb and Collins, 1979). In precedent studies, in which the stimuli have been entertainment programs produced for a general audience, second- and third-grade children typically recalled fewer explicitly presented details than older viewers. Even when these children did remember explicitly presented details, they were markedly less likely than older viewers to comprehend the implicit relationships among important program events, for example, causal and enabling relations between events portrayed in separate, often temporally distal, scenes (Collins et al., 1978; Newcomb and Collins, 1979). Indeed, in one study (Collins et al., 1978), viewing program events in the correct narrative order, as compared to a random sequence of scenes, made little difference in second-grade boys' comprehension of either the explicit or the implicit content of an action-adventure plot; viewers' comprehension was markedly better in ordered than in jumbled versions of programs.

Only meager evidence has appeared regarding the processes that underlie the selective and inferential difficulties of younger children. Several possibilities should be considered, however. In part, younger viewers' poor comprehension may reflect the information-processing demands of typical television dramatic programs, relative to the cognitive skill and efficiency of young children. For example, Collins (1979: 36-37) analyzed the implicit-content recognition items on which fewer than 40% of second graders were accurate in a program-comprehension measure. He found

Twin Cities metropolitan area, including Christ the King, Good Shepherd, St. Kevin's, and St. Margaret Mary's Schools, Minneapolis; St. Bernard's, St. Gregory's, and St. Peter's Schools, St. Paul; Sacred Heart School, Robbinsdale; Corpus Christi School, Roseville; and Transfiguration School, Maplewood. They also express appreciation to Tracy Sherman and Sally Westby, as well as Andrea Easter, Christine Mack Gordon, Jayne Grady, Royal Grueneich, and Barbara Olson for their assistance. Author Collins's address: Institute of Child Development, University of Minnesota, 51 East River Road, Minneapolis, Minnesota 55455.

that 80% of the items had been independently rated by a panel of adult judges as requiring multiple inferential steps; none of these items rated as difficult by the adult judges were answered by the majority (60% or more) of second graders. Neither the type (for example, causation or enablement) nor the topic (such as actor's motive or consequences) of the implicit content predicted children's difficulties in making inferences. Apparently, younger children's relatively poor comprehension of particular shows results at least partly from task demands of programs that older viewers can more readily meet.

A second possibility is that young grade-school viewers have lower levels of knowledge about social events and sequences relevant to program contents. Newcomb and Collins (1979) recently reported that middle- and working-class second graders each understood television portrayals of characters and settings similar to their own backgrounds better than did children from the other social class group. These effects of pertinent social-class experience were not evident among fifth and eighth graders. Newcomb and Collins (1979: 418) suggest that

young viewers' poor comprehension of television programs may not represent an absolute incapacity for processing such information, but may partly reflect their relative unfamiliarity with the types of roles, characters, and settings that are portrayed in typical entertainment programs. Older children and adolescents may remember the content of particular shows better than younger viewers because they have existing information sets or schemes that facilitate processing of program details, whereas the younger viewers have no such sets, or perhaps have less adequate ones.

One view of the process by which common social knowledge may affect understanding of television portrayals is summarized in Schank and Abelson's (1977: 67) recent discussion of *scripts*. In this formulation, "understanding . . . is a process by which people match what they see and hear

to pre-stored groupings of actions that they have already experienced." These action groupings, or scripts, are called into play when key parts of sequences are encountered. For example, knowing that policemen are involved in a story enables most viewers to instantiate a set of expected actions about police activities—policemen wear uniforms, drive cars with sirens, try to apprehend bad guys, and so forth. Comprehension of both explicit and implicit events should be easier for viewers who know scripts that accurately characterize what actors in a narrative do, think, and feel. These viewers can readily assimilate current observations to groupings of actions they have experienced before.

Two corollary possibilities can be advanced concerning age differences in application of social scripts to complex televised narratives. First, preschool and young elementary-school viewers probably know a smaller number and variety of scripts than older viewers, simply because they typically have experienced fewer and less varied social circumstances, persons, and interactions. A second, more speculative possibility is that younger children may be less flexible than pre-adolescent and older viewers in applying social knowledge scripts in comprehending new experiences. That is, for younger children, once a script has been instantiated by a salient cue (for example, the label "police"), the program may be assumed simply to follow a standard script; as a result, these children may fail to notice or may ignore ways in which the program varies from the script. Consequently, central explicit and implicit details of particular narratives may be short-circuited by stereotypes of actors and actions. In contrast, older, more knowledgeable viewers are more likely to recognize and encode departures from scripts; their comprehension difficulties are more likely to involve errors of detail about plot events than a tendency to substitute common sequences for what occurs on screen.

The present study was undertaken to examine age-related differences in viewers' recall of program events

about which viewers of different ages are similarly or differentially knowledgeable. Several predictions were tested. First, while both younger and older viewers should recall generally familiar content from programs, younger viewers are less likely than older ones to recall events that are uncommon, or relatively idiosyncratic to the plot of the program. Second, when younger viewers recall the content of the program inaccurately, their inaccuracies should primarily reflect what they would expect to happen based on knowledge of common events in spite of what occurred in the show, while older viewers' inaccurate remembering would more often reflect misunderstanding of, or confusion about, program events per se.

METHOD

These predictions were examined using previously unanalyzed data from the study reported by Collins et al. (1978). The study involved 252 males and females, drawn from grades 2 (mean age = 7,7), 5 (mean age = 10,4), and 8 (mean age = 13,5) in six parochial schools in Minneapolis and St. Paul. Each school was proportionally represented across conditions. The children were predominantly middle class, and more than 95% were white. Although some participants failed to complete 1 or more of the supplementary (nonquestionnaire) measures described below, participant loss was not disproportionate across cells in any instance.

EXPERIMENTERS

The study was conducted by a white female, who also served as an interviewer. She was assisted at each testing session by two other interviewers, one white female and one white male graduate student. Each interviewer worked with equal numbers of children at each grade level.

STIMULI

The stimuli were 24-minute edited versions of a general-audience television program about police detectives. In the plot, an unsuccessful young man steals a check protector from a business-machine repair shop. During the robbery, an elderly panhandler inadvertently comes on the scene, and the young man kills him. The police tie the killer to forged checks written with the stolen check protector and cashed in a series of grocery stores, and they eventually apprehend him. The videotape was played back on a Sony AV-3650 videorecorder and viewed on a 19-inch black and white television monitor.

PROCEDURE

Children were brought in mixed-sex pairs from their classrooms to a vacant classroom in the school building. Once in the experimental room, children were introduced to the other adults and told that they and the adults were to see a television program. Participants in each classroom were randomly assigned, prior to the study, to one of the two interruption or the no-interruption conditions for viewing the program.

The interruption conditions involved interrupting the videotape at 1 of 2 standard points. The children were then asked to predict what would happen next in the show. The purpose of this procedure was to assess children's use of information they had seen so far in the program in making predictions about subsequent events. In each cell two-thirds of the children were interrupted at 1 of the 2 points. The interruption points were selected according to the following procedure: 21 undergraduate college students in child psychology courses at the University of Minnesota viewed the program and were interrupted at 4 points that the experimenters had identified as suspenseful. These points were scenes after which something important might be expected to happen. The judges were asked to predict the

subsequent event. They consistently made predictions that were based on the sequence of program events that preceded the interruptions. Of the 4 scenes, 2 were then chosen as the interruption points for the study because they occurred at well-spaced points in the edited programs. The first interruption point occurred when the murderer met a derelict who reminded him of the man he killed; the second occurred when an alert grocery store manager went to verify the murderer's forged check. The interruption points occurred 7.5 and 14 minutes into the program.

The interviews of children who were interrupted during viewing were conducted separately, but simultaneously, for the two children in each pair. They were first asked to retell the events of the program thus far: "Pretend that I haven't been watching the show, and tell me what has happened so far." Children's retellings were recorded *verbatim* by the interviewers. Each child was then asked to predict what would happen when the program resumed. Following the interview, the videotape was viewed without further interruption.

The remaining children at each age were interviewed only at the end of the program. Thus there were three possible interview points: Interruption 1, Interruption 2, and Postviewing. (Interruption was treated as a treatment condition in early data analyses, in order to determine if interruption and interviewing contaminated postviewing responding. In no analysis, however, was interruption associated with either a significant main effect or interaction.) Each classroom contributed to all conditions.

After viewing and the story-recall measure, all children responded to a recognition measure of knowledge of explicit and implicit information from the program.

COMPREHENSION MEASURE

Questions about the program were developed on the basis of interviews with adult college students and second

and eighth graders from parochial schools. As a first step, college undergraduates ($N = 21$) from an introductory child psychology class viewed the program. They were then asked to recount the plot and to select, from a list of events from that version, those scenes that were "essential to retelling the plot of the story." Events that were named by 70% or more of the adult viewers were identified as *central*, or essential, scenes. These corresponded to the central events identified in a narrative analysis of the plot performed according to a procedure invented by Warren et al. (1979).

Two types of open-ended questions were then devised for the second step: *central explicit* questions about information explicitly portrayed in the central scenes, and *inference* questions about information implied by, but not actually shown in, the explicit scenes. An example is the relationship between two or more explicit scenes; for example, when cause is shown in one scene and effect in another. Second- and eighth-grade boys and girls were asked these questions after they had viewed the stimulus program. Their answers were then used to devise correct and incorrect alternatives to multiple-choice recognition questions about the central and inference items.

The incorrect alternatives were constrained as follows. One incorrect alternative represented a *stereotyped* action sequence, reflecting events that television dramas often show, but not the action sequence that had actually been portrayed in the program. The second incorrect alternative was a *confusion* alternative, in which elements from the program not pertinent to a given conclusion were implied to be a part of the correct answer. A typical central item was the following: The man is just walking along when an old man asks him for a quarter. When this happens, he . . . (a) gives the old man \$40 (Correct); (b) tells him he doesn't have a quarter (Stereotype); (c) hits the old man on the head (Confusion). A typical inference item was: The man gives an old man \$40 because the old man . . . (a) saw him stealing (Confusion); (b) reminded him of the man he hurt (Cor-

rect); (c) needed to buy things (Stereotype). Scores were the numbers of items of each type each child got correct.

RESULTS

Three sources of evidence are relevant to the hypothesis of age differences in representations of program content. We first examine the types of comprehension errors characteristic of younger and older viewers. We next examine the information from the program used by viewers of different ages to form expectations about subsequent events during viewing. Finally, we examine the extent to which viewers' representations incorporate common versus unique aspects of plots.

COMPREHENSION ERRORS

Collins et al. (1978) reported marked grade effects in number of correct central-content recognition items. Further, there was a significant increase between second and fifth grades in the probability that inference items would be answered correctly, given correct answers to both of the explicit items on which the inference was based.

In the present analysis, the errors made on these items were examined to determine age differences in children's preferences for incorrect *stereotyped* action sequences. Children's tendencies to choose stereotyped alternatives were assumed to reflect the intrusion of extraprogram common knowledge, rather than understanding of program events per se. The proportion of inference-item errors that were stereotypes was computed for each child. Arcsin transformation was applied to normalize the distribution of proportions, because they were based on a relatively small but variable number of errors across grade levels. The transformed scores were analyzed in a two-way (sex \times grade analysis of variance for unequal Ns (Winer, 1971).

As expected, only the grade effect was significant, $F(2, 247) = 2.69$, $p < .02$. A planned comparison was computed reflecting the prediction that stereotype errors were likely to be more frequent for second graders (transformed-proportion $M = 1.49$) than for fifth and eighth graders ($M_s = 1.29$ and 1.39 , respectively). The comparison accounted for a significant proportion of variance, $F(1, 247) = 3.92$, $p < .05$, with a nonsignificant residual, $p > .05$. These findings support our expectation that younger viewers' errors would reflect more intrusion of stereotyped event sequences than older viewers' responses, which would more frequently show attempts to make program details themselves coherent. In short, younger viewers more often made errors in comprehending the program and, in a higher proportion of instances, filled in gaps in their knowledge with stereotypes of common action sequences.

BASES FOR PREDICTIONS ABOUT PROGRAM EVENTS

The intrusion of event stereotypes was also seen in younger children's predictions about the plot when they were interviewed at one of the two interruption points. Protocols were coded for the extent to which a sequence of events from the plot, rather than just the immediately preceding event, were mentioned as a basis for predicting what would happen next. Predictions that did not show that the child had considered several pieces of information from the program were coded as *stereotypes*; these answers appeared to be based on scripts instantiated by some aspect of the scene immediately prior to interruption. Answers that were based on details from the *sequence* of prior scenes in the program were coded as *program-specific*. Uninterpretable responses and absence of a prediction were coded as "no response." Three independent coders achieved inter-coder reliabilities ranging from .85 to .91.

Chi-square analyses were performed on frequency of no response, program-specific, and stereotyped predictions by

sex, grade, and interruption condition. The distributions of responses were similar, regardless of which of the two interruption points participants experienced. Relevance of predictions to prior plot events was significantly related only to grade level, $\chi^2(4) = 36.44$, $p < .0001$. The majority of the fifth and eighth graders (78% and 68%, respectively) made predictions that invoked the sequence of plot occurrences prior to interruption (program-specific predictions). Second graders rarely (28% of the cases) predicted events that followed from the preinterruption scenes, but instead made stereotyped predictions. A typical stereotyped prediction made by these children was that the villain would "tell the old man to go away."

REPRESENTATION OF THE PLOT

In order to examine the effects of action stereotypes on program representation, children's retelling of the plots was recorded by the interviewers, and typewritten transcripts were prepared from each protocol. Two aspects of these retellings were analyzed: *content* (what information was included), and *organization* (how the information was organized). Only transcripts from participants who had seen the program without interruption ($N = 65$) were used in these analyses.

Concerning *organization*, rating categories were constructed to take account of the children's apparent attempts to make inferences about relations among events; thus our intention was to assess inferential activity rather than accuracy. Stories were coded in the following categories: *nonsequential lists*, indicating that the child simply listed scenes from the program randomly and showed no attempts to infer relations among them; *sequential list*, indicating that scenes were listed sequentially (that is, in an understandable order), but no connectives indicating relationships or causality were stated (instances in this category are similar to Piaget's, 1955, *juxtaposition* phenomenon); *ex-*

plicit-relations list, if the child mentioned connectives or relationships that were explicitly portrayed in the programs; and *inference of implicit relations*, indicating that the plot narrative included efforts to infer relationships that were only implicit in the programs. The final category refers to the kind of information we had asked about the inference items on the questionnaire. Transcripts were coded by two independent persons, each blind to the child's age. They achieved intercoder reliability of .74.

Cell frequencies were often too low to compute chi-squares; consequently, Goodman and Kruskal's gamma statistic (Hays, 1973) was used to indicate the degree of relationship between frequencies in the coding categories and the variables of sex, grade, and viewing condition. Proportions of responses assigned to higher-level categories increase as a function of grade, $\gamma = .66$, $p > .01$. The organization of program recall was more complete and aspects of the action more explicitly inter-related for older than for younger viewers. Narrative category was not significantly related to interruption condition or to sex.

Concerning the *content* of children's recall, our reasoning was as follows: In constructing a representation, mature viewers may use increasingly more specialized action sequences. At one level, comprehension may be based on various standard sequences that are evoked by details of the portrayal. For example, from seeing police in uniforms even a young child could understand that the plot was a police story and could infer that police are chasing someone who is guilty of some transgressions, and so forth. Thus certain types of program-elicited *common knowledge* are likely to be represented even in young children's scripts, and are thus likely to be incorporated into their understanding of portrayals. On the other hand, certain variations or embellishments on these simple sequences represent more *program-specific knowledge*, or more specialized understandings that would probably be typical only of older children.

TABLE 1
Proportions of Children Who Mentioned Common-Knowledge and Program-Specific Contents in Retelling the Televised Narrative

Grade	Common-Knowledge				Program-Specific Content		
	Police	Murder	Caught	Buying Groceries	Stolen Detectives	Stolen Items	Stolen Forgery
Second	9/17	12/17	15/15	16/17	2/17	3/17	1/17
Fifth	10/19	14/19	19/19	19/19	7/19	12/19	12/19
Eighth	3/14	12/14	12/14	14/14	13/14	14/14	14/14
	$\chi^2(2)=3.91$	$\chi^2(2)=2.66$	$\chi^2(2)=1.61$	$\chi^2(2)=0.78$	$\chi^2(2)=8.71$	$\chi^2(2)=7.1$	$\chi^2(2)=10.89$
	NS	NS	NS	NS	$p < .02$	$p < .05$	$p < .001$

Applying these distinctions to the stimulus program, we judged that the show probably evoked *common knowledge* about (1) policemen, (2) the fact that a murder was committed by one of the characters, (3) this same person's being shot or apprehended by the police in the end, and (4) his buying groceries (which the protagonist did repeatedly in order to cash his forged checks). More specialized *program-specific knowledge* seemed likely to include information that (1) some nonuniformed characters were also policemen (detectives), (2) the article stolen was not valued in itself, but could be used to write checks for money, and (3) the purpose behind buying groceries was to cash "fake" checks to get money, not to get groceries.

Thus scripts that differed in general familiarity were identified a priori within the plot of the program. Independent coders achieved interrater reliability of .97 in determining the presence or absence of these different aspects in children's narratives. Table 1 shows numbers of children who mentioned instances of the two categories of content in their postviewing retelling of the narrative. The chi-square statistics in Table 1 confirm that, while proportions of children who mention common-knowledge content are similar at all three grade levels, significantly lower

proportions of second graders than older children included program-specific knowledge in their retelling of the plot. Thus younger viewers' representations were characterized by fewer, more predictable social scripts than were older viewers' knowledge of the program.

DISCUSSION

Two conclusions emerge from these analyses. First, the data reiterate previous findings (see Collins et al., 1978) that young viewers' representations of typical televised dramatic narratives are incomplete and disorganized, compared to older viewers' comprehension of these types of programs. Second, and more importantly, the present findings indicate that the information younger children did retain from programs was especially likely to reflect stereotyped actions and events, cued by isolated, familiar occurrences in the televised portrayal. For younger children the content of recognition errors was more likely to be action stereotypes than confusions about program-specific occurrences. Similarly, in predicting what was about to happen next, younger children were more likely to predict common event sequences that followed from the immediately preceding scene, rather than drawing upon a more extensive array of cues from the program. And, in analysis of children's recall, common-knowledge scripts constituted significantly larger proportions of spontaneously cited plot events for younger than for older children.

These findings support our hypothesis that younger viewers should be particularly likely to recall aspects of dramatic portrayals that fit their social scripts. This memory bias may, of course, reflect several psychological processes. Children may attend more closely to content that is somewhat familiar to them (Holaday and Stoddard, 1933), perhaps because of the motivational power of perceived similarity (Maccoby and Wilson, 1957; Newcomb and Collins, 1979;

Rosekrans, 1967). A complementary explanation is that familiarity with certain basic elements of presentations permits deeper processing of content (Chi, 1978; Craik and Lockhart, 1972; Trabasso and Foellinger, 1978). Younger children may spontaneously mention program-elicited common knowledge because such information can be accommodated to existing schemes or structures more readily than program details that are less typical of common action sequences.

Thus disorganized, incomplete comprehension by younger participants and their typically stereotyped representations of portrayals are probably related phenomena. The significance of action sequences and the connections between such sequences in plots often depends on nontypical elaborations or interweavings of explicit depictions. This aspect of understanding narratives is often accentuated by the structure of typical complex dramatic plots in which suspense, unlikely twists, and atypical variations on a common theme are frequent. Given a viewer who primarily codes the presentation into a series of set, familiar scenarios, incomplete disorganized representations are likely. Older, more mature viewers, who command a larger repertoire of relevant action scenarios (for example, knowledge of check cashing and forgery) and whose relevant knowledge is potentially more variable (for example, that policemen do not always wear uniforms, but are sometimes dressed in plain clothes), are more likely to construct an organized, accurate representation of the narrative, including its deviations from commonly expected events.

Children's extrapresentation experiences, circumstances, and states have long been recognized as potential mediators of their postviewing behavior (for example, see Stein and Friedrich, 1975). Recent findings imply that these mediating effects may operate partly by influencing the way in which the social models on television are understood and remembered. Thus children's responses to television content may not only be affected by the behavioral tendencies

acquired in socialization, but also by the way in which the social schemata acquired in previous social experiences mediate children's encoding of the content of programs. This may be consequential for social learning in cases in which reliance on stereotyped knowledge could result in misleading impressions of social models—for example, in the case of the commonly occurring “double dealing” character. The appearance of this type of character may initially instantiate a script for benevolent behavior, although in the details of the program the character is actually revealed, subtly and by small increments, to be malevolent instead (Collins and Zimmermann, 1975).

The present findings add to an emerging network of evidence that prior social experiences underlie differences in children's television comprehension, both within and between age groups. Individual differences are particularly relevant to younger viewers whose comprehension of the explicit content of programs have been found to be generally poor (see Gouze, 1979; List et al., 1981; Newcomb and Collins, 1979). At this point, however, there is only a rudimentary basis for assessing how social knowledge is represented and how it enters in comprehension of television portrayals. Several relevant considerations have emerged recently, however, in theory and research on prose narratives (Bower, 1978b; Bower et al., 1979; Omanson, forthcoming; Schank and Abelson, 1977; Warren et al., 1979). The most detailed account of the role of prior knowledge in understanding stories is the scripts approach (Schank and Abelson, 1977), in which prior knowledge, in the form of stereotypes of event sequences, enables inferences about gaps in the linkages between the actions or states of the story characters. As Bower (1978b) notes, it is often difficult to distinguish the script's construct from a cumbersome aggregation of similar experiences. Schank and Abelson (1977) emphasize the abstract, categorical quality of scripts, however. In their view, scripts are *sche-*

mata for the processing of new instances of social information. Hastie (1981) has recently reviewed extensive evidence for the schema-like qualities of both encoding (Bower, 1978a; Markus, 1977; Rogers et al., 1977) and retrieval (Cantor and Mischel, 1977; Hastie, 1981; Zadny and Gerard, 1974) of social information. Collins (1981, forthcoming) has recently proposed that schema notions may be useful in conceptualizing and assessing the cognitive and attitudinal characteristics of viewers that affect comprehension and postviewing behavior. One focus of future research should be further specification of the nature and representation of social knowledge and its role in processing of newly encountered social stimuli such as television programs by both children and adults.

REFERENCES

- BOWER, G. (1978a) "Experiments on story comprehension and recall." *Discourse Processes* 1: 211-231.
- (1978b) "Representing knowledge development," pp. 349-362 in R. Siegler (ed.) *Children's Thinking: What Develops?* Hillsdale, NJ: Erlbaum.
- J. B. BLACK, and T. J. TURNER (1979) "Scripts in memory for text." *Cognitive Psychology* 11: 177-220.
- CANTOR, N. and W. MISCHEL (1977) "Traits as prototypes: effects on recognition memory." *J. of Personality and Social Psychology* 35: 38-48.
- CHI, M. (1978) "Knowledge structures and memory development," in R. Siegler (ed.) *Children's Thinking: What Develops?* Hillsdale, NJ: Erlbaum.
- COLLINS, W. A. (forthcoming) "Inferences about the actions of others: developmental and individual differences in using social knowledge," in J. Masters and J. Harvey (eds.) *Boundary Areas in Psychology: Social and Developmental*. Hillsdale, NJ: Erlbaum.
- (1981) "Schemata for understanding television," in H. Gardner and H. Kelly (eds.) *New Directions in Child Development*. San Francisco: Jossey-Bass.
- (1979) "Children's comprehension of television content," in E. Wartella (ed.) *Children Communicating: Media and the Development of Thought, Speech, and Understanding*. Beverly Hills, CA: Sage.
- (1970) "Learning of media content: a developmental study." *Child Development* 41, 4: 1133-1142.
- and S. A. ZIMMERMAN (1975) "Convergent and divergent social cues: effects of televised aggression on children." *Communication Research* 2: 331-347.

- COLLINS, W. A., T. BERNDT, and V. HESS (1974) "Observational learning of motives and consequences for television aggression: a developmental study." *Child Development* 45: 799-802.
- COLLINS, W. A., H. WELLMAN, A. KENISTON, and S. WESTBY (1978) "Age-related aspects of comprehension of televised social content." *Child Development* 49: 389-399.
- CRAIK, F. and R. LOCKHART (1972) "Levels of processing: a framework for memory research." *J. of Verbal Learning and Verbal Behavior* 11: 671-684.
- FLAPAN, D. (1968) *Children's Understanding of Social Interaction*. New York: Columbia Univ. Press.
- GOUZE, K. (1979) "Effectiveness of interventions in moderating the impact of aggressive television on high- and low-aggressive second graders." Presented at the biennial meeting of the Society for Research in Child Development, San Francisco, March.
- HASTIE, R. (1981) "Schematic principles in human memory," in E. T. Higgins et al. (eds.) *The Ontario Symposium on Personality and Social Psychology: Social Cognition*. Hillsdale, NJ: Erlbaum.
- HAYS, W. (1973) *Statistics for Social Sciences*. New York: Holt, Rinehart & Winston.
- HOLADAY, P. and C. STODDARD (1933) *Getting Ideas from the Movies*. New York: Macmillan.
- LEIFER, A. D. and D. ROBERTS (1972) "Children's responses to television violence," in J. Murray et al. (eds.) *Television and Social Behavior*, Vol. 2. Washington, DC: Government Printing Office.
- LIST, J., W. A. COLLINS, and S. WESTBY (1981) "Children's sex-role expectations and processing of televised social role portrayals." University of Minnesota. (unpublished)
- MACCOBY, E. E. and W. C. WILSON (1957) "Identification and observational learning from films." *J. of Abnormal and Social Psychology* 55: 76-87.
- MARKUS, H. (1977) "Self-schemata and processing information about the self." *J. of Personality and Social Psychology* 35: 63-78.
- NEWCOMB, A. F. and W. A. COLLINS (1979) "Children's comprehension of family role portrayals in televised dramas: effects of socioeconomic status, ethnicity, and age." *Developmental Psychology* 15, 4: 417-423.
- OMANSON, R. (forthcoming) "An analysis of narratives: identifying central, supportive, and distracting content." *Discourse Processes*.
- PIAGET, J. (1955) *The Language and Thought of the Child*. Cleveland, OH: Meridian.
- ROGERS, T. B., R. G. KUIPER, and W. S. KIRKER (1977) "Self-reference and the encoding of personal information." *J. of Personality and Social Psychology* 35: 677-688.
- ROSEKRANS, M. (1967) "Imitation in children as a function of perceived similarity to a social model and vicarious reinforcement." *J. of Personality and Social Psychology* 7: 307-315.
- SCHANK, R. and R. ABELSON (1977) *Scripts, Plans, Goals, and Understanding*. Hillsdale, NJ: Erlbaum.
- STEIN, A. and L. FRIEDRICH (1975) "Impact of television on children and youth," in E. M. Hetherington (ed.) *Review of Child Development Research*, Vol. 5. Chicago: Univ. of Chicago Press.

- TRABASSO, T. and D. FOELLINGER (1978) "The growth of information processing capacity in children: a critical test of Pascual-Leone's model." *J. of Experimental Child Psychology* 26: 1-17.
- WARREN, W., D. NICHOLAS, and T. TRABASSO (1979) "Event chains and inferences in understanding narratives," in R. Freedle (ed.) *Advances in Discourse Processes*, Vol. 2. Hillsdale, NJ: Erlbaum.
- WINER, B. J. (1971) *Statistical Principles in Experimental Design*. New York: McGraw-Hill.
- ZADNY, J. and H. GERARD (1974) "Attributed intentions and informational selectivity." *J. of Personality and Social Psychology* 10: 34-52.

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