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**Constructions of Mental Representations
in the Audiovisual Mode of Discourse**

by

Chrysoula K.E. Fantaousakis

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

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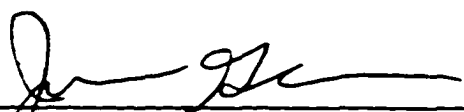
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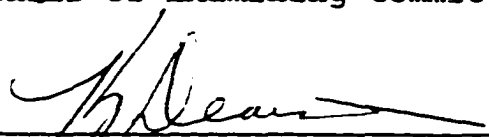
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This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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THE CITY UNIVERSITY OF NEW YORK

To my nephew Jimmy
With whom I travelled many roads
and found lots of treasures

Abstract

Constructions of Mental Representations in the
Audiovisual Mode of Discourse

by

Chrysoula K.E. Fantaousakis

Advisor: Professor Joseph Glick

This research project studied the relationship between internal cognitive and external narrative forms of representation by examining children's interpretations of content presented in the televisual mode of communication. It investigated how television mediates children's comprehension through specialized production conventions -- cinematic techniques and editing manipulations -- that compose its visual and auditory forms of signification into age-appropriate textual structures. This study assumed that children's comprehension is influenced both by internal and external factors and that such conventions guide young viewers through the zone of proximal development by scaffolding their cognitive behavior. That is, in the external domain, a program's narrative complexity and the type of content it presents influences the children's interpretation. In the internal domain, factors such as the children's cognitive sophistication as well as their experience with and understanding of the medium influence their interpretation.

In order to investigate this scaffolding process, children individually viewed three segments from the cartoon: "The Legend of Johnny Appleseed," produced by Walt Disney in 1948. These segments varied with respect to: 1) topical content and 2) overall complexity as determined by the presence or absence of facilitative features (explicit pictorial and auditory cues reinforcing implicit narrational meaning and cinematic techniques reinforcing part-whole relationships). Also, to determine with more precision the impact of textual factors, this study examined a specific cinematic technique, the dissolve, and children's understanding of its syntactic properties. Following Salomon's notions of "supplanting" and "eliciting," the complexity of the dissolves under investigation was varied by presenting them: 1) at the normal pace, 2) at a slower pace, and 3) transformed into cuts.

In order to examine the interaction between cognitive developmental and external textual factors in television's mediational role, children at three grade levels participated in this study: pre-kindergartners, kindergartners and second-graders. In each grade 15 boys and 15 girls were selected from two after-school programs in New York City. The children participated individually and viewed each segment separately. To determine the degree of continuity in their narrative representations of content, the accounts they gave were analyzed for global coherence (the overall interpretation of each segment) and local

coherence (the interpretation of the syntactic features under investigation). The global level of interpretation was evaluated through the systematic use of focused and unfocused interviews. The local level of interpretation was evaluated through a series of pictorial sequences completed by the children and the thematic justifications that they gave for them.

To describe the interaction between internal cognitive and external textual forms of representation, this study evaluated children's accounts of each segment by considering both what each child, as an active participant, and the medium, as a social institution, brought to the viewing experience. It examined the degree of continuity in children's accounts in relation to the complexity of each segment's textuality. In order to evaluate the topical correspondence between each segment's content and the children's representations of this content, the data analysis traced the multiple psychological levels on which the children relied, i.e., cognitive, emotional, social and cultural. To this end, the study used a multiple theoretic approach, integrating the perspectives of Piaget, Vygotsky, and Werner. Piaget's theory of genetic epistemology was used to describe the structural criteria by which children organized program content and the operative formal features of their narrative competencies. Vygotsky's and Werner's dynamic process viewpoints are used to account for facts of

semiotic mediation and the multilinearity of psychological processes behind these formal criteria.

The results showed limited and extensive textual effects. Specifically, variations in the complexity of the particular dissolves under investigation limited those effects on the perceptual level. However, variations in the complexity of the segments' overall narrative structure extended those effects both on the perceptual and conceptual levels. These limited condition effects did not support Salomon's conception of "supplanting" while the extensive segment effects supported his conception of "eliciting" by demonstrating grade- and experience-related variations.

The grade-level effects showed that narrative competencies in the televisual discourse mode, like the oral, are related to both cognitive and experiential factors and evolve developmentally. However, narrative viewing competencies develop slower than linguistic ones. The special challenge of television, in this study, was that the children had to integrate the medium's multiple forms of content (re)presentation and then translate them into oral narration.

All children responded to the multiple semantic levels of each segment's textual structure. Developmental variations, however, were found in children's recognition of meanings expressed at the presentational and representational levels as well as in the degree to which they integrated these meanings into a continuous narrative.

That is, four levels depicting the progressive thematic integration of content were identified in children's accounts: enumerational, pseudo-conceptual, quasi-conceptual, and conceptual. These levels illustrate the range of narrative continuities found in the performances of pre-kindergartners, kindergartners, and second-graders.

These continuities were related both to the children's grade-level and to the processing strategies on which they relied to organize their accounts. The pre-kindergartners and kindergartners were more likely to rely on detail-driven processing strategies and to organize their accounts at the enumerational or pseudo-conceptual level. The kindergartners, who relied on a sequence-driven strategy, were more likely to organized their accounts at the quasi-conceptual level. Most of the second-graders relied on sequence- or generality-driven strategies, and they organized their accounts at the conceptual level.

The processing strategies and levels of thematic integration pertained mainly to denotative operative meanings and described the perceptual and cognitive processes in which the children engaged. The heterogeneity found across the four levels of thematic integration illustrated that the degree of continuity in children's representations of content was a function of both cognitive and experiential factors and was influenced by both denotative operative and connotative figurative meanings. That is, the children's performances were influenced by the

experiential cognitive meanings on which they relied to make sense of abstract textual content. These experiential meanings reflected social-affective processes and were related to the social relevance of content: textual-conventional, social-conventional, social-personal, and experiential-egocentric.

As the children's narrative accounts demonstrated, processes in the perceptual, conceptual, and social-affective domains worked in concert and influenced the children's interpretations and re-presentations of content. The four levels of narrative continuity were distinguished by the ways in which psychological processes in these domains constantly interacted and influenced one another. This interplay of psychological processes, in turn, revealed the multilinear and complex nature of children's cognitive behavior as well as the multidimensionality of their narrative representations. Thus, across the four levels of thematic integration, a gradual shift was found in the integration of psychological processes in the perceptual, conceptual, and social-affective domains. The interaction that was established between these psychological processes and the children's narrative skills demonstrated that the degree of continuity in their accounts was related to their cognitive development as well as to their familiarity with the sequential story-like forms of social discourse.

The complex interweaving of these multilinear psychological processes revealed that the developmental

variations in children's narrative representations were related to the fine-tuning of the communicative and psychological processes. The developmental, experiential, and textual variations suggest that this fine-tuning was based on the organismic tie between experiential-cognitive and cultural-textual meanings. The textual effects in the integration of processes in the perceptual, conceptual, and social-affective domains demonstrated that the degree of thematic continuity across the four levels of narrative representations was related to: 1) the extent to which each segment's narrative structure made its content accessible, and 2) the extent to which each segment's content was relevant to the children's lives. The children actively participated in the construction of semantic meanings. Thus, the medium as a social institution and the children as active viewers negotiated the interpretation of content.

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Practice Condition

Transcription of the first experimental segment

Transcription of the second experimental segment

Transcription of the third experimental segment

Chapter 1

Introduction

In our society, television viewing is generally considered a relatively easy and passive task. Perhaps this supposition is made because television's visual and auditory forms of articulation are a simulation of and correspond to the intermodal synthesis through which information is processed in life. According to the research literature, however, this interchange is not so simple. Television viewing is a complex cognitive activity (Simon, 1976) in which the medium's multiple forms of content representation require the viewer to be involved actively, attending to both explicit and implicit forms of presentation (Collins, 1983; Hodge & Tripp, 1986; Salomon, 1983b).

This project refers to the knowledge of the medium's audiovisual forms of signification and the production conventions it uses to organize the flow of program content as "television literacy." This "literacy" refers to viewing competencies in the multimedia modes through which television articulates narrational meanings. As Abel (1992) states, "... 'multimedia' doesn't mean 'a lot of media,' it means the multiple ways that you can look at ideas ..." (p.33). In the context of television, a program's text functions as a "semiotic space" that affords the generation

of narrative meanings on various levels of signification. Critical interpretation of content, thus, requires a viewer to unravel the medium's complex multilayered textual montage and to be an active agent in the production of meaning (Fiske, 1987; McLaren & Hammer, 1996; Ulmar, 1989).

Semiotics and the Textuality of Television

The term *semiotics* was coined in America by the philosopher Charles S. Peirce (1839-1914), and later in Europe by the Swiss linguist Ferdinand de Saussure (1857-1915). Semiotics deals with the study of signs: their production and communication, their systematic composition in languages and codes, and their social functions. The sign-function is not only basic to language and literature but also to the semiotics of culture in general.

For the purpose of this project, semiotics refers to the "general study of meaning-making (semiosis) including not just meanings we make with language, but meanings we make with every sort of object, event or action in so far as it is endowed with a significance or a symbolic value" (Lemke, 1995). In a semiotic moment, we decode signs when we find meanings, and

we need codes to tell us how to know what words mean and what signifiers and symbols mean. The meaning is arbitrary, based on convention, not natural. Thus, by extension, what we call culture can be looked upon as a collection or system of

codes, analogous in many respects to language.
(Berger, 1995, p. 83)

The primary focus of a semiotic analysis, therefore, is the text, whether presented in the form of print, painting, cinema, drama, or the like. Its goal is to make sense of semantic categories behind textual content by studying how meanings are created. It concentrates on three main areas of inquiry: 1) the sign itself; 2) the codes or systems into which signs are organized; and 3) the culture within which these codes and signs operate.

The similarity between Peirce's and Saussure's semiotic models is that they both seek meaning in structural relationships. For Saussure, however, who relied on a closed linguistic system, meaning is better defined by the relationships of one sign to another than by the relationship of that sign to an external reality.

Saussure's basic model differs in emphasis from Peirce's in that Saussure focuses his attention much more directly on the sign (the word) itself, while Peirce focuses on the sign and the object it represents in relation to the interpretant. For Saussure, the *sign* is a physical object with a meaning; or, to use his terms, a sign consists of a *signifier* and a *signified*. The signifier is the sign's image as it is perceived -- the marks on the paper or the sounds in the air; the signified is the mental concept to which it refers. The signifier and signified, in

communication, function as binary dyadic categories so that the mental concept is broadly common to all members of the same culture who share the same language.

Peirce, on the other hand, avoids this binary system and focuses on the dynamic relationship between the sign and its external reality. Unlike Saussure, his model is not confined to a closed linguistic system (Lee, 1985, p. 112) and it does not focus directly on the sign. For him sign is a general category that can be divided into three types: the *icon* (linkage through resemblance), the *index* (with an existential or causal linkage), and *symbol* (with an arbitrary habitual linkage).

Peirce, as a philosopher, is concerned with the "Kantian problem of empirical knowledge." The basic tenet of his position is the anti-Cartesian claim that all cognition is mediated by signs. His focus is on semiosis, that is, acts of signifying, so that for him:

Cognition and reality are brought into homologous, law-like articulation by the mediation of semiosis, a dialogic process in which one sign determines subsequent interpreting signs while, simultaneously, these interpreting signs form representations of this determination. (Parmentier 1985, p. 23)

For Peirce, the sign is a generalized category that consists of three fundamental dimensions: Firstness or qualitative potentiality, Secondness or actual otherness, and Thirdness or general regularities. The generation of these categories is based on the sign relation, that is, on

the triadic relation among the three sign elements or components as they are bound together in a semiotic moment -
 - Sign or Representamen, Object, and Interpretant.

A sign therefore is an object which is in relation to its object on the one hand and to an interpretant on the other in such a way as to bring the interpretant into a relation to the object corresponding to its own relation to the object.

A *Sign*, or *Representamen*, is a First which stands in such a genuine triadic relation to a Second, called its Object, as to be capable of determining a Third, called its *Interpretant*, to assume the same triadic relation to its object in which it stands itself to the same Object. (cited in Parmentier, 1985, p. 27)

Figure 1 shows the dialectical relationship of the two opposing forces or vectors that bond the semiotic elements, namely, determination and representation. Both the Representamen and the Interpretant function as signs that represent the same object to different degrees of specificity. However, the object of the sign determines both the first sign and the second interpreting sign. Thus, the sign relation is a process in which the triadic relationship among the semiotic elements makes for a certain dynamism. The Interpretant is itself a sign, so the process recurs and in a semiotic moment there is a series of similar moments. This openendedness in Peirce's model indicates an unlimited semiosis by the Interpretant and allows a greater role for motivated linkage.

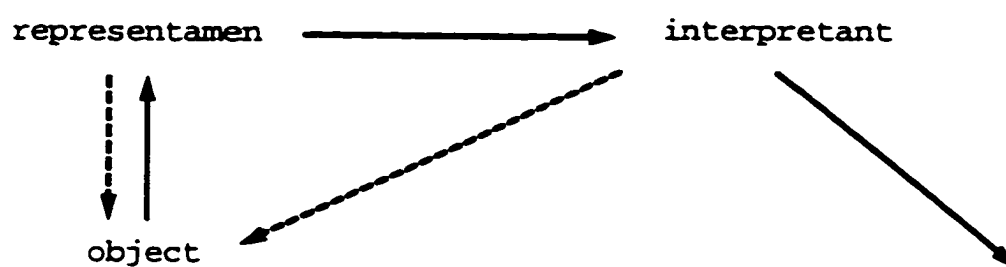


Figure 1. Determination and representation in sign relation.
(Adapted from Parmentier, 1985)

Although Peirce's semiotic model is greater in scope and is more critical than Saussure's binary linguistic system, Saussure's model exercised greater influence with the rise of structuralism. In an effort to extend the Saussurean base, Roland Barthes in the *Elements of Semiology* (1964, trans. 1968) assigns a greater role to motivated linkages and introduced doubts regarding binarism. In addition, during the last 25 years or so, the post-structuralist movement has heavily criticized the semiotic enterprise, and the positivist ideal of a closed structural system is under the attack of *Deconstruction*. Eco (1976) in his *Theory of Semiotics* actualizes Peirce's potential dynamism by emphasizing the dialogic processes of a semiotic moment through what he calls the "mobility of semiotic space." In this "space," codes and sign systems of signification are subject to change in specific moments of communication. For Eco, the infinite semiosis attributed to Peirce's interpretant is due to the motivational linkage of meanings.

This project adheres to a Peircian semiotic approach and assumes that *signs* are human constructs and that the ways they are used in human activity can influence their interpretation. More specifically, audiovisual semiosis depends on the qualities through which the viewer "reads" television's semiotic space.

This symbolic value is culturally laden and gives conventional meanings to sign systems. Accordingly, in a semiotic moment, even the simplest actions or symbols become meaningful within the interpretive context. As Barthes aptly elaborates in *Image-Music-Text*:

Narrative is...a prodigious variety of genres, themselves distributed amongst different substances - as though any material were fit to receive man's stories. Able to be carried by articulated language, spoken or written, fixed or moving images, gestures, and the ordered mixture of all these substances; narrative is present in myth, legend, fable, tale, novella, epic, history, tragedy, drama, comedy, mime, painting (think of Carpaccio's *Saint Ursula*), stained-glass windows, cinema, comics, news items, and conversation. (1977a, p. 79)

This diversity in forms of narration suggests that the textuality of a message cannot be restricted to written language. This is particularly applicable to the narrative structures used in the televisual mode of discourse. One of television's most distinctive characteristics is its tendency to use *sign systems* from various channels of communication simultaneously.

In this medium, the concept of textuality is not restricted to print or to a language-centric view. The interpretation of such complex "text" requires the reader to avoid the "naive verbal realism that refuses to let him realize the full extent of the role played by symbolicity in his notions of reality" (Burke, 1966, p. 5). In television, linguistic forms acquire meanings when they are viewed as an

integral part of: pictorial depictions of objects and actions; the cinematic techniques of presentation and organization; the texture and tone of colors, light, music, sound effects, and diction; as well as the speed and sequence of presentation.

From a semiotic perspective, these multiple features consist of what Peirce would call signs and are organized by culturally relevant codes and conventions into meaningful textual structures. According to Peirce's division of the sign, these features convey semantic meanings by operating as *iconic*, *indexical*, and *symbolic* forms of communication. On the iconic level, meanings are conveyed by resemblance to the object and are relatively easy to interpret. However, on the indexical level, the viewer must establish a causal relationship or semantic correspondence between the indexical signs and their meanings. On the symbolic level, the meanings are conventional and viewers must learn them.

Furthermore, the narrative complexity created by the convergence and divergence among television's visual and auditory sign systems results in a "textual montage" or "semiotic space" that consists of the phenomenological relationship among its multiple narrative features. The textuality of the televisual message (as in any mode of discourse) consists of a dramatic narrative structure that reflects the multi-dimensionality of its content and the

multiple semiotic moments it represents (Fiske, 1987; Fiske & Hartley, 1978, McLaren & Hammer, 1996; Ulmar, 1989).

The audiovisual textual montage, then, is a semiotic field that displays a text of "signifiers" that nest the content, or "signifieds," and reflect the unlimited semiosis promised by Peirce's interpretant. Denotative and connotative meanings reside in the phenomenological relationship between signifying sign systems and content. Adhering to Peirce's trichotomies of the sign, the connotative meanings of a text have to be learned because they involve the symbolic realm which is purely conventional.

Eco (1976, 1985) suggests that, unlike the print text, iconic signifiers such as images cannot be reduced to smaller units. Images are comprised of combinations of various signs and are already "texts" with conventions or codes governing their composition. These codes, however, are "weak" in relation to the grammar that shapes the use of language. The codes that guide the composition and subsequently the interpretation of iconic sign systems, therefore, are flexible, changeable, and can produce other interpreting signs. Thus, the composition of the pictorial language is a semiotic space in which the viewer is an active agent. So then, any determinate meaning can be replaced by something transitory that is based on the provisional semantic stability of a given culture or

subculture. This active agency attributed to the viewer in the production of textual meaning enlarges the notion of a speaking subject and extends the role of a reader.

The dramatic narrative structures of the medium create a text "thick" with meaning (Geertz, 1973) on various levels. These discursive processes are governed by social, material, and historical forces that create a dialogic relationship between the program's textuality and the viewer (Bakhtin, 1981, 1984; Barthes, 1975a; Voloshinov, 1973, 1988). These forces, in turn, determine and limit what can be said or known about certain subjects. In this way, the narrative organization of its text serves particular interests in the power structure of a society (Foucault, 1978, 1987, 1989) and leads to a situatedness-of-content interpretation.

Barthes's discussion of polysemy reinforces this relationship between textual and social structures and suggests that televisual "text" is a product of the relationship between cultural artifact and society. The viewer participates in this dynamic event, transforming the language of televisual artifacts and attributing intention to television's formal features, making its textuality socially and personally relevant. These socially-situated viewers derive meaning which is contingent upon what Voloshinov describes as the social and particular encounters that structure the discursive reading relation. Through

this active engagement, viewers create what Barthes (1975a) would call "producerly" or "writerly" interpretations of television's textual content.

Television's Formal Textual Features

To become literate in the audiovisual discourse mode, viewers must become familiar with its manifold signifying properties, which comprise the cultural fabric of its intermodal and polysemic systems of representation. Viewers must learn the medium's formal features and production conventions. Formal features serve as program attributes that have both operative and normative meanings. In semiotic terms, television literacy as a cultural practice requires the viewer to learn this medium's forms, formats, and codes of presentation on at least three levels of specificity:

- (1) codes unique to a particular program series or genre;
- (2) codes that are specific to the television medium; and
- (3) codes that are generic to the culture beyond the medium.

Although television viewing involves the knowledge of codes in all three domains, this research project is concerned only with those codes which are specific to the televisual discourse mode, particularly children's animation.

Grammar of the Audiovisual Textual Montage

In television, the composition of the audiovisual montage adheres to a grammar and syntax intrinsic to the televisual text. The medium's formal features organizing its narrative structures can be viewed as similar to the rule-governed structure of language. For example, television's grammatical conventions, such as cuts and fadeouts -- which mark breaks in content, changes in scenes, connections between distant events and organize program boundaries -- are analogous to the grammatical rules of written language, such as punctuation, capitalization, paragraphing, chapter heads and the like.

Cuts, for example, organize the pictorial flow of content so as to symbolize the end or beginning of a segment and/or the progression of consecutive or simultaneous actions or events. Cuts signal a need to consider what may have happened in the interim. In order for viewers to integrate effectively the content presented in a program's narrative textuality, they must learn the syntactic properties conveyed by cuts and other semiotic features such as:

- (1) **Dissolves** organize the pictorial flow of content so as to symbolize movement in space or passage of time and a reflective state of mind suggesting different planes of consciousness by going back to the past or forward to the future. Dissolves also signal a need to consider what may have happened in the interim.

- (2) **Fadeouts** suggest the completion of one segment in a program and the beginning of another.
- (3) **Zooms in from a distance** draw attention to particular thematic elements by focusing on them and suggesting the beginning of a story sequence or scene.
- (4) **Zooms out to a panorama** often mark the end of a program, sequence, or scene by shifting from a narrow to wider view and drawing attention to the thematic relevance of particular content in relation to the story or scene as a whole.
- (5) **Auditory special effects** including vocalization and sound effects, such as a drum roll or loud crash of music, serve as emphasizing signals, often announcing that a critical event in a story is occurring.

Such conventional codes or cinematic techniques, characteristic of this medium, function as a grammar that signals the temporal flow of program content. From a semiotic viewpoint, however, these codes do not function only as signifiers of grammar, they also operate as signs with multiple textual properties. On the one hand, they iconically, themselves signify syntactic properties (as when a zoom out to panorama indicates the end of a story) and, on the other hand, these codes also become the signified at the place where textuality and extratextuality are interwoven. Thus, to avoid the binarism found in Sausure's semiotic model, televisual grammar's cannot be viewed as a value-neutral internal organizing principle. But, as a value-rich textual category that operates as a means by which other value-rich systems obtain access to the narrative structure. This is particularly evident when formal conventions sustain

social values (e.g., the way sharp cuts, fast pans, and extremely brief dissolves, in contemporary children's animation, supports violent content).

Formal Features for Connotative Meanings

In addition to the organizational and punctuational properties of its syntactic features, television has evolved formal features that convey the polysemic properties of program content. Examples of such program attributes are features that serve as markers of a particular type of content, or particular genre of program (Huston & Wright, 1983; Huston, Greer, Wright, Welch, & Ross, 1984).

Content markers. The medium's use of techniques and/or type of narrative dramatic enactments can suggest the type of content presented. Below are some examples of formal features which serve as markers.

1. **Advertisements of feminine and masculine products**
 - Advertisements of women's or children's products are usually composed of a slow-paced flow of images; soft, "delicate" music; and a "dreamy" background.
 - Advertisements of men's products are often composed of a rapid flow of images and loud music, and are forthright and action-oriented.
2. **Technique**
 - Musical themes or songs can signal the entrance of a particular character or stylized story script (e.g., Sesame Street theme music for particular

cognitive tasks such as classification and counting).

- Extreme close-ups direct the viewer to pay closer attention to details. While they allow the sharing or invasion of the character's personal space, they signify the need to see into the character through a close examination of her/his words and actions.
- Lighting transition using soft yellowish colors signifies qualities such as positive transactions, gentle characters, or feminine attributes, in contrast to harsh whiter colors signifying aggressive or negative transactions.

3. **Narrative dramatic enactments**

- Casting involves the encoded selection of performers who represent embodiments of ideological values.
- Actions include encodings of "actional" narrations that harmonize with the ideological roles that characters portray.
- Dialogue includes forms of verbal narration used to suggest the entire range of emotional relationships.

Genre Conventions. Below are some of the formal features which the medium uses as signals for particular genres of programs.

- (1) **Animation** (in the United States) suggests children's stories.
- (2) **Staged appearance and music** suggest fictional as opposed to real content.
- (3) **Dialogue** among adults suggests the presentation of serious content.
- (4) **Magazine** suggests multiple segments of distinct content with no continuity between them.

To comprehend a program's narrative textuality, the young viewers must learn to interpret the medium's signifying systems that signal these categories of meanings. The child has to learn to decode the phenomenological relationship among these signifying features and extract both the denotative and connotative semantic properties that they suggest.

Specialized Production Conventions

Age-related differences found in the interpretation of the medium's complex symbolic systems of communication have led to the development of specialized cinematic techniques and production conventions for viewers of different ages. Viewers of different ages have different attentional and cognitive skills that influence the types of program they tend to watch. Specialized production conventions serve as guiding features that help young viewers to focus their attention.

The specialized features that the medium has developed reflect the type of stimulation to which young children are more likely to attend. Young children are inclined to be attentive to perceptually salient features such as animation, peculiar voices, lively music, rhyming, auditory changes (Anderson & Levin, 1976), and sound effects (Calvert & Gersh, 1987). Their attention is also increased by the

presence in the program of women, children, eye contact, puppets, rapid pacing, and repetition. By contrast, their attention is reduced by the presence of adult men, inactivity, and still drawings (Anderson, Levin, & Lorch, 1977).

Furthermore, young viewers who have difficulties in discriminating and integrating central and incidental content have fragmented narrative representations when viewing long programs. To accommodate such viewers, the medium deploys specialized formal features. For example, programs for pre-school children typically use rehearsal, repetition, and elaboration. These specialized formal features can be divided into three main categories of attributes or stylistic codes and conventions (Huston & Wright 1983):

- (1) **Perceptual salients** include attributes such as rapid pace, physical motion, unusual and unexpected perceptual events and intense auditory stimulation.
- (2) **Reflective techniques** include attributes such as zooms, songs, and moderate levels of physical activity that appear appropriate for rehearsal, repetition and elaboration.
- (3) **Character dialogue** includes adult, child and non-human verbal exchange (in which the form is the dialogue, and the meaning of the words is the content).

The younger television viewers rely more heavily on salient perceptual features to highlight the relevance of actions and events in the program as a whole. Children

younger than eight years old rely primarily on iconic or pictorial formats, since these can function as perceptual aids. Symbolic forms, such as adult dialogue, may confuse the children. These visual formal features serve an enhancing function, for they guide the young children's interpretation of symbolic forms such as child and adult dialogue.

The older children's shift away from reliance on perceptual salience is accompanied by an increasing skill in searching for informative content (Calvert, Huston, Watkins & Wright, 1982). With age and experience, children cultivate a larger variety of cognitive bases for selection and are therefore less reliant on perceptual forms and perhaps more reliant on symbolic forms of presentation. They appear to attend more strategically to information and use more active and schematic modes of processing (Wright, Huston, Ross, Calvert, Rolandelli, Weeks, Raeissi & Potts, 1984).

Children are not passive participants; rather, they apply their own experience to derive meanings from a program's content (Anderson & Lorch, 1983). Salient features influence selection of information for all viewers but differently according to age levels. With age there is an increase in children's knowledge base and in the level of sophistication of their narrative skills. They are now able to search for informative features that signal moments when

critical content is presented (Huston-Stein & Wright, 1979; Wright & Huston, 1981). As children acquire television literacy, therefore, the cognitive demands made by the complexity of a program's narrative textuality become more important (Anderson & Smith, 1984; Pezdek & Hartman, 1983; Wright et al., 1984). Although understanding is clearly related to the viewers' age and experience with the medium, there are various individual differences that can also influence interpretation: gender, cultural background, socio-economic status, reasons for viewing, input from others, attitudes towards television viewing, and the amount of effort expended in viewing. What the viewers bring to the television experience, then, is as important as what television presents to the viewers.

Chapter 2

The Development of Television Literacy

The plurality of television's intermodal forms of presentation renders its narrative textuality highly varied and open to several levels of analysis. This textual complexity presents the viewer with an "ill-structured problem" (Simon, 1976) demanding a great deal of attentional, organizational and inferential activity. To attend to and comprehend the content in this discourse mode, children must use fairly sophisticated organizational skills (Anderson and Smith, 1984; Collins, 1983; Huston and Wright, 1983). Their level of cognitive organization and processing of televisual content is related to their understanding of the medium's forms of presentation and production conventions.

Cognitive Organizational Narrative Skills of Preschoolers

These cognitive activities are not unique to television viewing: they are used in other modes of communication and real-life activity. With the development of mental representation, young children use temporal sequence as an organizing principle in their everyday activity and social interaction. This representational

capacity leads to a rapid improvement in cognitive organizational skills during the pre-school and early elementary school years. Children first acquire ordering principles from familiar and meaningful activities or events in which they participate (Nelson & Gruendel, 1981; O'Connell & Gerard, 1985).

According to Nelson (1986) and her colleagues, children's reports of events "suggest that important or typical actions for an event are represented at a higher level than variable or optional information, and that children are highly sensitive to event sequence, especially when the actions consistently occur in the same order [as] in the real world" (p.47). Research into young children's performance on a variety of conceptual and logical reasoning tasks suggests that a well-structured knowledge system concerning events is an achievement that emerges during the latter part of the pre-school years (Nelson & Gruendel, 1981). Later, with the acquisition of conceptual thinking, sequential understanding of events is also possible in unfamiliar and context-free events (Case & Khanna, 1981).

Nelson's findings amply describe pre-conceptual children's mental representation and organization of real-life events. However, these findings concern scripted sequences in familiar events and may not be directly applicable to the temporal flow of content represented in the televisual discourse mode.

Television presents information through dramatic enactments of actions and events. The use of intermodal features, unique to television, contextualizes semantic content and allows it to penetrate smoothly into its audience's social life. Televisual representation of real-life actions and events can be deceptive because it introduces an ease in the flow of content, suggesting an objective and accurate depiction. For this deceptive appearance to be effective, the viewers must passively attend to a program's direct meaning. Active readers complicate this apparent objectivity by critically reading the program's narrative structure and attending to both explicit and implicit meanings (Fiske, 1987; Hodge & Tripp, 1986).

Television content is composed of culturally loaded visual and auditory images, both of which are iconic and/or symbolic forms of articulation. These forms encode representations of events and phenomena from the real world. The iconic (or analog) mode of representation is processed more easily than the symbolic mode, especially by children younger than seven or eight years old. The medium's formal features are used as symbolic codes to organize the presentation of its message. As symbolic means of communication, these formal features have a two-fold effect: first, they function as representational forms, and second,

they have the power to shape the viewer's modes of representing and processing information.

Learning to Interpret the Medium's Narrative Structure

Pre-schoolers have not fully acquired the conceptual properties of time and space. This could explain why they find the comprehension of the layered meanings presented in the televisual flow a very challenging task. Their limited knowledge of the world and unfamiliarity with televisual communication techniques hinder their attention to the medium. These factors may result in fragmented or incoherent comprehension of program narrative. Pre-schoolers may have difficulties in understanding the relationship between filmic sequences as part of a coherent text, perceiving them as a series of unrelated events. The perceptual transformations of camera techniques and editing manipulations can disrupt rather than enhance comprehension.

Learning to decode this medium's symbolic forms and syntactic features is akin to learning to read the symbols and syntactic features of written language. Young children, under the guidance of more mature viewers and the medium itself, learn the formal features of television that maintain attention, mark important content, and transmit explicit and implicit meanings. Through such guidance young viewers learn to make distinctions and draw connections

between the objects, actions, and events presented in programs. As children become literate in television's discourse mode, they recognize that it has its own rules and conventions that produce unique syntactic narrative structures.

Television literacy can be a more demanding task than print literacy. In addition to basic cognitive skills, audiovisual narrative requires additional verbal and extensive visual skills to process the flow of content. Pezdek, Lehrer, and Simon (1984) compared children's processing skills with respect to print and audiovisual text. Their findings showed that general cognitive skills are involved in both modes of discourse; however, some skills required are unique to each. A follow-up study identified two cognitive skills peculiar to the comprehension of televisual narrative: the skill of manipulating visual-spatial information (as measured by a paper-folding task), and the skill of integrating such information (Pezdek, Simon, Stoeckert & Kiely, 1987). For young viewers, therefore, the audiovisual narrative poses an even greater challenge because these children have not fully acquired the skills to manipulate visual-spatial information. Nor have they acquired the skill to reason about verbal and visual concepts. Additionally, their limited language use and small vocabulary base makes it

difficult for them to interpret verbally-communicated content.

Literacy in the audiovisual discourse mode requires the integration of the medium's multiple forms of communication, because the synergistic relationship between these forms creates a dynamic flow of narrative textuality. Each of these modalities supports and enhances the other. The viewer's attempt to integrate formal features across modalities strengthens the impact. As Arnheim (1971) puts it: "Whether or not such combinations of sensory modes are helpful or disturbing depends largely on whether structural correspondences can be experienced among them" (p. 111).

The child acquires a televisual context that allows the medium's forms of articulation to become symbolic representations of the real world. To make sense of a program's content, the young viewer must integrate simultaneous and sequential content elements as well as attributions of motives or purposes (Dorr, 1986). In order to achieve cognitive continuity, the viewer must create a context of expectations and integrate central and incidental program events (Anderson & Smith, 1984). Hence, to study the comprehension of audiovisual program content, one has to examine the ways in which viewer interpretations were influenced by factors such as modality of content presentation, textual complexity, relevance of content, forms of organization, and experience with the medium.

Influence of Textual Complexity and Relevance of Content on
Children's Interpretation of Program Meaning

According to the data reported by Collins, Wellman, Keniston, & Westby (1978), comprehension of dramatic presentations involves at least three cognitive tasks: selective attention to central program events, orderly organization of the program events, and temporal integration of events where the child is required to infer implicit relations between scenes. As Collins (1983) suggests, program comprehension "involves both attention to and retention of explicitly portrayed relevant events and inferences in which viewers go beyond on-screen events to grasp the relations among them" (p.127). Thus, in addition to the child's intellectual level of performance, the degree of narrative complexity and the young viewer's prior experience of the medium may also affect her understanding.

In a series of studies, Collins and his colleagues (1970, 1973; Collins et. al., 1978) have focused on children's comprehension of televisual content independently of its forms of presentation. Their data demonstrated that pre-school and primary grade children show difficulty in drawing from selective memory for central events. It also revealed that children at this grade level were challenged by televisual cues requiring the inference of implicit and explicit relationships within program content such as

motives, actions, goals, or consequences. These investigators did not ascribe this "fragmented" comprehension of televised story narrative to program length or to extraneous plot information. Instead, they attributed the children's poor integration processes to a failure to attend to the causal sequence of screen events. This level of processing perhaps also contributes to the children's low recall of program content.

According to these studies, between the pre-school and early-grade years there appears to be a sharp distinction with respect to the degree of narrative continuity in children's representations of dramatic adult programs. Young children are more likely to attend to direct program meanings. They do not understand causal sequences very well, so that it is more difficult for them to recognize implicit content and relationships between events in the program (Collins, 1981). As a result, they are more likely to attend to incidental events, contributing to their poor recall and reducing their overall understanding of the program (Hayes & Kelly, 1984). This viewing style impedes their spontaneous organization and integration of essential plot information. Prior to the age of seven or eight, children do not appear to comprehend the abstract message of a program (Christenson & Roberts, 1983).

Investigations that focus on comprehension of semantic content apart from its forms of expression and viewing context describe television literacy as an abstract category located within the minds of the viewers. This view is consistent with Piaget's conception of cognitive activities that are internally organized by abstract operational structures. This unidirectional orientation neglects the medium's impact and is only concerned with what the children bring to the viewing experience.

Television viewing, however, involves a bidirectional process. Accordingly, age-related differences in the integration of content are specific to adult dramatic programs (which were long and included unfamiliar events). However, when the program viewed was short and its content consisted of familiar language and events, children were able to draw a variety of inferences and form continuous and coherent representations as early as the pre-school years (Anderson & Collins, 1988; Smith, Anderson & Fischer 1985). The age-related differences in comprehension of full-length adult programs are not merely the result of cognitive development. They also appear to be due to the program's textual complexity, to the children's knowledge of the content they viewed, and to their experiences with and understanding of this medium. This research suggests that older children are able to have a continuous representation of program content because their viewing style is based on

expectations -- created by themselves -- about the program and the relationships between events.

In fact, Jacobvitz, Wood, and Albin (1991) studied the relative contributions made by basic verbal and visual information-processing skills in the comprehension by five-year-olds of a lengthy program that contained complex social themes. Their findings showed that performance was related to the mode in which the program's content was presented. They suggest that "verbal skills were highly related to comprehension of central events and visual skills to comprehension of incidental events, because there were differences in the amount of, or difficulty of, the verbal and visual information contained within the two types of content" (p.229). These results do not suggest, however, that the children used only the verbal content for central events and pictorial content for incidental events. Research on the relationship between attention and comprehension shows that although children are more likely to attend to visual forms of presentation, auditory forms influence their attention to these visual forms (Krull, 1983; Pezdek & Hartman, 1983; Pingree, 1986).

Modality Effects

Children's overall comprehension is influenced at all ages by features in both modalities. Studies, however,

suggest that young children as novice viewers better understand information presented in the visual mode. Although Anderson (Anderson, Lorch, Field & Sanders, 1981; Lorch, Anderson, & Levin, 1979) has demonstrated that young children are able to process both audio and video features, Calvert, Huston, Watkins and Wright (1982) and Hayes and Kelly (1984) suggest that pre-schoolers show significantly greater retention of televised information presented visually rather than aurally. Specifically, the findings of Gibbons, Anderson, Smith, Field and Fischer (1986) suggest that four-year-olds remembered actions better when they saw the actions performed than when they heard them described verbally. Also, Stoneman and Brody (1983), who studied children in pre-school, kindergarten and second grade, suggest that, in all three grade levels, memory for visual television content is superior to that of verbal content. The successive presentation of content conveyed primarily by visual mediators might be integrated by young children to a higher degree because visual forms are more congruent with the child's schematic representation of the world.

Furthermore, some studies, in comparing the levels of comprehension of audio, visual, and audiovisual narratives, suggest that children remember more information from audiovisual presentations than from audio versions of the same stories (Gibbons et al. 1986). Children as old as seven years can remember visual and verbal content equally

well. Despite a developmental increase in the comprehension of information presented linguistically (Hoffner, Cantor & Thorson, 1988), younger viewers show a better understanding with audiovisual forms of presentation because they draw meaning from both modes of articulation. A developmental explanation of television literacy, therefore, suggests that children at all age levels rely on both modes of representation but that, initially, young viewers may depend more heavily on one modality than on the other.

The Effects of the Medium's Cinematic Montage

Comprehension of television programs is not solely a function of the modality in which content is presented (Gibbons et al., 1986; Hoffner et al., 1988). One cannot explain such a complex phenomenon by merely focusing on the relationship between program comprehensibility and children's attention to formal features of different modalities (Calvert et al., 1982). Two important aspects of television literacy require further study: the medium's formal features of articulation and the context that organizes the viewing experience as a cultural activity. The composition of the medium's multiple forms directly affects program meaning.

The level of compositional complexity interferes with the children's interpretation of a message. Because dramatic and cinematic techniques articulate meanings on various levels, features that organize the flow of content may also block or skew the comprehension of an unsophisticated viewer. The formal and qualitative semantic properties of the medium's cinematic grammar and syntax carry considerable information regarding the narrative flow. The viewer's level of understanding and experience with the textual formatting of audiovisual narratives is determined by the ability to attend to the semantic properties which the syntactic features symbolize. In order to gauge the degree to which the medium's syntactic features affect the comprehension of various age groups, it is necessary to study the interpretation of specific syntactic forms of articulation.

Camera techniques such as cuts, tracks, pans, zooms, fades and dissolves organize a program's dramatic narrative structure and articulate its temporal flow. As communication devices, these syntactic features carry both iconic (concrete) and symbolic (operative) properties conveying meanings on two levels: the presentational with literal and explicit meanings, and the representational with figurative and implicit meanings. The comprehension of information expressed on these levels of articulation depends on both the viewers' level of cognitive

sophistication and their level of familiarity with this medium's discourse mode. According to the literature, children younger than seven or eight years old are more likely to attend to explicit meanings conveyed at the presentational iconic level than to implicit meanings conveyed at the representational symbolic level.

The dramatic narrative flow of program content (objects, actions, central and incidental events), is a crucial aspect of the textual formatting of audiovisual story narratives. The way in which a program's textual montage is organized determines its level of structural complexity. In turn, this level of complexity influences the narrative meanings that viewers in different age or cultural (viewing experience) groups may derive. Thus, to effectively interpret the narrative flow of content one must be familiar with the textual formatting used in the various genres of programs and with the possible meanings that the medium's syntactic features carry.

Television programs for children are characterized by particular constellations of formal features constituting a specialized genre of narration. Downs (1990) suggests that children as young as four years old are able to distinguish between different genres of television programs.

To test the comprehension of specific cinematic techniques of different complexities, Smith et al. (1985) conducted two studies with short audiovisual narratives

whose form and content complexity was controlled. In their first study, they used three scripts presented in three different editing conditions. In the first, the action unfolded in front of a stationary camera without any cinematic techniques. In the second, the camera panned and zoomed in at various points in the story. The third version combined pans and zooms with cuts. The results of this study suggest that, among three- and five-year-olds, the use of cinematic montage to organize content (i.e., second and third conditions) neither enhances nor diminishes the children's comprehension.

In their second study these investigators used longer event sequences and incorporated more challenging cinematic manipulations. This study included twelve additional segments, each of which incorporated elements of montage requiring inferences of space, simultaneity of action, ellipsis (implied action), and character perspective. The comprehension of four-year-olds was compared to that of seven-year-olds. Their reconstruction of the narratives they viewed was scored with respect to sequences of action and character placement. On average, 62% of the four-year-olds' critical inferences were correct, while 88% of those by seven-year-olds were correct. Both age groups made inferences concerning implied action most easily. However, the four-year-olds found inferences of simultaneity the most

challenging, whereas seven-year-olds found inferences of character perspective the most difficult.

The results of both the first and second studies that Smith et al. (1985) reported suggest that there is already substantial comprehension of audiovisual montage among preschoolers. When the narrative flow of content consists of short sequences and conforms to a specialized grammar of organization, children as young as three and five years are able to comprehend the text of the story. However, as the results of the second study suggest, preschoolers were more likely than the seven-year-olds to miss critical inferences when the duration of the sequences was longer and the composition of the cinematic techniques was more complicated. However, the fact that both groups recognize implied actions with ease suggests that pre-schoolers were able to integrate to a certain degree of continuity both explicit and implicit meanings.

Accordingly, despite the positive findings that Smith et al. (1985) reported, these authors suggest that comprehension by preschoolers of full-length dramatic programs may indeed become fragmented as a result of the duration or more complex cinematic techniques. But when the content of a story conforms to a specialized grammar, children as young as three and five years are able to comprehend the program text.

Salomon and Cohen (1977) studied the understanding of montage techniques among ten-year-olds in Israel by using five versions of an 8-minute film. 1) The "filmic bit" was based on the fragmentation of space. Shots were taken from different points of view so that the viewer had to relate fragmented spaces to follow the plot. 2) The filmic bit contained logical gaps -- segments of certain scenes were deleted so that there were brief breaks in the continuity of the bit's narrative textuality. 3) The filmic bit consisted of numerous close-ups interspersed with long shots. 4) The flow of content was presented by zooms in and zooms out. 5) The filmic bit was as simple and straightforward as possible.

The data indicate that children's comprehension was influenced by the montage of cinematic techniques. Children experienced difficulties in three of the five conditions because they had to restructure the content and construct a causal or spatial relationship between shots. However, they remembered the straightforward presentation better than any other version, as this program was less fragmented and its flow of content made it easier for them to make causal connections. In addition, the zoom version was understood almost as well as the straightforward one. This is not surprising, since a zoom is a single shot and does not require the viewer to infer the relationships between shots.

To understand the performance on these five versions of the film, Salomon and Cohen (1977) also studied the relationship between children's cognitive and visual skills and their comprehension of audiovisual montage. They asked whether children's ability to interpret televisual techniques depends on more general visual skills. To this end, they tested children on skills related to the editing techniques included in the five versions of the film they observed. One of these tests, the Space Construction Task, required the child to arrange four pictures to form a whole. The researchers assumed that this sort of task corresponds to a montage of camera shots where parts of some scenes must be integrated mentally to construct an image of the whole. All versions of the film, except the straightforward one, required the viewer to coordinate bits of spatial information. The level of performance on the Space Construction Task indeed correlated with comprehension of all versions except the straightforward one. Children who performed well in the Space Construction Task also understood the more highly-edited film. This relationship suggests that comprehension of filmic montage, with its symbolic devices, is related to more general visual-organizational-skills. It involves not merely a general intellectual ability but also the development of specific skills related to the medium's forms of articulation.

Salomon has also studied the effects of television viewing on children's more general visual skills. Many of the techniques of television make relationships visible that would otherwise have to be constructed mentally. For instance, when a camera zooms in on a detail, this makes the relationship between a part and its whole visually explicit. Salomon (1979) studied the effects of zooming and long-shot techniques on the viewer's comprehension of part-to-whole relationships. He examined whether use of the zoom technique to highlight details could help eighth-grade children to single out details from a complex visual display. He showed one group of children films of a painting, in which the camera zoomed in on details and out again to the entire painting eighty times. Another group simply practiced identifying details from a slide of a painting. Both before and after this training, the children were tested by being asked to pick out as many details as possible from a slide of a classroom scene.

Salomon found that the degree of help provided by zoom training depended on the child's initial level of visual skill. Children who began with low ability to notice details benefited much more from the zoom training than from simple practice. But children who were already skilled in noticing visual detail actually did slightly worse after the zoom experience. For them, simple practice without zoom was most helpful. Thus the value of the zoom technique in

teaching children the relationships between a detail and its whole seemed greater at the earlier stages of learning. At a certain level of skill, more challenging tasks of picking out details without the aid of a camera became the best way of perfecting the skill. The same pattern of results emerged with other camera techniques. It seems that camera techniques can promote the learning of visual skills. However, by modeling visual processes, the camera brings to the viewer the operative properties which are signified by the program's textual formatting. It can thus do too much for a viewer who already has the basic cognitive skills.

Salomon's study elaborates the informative potential of the medium's formal features and some of the ways that these formal features affect the interpretation of televisual information. The visual formatting serves two additional distinct functions for viewers at different levels of competence. First, the medium can enhance comprehension by "supplanting" mental operations for children not yet possessing advanced cognitive skills by visually articulating the successive flow of temporal- and spatial-textual relationships. Second, the medium can "elicit" mental operations from more mature viewers by suggesting or cueing cognitive processes.

Through such technical devices, the plurality which exists in the medium's forms of representation may enhance the development of a comparable cognitive plurality in the

viewer's mode of thinking. This possibility bears on communicational skills in general and on the cognitive development of the child in particular. As Baron (1980) suggests, however, camera techniques such as zooms and editing manipulations are understood poorly by children younger than eight years old. A Piagetian developmental approach would lead to the hypothesis that a pre-school child has not fully acquired concepts of time and space and should find comprehension of the layered meanings of televisual montage a very challenging task. Thus, the perceptual transformations of camera techniques and editing manipulations may, rather than enhance comprehension, disrupt the construction of a unified representation of story narratives. However, the differential facilitative effects which Salomon's editing techniques had on viewers of varying cognitive skills suggest that the medium can use specialized production conventions to mediate this challenge. Hence, children's interpretation of content does not merely depend on their cognitive sophistication. Rather, the degree of narrative complexity in a program's textuality can also enhance or hinder children's comprehension.

Chapter 3

A Developmental Model for Television Literacy as a Cultural Competency

Much of the early research on television comprehension was based on a deficit model. This model adapts methods of cognitive psychologists and computer scientists trying to describe human understanding of scripts, stories, schemas, and other narrative structures by relying on cognitive processing perspectives. It assumes that television literacy is an abstract narrative competency similar to the Piagetian abstract cognitive structures which regulate viewing behavior. According to this model, the age-related differences in comprehension are attributed to the young children's intellectual immaturity and reliance on egocentric and stimulus-bound cognitive structures in interpreting programs' content (Anderson and Smith, 1984; Collins, 1983; Collins, et al., 1978).

The deficit model, relies on cognitive stage theories, explaining responses by dividing them into preconceptual and conceptual categories. The interpretive skills of pre-conceptual children relate closely to their perception because their judgments are based on perceived immediate appearances. On the other hand, children at the conceptual level make inferences beyond appearances because their

cognitive skills mediate their perception, allowing them to recognize relationships between events (Rubin, 1986). This conceptual framework focuses, however, only on a narrow subset of what the children bring to the viewing situation. It does not take into account the complexity and adaptive nature of their cognition nor what television, as a medium of communication, brings to the viewers.

Television viewing involves a bidirectional process in which the dynamic textuality of a program's narrative flow reflects the multidimensional nature of the cognitive activities in which children engage. Thus, to study the comprehension of television programs, one has to rely on a bidirectional model which examines what both the children, as socially situated viewers, and the medium, as a social institution, bring to the viewing experience. The age-related differences in the comprehension of long, adult programs may be due not only to differential attention and memory capacity of young children, but also to their experience with and understanding of the medium. Children at all ages rely on cultural medium-constructs or paradigms that help determine the reasons for viewing and develop a context of program expectations (Dorr, 1980).

For children of all ages, the viewing experience is influenced by the situatedness of the activity. Some circumstances lead to a passive viewing experience in which viewers attend to the more direct meanings presented.

Other circumstances, however, lead to an active viewing experience where the level of the viewer's involvement influences interpretation of program content (Dorr, 1980). This bidirectional nature of the medium-construct within which children operate makes television literacy a fluid narrative competency that continually evolves with age and experience.

At all age levels, there is a bidirectional relationship between the viewers and the medium (Durkin, 1985). The reliance by older children on informative features which signal, mark, and organize content (Calvert, et. al., 1982) suggests that their involvement is active. The mere fact that young viewers rely on perceptual salience (Anderson, et. al. 1976; Calvert, et. al. 1987) suggests that, regardless of their cognitive involvement, they also attend actively to the content. A further indication that children are actively engaged in their viewing experience is their superior comprehension of short programs with familiar language and events. In such programs, children can integrate content and make inferences as early as during the preschool years (Anderson & Collins, 1988; Smith et al., 1985).

Studies that take into account the type of program content indicate that the improvement with age in children's comprehension of long adult programs is not merely related to shifts in their ability to discern central content and

make inferences. Rather, it is closely related to their increased experience with the medium and their growing general knowledge of the world (Anderson & Collins 1988; Smith et al., 1985). The framework on which children rely to interpret television's content, therefore, is grounded in the context of viewing as a cultural practice. Hence, even though children have different expectations of the medium and make different interpretations of program content, they have their own understanding of this medium by the age of nine (Hodge & Tripp, 1986).

The development of children's medium-constructs with age and experience is accompanied by a fine-tuning of their narrative viewing competencies; this enables them to interpret program content more critically. The development of these competencies entails the mastery of the forms that constitute television's discourse mode. Although these forms are an integral part of social discourse as a whole, they are also specific to this medium. The concept of "literacy as a practice" (Scribner & Cole, 1981) can be used to explain an individual's mastery of this discourse mode as a cultural narrative competency activated by the viewing practices of a society as a whole.

To describe the developmental processes of the narrative viewing competencies necessary to capture the dynamic flow of program content, one must take into account the multiple psychological levels at which this content is

processed: cognitive, emotional, social, and cultural. To study the complexity of psychological processes in the development of narrative viewing competencies, a multiple theoretic perspective would have to be adapted that can take into account the impact of both the child and the medium. Piaget's theory of genetic epistemology can be used to describe the structural criteria by which children organize program content and the operative formal features of their narrative competencies. The dynamic process viewpoints of Vygotsky and Werner are useful to account for facts of semiotic mediation and the multilinearity of psychological processes behind these formal criteria. That is, Vygotsky's semiotic-mediational perspective can elaborate on the bidirectional relationship between internal cognitive and external communicative forms of thinking. Integrating this perspective with Werner's comparative-organismic developmental approach can account for acts of mediation in relation to the organization of internal processes across psychological domains.

Cultural Mediation in the Development of Television Literacy

To apply the concept of "literacy as a practice" requires that television viewing be perceived as a cultural activity. Viewing does not occur in isolation; rather, as a cultural means of communication, it is an integral part of

social life. To study the complexity behind the social formation of narrative viewing competencies, Vygotsky's concept of "activity" can be used as an explanatory principle of physical and cognitive behavior. According to the "general genetic law of cultural development" assumed in Vygotsky's activity theory, the formation of mental functioning "begins on the interpsychological plane and then, through mastery and internalization, moves to the intrapsychological plane" (Wertsch, 1985). This transition reflects the social origins of both physical and cognitive behavior. As Leont'ev (1981, cited in Wertsch and Stone, 1985) elaborates, consciousness is an expression of cultural knowledge because it is externally driven and organized by human activity:

Human's activity assimilates the experience of humankind. This means that humans' mental processes (their "higher psychological functions") acquire a structure necessarily tied to the socio-historically formed means and methods needed to carry out a process in any way other than in external form - in the form of action or external speech. (p. 56)

In this three part scheme, "the third part, encompassing the other two [stimulus and response] is the subject's activity ..., including the goals, means, and constraints operating on the subject" (Cole, 1985, p. 151). As Vygotsky puts it, "[c]ulture creates nothing, it only alters natural data in conformity with human goals" (in Wertsch, 1985, p. 51), so that the subject's activities are

heavily mediated by social systems of tools and signs. The natural data to which Vygotsky refers consist of the *elementary mental processes* which derive from species endowment or biological maturation. They provide the foundations, or the raw materials, for the social formation of semiotically-mediated higher mental functions.

What links the components of the "three part scheme" in Vygotsky's activity theory, therefore, is the act of mediation. For him, sign systems operate as "psychological tools" and the mastery of their organizational properties transforms the mental functioning of their users. As he explains,

By being included in this process of behavior, the psychological tool alters the entire flow and structure of mental functions. It does this by determining the structure of a new instrumental act just as a technical tool alters the process of a natural adaptation by determining the form of labor operations. (Vygotsky, 1981)

This assumes a bidirectional relationship between processes in the internal and external domains that have the power to influence one another and shape behavior. Vygotsky's semiogenetic perspective, therefore, addressed the social formation of higher mental functions and used sign mediation to explain the "ontogenesis of mental processes...governed by the [goal oriented] organization of sign systems" (Wertsch, 1985, p. 51).

Although Vygotsky acknowledged the impact of diverse cultural tools on higher mental functions, he was primarily

concerned with language as a psychological tool. He mainly focused on the transformatory power of the linguistic sign system. He writes:

[t]he most significant moment in the course of intellectual development, which gives birth to the purely human forms of practical and abstract intelligence, occurs when speech and practical activity, two previously completely independent lines of development, converge. Although children's use of tools during their preverbal period is comparable to that of apes, as soon as speech and the use of signs are incorporated into any action, the action becomes transformed and organized along entirely new lines. (Vygotsky, 1978, p. 24)

The power which Vygotsky assigns to symbolic forms of communication in the transformation of culture into cognition makes his perspective critical to the social formation of consciousness in contemporary multimedia society. For him, the "zone of proximal development" (ZPD) is the mechanism that mediates this interplay between the inter- and intra-psychological planes. The ZPD is where the individual and culture interact, and makes possible the dialectical and reciprocal relationship between consciousness and the collective forms that coordinate social life and practical activity (Cole, 1985; Valsiner, 1987, 1994a; Wertsch & Bivens, 1993; Wertsch & Minick, 1990). The ZPD is, therefore, the psychological space in which mediational mechanisms connect to form a culturally appropriate semiotic system that enables individuals to participate in social discourse. To use Vygotsky's

figurative explanation of this psychological space, "the zone of proximal development is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined by problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky 1978, p. 86).

In Voices of the Mind, Wertsch elaborates on the ZPD as a semiotic mediational mechanism by expanding on Vygotsky's original emphasis on semiotic mediation and internalization. Even though Vygotsky, in his semiogenetic perspective, devoted attention to "the diversity of mediational means...he did not deal with many of the implications of explicitly viewing psychological tools as part of a larger organized whole..." (Wertsch, 1991, p. 93). Therefore, in order to effectively use Vygotsky's semiogenetic perspective in the contemporary multimedia world, it is necessary to expand upon the analogy he made between tools and semiotic mediation (Vygotsky, 1981).

Wertsch expands on this analogy by using a text-mediated approach which "rests heavily on the assumptions that: (a) intermental and intramental functioning is fundamentally shaped by mediational means such as forms of language (Wertsch, 1985, 1991), and (b) all participants in intermental functioning are actively engaged in shaping this functioning" (Wertsch & Bivens, 1993, p. 211). These claims

are grounded both within an activity-theoretic perspective (mainly Leontievian, 1975, 1981 cited in Wertsch, 1990) and a Soviet semiotic perspective (Bakhtin, 1981, 1984, 1986; & Lotman, 1988a, 1988b). As Wertsch outlines, for Lotman "a text is any semiotic corpus that has significance. It may be verbal (e.g., a single utterance, a book-length treatise) or nonverbal (e.g., a painting, a costume)." However, Wertsch's text-mediated adaptation of Vygotsky's perspective focuses on verbal texts and particularly those "that are spoken in the flow of intermental functioning" (Wertsch, 1991, Wertsch & Bivens, 1993). He achieves this by distinguishing two characteristics of the "functional dualism" Lotman outlined of any text, namely, a univocal and a dialogic function. While Wertsch acknowledges the communicative value of the univocal function, he focuses on the dialogic function to account for the interpersonal processes that retain their cultural roots on the intrapersonal level. He is mainly concerned with the internal dialogic processes stimulated by diverse sign systems of verbal communication regulating human activity.

Both Lotman's definition of text and Wertsch's text-mediated approach to cognition are based on Bakhtinian conceptions of multivoicedness and dialogic processes of human activity in general and verbal communication in particular. According to Wertsch (1985), Bakhtin's

writings complement Vygotsky's in that Vygotsky focused on psychological processes and said relatively little about the interrelationships among texts at a sociocultural level, whereas Bakhtin wrote extensively on interrelationships among texts and said little about the precise mechanisms of psychological processes. (p. 63)

Thus, while Vygotsky discusses mediation by focusing on communication and psychological processes of socially situated individuals, Bakhtin discusses mediation by focusing on large-scale social processes that affect the communication of individuals, groups, or people in general. The integration of these perspectives provides insights into the impact of psychological tools as part of a larger organized whole.

By taking into consideration Bakhtin's account of heteroglossia and social languages, Vygotsky's notion of sense can be expanded to deal with the context of ideological perspectives. (Wertsch, 1985, p. 67)

In addition, by integrating Vygotskian conceptions of mediation and communication with Bakhtin's account of semiotic mechanisms such as reported speech and hybrid constructions,

Vygotsky's analysis of the semantic properties of inner speech can be expanded to include the specific mechanisms that make possible the influence of the ideological context on the individual. (Wertsch, 1985, p. 67)

Therefore, Wertsch rejects "Vygotsky's strong emphasis on word meaning as the unit of analysis, and [extends] it toward a text-semiotic mediation perspective" (Valsiner &

van der veer, 1993, p. 52). This way, Wertsch is able to capture the dialogic processes behind the ZPD. He substantively enhances the concept of the ZPD and is able to "accomplish what Vygotsky has failed to accomplish" (Valsiner & van der Veer, 1993, p. 52).

To apply Wertsch's text-mediated adaption of Vygotsky's perspective in a contemporary multimedia context, both the verbal and nonverbal attributes of text must be taken into account. This is of particular importance in the televisual mode of discourse. The visual and auditory sign systems television uses as well as its composition of these systems influence the social formation of the "medium-construct." While this text-mediated approach is different from Wertsch's because it is not limited to linguistic forms of communication, the same assumptions underpin the social formation of narrative viewing competencies. This text-mediated adaptation of the ZPD can help explain the interplay between the inter- and intra-psychological planes, and thus account for the elasticity necessary in acquiring conventional and personal coherence in televisual forms of discourse. It can help trace the microgenetic process guiding young children as they "fine-tune" the semiotic forms into a mastery of the medium.

Television can be thought of as an environment in which the cultural meanings of objects, actions and events are not directly accessible to novice viewers. They require

cultural mediation to facilitate their interpretation of the forms which the medium uses to encode the multiple meanings of program content. Therefore, young children cultivate their understanding of this medium and become literate in its mode of articulation through the guidance of both more sophisticated viewers and the medium itself.

Television, as a social institution, incorporates specialized production techniques that guide novice viewers through the zone of proximal development to acquisition of television literacy. To fulfill this facilitative role, its use of cinematic techniques and editing manipulations varies according to the potential viewer's level of medium sophistication. Specialized production conventions help to focus children's attention on the relevant content embedded in the complex multilayered composition of the audiovisual montage. This enhancing characteristic is a crucial element because it guides the scaffolding processes necessary for the child to make sense of the screen presentation.

Through the scaffolding processes made possible by the text-mediational perspective described above, the viewers reconstruct internally the medium's forms of content presentation and recognize its articulation of denotative operative and connotative normative meanings. This way, children learn to participate in television viewing as a form of social discourse and reconstruct for themselves the analytical and sequential content of culturally meaningful

narratives. They learn to attune themselves to the dynamic and expressive qualities of objects, actions and events presented on the screen. The young viewers' skillfulness in interpreting the medium's complex systems of signification is a function of their level of engagement with television viewing as a social practice and as an individual activity which occupies its own place.

Accordingly, the pre-school children, who perceive the medium as an extension of their immediate environment, can effectively interpret familiar content when it is within the realm of their personal experiences. On the other hand, the older children, who organize their behavior by relying on conceptual abstractions, can see television as an integral part of a culture and as having its own purposeful function in society. As a result, their expectations of this medium and the attributes they assign to it reflect its multifunctional purposes in their milieu.

Thus, under the guidance of both mature viewers and the medium itself, a constantly evolving mediational process of "fine-tuning" helps children establish a correspondence between external communicative and internal psychological processes. In comparison to the written mode, the audiovisual discourse mode uses symbols which are more congruent with a child's schemata and make easier the elaborations of relevant information. Television uses formal features that can "supplant" or "elicit" (Salomon,

1979; Salomon et al., 1977) cognitive skills or mental operations (i.e., visual analysis, perspective-taking and spatial manipulation). This elaborative role of the medium's conventions guides the young viewer's interpretation of causal connections in the flow of program content.

The Multilinearity of Narrative Viewing Competencies

Television content consists of objects, actions, and events which are multidimensional in physical terms and in terms of attributed meanings both on cultural and individual levels. To capture the dynamic and expressive qualities articulated by these multidimensional semantic properties of program content, viewers have to respond on cognitive, emotional, social, and cultural levels. The complexity of narrative viewing competencies, therefore, depends on the extent to which psychological processes in these domains are stimulated and interact to organize viewing behavior.

The "medium-construct" on which children rely creates the context of their cognitive behavior and can influence the organization of the psychological processes across these domains. Wernerian conceptions of development, like Vygotskian, would explain the social formation of such a "medium-construct" by taking into account the medium's symbolic forms of mediation as well as television viewing as

a cultural practice of a people. Therefore, adapting a comparative-organismic orientation to the text-mediated approach that was established above would address the scaffolding of cognitive behavior while focusing on the organization of the processes scaffolded across various psychological domains.

Werner's comparative-organismic developmental approach can be used as a framework to describe the multilinear processes involved in the mastery of narrative viewing competencies. Werner's (1948) analytic and conceptual construct of "analogous processes" can provide a perspective from which to explain the development of narrative viewing competencies in the televisual discourse mode. Werner borrowed the construct of analogous processes from comparative anatomy. He adopted this construct and defined mental processes "as processes at different genetic levels directed toward the same achievement but involving different function patterns [which] can easily be demonstrated to exist in almost any field of mental activity" (p. 214).

To account for such interfunctional psychological patterns in the context of the development of narrative viewing competencies, one would have to focus both on communicative processes in the external domain and psychological processes in the internal domain. The focus of attention in the external domain would have to become the

multidimensional aspects of content that reflect the dynamic and expressive semantic qualities of objects, actions and events presented on the screen. Comprehending this multidimensionality in the external realm depends on the interplay of psychological processes across domains (e.g., attentional, perceptual, conceptual, and social affective).

This correspondence between the multidimensional textual attributes in the external realm and multilinear psychological processes in the internal realm reflects the denotative operative and connotative figurative structural properties behind viewers' cognitive behavior. According to Werner's conception of analogous processes, these multiple levels of operating are genetically related. Variations in the complexity of narrative viewing competencies is, thus, related to the "overlapping [psychological] systems that mutually influence one another...[as they] represent co-existing developmentally different levels of functioning" (Glick, 1985, p. 113).

Werner's definition of development -- outlined by the orthogenetic principle -- elaborates on the comparative-organismic developmental processes which determine the organization of these overlapping psychological systems.

Whenever development occurs, it proceeds from a state of relative lack of differentiation to a state of increasing differentiation and hierarchic integration. (Werner & Kaplan, 1948)

This notion of development assumes that there are continuous changes in mental structures which occur through the interactive processes of differentiation and hierarchic integration. "As behavior becomes differentiated, it also becomes *hierarchically integrated*. That is, behaviors (physical and cognitive) come under the control of higher regulating centers" (Crain, 1992, pp. 78). Development evolves through this constant regulation of "qualitatively distinct states marked by varying levels of intrafunctional organization at varying levels of interfunctional organization [emphasis added]" (Glick, 1992, p. 560).

This conception of development, where physical and cognitive behaviors gradually come under the control of "higher regulating centers," is applicable to the mastery of narrative viewing competencies. The effectiveness of the medium-construct, on which viewers rely in a particular situation depends on the extent to which the microgenetic process operates. That is, it depends on the extent to which a particular viewing situation (defined by factors such as: purpose of viewing, narrative complexity of program and the type of content it presents) stimulates processes in the attentional, perceptual, conceptual, and social-affective domains. These processes can be in different developmental levels and their overlap could enhance (or hinder) viewing behavior by influencing one another. This overlap of processes across psychological

domains reflects the complexity and multilinearity of cognitive behavior which makes possible the differentiation and integration of content presented across a program's narrative textuality.

During the pre-school years, children operate at the pre-conceptual level and their interpretation of a program's narrative flow of content is fragmented. This fragmented representation of content is due to their predominant use of perceptual abstractions and their focus on the medium's forms of expression at the explicit, presentational level (iconic signs). By contrast, during the school years, children operate at a conceptual level and rely mainly on conceptual abstractions. School-age children are more likely to construct thematically continuous representations of content because they can recognize the explicit and implicit meanings integrating the narrative elements within the flow of content. Hence, by relying on conceptual abstractions, these children focus on both the presentational (iconic) and representational (indexical and symbolic) levels. They attend both to the formal and qualitative semantic properties of the program's narrative structure.

In accordance with Werner's concept of analogous processes, the level at which children integrate a program's content is related to the extent to which they coordinate these processes into a multilinear functional system. The

constant organization and re-organization of such interfunctional psychological systems is influenced both by internal and external factors. The regulatory and directive function which Werner assigns to external experiences indicates that for him the fine-tuning of these interfunctional psychological systems is organismically determined. Thus, according to this perspective, the mastery of narrative viewing competencies would have to be described in terms of the comparative-organismic developmental processes behind viewing behavior.

This way, the schematic representation of a viewer's interpretations of program content would consist of both denotational and connotational narrative structures making them both textually and socially relevant. To achieve this level of thematic integration, viewers must establish a semantic correspondence among the medium's multiple forms of articulation as they are integrated in the program's textual structure. Children must attend to the various "symbolic vehicular patterns" (the configurations of the medium's symbolic systems of signification) and recognize the multiple semantic levels.

Correspondence [between symbolic medium and referent] is achieved when both pattern and object are rooted in similar or identical organismic states, the formation of these states being directed and regulated by the underlying activity of schematization (Werner & Kaplan, 1984, pp. 24).

... the relation between the schematizing process and the articulated end-form (the symbolic

vehicle) is not a sequential one. The process of schematizing operates throughout, in a regulatory, directive manner, on the inner organismic states as well as on the final (externalized) articulation; it directs all the mental operations involved in the formation of the symbolic vehicle, such as scanning, selecting, discarding, and sequentializing. It is the directed means-ends character of schematizing activity that binds the vehicular form to its organismic matrix and gives meaning to the vehicular pattern. (Werner & Kaplan, p. 23)

Werner's theoretical perspective thus views the relationship between internal cognitive and external cultural forms of organization as one of "dual schematization" whereby processes in the two domains have the power to affect one another. The overlap of organizational processes in the internal cognitive and external cultural domains influences the underlying activities of schematization that regulate children's interpretation and organization of program content. This notion of dynamic schematization is in agreement with Bartlett's (1932) schema theory of remembering that suggests children's memory of content is based, not on passive, reproductive processes, but on active, constructive ones. To build meaningful mental representations of a program's content, children must actively interpret its narrative textuality and use knowledge from their past experience that is relevant to its content.

In this dynamic process of schematization the children's past experience "operates as an organized mass

rather than as a group of elements each of which retains its specific character" (Bartlett, 1932, p. 197). These experientially-driven forms of organization become "natural categories" of schematic representation which allow the viewer to discern sequentiality, canonicity, intentionality, and perspectivity. The reliance on such "natural categories" of organization facilitates the children's interpretation of program content by establishing an organismic tie between experiential-cognitive and cultural-textual forms of organization.

In the context of television viewing, the level at which children integrate program content is related to the extent to which the meanings they derive from a program's textuality are organismically embedded. The interpretation of both the formal and qualitative semantic properties connecting the medium's various symbolic systems of signification is facilitated by the organismic tie between experiential-cognitive and cultural-textual meanings. This tie helps children to make sense of a program's textuality and integrate the semantic correspondences that unify its narrative flow of content on the perceptual, conceptual, social, and cultural levels of signification.

Therefore, children do not attend to a program's thematic elements as mere perceptual and/or conceptual objects. To make sense of the objects and events they view, children must read a program's content in terms of the

denotative operative and connotative figurative meanings they convey. With age and experience, children learn to recognize the various levels of meaning represented by the medium's multiple articulation. Psychological processes on the perceptual, conceptual, and social-affective domains interact and influence cognitive behavior. However, depending on the child's level of cognitive and social sophistication, one domain is likely to dominate the others and to determine the effect the three modes will jointly have. Most evident, in this connection, is the way that with age and experience the perceptual abstractions become increasingly subordinated to, and integrated within, the conceptual abstractions necessary for higher levels of interpretation.

To coordinate a program's textual semiotic (in)variance, children must recognize that the structural patterns of the medium's multiple forms of articulation have both a presentational function -- that of the iconic sign -- and a representational one -- those of the indexical and symbolic signs (Smith, 1997). For children to derive textual and yet socially relevant meanings, they must focus on the representational level and recognize the formal and qualitative semantic properties that unify them into a textual structure. In this process, a number of factors come into play:

One of these factors is the (actual or potential) *expressiveness of objects*, that is, the experience

of expressive features in things seen and heard; a second is the *transcendence of expressive qualities*, the manifestation of the 'same' expressive-dynamic features in objects that are otherwise dissimilar; a third factor is the *intentional act of denotative reference*, the intention to use one item of experience to denote another; finally -- and closely tied up with denotative reference -- is the *establishment of semantic correspondence*, namely, the construing of the pattern qua vehicle so that its expressive meanings correspond to the connotational structure of the referent. (Werner & Kaplan, 1984, pp. 19-20)

Accordingly, the children who rely predominantly on conceptual abstractions are able to differentiate and integrate a program's content while attending to both denotative operative and connotative figurative meanings. This level of narrative integration enables them to grasp the transcendence of the expressive qualities intrinsic to the medium's multiple forms of narration and derive textually and socially relevant meanings (Cirillo & Kaplan, 1983; Kaplan, 1983). These children, therefore, do not merely rely on processes of perceptual or conceptual abstractions. They also rely on social-affective processes to find the figurative meanings that give social relevance to a program's content (Sigel, 1983). The construction of narrative representations at a conceptual level, therefore, entails the coordination of *denotative operative* and *connotative figurative* meanings into a textual gestalt.

This comparative-organismic approach to cognitive behavior can explain the different ways in which children

use textual features of a program's narrative structure. The pre-schoolers' reliance on perceptual salience and their superior performance on television programs with familiar language or events -- as suggested by the studies reported above -- are related to the level at which psychological processes in the perceptual, conceptual and social-affective domains are organized. Pre-schoolers operate at a pre-conceptual level and need perceptual salient features to guide their attention through the configurational structural patterns of a program's textuality. By contrast, as research in the field indicates children who operate at a conceptual level do not rely on perceptual features to read the flow of content presented in a program's narrative structure. Rather, these children attend to perceptual salient features only for the semantic meanings they may contribute.

The overlap of perceptual, conceptual and social-affective processes is demonstrated by the superior performance of pre-schoolers on particular types of content. Their reliance on perceptual abstractions, strongly bound up with their actions and feelings, enables them to integrate and infer content from short programs with familiar events. This familiarity triggers higher levels of content organization and integration across psychological domains. Even though these children relied on perceptual abstractions to organize content, they were able to recognize semantic

relationships between events and give integrated narrative accounts. The pre-schoolers perceived the familiar program content as expressive forms resonating with life and feelings by maintaining an inner organismic tie between the medium's symbolic forms of articulation and their referents. The connotative meanings which these children recognize in familiar content enable them to grasp the *transcendence* of the expressive qualities intrinsic to the medium's multiple forms of communication and derive textually and socially relevant meanings. Hence, this organismic tie enables even pre-conceptual children to capture the dynamic expressive qualities of the program content.

However, in the case of lengthy adult programs with a complex textual organization and unfamiliar content, the narrative accounts of pre-school children are reduced to descriptions of peripheral, incidental and, at times, irrelevant events. By contrast, the older children rely on conceptual abstractions, and this enables them to perceive unfamiliar content as differentiated from their own immediate needs, feelings, and actions. As these specific mental operational structures emerge they gain hierarchical control over the children's cognitive behavior. This control, in turn, enables them to recognize both denotative and connotative meanings of unfamiliar content and grasp the *transcendence* of the expressive qualities intrinsic to the medium's multiple forms of communication. Moreover, this

transcendence facilitates these children's cognitive behavior and helps them derive textually and socially relevant meanings of lengthy programs with unfamiliar content.

Therefore, children who rely on conceptual abstractions are able to conserve the semiotic (in)variance found across a program's narrative textuality as a gestalt, thus enabling them to differentiate and integrate unfamiliar content into continuous and coherent narrative representations. These children organize the content into meaningful clusters that are thematically coordinated, because they can grasp the formal and qualitative semantic properties which unify the program's textual structure.

Even mature viewers, who rely on conceptual abstractions and who are familiar with the medium's production conventions, do not rely merely on arbitrary conceptual meanings. Literate viewers are able to give social relevance to unfamiliar content by introducing interpretations which are personally meaningful and yet effectively integrated within the program's overall message. With development and experience they have established an inner organismic tie between the denotations and connotations articulated by the medium's symbolic forms of narration. The effectiveness of their narrative viewing competencies is now maintained by more refined and flexible systems of psychological processes. The flexibility

inherent in the level of refinement determines the effectiveness of their narrative competency across program genre and types of content.

A Sociogenetic Multilinear Mode of Processing Televisual Content

This study uses Vygotsky's semiogenetic perspective to describe the social formation of the medium-construct on which viewers rely to interpret the content of television's textual montage. Although Werner's perspective was also sensitive to experiential cultural factors, he did not devise experimental methods to study factors of semiotic mediation. Rather, the goal in Werner's comparative-organismic approach was to find a way of studying developmental phenomena in relation to the cultural practices of a people (Glick, 1992). Therefore, by integrating Vygotsky's semiogenetic perspective with Werner's comparative-organismic approach, one can explain more effectively the dynamic processes behind the formation of such a medium-construct and the mastery of narrative viewing competencies that accompany it.

To derive meaningful schematic representations of content, children must perceive a program's narrative textuality as a symbolic situation with some degree of relevance to their social context. Television content is

composed of visual and auditory sign systems of signification that convey meaning on different levels of specificity: iconic, indexical, and symbolic. According to Peirce's semiotic model of mediation, the iconic or analog level of representation is processed more easily than the indexical referential or symbolic conventional, especially by children younger than seven or eight years old. In accordance with Vygotskian semiogenetic perspectives, the use of these sign systems have a two-fold effect: on the one hand they mediate the interpretation of televisual content, and on the other, they have the power to shape the viewer's mode of representing and processing information (John-Steiner, 1985, 1991; Scribner & Cole, 1981; Valsiner, 1994b; Wertsch, 1985, 1991).

Through this ever-evolving development of culturally mediated codifications of experience, televisual discourse embeds the growing child's cognitive behavior. As Scribner and Cole (1981) stress in their findings, the communication mode of a people affects the way they organize and process information. The level and degree of engagement in literacy-related activities lead to the development of domain-specific cognitive skills in the form of localized intellectual competencies. In the context of television literacy, as Watkins (1988) suggests, the medium's symbolic forms of articulation and content organization influence the viewer's overall mental organization of information. Even

though Watkins found no specific program genre effects, the viewer's overall style of representing and organizing content in the written mode was significantly related to the amount of television viewing.

In addition, the tendency of younger viewers to communicate program content better through pictorial means and actions in reconstruction tasks indicates that there is not necessarily an equal level of sophistication across cognitive domains (Hays & Kelly, 1989). Young children are better able to understand program content when it is presented audiovisually because it creates correspondences to their experience. The plurality of symbolic codes makes the audiovisual montage more compatible with their multimodal means of experiencing the world. Thus "...the coordinated use of two differing codes can assist a thinker in successfully solving a demanding task" (John-Steiner, 1991, p. 69).

Even though the diversity in television enhances narrational meaning, literacy in this mode of discourse becomes a more demanding task. A literate viewer would have to cultivate knowledge of the medium's visual and auditory forms of signification and production conventions in the same way as (s)he would have to learn grammar and punctuation in print literacy. In addition to the medium's forms of content organization, critical viewing requires familiarization with the narrative subtleties of its textual

structure. Thus, to become literate, the novice viewer must be exposed to the medium itself (Abelman, 1991), and be actively engaged with its multiple forms of narration (Salomon, 1977). The interpretation of content, therefore, is a function of the viewer's level of: (1) intellectual development, (2) familiarity with the medium's syntactic narrative structures and production conventions, 3) experiences with and understanding of the medium, and (4) social attitudes towards television viewing (Abelman, 1990; Collins et al. 1978; Salomon, 1979, 1983a, 1983b). These findings suggest that the effectiveness of narrative viewing competencies depends in large part upon the activation of a parallel mode of information processing (Greenfield, 1984, 1993).

With age and experience, children's understanding of the medium itself and their knowledge of the world increases and, as a result, they can comprehend a wider range of content and effectively participate in various viewing situations. These experiential knowledges enable them to coordinate, with some degree of consistency, the (in)variant semantic properties across a program's textuality and grasp the semantic correspondences that unify its narrative structure. They can recognize both denotative and connotative narrational meanings so that the multidimensionality found in the medium's textuality corresponds to the complexity in their mental

representations of content. This correspondence is indicative of a multilinearity in children's narrative viewing competencies and reinforces the bidirectional relationship between internal and external forms of organization assumed in this study.

The superior performance found in the audiovisual forms of presentation supports Greenfield's assertion for a parallel mode of processing and underlines the multilinearity or multidimensionality of viewing behavior assumed in this study. To account for one's viewing experience, as a semiotic moment, one must study how processes in the attentional, perceptual, conceptual, social-affective, and cultural domains interact and influence one another. This calls for a theory of cognitive development that will view rational thought as a complex system of inter-functional relations -- a theory of *human* development, rather than a particular type or line of development. Therefore, the medium-construct on which viewers rely and its accompanying narrative viewing competencies become relevant to the viewers' level of psychological functioning, their cognitive styles, and personality.

For the study of television literacy, therefore, the multiple theoretic perspective assumed in this project rejects the deficit model promoting a linear progression from the pre-conceptual to the conceptual level of

interpretation. The perspective of this project questions studies adhering to a cognitive science orientation. It also questions stage models that describe cognition in the form of hierarchically discrete structures. Examples of such models are Piaget's structural theory of scientific knowledge (as a particular type or line of knowledge) and Bruner's (1966) early theory of cognitive development.

Purpose and Predictions of the Present Study

The purpose of the present research project is to study the relationship between internal cognitive and external narrative forms of content representation and organization. It assumes a bidirectional relationship between the processes in these two domains. In the internal domain, the "medium construct" -- determined by the children's intellectual sophistication as well as their understanding of and their experience with this discourse mode -- creates the context on which the children's cognitive behavior is based. In the external domain, the type of content presented and the narrative complexity of a program's textuality will influence both the children's level of engagement and their level of comprehension.

To study this bidirectional relationship, the present research project investigates the multilinear developmental processes that make the mastery of narrative viewing

competencies possible. To this end, the degree of continuity in the narrative representations of audiovisual stories children observed is examined during the transition from the pre-conceptual to the conceptual mode of thinking. The pre-conceptual mode is "saturated with experience" and is full of socially embedded spontaneous actions (Vygotsky, 1988; Werner, 1957). At the conceptual mode of thinking, however children cultivate a broader framework which helps them to gain control of their own experiential concepts. This study assumes that the two modes of thinking are mutually influential and beneficial in the formation of a broader framework in which children gain awareness and control over both personal-experiential and social-conventional concepts.

According to developmental theory, pre-school children operate at the pre-conceptual level and school age children at the conceptual level. Thus, in order to study children's narrative representations of audiovisual stories during the transition from the pre-conceptual to the conceptual mode of thinking, the present research project examined how pre-kindergartners, kindergartners, and second-graders organized the content of their accounts. Hence, for the purpose of the present study, the children's conceptual level was not directly measured. Rather, the children's age indicated their conceptual level.

The experimental stimuli used in the present study were taken from the Walt Disney cartoon, "The Legend of Johnny Appleseed" (1948). A cartoon was selected as the stimulus for this study because, children between the ages of four and seven appear to prefer the narrative textuality of animated programs (Van Evra, 1990). This production was chosen because, although the theme of the story may have been familiar to the children, this particular version is not on general video release and was unfamiliar to them.

Following Vygotsky's semiotic-mediational and Werner's comparative-organismic developmental approaches, close attention was paid to the schematic organization of the textually relevant and organismically embedded meanings that children derived. The textual structure of each segment presented to the children is viewed as a "semiotic space" in which the medium's visual and auditory forms of communication interact and influence the meanings they convey (Wertsch, 1991). It was assumed that in this semiotic space, both denotative operative and connotative conventional meanings are nested, making it a "meaning-generating device" (Lotman, 1988a, 1988b).

The complexity of a segment's narrative structure is influenced by the composition of its intermodal forms of narration, the composition of the cinematic techniques organizing the flow of content, and the degree of overlap between pictorial and auditory forms of communication. This

project examines the impact of a segment's overall narrative complexity as well as the children's understanding of the formal features organizing flow of content. Cinematic techniques such as pans, cuts, and dissolves encode shifts in time and space, and organize the temporal flow of content. The present study focuses on cuts and dissolves. These techniques are generally use to represent different temporal and spatial distances and are expected to have different effects on children's comprehension:

Dissolves involve perceptual transformations that can symbolize: 1) temporal dislocation, 2) spatial dislocation, and 3) a reflective state of mind which suggests different planes of consciousness by moving to the past or to the future.

Cuts organize visual images so as to symbolize: (1) the end or beginning of a segment and (2) the progression of consecutive or simultaneous actions or events.

Pre-schoolers should be able to understand the organizational functions of cuts (Smith et al., 1986). Both pre-kindergartners and kindergartners are anticipated to be skillful enough to interpret the organizational properties signified by cuts. Dissolves are expected to require more sophisticated processing skills. Viewers must recognize the semantic correspondences articulated in the (in)variant features across the perceptual transformations of the dissolves. Viewers must conserve these semiotic (in)variants into a textual gestalt by attending both to the operative and figurative meanings they convey. Confronted

with this level of complication, the younger children are expected to assign the same interpretive value to the cuts and dissolves under investigation.

In accordance with Piaget's, Vygotsky's, and Werner's developmental theories, the pre-kindergartners and kindergartners -- who operate at a pre-conceptual level -- are expected to experience difficulties in coordinating the formal and qualitative semantic properties of a program's narrative textuality. These children are not expected to conceptually coordinate the perceptual transformations of the dissolves because they can neither distinguish the different elements articulated by the dissolves nor see them as integral parts of the dissolves in particular and of the segment as a whole. However, the second-graders -- who operate at a conceptual level -- are expected to produce narrative representations of content with an adequate degree of continuity. These children are expected to maintain the semiotic (in)variance found across the perceptual transformations of the dissolves. This level of interpretation will help them recognize the syntactic properties of these dissolves and grasp the narrative relevance within the segment's textuality.

According to Piaget, most of the pre-kindergartners and kindergartners are in the pre-operational stage and, although they have acquired the concept of identity, they have not yet acquired a conceptual representation of time

and space (Piaget & Inhelder, 1969). However, most of the second-graders are in the concrete operational stage and, having acquired the concept of conservation, have by this time also acquired the concepts of time and space.

The comprehension of young children is facilitated when content is presented at a slower pace (Rice, 1979; Tower, Singer, Singer, Biggs, 1979; Wright & Huston, 1982). Most of the pre-kindergartners, therefore, are expected to experience difficulties in following each segment's narrative flow. Their representations of content are expected to be more fragmented than those of children in the other grade levels. To enhance the interpretations of the younger children, Salomon's notions of "supplanting" and "eliciting" will be used to manipulate the presentation of the dissolves under investigation.

Therefore, the speed at which the dissolves are presented is expected to influence the children's interpretation of their formal and qualitative semantic properties. Following Salomon's notions of "supplanting" and "eliciting," the complexity of the dissolves under investigation was varied by presenting them: 1) at the normal pace, 2) at a slower pace, and 3) transformed into cuts.

In line with Salomon's (1979; Salomon & Cohen, 1977) postulation of an "activating mechanism" that triggers cognitive skills, the speed manipulations are expected to

influence the cognitive activities involved in children's interpretation of the dissolve's syntactic properties. According to this conception, the slower speed of presentation should enhance the younger children's comprehension by "supplanting" or "modeling" the organizational properties of the dissolves and eliciting the emergence of the necessary perceptual and conceptual processes. The second-graders, however, who operate at a conceptual level, are not expected to need the facilitation provided by the slower presentation. They are expected to perform optimally when the dissolves are presented at their normal pace and when they are transformed into cuts.

The facilitative role which these speed manipulations of the dissolves are expected to have will be explained by applying both Vygotsky's semiotic mediational and Werner's comparative-organismic approaches. The slower presentation is expected to reduce the complexity of the dissolves by providing additional time for perceiving, decoding, and processing syntactic properties. According to Vygotsky's conception of the zone of proximal development, the slower presentation of the dissolves should enhance the younger children's interpretation by scaffolding the necessary attentional, perceptual, and cognitive processes. From Werner's dynamic viewpoint, this scaffolding will depend on the extent to which the speed manipulations stimulate the microgenetic processes by triggering the organization of

psychological processes in these domains that are functional to the task at hand.

Thus, to describe the psychological processes during the transition from the pre-conceptual to the conceptual modes of thinking, the degree of continuity in children's representations of content will be analyzed with respect to: their cognitive development, the type of content they viewed, and the structural complexity of the program's textuality. In addition, the speed at which the dissolves under investigation are presented are expected to influence the children's interpretations of content. Specifically, the pre-kindergartners and kindergartners are anticipated to be better able to distinguish between the two forms of organization when dissolves are presented at a slower pace. The children will have more time to process the semiotic significance of the dissolve.

Accordingly, this study examines the continuity in children's narrative accounts with respect to the complexity of each segment's overall narrative structure and the dissolves under investigation. Additionally, the project studies the points at which the narrative representations of children in each grade level remain continuous or break down both on global and local levels of interpretation. In the context of this investigation, the global level of analysis refers to the overall meanings children derive from each segment; the local level of analysis refers to the meanings

children derive from the specific dissolves under investigation in this study.

To achieve a continuous representation of content, children have to interpret the symbolic configurational patterns of a segment on both global and local levels so that they can capture the part-whole narrative relationship. Performance in the global coherence tasks is expected to reflect children's overall interpretation of each segment. The local coherence tasks offer a supplement to the global tasks because they address textual content of particular points of information, i.e., the dissolves under investigation. Therefore, this study expects to measure the degree of continuity in children's representations by evaluating the part-whole relationships found in their global and local coherence accounts.

Specifically, on the local and global levels of interpretation, the children's accounts will be evaluated for: 1) type of content -- large-scale and small-scale (simple and complex); and 2) narrative properties -- processing strategies, level of thematic integration, and social idiosyncratic relevance of content. A detailed elaboration of these categories of data is provided in Chapter 4.

The following six hypotheses guide the conceptualization of this study:

1. Because dissolves are more complicated symbolic forms than cuts, they should require more sophisticated processing skills than cuts.
2. Younger children should understand the temporal and spatial relationships of content better when presented by cuts than by dissolves.
3. Younger children should view the dissolves as long cuts and, therefore, should not differentiate between these two syntactic features.
4. The speed at which the dissolves are presented should influence the child's comprehension of their syntactic properties. Therefore, younger children should perform better when the dissolves are presented at a slower speed because they should have more time to process the semantic content presented across the perceptual transformations.
5. The complexity of a segment's overall narrative structure, that is, the extent to which it makes its content accessible, should influence the degree of continuity in children's narrative representations.
6. Regardless of whether the flow of content is organized by cuts or dissolves, the performance of younger children should be significantly different from that of the older children.

Chapter 4

Method

Sample

The sample in this study consists of 30 pre-kindergartners, 30 kindergartners, and 30 second-graders. In each age group there were 15 females and 15 males. These children were selected from two after-school recreational programs in Manhattan. All of the children were attending schools for the gifted; 83% were selected from one school and 17% from another.

The socio-economic status of the sample was middle and upper-middle class. To avoid communication difficulties either in the children's comprehension, or reporting, of the cartoon, it was required that children speak English as a first language.

Preliminary Information

The investigator participated as a volunteer counselor for several weeks prior to the study in the two after-school programs that were used in the present research project. This was done in an effort to introduce a level of familiarity between the children and the investigator and to enhance the children's ability to communicate with her. The

study began with each child immediately after the experimenter and the children became comfortable with one another.

Prior to each child's participation in the study, the parents received a consent form for approval and a questionnaire (see Appendix A) about the child's television viewing habits. In addition, during the pre-test phase, the investigator introduced the children to the experimental situation by engaging them in a discussion about television in general and cartoons in particular.

Experimental Materials and Conditions

The stimuli of this study consisted of four scenes from the Walt Disney cartoon, "The Legend of Johnny Appleseed" (1948). For the purpose of this study, each scene was labeled a "segment." The first segment was used for the warm-up phase in the practice condition, and the remaining three were used in the experimental conditions. Each segment consisted of two sequences (ranging from one minute and eight seconds to one minute and thirty seconds).

In addition, a series of pictures (four by six inches) were taken directly from the cartoon and were used for the pictorial multiple choices in the local coherence tasks.

Description of Each Segment's Textual Structure

The degree of narrative complexity in a segment's textual structure was determined by both semantic content and the composition of its multiple formal features. Narrative complexity included the type of content presented and the linguistic level of discourse. In addition to these elements, three formal factors influenced textual complexity: the syntactic features, composition of cinematic techniques, and the degree of overlap between pictorial and auditory forms of communication.

Appendix B includes a detailed description of each segment's overall narrative structure and content. Appendix C includes a transcription of the visual and auditory forms of communication used in these segments. In addition to each segment's distinguishing narrative features, based on the semantic content presented, the experimenter manipulated the speed of the dissolve which pertained to the textual core themes. Accordingly, two dissolves were manipulated in the first segment, four dissolves in the second, and three dissolves in the third.

First segment. The semantic content of the first segment consists of several interrelated major categories: the predominance of farming activities during the preindustrial era, Johnny's love and enthusiasm for his

farming activities, the courage and excitement behind pioneering during this period of Westward expansion, Johnny's desire to be a pioneer and his fantasy of joining a group of pioneers as Davy Crockett, Johnny's subsequent disappointment and change in his attitude towards his agricultural occupation.

This segment's semantic content is more accessible to younger children because it is expressed through visual forms of articulation that render people's thoughts, emotions, and actions with graphic immediacy. The pre-school children were expected to find it easier to interpret program content expressed through direct-pictorial forms. Moreover, the systematic integration of pictorial-explicit forms of narration with linguistic-implicit meaning was expected to reinforce and facilitate the interpretation of the latter category.

Furthermore, the composition of the first segment's cinematic techniques reduces its narrative complexity and makes its content accessible. The various pans, cuts, dissolves, and zooms are organized in such a way that they make systematic reference to Johnny's level of involvement and position. For example, the concept of spatial dislocation is conveyed by presenting the pioneers at different locations with continuous reference to the point where Johnny watches them. The continuous return to Johnny's location as a reference point should enable

children to recognize part-whole relationships, conveying the concept of distance traveled. Similar techniques are used to present Johnny's changing awareness of imaginary and real activities as well as his shifting attitudes regarding his occupation. Therefore, three features distinguish the first segment from the other two: 1) the type of content presented, 2) the systematic back-and-forth procedure in the composition of the cinematic techniques, and 3) the systematic overlap between pictorial and auditory forms of communication.

In addition, in the first segment, the experimenter manipulated the speed of two dissolves. The narrative structure of this segment was divided into two sequences. The first sequence places Johnny in a socio-historical context with respect to his lifestyle, occupation, and character. The second sequence consists of the two core textual themes: 1) Johnny looking at the pioneers going West and pretending that he has joined them, and 2) Johnny's change of attitude towards his work of planting apple trees. In the first sequence, the dissolve manipulated is pertinent to the first segment's situational context, and it presents Johnny planting a sapling while the pioneers were passing by his farm. In the second sequence, the dissolve presents Johnny's shift in consciousness as he fantasizes himself as Davy Crockett joining the pioneers. This dissolve is

pertinent to the first and second overall themes analyzed in the present study.

Second segment. The semantic content of the second segment consists of several interrelated major categories: the passage of time as expressed through the growth of the apple trees that Johnny had planted, the "pushing back of the forest" to plant apple orchards, the transformation of the wilderness into a settlement, the collective celebration around apple harvesting, and the settlers' appreciation of Johnny's mission while he was befriending all of them.

The comprehension of the second segment's narrative textuality should be more demanding because there is no direct pictorial presentation of the character(s) and the activities leading to these major events. Children had to infer the passage of time and the characters' activities through the changes in the landscape and seasons, as well as through the linguistic narration. Since they had to rely mostly on abstract forms of presentation and implicit meanings, the children -- especially the younger ones -- would be expected to show discontinuity in their narrative representations of this segment's content.

In addition, the cinematic composition of the second segment makes its narrative textuality more demanding than the first segment. In the second segment, the flow of content progresses in time without returning to a reference

point. As a result, the younger children do not receive a reinforcement of the part-whole relationships among the thematic elements. The absence of this reinforcement both increases narrative complexity and reduces accessibility. Since the children in the younger two grades are not as familiar with this medium's production conventions as the second-graders, they would be expected to find it more difficult to coordinate the thematic elements presented in this linear form of presentation.

Moreover, the articulation of time presented through the transformation of the landscape is also expected to pose varying degrees of difficulties to children in all three grade levels. The pre-kindergartners and kindergartners, who have not fully acquired the concept of time, should have greater difficulties inferring the connections both for long and short spans of time. On the other hand, the second-graders -- who operate at a conceptual level -- should have no difficulties inferring thematic connections for short spans of time. Even the second-graders, however, may not be able to infer the thematic connections for long spans of time (in this case, the transformation of the wilderness into a settlement).

The second segment's content is organized in one scene with two sequences. The first sequence presents the wilderness in which Johnny starts planting apple trees. The second sequence presents the transformation of the

wilderness into a settlement. The two sequences present the two overall themes that are analyzed in the present study. These themes are: 1) the passage of time as shown through the growth of the apple trees that Johnny plants and through seasonal changes, and 2) Johnny making friends with pioneers in the settlement through his kindness and generosity.

In addition to these features the second segment was distinguished by the experimenter's manipulation of the speed of four dissolves. Three of the dissolves manipulated are included in the first sequence. All these dissolves convey the passage of time through the transformation of the landscape, change of seasons, and the growth of apple trees. These dissolves are pertinent to the first overall theme analyzed in this study. The fourth dissolve is included in the second sequence, and it presents the transformation of the wilderness into a settlement. This dissolve is pertinent to the second overall theme analyzed in the present study.

Third segment. The semantic content of the third segment consists of several interrelated major categories: Johnny's undaunting courage and perseverance in fulfilling his mission under adverse conditions, Johnny's traveling across the country over a long period of time to plant apple trees, and his becoming a tired old man after a lifetime's work. The narrative flow of this segment's textuality is

articulated through linguistic-implicit, visual-explicit and visual-implicit forms.

As in the first segment, the range of cinematic techniques in the third segment is broad, and the resulting interaction of the various forms of articulation is quite dynamic. Although the diversity in the forms of presentation is similar to that of the first segment, the third segment's textuality is more demanding for two reasons. The part-whole narrative relationships are not reinforced and the overlap between auditory and visual forms of communication does not explicitly enhance their meaning. Thus, even though pictorial actional narrative is one of this segment's distinctive features, compositional cinematic techniques make the semantic content conceptually more demanding. This is especially so for the younger viewers who may not be familiar both with the medium's production conventions and with the linguistic forms of narration.

Moreover, the third segment's narrative complexity is further increased by its semantic content. The first sequence presents Johnny walking through the wilderness and planting apple trees under severe weather conditions and hardship. The second sequence presents Johnny as an old man walking across a landscape of apple trees. This segment's overall themes are: 1) Johnny traveling over a long period of time across the country and planting apple trees, 2) Johnny becoming a tired old man over time.

In addition to these features, the third segment was distinguished by the experimenter's manipulation of the speed of three dissolves. Two of the dissolves were included in the first sequence: one which conveys the distance traveled by Johnny, and a second one that illustrates the weather conditions under which Johnny traveled. These dissolves are pertinent to the first overall theme analyzed in this segment. The third dissolve is included in the second sequence and it presents the impact of Johnny's planting efforts on the landscape across the country. This dissolve is pertinent to both the first and second overall themes analyzed in the present segment.

Experimental Conditions

The segments viewed in this study were different with respect to their semantic content and the production conventions used to organize the narrative flow of content. In addition to these narrative features, each segment was also different with respect to the speed at which the dissolves under investigation were presented. To determine with more precision the impact of textual factors, this study examined a specific cinematic technique, the dissolve, and children's understanding of its syntactic properties. Following Salomon's notions of "supplanting" and "eliciting," the complexity of the dissolves under

investigation was varied by presenting them: A) at the normal pace, B) at a slower pace, and C) transformed into cuts (see Table 1). The slower presentation of the dissolves was expected to enhance the comprehension of the younger children by providing additional time for perceiving and processing the flow of content.

Children viewed these segments in the same order as they occurred in the cartoon. However, to make sure that each segment was presented in all three conditions, a Latin square matrix was used to organize the sequence of the conditions (see Table 1). Three orders of presentation were used, and one third of the sample was assigned to each one. Therefore, every child viewed one segment in each condition. Table 1 is a schematic representation of the experimental design.

Table 1

Distribution of each order of the three
experimental conditions

Order	Segment		
	1	2	3
1	A	B	C
2	C	A	B
3	B	C	A

These experimental conditions can be described as follows:

- Condition A All the dissolves of a segment were presented in exactly the same way as they were produced by Walt Disney Studios.
- Condition B The same dissolves as in Condition A were used. However, dissolves under investigation were lengthened to three times their original duration. The transition across the frames of these dissolves were presented at a slower speed and this provides additional time to perceive and process the information presented across the perceptual transformations.
- Condition C The same dissolves that were lengthened in Condition B were now transformed into cuts. This transformation is accomplished by cutting directly from the first to the last frame of the dissolve.

In the design of this study, five main effects were included: grade-level, gender, condition, order, and segment. Grade level, gender and order were between subject variables; while condition and segment were within subject variables. To study the degree of continuity in children's narrative representations of content the data were examined for the main effects of these variables and their interactions. To this end, the following statistical analyses were performed: ANOVAs, MANOVAs, and Chi square analyses.

Experimental Setting and Procedures

Setting

The children were tested in a classroom familiar to them at the recreational facility of their after-school program. The setting was informal and, to accommodate the needs of this research project, it included a television with a VCR monitor and a cassette tape recorder in addition to the typical classroom objects. Initially, children were encouraged to explore the room and make themselves comfortable.

Procedure

The testing procedure used Piaget's clinical method. However, it strove to be neither manipulative nor deceptive, but facilitative in a Vygotskian spirit. It tested for the presence of the cognitive (in)variance necessary to the differentiation and integration of semiotic (in)variance across the perceptual transformations of the dissolves.

Since the dissolves under investigation were presented at three different speeds, children were presented with several variations of a given problem-solving situation, that is, the variations in the speed of the dissolve in each segment. Furthermore, in conforming to Vygotskian notions

of the zone of proximal development, the children's responses were used to formulate tailored (not standardized) follow-up probing questions (see next section for elaborations).

Pre-test

The practice segment was two minutes and thirty-nine seconds in length and consisted of two sequences from the beginning of the cartoon. The first sequence is one minute and thirty-six seconds and the second sequence is one minute and three seconds. The purpose of the practice condition was two-fold:

- 1) To familiarize each child with the main theme of the story and to contextualize the content of the three experimental segments within the story of Johnny Appleseed as a whole. The first scene situates the story within the period and the setting in which it occurred. The second scene describes Johnny's character, his faith in God, his love for animals, and his love for his occupation--that is, picking apples.
- 2) To familiarize each child with the experimental situation, that is, the testing procedure, materials and tasks used in this study. During this phase, children were introduced to the unfacilitated and facilitated interviews of the global coherence, as well as the pictorial multiple-choice tasks of the local coherence.

To ascertain the cognitive activities in which children engaged, the experimenter relied on Vygotskian notions of the zone of proximal development and devised a variation of the clinical method. Through this technique, each child's

responses were taken into account in order to tailor probes and counter-probes that would elicit additional information concerning his or her cognitive behavior. At the end of the practice phase, children received feedback on the accuracy of their responses to the segment in general and to the dissolve in particular.

The experimenter introduced each child to the practice segment with the following instructions:

We are going to watch a cartoon, and this cartoon is about a farmer.

This farmer's favorite thing in the world was to plant apple trees and to pick apples.

Do you know who that farmer was? (Independent of the child's response, the experimenter continued as follows.)

Well, to show you how much he liked his work I want you to watch the beginning of the cartoon. But, remember, I want you to watch very carefully because at the end I am going to ask you some questions to see what you understood.

Unfacilitated Global Coherence Interview. Each child watched the practice segment and then the experimenter asked him or her to give a verbal account of the segment's content. The participants received the following instructions:

Now tell me, what did you just see happen?

In cases where children were hesitant to talk, they received encouragement with the following instructions:

I know some of the words in this cartoon are not easy, but don't worry, you can use your own words to tell me what you just saw happen.

This was the only type of encouragement children received, when necessary, in the unfacilitated phase of the global coherence interview. The experimenter did not probe with respect to specific content from the segment in order to elicit additional content. To keep the child engaged in the reporting of the content, the experimenter acknowledged the process from time to time by uttering "uh-huh". The unfacilitated phase was completed when the experimenter asked, "Anything else?", and the child explicitly responded, "No".

Facilitated Global Coherence Interview. The global coherence interview was open-ended so that the children would report and elaborate the segment's content to the extent they felt comfortable. This also enabled the experimenter to organize her probes by taking into account the content children mentioned in their unfacilitated narrative accounts. If a child did not report any content, then the experimenter asked the child if (s)he noticed particular objects. However, when an account of the segment was provided, the experimenter then drew content from the

child's narrative and asked for elaboration on particular and/or additional content.

In the practice segment, most children reported mainly on the content of the second sequence, which shows Johnny singing while he was picking apples. After this report, the experimenter provided each child with the following facilitative probes:

Did you notice any birds?

Did you notice any bees?

Did you notice the tall buildings and the bridge across the river at the beginning of the story?

These probes were of two types. The first two questions above were of the first type whose purpose was to determine whether the children paid attention to the content they viewed and to engage the children in a discussion with the experimenter. However, the third question, which was of the second type, did not merely test the children's attention; rather, its function was to elicit additional content concerning the concept of change in the period of time which the dissolve in the practice segment presented. This particular information was articulated through both linguistic and pictorial forms of communication. The linguistic forms consisted of the phrases which the narrator articulated. The pictorial forms articulated the concept of going back to a different period of time through the

articulation of a time-dissolve. Most of the younger children could not interpret the implicit meanings which these symbolic forms of communication conveyed.

Source of Content. To determine whether the children focused on the narrator's spoken language, or on the cartoon's visual presentation of content, or on both, the experimenter asked each child the following question:

How do you know that "X" (i.e., the thematic content the child reported) happened?

A Pictorial Multiple Choice of the Local Coherence Task. To determine the degree of continuity in the children's narrative representations of the content presented by the dissolves under investigation, the experimenter administered a series of pictorial multiple-choice tasks, using pictures which were taken directly from the cartoon. Children were introduced to these tasks by the following instructions:

I took some pictures from the screen and they look exactly like those you saw in the cartoon. Now I want to show them to you to help you remember some parts of the cartoon you just saw.

The objective of the multiple-choice tasks was to determine: 1) whether the children maintained the (in)variant features of the content presented across the

perceptual transformations of the dissolves; and 2) whether the children recognized the semiotic relevance of each dissolve within the segment's narrative structure. To capture the degree of narrative continuity that reflected the performance of the children in each grade level in a uniform way, the experimenter used a standardized set of questions repeated for all the multiple-choice tasks and object identity tasks. The procedure below was followed in the practice segment and illustrates the instructions children received for all the multiple-choice tasks.

Do you remember this picture (checking for the memory of the pre-dissolve picture while placing it on the table)?

Independent of the child's response, the experimenter then asked the child to describe the pre-dissolve picture:

Tell me, what does it show?

The same procedure was followed for the memory and description of the post-dissolve picture. Subsequently, the experimenter placed the pre- and post-dissolve pictures on the same line with an empty space between them (see Figure 1). The experimenter then gave the following instructions:

I am going to place this picture (pre-dissolve) here and this picture (post-dissolve) here. You see there is a space in the middle, which means a picture is missing (experimenter points to the space between the pre- and post-dissolve pictures). Now I am going to

put these pictures here below, and I want you to pick one from these three pictures. Pick the one which you think best belongs there (while pointing at the empty space between the pre- and post-dissolve pictures).

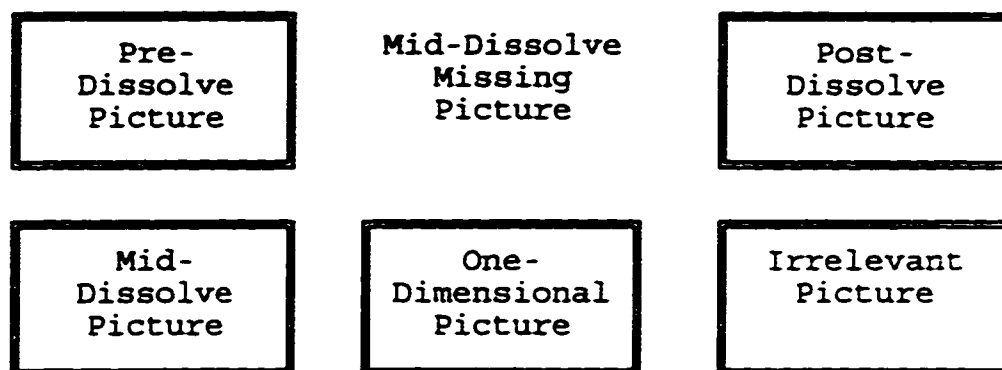


Figure 2. Schematic representation of the way in which the pictures were organized in the pictorial multiple-choice tasks.

Independent of the accuracy of the child's choice, (s)he was then asked to justify the thematic connection between the pictures (s)he selected and the pre- and post-dissolve pictures. Each child received the following instructions:

Okay. Now tell me, why did you choose this picture?

In the event that the child did not elaborate, the experimenter attempted to identify the elements which the child took into account by giving him or her the following instructions:

Is there anything in this picture
(pointing to the picture the child

chose) that looks the same as in this picture (pointing to the pre-dissolve picture)?

After the child responded, the experimenter continued:

Is there anything in this picture (pointing to the picture the child chose) that looks the same as in this picture (pointing to the post-dissolve picture)?

Subsequently, the experimenter took away the picture the child selected and gave the following instructions:

Now, I am going to take this picture away (placing the child's selection away from his or her view) and this time I want you to pick one picture from these two pictures (while pointing to the remaining two pictures) and put it here (pointing to the empty space).

Independent of the accuracy of the choice, the procedure followed was the same as that in the first selection the child made. Subsequently, the experimenter asked the child to justify why (s)he did not choose the last picture.

You were right to pick this picture (only if that were true) but now tell me why you didn't pick this picture (while experimenter was pointing to the picture which the child did not pick)?

Next, the experimenter removed all three pictures used as options for the pictorial multiple-choice task and proceeded with the object identity task thus:

Now tell me, is the object (person or place) in this picture (pointing to the

pre-dissolve picture) the same as the object (person or place) in this picture (pointing to the post-dissolve picture)?

Again, independent of the accuracy of the child's response, (s)he was asked to thematically justify his or her answer by responding to a series of probes and counter-probes.

Then tell me how come they look so very different (in cases where the child asserted that they are the same object). Or (in cases where the child did not assert object identity) tell me, why do they look so similar?

At the completion of the pictorial multiple-choice and object identity tasks, the child viewed the first sequence of the practice segment for a second time. In the first sequence, the dissolve which presented the change from one period to another was included and each child was instructed to pay attention to that particular piece of information. The following instructions were given.

Now, I am going to show you again the beginning of the cartoon. This time, I want you to watch very carefully and see what happens to the tall buildings and the bridge.

After viewing the first sequence of the practice segment, the child was given the following instructions:

Tell me, what did you just see happening?

When the child did not mention anything about the objects (buildings and bridge) which underwent transformation in the dissolve, the experimenter asked the child if (s)he noticed the tall buildings and the bridge. If the child said "yes," the experimenter asked, "Did you notice what happened to them?"

Upon completion of their verbal reconstructions, all children, even those who responded correctly to the above questions, listened to the experimenter recounting the content of the practice segment. The experimenter repeated her account, and the object identity task was administered again. This task completed the practice phase of the study. The experimental conditions were then administered, and each child viewed three segments and was tested individually at the end of each segment. To avoid complications with memory difficulties, each segment was treated as a separate script and children were tested at the end of each segment.

Overview of the Global and Local Coherence Tasks

To make sense of each segment, children had to interpret the configurational patterns of its narrative textuality on both global and local levels of interpretation so that they could grasp the part-whole relationship of the content. The global and local coherence tasks were designed

to examine the continuity in children's representations of content in terms of this part-whole relationship.

In addition, the coding scheme used in this study was developed by tracing this part-whole relationship that was implicitly and explicitly articulated in the narrative content included in the children's accounts. The coding categories that were used to assess the degree of continuity in children's narrative representations were not *a priori*; rather, they were theory- and data-driven. These coding categories emerged from repeated comparisons of the children's responses in the global and local coherence tasks. Of particular interest was the content included in the communicative structures the children constructed in their narrative accounts.

Global Coherence Tasks

In the global coherence tasks children gave both unfacilitated and facilitated accounts of each segment. The unfacilitated accounts were based on the children's responses to the experimenter's instruction "tell me what you just saw happening." In the facilitated accounts children responded to the probes the experimenter devised in order to follow up on the content the children reported in the unfacilitated accounts.

The experimenter's probes may have had one or more of the following facilitative functions: 1) to encourage the children to report as much information as possible; 2) to provide regulatory and organizational assistance to the younger children who may understand the content, but may not know how to organize it linguistically; and 3) to help the experimenter obtain additional information concerning a segment's small- and large-scale content.

The degree of continuity in children's performance on the global coherence tasks were assessed by analyzing their accounts with respect to *small-* and *large-scale* content. The *small-scale* information consisted of *simple* and *complex* content. While the *simple small-scale* content consisted of details (objects, people, actions, activities, happenings) and character attributes, the *complex small-scale content* consisted of explicit causal links, motivational intentions, and emotional states of mind. The ways in which children integrated this simple and complex small-scale content influenced the complexity of the narrative properties in their accounts.

The *large-scale* content consisted of the implicit and explicit meanings that were revealed in the children's own organization of the cartoon's simple and complex small-scale content. The large-scale content was determined, in each segment, with respect to core thematic connections that were: 1) *textually relevant* (situational context, first

core theme, and second core theme); and 2) *textually and socially relevant* (contextualizing the topical content both within the segment and society at large).

In addition, the ways in which children integrated simple and complex small-scale content influenced the complexity of the narrative properties in their accounts. To determine the degree of continuity in children's representations of content, their accounts were evaluated with respect to three narrative properties: I) processing strategies, II) types of narrative representations, and III) social-idiosyncratic relevance.

I. Children organized the content in each account they gave by relying on one of the three *processing strategies* that ranged from concrete-perceptual to abstract-conceptual.

- **Detail-driven** accounts were based on perceptual abstractions, and they enumerated discrete objects and actions without thematically connecting them to the segment. The narrative representations of such accounts were pre-conceptual because they included enumerations of concrete features and actions and used a limited scope of thematic integration and generalization.
- **Sequence-driven** accounts were based on perceptual and conceptual abstractions. The narrative representations of such accounts could be either pre-conceptual or conceptual. At the pre-conceptual level, clusters of narrative elements were elaborated upon without differentiating their thematic meanings or integrating them within the segment. At the conceptual level, however, these narrative elements were elaborated upon and contextualized within the segment's textual structure.

- **Generality-driven** accounts were based on conceptual abstractions. Such accounts were organized at a conceptual level and consist of succinct statements that focus on clusters of a segment's core concept(s) while coordinating the narrative elements of these clusters thematically.

II. The *types of narrative representations* revealed the degree of continuity in children's accounts. This narrative property was derived from two categories of data: the *topical focus* and the *level of thematic integration*.

The *topical focus* of children's accounts was related to the internal coherence in their responses and the accuracy of their storyline;

- **Internal Coherence** described the internal consistency of the connections that the children established among the thematic elements of the accounts they constructed. Children's accounts were viewed as coherent when they were embedded within a conceptual framework and when the references made throughout the narratives were consistent.
- **Story line** referred to the focus of elaboration in children's accounts, and the extent to which the content thematically corresponded to the segment's textual content. The children's narrative accounts were evaluated as accurate or inaccurate. In the accurate story lines, the topical content of the children's accounts thematically corresponded to the segment's narrative structure, while the inaccurate story lines did not, rather, they were irrelevant.

The *level of thematic integration* was identified by the *simple and complex small-scale* content the children mention and integrated to derive *large-scale* content. Each level

was viewed as a conceptual frame of reference on which the children relied to make sense of the content. The hierarchic order of these levels does not assume a fixed linear progression; the children's performance fluctuated depending on each segment's complexity. Four levels of thematic integration were identified that capture the range of continuity in children's accounts:

- **Enumerational level** - Children who produced enumerational accounts focused on the presentational level of the segment's multiple forms of articulation, and their interpretations were based predominantly on *one-way perceptual abstractions*. They relied on detail-driven processing strategies, and their accounts consisted merely of simple small-scale content, that is, a list of discrete objects and actions. These children focused on direct, explicit meanings of particular narrative features without organizing them into textually meaningful clusters that reflected the segment's narrative flow of content.

Consequently, these children did not recognize the causal connections between actions or events, the motivational intentions that led to these actions, the emotional states that were the cause or result of these actions, or the attributes that distinguished the characters. As a result, their narrative representations of a segment's textuality were fragmented because their thematic scope was restricted to meanings of discrete details constituting discontinuous fields of content.

- **Pseudo-conceptual level** - Like the enumerational accounts the pseudo-conceptual accounts focused mainly on the presentational level of the segment's forms of signification, and their interpretations were based predominantly on *one-way perceptual abstractions*. Most of these accounts were detail-driven, and focused only on a subset of certain narrative elements making up the segment's textual structure. However, unlike the enumerational accounts the pseudo-conceptual ones *coordinated a restricted set of the semantic correspondences* that thematically connected the subset of content on which they focused. The children who produced such accounts partially recognized the

thematic connections of the content within and across the narrative subclusters on which they focused. They had a partial understanding of the small- and large-scale content.

That is, even though they grasped the thematic connections concerning the segment's setting or one of the two core themes, they could not integrate this content into the segment's overall textual structure. As a result, even though these children might have grasped some of the causal connections of actions and events, they could not grasp either the motivational intentions that inspired these causal actions or the emotional reactions that resulted from them. Thus, although they grasped one of the textual core themes, they did not recognize its thematic connections to the segment's narrative context or the consequent actions and events that were expressed in the second core theme.

- **Quasi-conceptual level** - children who produced quasi-conceptual accounts focused mainly on the presentational level of the segment's symbolic forms of narration, and partially attended to the representational level of signification. As a result, their cognitive behavior *fluctuated between one-way perceptual and two-way conceptual abstractions*, leading to the emergence of a wider field of thematic connections. This fluctuation enabled children to recognize and to partially coordinate the semantic correspondences of explicit and implicit textual meanings.

Most of these accounts were organized sequentially and focused on the flow of a subset of thematic elements. Although they organized this subset of elements into meaningful clusters, these clusters only partially reflected the segment's thematic context as a whole. That is, the thematic scope of these accounts consisted of the segment's first core theme integrated with its immediate textual context.

- **Conceptual level** - Children who produced conceptual accounts focused on both the presentational and representational levels of the medium's symbolic forms and *relied predominantly on two-way conceptual abstractions*. In addition, these children used sequence-and generality-driven processing strategies, and they were able to attend to larger clusters of content as well as coordinate the semantic

correspondences connecting these clusters. As a result, they were able to recognize and coordinate the simple and complex small-scale content that led to the actions and events presented in each segment. This degree of continuity in narrative representations of these accounts range from the concrete to the abstract conceptual level. The *concrete conceptual level* is restricted to textual core themes and their narrative contextualization by capturing implicit meanings that are reinforced with explicit pictorial forms of narration. The *abstract conceptual level*, on the other hand, encompasses both textually and socially relevant meanings because the children were able to capture implicit meanings that were not explicitly reinforced on the screen.

The two-way conceptual abstractions characteristic of these accounts helped the children to grasp the thematic connections across the narrative clusters on which they focused and *coordinate the formal and qualitative semantic properties that unified the segment's narrative structure*. In such cases, children were able to coordinate the semiotic (in)variance across the segment's narrative structure into a textual gestalt and to recognize both explicit and implicit meanings expressed at the presentational and representational levels. Their ability to focus on (re)presentational meanings opened their field of thematic connections so that they were able to organize the content into narrative clusters *with both textual and social relevance*.

III. The extent to which each segment's content was relevant to the children's lives influenced the degree of continuity in their narrative representations. Accordingly, their accounts were evaluated with respect to the textual-conventional and socio-idiosyncratic domains from which they drew content. Four types of social relevance were identified:

- **Experiential-Egocentric** Meanings were extracted from the children's personal and private context. A segment's thematic elements triggered meanings which were restricted to the children's idiosyncratic experiences. These restrictive thematic criteria led to thematic associations that produced meanings which were irrelevant to the segment's content.
- **Social-Personal** Meanings were extracted from the child's personal context but were relevant and effectively integrated into the segment's textuality. Personal meanings were not conventional but private ones that were given a certain degree of textual relevance. The semantic content originated from the segment, but the thematic criteria of the meanings they derived came from the children's experiences in their personal context.
- **Social-Conventional** Publically shared meanings were extracted from the social domain and were effectively integrated into the segment's narrative textuality. The content articulated by a segment's narrative textuality was read as a cultural product, and the thematic criteria of the meanings children derived came from both the textual- and social-conventional domains.
- **Textual-Conventional** Meanings were extracted from the segment's textual content. Children focused only on the segment's textual forms of articulation.

The perceptual and conceptual abstractions identified in the four levels of thematic integration above were related mainly to the denotative operative meanings of content. However, the social relevance this content had to the children's lives was related to the connotative figurative meanings. To identify the social relevance each segment's content had to the children's lives, their narrative accounts were evaluated with respect to the social-idiosyncratic domains from which they drew content.

For children to grasp the narrative flow of content, it had to have a certain degree of relevance to their lives. To make sense of the segment's text, children drew meanings from their social and personal experience.

Local Coherence Tasks

The local coherence tasks examined the children's interpretations of the syntactic properties of the dissolves under investigation. These tasks provided more precise data than those of global coherence with respect to the degree of continuity in children's representations of content. Nine dissolves were manipulated in this study: two dissolves in the first segment, four in the second, and three in the third. For each dissolve, a pictorial multiple-choice task was used that consisted of two pictorial sequences and one object identity task.

To assess whether children recognized the narrative continuity of these pictorial sequences, their accounts were evaluated for level of which they integrated semiotic (in)variance on the basis of: (1) the particular pictures children selected to complete the two pictorial-sequence tasks; (2) the narratives that they constructed to provide thematic justifications for each pictorial sequence; and (3) the narratives that they constructed to account for any shift in thematic content within the object identity task.

The quantitative data in the local coherence tasks were based on both the selections children made to complete the two pictorial sequences and the judgments they made on the object identity tasks. The quantitative scores for each choice were determined by the number of pictures the children took into account and the number of elements that their choices had in common with the pre- and post-dissolve pictures. Accordingly, the following distribution of scores was given for each possible selection: three points for the mid-dissolve picture; two points for the one-dimensional picture; and one point for the irrelevant picture.

In the object identity task, children were tested on the conservation of semiotic (in)variance, i.e., the object identity, between the pre- and post-dissolve pictures. Those who preserved the semiotic (in)variance received two points because it was assumed that they took into account both pictures and perceived them as two integral elements of the dissolve's pictorial narrative sequence. Those who did not preserve semiotic (in)variance received one point because it was assumed that they took into account only one of the two pictures at a time and did not perceive the narrative flow of the dissolve.

The qualitative data were based on both the narratives of the thematic justifications children gave on the pictorial sequences and the object identity judgments. This qualitative data provided more precise information

concerning the children's narrative representations of the dissolves under investigation. The thematic justifications for both the pictorial sequences and the object identity tasks were analyzed with respect to the same narrative properties as the global coherence tasks.

The precision of the local coherence tasks demanded other categories of data in addition to the narrative properties: memory of the pre- and post-dissolve pictures, descriptions of the pre- and post-dissolve pictures, configurations of details, scope i.e., thematic contextualization of content, and pictorial techniques (i.e., the special effects of the dissolve and their stylized pictorial presentation of content).

Conceptual and Perceptual Semantic Properties of the Local Coherence Tasks. Children completed pictorial sequences and made object identity judgments by relying on perceptual and/or conceptual abstractions.

Those who made the optimal selections and object identity judgments merely on the basis of perceptual abstractions focused on perceptual similarities of discrete objects and/or features without coordinating their (in)variant thematic properties. These children viewed the multiple-choice tasks more as sorting tasks than as pictorial sequences displaying their understanding of the dissolves' syntactic properties as a semiotic operation.

These children would base their responses on perceptual similarities rather than on the semantic correspondences representing continuity across the pictorial sequences.

On the other hand, children who approached the multiple-choice tasks as a pictorial representation of the dissolves' syntactic properties coordinated the (in)variant features across the pictorial sequences. They relied on both perceptual and conceptual abstractions, and they recognized the textual relevance behind the syntactic properties of the dissolves. Therefore, their coordination of the pictorial elements was textually driven. On the other hand, those who viewed the multiple-choice tasks as sorting tasks relied predominantly on perceptual abstractions, and their coordination of the elements was picture-driven.

In order to determine whether performance in the local coherence tasks was based on perceptual and/or conceptual abstractions, thematic justifications were analyzed with respect to the categories of data that were identified in the global coherence tasks: *small-* and *large-scale* content. In addition, these two types of content were evaluated by taking into consideration the three narrative properties identified in the global coherence tasks: processing strategies, level of thematic integration, and social-idiosyncratic relevance.

The conceptual level at which children integrated the content of their justifications was evaluated separately for each pictorial sequence and object identity task. However, to determine whether children understood each dissolve's syntactic properties and its textual relevance, their justifications of the first and second pictorial sequences were analyzed in combination. This analysis also addressed the variations in the options available for the two pictorial sequences children completed. In addition, this analysis provided further insight into the degree of local and global continuity in children's representations of content.

Data Transcription and Reliability of Coding

The interviews, both in the global and local coherence tasks, were recorded on audiotape and then transcribed. In order to establish transcription reliability, the interviews were first transcribed by the experimenter and then were verified for both consistency and accuracy by an assistant unfamiliar with the goals of the experiment.

To capture the dynamic psychological processes behind children's cognitive behavior, the transcripts consisted of both the experimenter's questions and the children's accounts. The transcripts provided a detailed record of both the children's and the experimenter's participation in

each viewing and testing situation: 1) declarative statements, 2) duration of pauses, 3) questions, 4) exclamations, and 5) pictures used and referred to in the local coherence tasks.

The reliability of the data was established by a four-part process. First, the experimenter and an assistant (from a different field of study), coded the data in most of the transcripts. Second, to avoid experiential bias several individuals from various fields of study were invited to respond specifically to the initial coding of the children's experiential meanings (which were used to determine social relevance). Next, a trained collaborator in developmental psychology coded the data (across all categories) in 15% of the sample. Based on this feedback, the coding scheme was revised slightly. Finally, 20% of the accounts were independently coded by a graduate student trained by the experimenter in the coding system. This final coding was compared with the experimenter's coding in order to establish reliability. The reliability of the coding scheme ranged from 83.3 - 100 % agreement across the data categories (see chart below).

Reliability Chart

<u>Type of Content</u>	<u>Reliability Score</u>
<u>Simple small-scale Content</u>	%
Details	
People	100
Objects	100
Actions	100
Activity	100
Happenings	100
Character attributes	100
<u>Complex Small-scale Content</u>	
Explicit causal links	88.8
Motivational intentions	94.4
Emotional states	100
<u>Narrative Properties</u>	
Processing strategies	94.4
Internal coherence	100
Story line	100
Level of thematic integration	94.4
Socio-idiosyncratic relevance	83.3

Chapter 5

Results

Textual Effects on the Representation of Content: The Narrative Complexity of Cuts and Dissolves

To determine the impact of external textual features on the degree of continuity in children's representations of content, the data were analyzed with respect to the narrative complexity of: 1) cuts and dissolves; and 2) each segment's overall textual structure. This continuity was described in relation to specific organizational features both separately and as facilitated by other features of the medium.

Global Level of Analysis

Contrary to the expectations of the present study, there were no condition effects in the global coherence tasks on processing strategies, topical focus, level of thematic integration, and social relevance. Neither slowing the speed at which the dissolves were presented nor transforming them into cuts influenced the children's interpretations of the small- or large-scale content. While these results confirm the hypothesis that the younger

children would not distinguish between the syntactic properties of cuts and dissolves, they did not support the hypothesis that the slower presentation of the dissolves would enhance the younger children's attention and comprehension.

Local Level of Analysis

The local coherence tasks were designed to examine the continuity in children's representations of content in terms of the four hypotheses regarding the effects of the specific syntactic features. To determine whether children were able to recognize the pictorial flow of content across the perceptual transformations of the dissolves, the quantitative data were analyzed independently. These data in the local coherence tasks were based on both the selections children made to complete the two pictorial sequences and the accuracy of the judgments they made on the object identity tasks. To determine the condition effects on these tasks and how these effects interact with the children's grade level and gender, a three-way ANOVA (grade-level-by-gender-by-condition) was performed separately for each multiple-choice task. The results showed only grade-level effects on some of the variables in the second and third segments (Table 2).

Table 2

Mean scores for each of the two pictorial sequences children completed and the object identity judgments they made in the multiple choice tasks of each segment.

Grades	<u>First Segment</u>											
	Space-Dissolve						Imagination-Dissolve					
	Choice 1		Choice 2		Object Identity		Choice 1		Choice 2		Object Identity	
	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
Pre-K	2.80	.41	2.13	.43	1.97	.18	2.87	.43	2.00	.37	1.97	.18
K	2.80	.41	2.20	.41	2.00	.00	3.00	.00	1.97	.18	1.97	.18
2nd	2.97	.18	2.03	.18	1.97	.18	3.00	.00	1.93	.25	1.97	.18

Table 2 (continued)

Mean scores for each of the two pictorial sequences children completed and the object identity judgments they made in the multiple choice tasks of each segment.

<u>Second Segment</u>												
Grades	1st Time-Dissolve						2nd Time-Dissolve					
	Choice 1		Choice 2		Object Identity		Choice 1		Choice		Object Identity	
	F(2,87) = 6.70**		F(2,87) = 3.71*		F(2,87) = 6.04**						F(2,87) = 5.48**	
	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
Pre-K	2.63	.56	2.20	.55	1.70	.47	2.97	.18	2.00	.26	1.67	.48
K	2.83	.38	2.17	.38	1.87	.35	2.97	.18	2.03	.18	1.67	.48
2nd	3.00	.00	1.93	.25	2.00	.00	2.97	.18	1.96	.32	1.97	.18
Grades	3rd Time-Dissolve						4th Time-Dissolve					
	Choice 1		Choice 2		Object Identity		Choice 1		Choice		Object Identity	
	F(2,87) = 4.56**				F(2,87) = 4.77**						F(2,87) = 3.24*	
	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
Pre-K	2.40	.56	2.23	.73	1.60	.50	2.87	.43	2.03	.32	1.67	.48
K	2.27	.45	2.53	.68	1.53	.51	2.97	.18	2.03	.18	1.87	.35
2nd	2.67	.55	2.30	.47	1.90	.31	3.00	.00	2.00	.00	1.87	.35
*p < .05 **p < .01												

Table 2 (continued)

Mean scores for each of the two pictorial sequences children completed and the object identity judgments they made in the multiple choice tasks of each segment.

Grades	<u>Third Segment</u>																	
	<u>Space-Dissolve</u>						<u>Weather-Dissolve</u>						<u>Perspective-Dissolve</u>					
	Choice 1		Choice 2		Object Identity		Choice 1		Choice 2		Object Identity		Choice 1		Choice 2		Object Identity	
	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
Pre-K	2.57	.57	2.17	.70	1.70	.47	2.30	.60	2.50	.51	1.97	.18	2.70	.65	2.10	.31	1.33	.48
K	2.67	.55	2.20	.55	1.83	.38	2.50	.51	2.50	.51	2.00	.00	2.87	.43	2.07	.37	1.23	.43
2nd	2.83	.38	2.13	.43	1.77	.47	2.57	.50	2.43	.50	1.97	.18	3.00	.00	2.00	.00	1.60	.50
*p < .05		**p < .01																

A two-way ANOVA (gender-by-condition) for the quantitative data of each grade showed some main and interactional effects in the second and third segments. For the children, the interpretation of the first segment was a more manageable task. None of the variables showed main or interactional condition effects. In fact, among the kindergartners and second-graders, some of the imagination dissolve's variables showed ceiling effects. In the second and third segments, narrative textuality and thematic concepts were more complex, and there were gender-by-condition interactional effects on some of the variables.

In one of the time dissolves in the second segment and in the space and weather dissolves in the third segment, both girls and boys performed better when the dissolves were presented at a slower pace. Both also performed better when the dissolves were transformed into cuts. However, analysis of the qualitative data showed neither grade nor gender effects on these variables. The results showed that most children relied mainly on one-way perceptual abstractions and focused only on qualitative invariant pictorial features. That is, they focused on the perceptual similarities of discrete objects without attending to the configurational pattern of the semiotic (in)variants.

As the three-way ANOVA above showed, despite the lack of condition effects, distinct performance patterns emerged in each segment (see Table 2). The mean scores indicate

that all children demonstrated the highest degree of continuity in the pictorial sequences and in the object identity judgments of the first segment. The lack of grade differences in the first segment indicates no significant differences in children's performance across the three grades. However, the distinct grade-related patterns found in the second and third segments suggest that both cognitive and textual factors influenced children's perceptions of narrative continuity.

A three-way MANOVA was performed for the grade-level-by-gender-by-segment effects, with segment as a within-subject repeated measure. This analysis of the quantitative data reinforced the notion that both cognitive and textual factors influenced children's performance. There were both grade-level and segment main effects on the two pictorial sequences and on the object identity tasks. As Tables 3 and 4 illustrate, while children showed the highest degree of continuity in their interpretations of the two dissolves in the first segment, they showed the lowest degree of continuity in the third segment. In addition, the variations in performance within each grade showed that all children, even the second-graders, did not perform as well in the the second and third segments. These grade- and segment-interactional effects demonstrated that cognitive sophistication and the segment's overall narrative complexity influenced performance.

Because the complexity of a segment's textual structure is determined both by the composition of its forms of narration and by the type of content it presents, a three-way MANOVA was performed (grade-level-by-gender-by-type-of-content, with type-of-content as a within-subject repeated measure). The results showed significant type-of-content effects on the first ($F(4,348) = 27.93, p < .001$) and on the object identity judgments made ($F(4,344) = 66.68, p < .001$), as well as significant grade-by-type-of-content interactional effects on the object identity tasks ($F(8, 344) = 3.74, p < .001$).

These results further reinforce and elaborate on the grade-level-by-segment interactional effects reported in Tables 3 and 4. As Table 5 illustrates, these grade and segment variations were related not only to the forms of narration used in each segment but also to the type of content presented. All children had the least difficulty in recognizing the perceptual similarities in the object identity tasks of the imagination and weather dissolves. All children also found the shift in spatial perspective the most difficult and the shift in time and space the second most difficult. Specifically, even the second-graders were not able to maintain the same degrees of continuity across the dissolves.

Table 3

The mean scores for the two pictorial sequences and the object identity judgements children made across the dissolves in the three segments.

Tasks	Segment 1		Segment 2		Segment 3	
	<u>X</u>	<u>SD</u>	<u>X</u>	<u>SD</u>	<u>X</u>	<u>SD</u>
Choice 1*	2.91	.24	2.79	.23	2.72	.30
Choice 2*	2.04	.22	2.12	.23	2.15	.24
Object Identity Judgement*	1.97	.12	1.78	.31	1.63	.23

*p < .05

Table 4

The mean scores for the two pictorial sequences and the object identity judgment children made across the three segments in each grade level.

Tasks	Segments	<u>Grades</u>					
		Pre-K		K		2nd	
		<u>X</u>	<u>SD</u>	<u>X</u>	<u>SD</u>	<u>X</u>	<u>SD</u>
Choice 1	1	2.83	.33	2.90	.20	2.98	.09
	2	2.72	.27	2.76	.19	2.91	.17
	3	2.57	.39	2.75	.23	2.84	.17
Choice 2	1	2.07	.31	2.08	.19	1.98	.09
	2	2.12	.29	2.19	.20	2.05	.15
	3	2.21	.28	2.13	.20	2.12	.22
Object Identity Judgement	1	1.97	.13	1.98	.09	1.97	.13
	2	1.66	.37	1.73	.30	1.93	.15
	3	1.59	.25	1.58	.21	1.72	.20

Table 5

Mean scores for the selections children made in the two pictorial sequences and the object identity judgments in each type of content.

Type of Content	Task	Grades					
		Pre-K		K		2nd	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Imagination	Choice 1	2.87	.93	3.00	.00	3.00	.00
	Object Identity	1.97	.19	1.97	.18	1.97	.18
Weather	Choice 1	2.30	.60	2.50	.51	2.57	.50
	Object Identity	1.97	.19	2.00	.00	1.97	.18
Space	Choice 1*	2.68	.38	2.73	.31	2.90	.20
	Object Identity**	1.83	.24	1.92	.19	1.87	.23
Time	Choice 1*	2.71	.26	2.80	.16	2.92	.14
	Object Identity**	1.69	.35	1.78	.27	1.95	.11
Spatial Perspective	Choice 1	2.70	.65	2.87	.43	3.00	.00
	Object Identity	1.33	.48	1.23	.43	1.60	.50

*Choice 1: $F(2,87) = 8.27, p = .001$

**Type of Content Object Identity: $F(4,344) = 66.68, p < .001$

Grade-level-by-Type of Content Object Identity: $F(8,344) = 3.74, p < .001$

When the quantitative data of the local coherence tasks were analyzed in conjunction with the qualitative data, the results elaborated on the segment and type-of-content effects that were demonstrated by the analysis of the quantitative data above (see Tables 2 - 5). The frequency distributions of the thematic justifications (Table 10) shows that children indeed performed significantly better in the two actional dissolves of the first segment than they did in the weather, space, time, and spatial-perspective dissolves presented in the second and third segments.

Although the analysis of the quantitative data showed distinct developmental patterns only in the second and third segments, when the quantitative and qualitative data were analyzed together, the results showed the opposite effect. In the first segment, a developmental pattern of performance was identified that was comparable to that found on the global level of interpretation. All the children made the optimal selection to complete the first (mid-dissolve) and the second (one-dimensional) pictorial sequences. Their thematic justifications, however, showed significant grade effects on the level at which they integrated the imagination dissolve's (in)variant features. Therefore, the continuity of children's narrative representations cannot be described only in terms of the organization posed by specific syntactic features (dissolves under investigation). These syntactic features acquire textual relevance only when

they are viewed in relation to the segment's overall narrative structure. Comprehension of specific syntactic features must be examined in relation to overall textual complexity and not in isolation. To capture the ways in which factors in the internal cognitive and external textual domains interact and influence one another, the quantitative data must be analyzed in conjunction with the qualitative data of both the local and the global coherence tasks.

Qualitative and Quantitative Data in the Global and Local Coherence Tasks

As the fifth hypothesis states, the degree of complexity in a segment's narrative structure should influence the degree of continuity in children's representations of content. While grade effects on processing strategies demonstrated developmental variations, the lack of segment effects demonstrated experiential variations with the acts of communication in general. Grade- and segment-related results on the simple and complex small-scale content further supports this hypothesis, demonstrating the interaction of internal cognitive factors with external textual factors.

Processing Strategies

The analysis of the qualitative data in the global and local coherence tasks showed that the processing strategies on which children relied to organize the content in their accounts were related to both their grade level and the criteria of the task at hand. Three processing strategies were identified, ranging from concrete-perceptual to abstract-conceptual: detail-driven, sequence-driven, and generality-driven.

The nature of the local coherence tasks was conducive to only detail- and sequence-driven processing strategies. That is, the multiple-choice tasks required thematic justifications of the pictorial sequences children completed, accounting for the transition from one picture to another. Consequently, children who viewed the multiple choice as a sorting task or as pictorial representations of the dissolve had to account for the pictorial transitions by referring to the sequence in the flow of content. The nature of this task, therefore, did not allow for generality-driven strategies.

On the other hand, in the global coherence tasks, there were variations in the narrative criteria posed in the unfacilitated and facilitated accounts. The presence or absence of the experimenter's probes influenced the ways in which the children organized the content in their responses.

The nature of the task led to distinct patterns of performance. In the unfacilitated accounts, there was a developmental pattern across the grade levels. In the facilitated accounts, however, the experimenter's probes influenced both the length and thematic complexity of the children's responses. For example, most of the second-graders used a detail-driven strategy, demonstrating an abrupt shift between their responses in the unfacilitated and facilitated accounts. The experimenter's probes, then, had an impact on the processing strategies children used.

The unfacilitated accounts, therefore, were better indicators of children's processing strategies, because these accounts reflect the manner in which *children themselves* organized each segment's content without any interference from the experimenter. In the unfacilitated and facilitated accounts of the first and second segments ($X^2 (4) = 11.67, p < .02$), a significant relationship existed between processing strategy and grade level; in the third segment, however, this relationship occurred only in the unfacilitated accounts. As Table 6 and Figure 3 shows, each strategy appears in all three grade levels to varying degrees. In these accounts most of the second-graders relied on sequence-driven processing strategies, whereas most of the pre-kindergartners and kindergartners relied on detail-driven strategies. In contrast, unfacilitated generality-driven accounts were virtually non-existent

Table 6

Frequency distribution and percentage of the processing strategies
children displayed in each grade-level in each segment.

Unfacilitated Accounts																		
Grades	Segment 1*						Segment 2*						Segment 3*					
	Detail Driven		Sequence Driven		Generality Driven		Detail Driven		Sequence Driven		Generality Driven		Detail Driven		Sequence Driven		Generality Driven	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Pre-K	25	86.2	4	13.8	-	-	25	92.6	1	3.7	1	3.7	24	88.9	3	11.1	-	-
K	20	66.7	8	26.7	2	6.7	21	70.0	9	20.0	-	-	23	76.7	5	16.7	3	6.7
2nd	5	16.7	24	80.0	1	3.3	5	16.7	24	80.0	1	3.3	5	16.7	22	73.3	3	10.0

Facilitated Accounts																		
Grades	Segment 1						Segment 2						Segment 3					
	Detail Driven		Sequence Driven		Generality Driven		Detail Driven		Sequence Driven		Generality Driven		Detail Driven		Sequence Driven		Generality Driven	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Pre-K	30	100	-	-	-	-	30	100	-	-	-	-	29	96.7	1	3.3	-	-
K	27	90.0	3	10.0	-	-	30	100	-	-	-	-	29	96.7	1	3.3	-	-
2nd	18	60.0	12	40.0	-	-	22	75.9	5	17.2	2	6.9	27	90.0	3	10.0	-	-

* $\chi^2(4) = 11.67, p < .02$

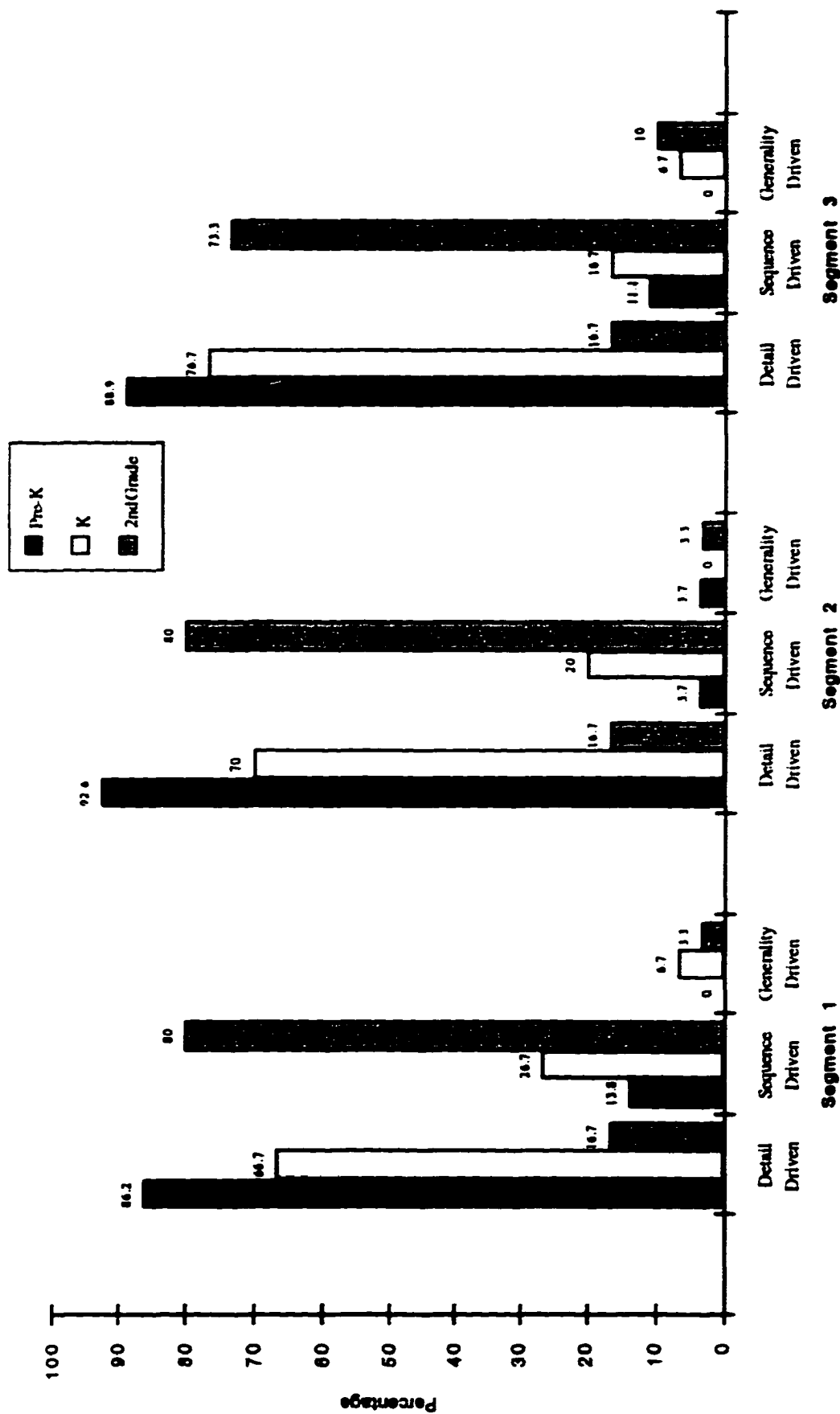


Figure 1. Types of processing strategies used in the unfacilitated accounts of the three segments across the three grades.

across the grades: only a few of the kindergartners (6.7%) and second-graders (3.3%) relied on this processing strategy.

The younger children -- whose accounts were detail-driven and whose interpretations were based predominantly on child-centered one-way perceptual abstractions -- were more likely to construct fragmented narrative representations than those whose accounts were sequence- or generality-driven. In other words, children's processing strategies influenced the level at which they organized the content in their accounts, which, in turn, influenced the degree of continuity in their narrative representations of content.

Narrative Continuities Ranging from the Pre-conceptual to the Conceptual Modes of Thinking

Topical Focus

The children's accounts were examined first for topical focus by evaluating the internal coherence and accuracy of the story line (see Chapter 2). In the local coherence task, the topical focus of the thematic justifications most children gave had both internal coherence and topical relevance. Therefore, children's justifications of the pictorial sequences and of the object identity tasks were not analyzed for this narrative property.

In the global coherence accounts, almost all children gave accounts of each segment that were both coherent and accurate. However, a significantly greater number of accounts were more inaccurate than incoherent. Specifically, most of the inaccurate accounts were constructed by the pre-kindergartners, and, more specifically, by boys. In addition, although there were gender differences in all three segments, the differences were most pronounced in the unfacilitated and facilitated accounts of the third segment. That is, 87.5% of the unfacilitated and 83.3% of the facilitated inaccurate accounts were constructed by boys. In the unfacilitated accounts, 2.2% of the girls were inaccurate compared with 16.7% of the boys. Similarly, in the facilitated accounts, 4.4% and 22.2%, respectively, of the girls and boys gave inaccurate accounts. The results showed that the pre-kindergartners and kindergartners were more likely to give inaccurate accounts than the second-graders. In addition, most of the inaccurate accounts were detail-driven and were constructed by boys.

Level of Thematic Integration

The development of narrative viewing competencies is a function of the refinement and integration of psychological processes in the perceptual, conceptual, and social-

affective domains. The interplay of processes in these three domains reflects the multidimensional and complex nature of the cognitive structures behind these competencies. To elaborate on this multi-dimensionality in children's cognitive behavior, four levels of thematic integration were identified in this study, namely, enumerational, pseudo-conceptual, quasi-conceptual, and conceptual. These levels serve as a heuristic capturing a developmental pattern in the organization of the psychological processes.

The children's accounts were evaluated for the simple and complex small-scale content they mentioned. To determine how children integrated this content to make sense of each segment's large-scale content their responses were evaluated for one-way perceptual and/or two-way conceptual abstractions. A Chi square analysis for levels of thematic integration by grade showed a significant relationship between these two variables in all three segments ($X^2 (4) = 18.47, < .001$). Table 7 and Figures 4a-c illustrates the grade-related patterns found in each segment.

In addition, to determine the operative processes behind children's cognitive behavior across the three grades, the data were analyzed with respect to the processing strategies children used and the level at which they integrated the content.

Table 7

Frequency distribution of the four levels at which children integrated the content in their unfacilitated and facilitated across the three grades.

Grades	Levels of Thematic Integration	Segment 1				Segment 2				Segment 3			
		Unfacilitated Accounts*		Facilitated Accounts		Unfacilitated Accounts*		Facilitated Accounts		Unfacilitated Accounts*		Facilitated Accounts	
		n	%	n	%	n	%	n	%	n	%	n	%
Pre-K	Enumerational	17	58.6	19	61.1	19	70.4	21	76.7	17	61.0	18	59.3
	Pseudo-Conceptual	9	31.0	11	36.7	7	25.9	7	23.3	9	31.3	10	31.3
	Quasi-Conceptual	3	10.3	-	-	-	-	-	-	1	3.7	-	-
	Conceptual	-	-	-	-	1	3.7	-	-	-	-	2	7.4
K	Enumerational	11	36.7	23	76.7	10	31.1	27	90.0	8	26.7	20	66.6
	Pseudo-Conceptual	11	36.7	7	23.1	12	40.0	3	10.0	15	50.0	8	26.7
	Quasi-Conceptual	7	23.3	-	-	6	20.0	-	-	2	6.7	-	-
	Conceptual	1	3.3	-	-	2	6.7	-	-	5	16.7	2	6.7
2nd	Enumerational	3	10.0	25	89.1	2	6.7	27	93.1	2	6.7	17	56.7
	Pseudo-Conceptual	4	13.3	3	10.7	5	16.7	2	6.9	6	20.0	11	41.1
	Quasi-Conceptual	10	31.1	-	-	4	13.1	-	-	1	10.0	-	-
	Conceptual	13	43.3	-	-	19	61.1	-	-	19	61.1	-	-

*X'(4) = 18.47, p < .001

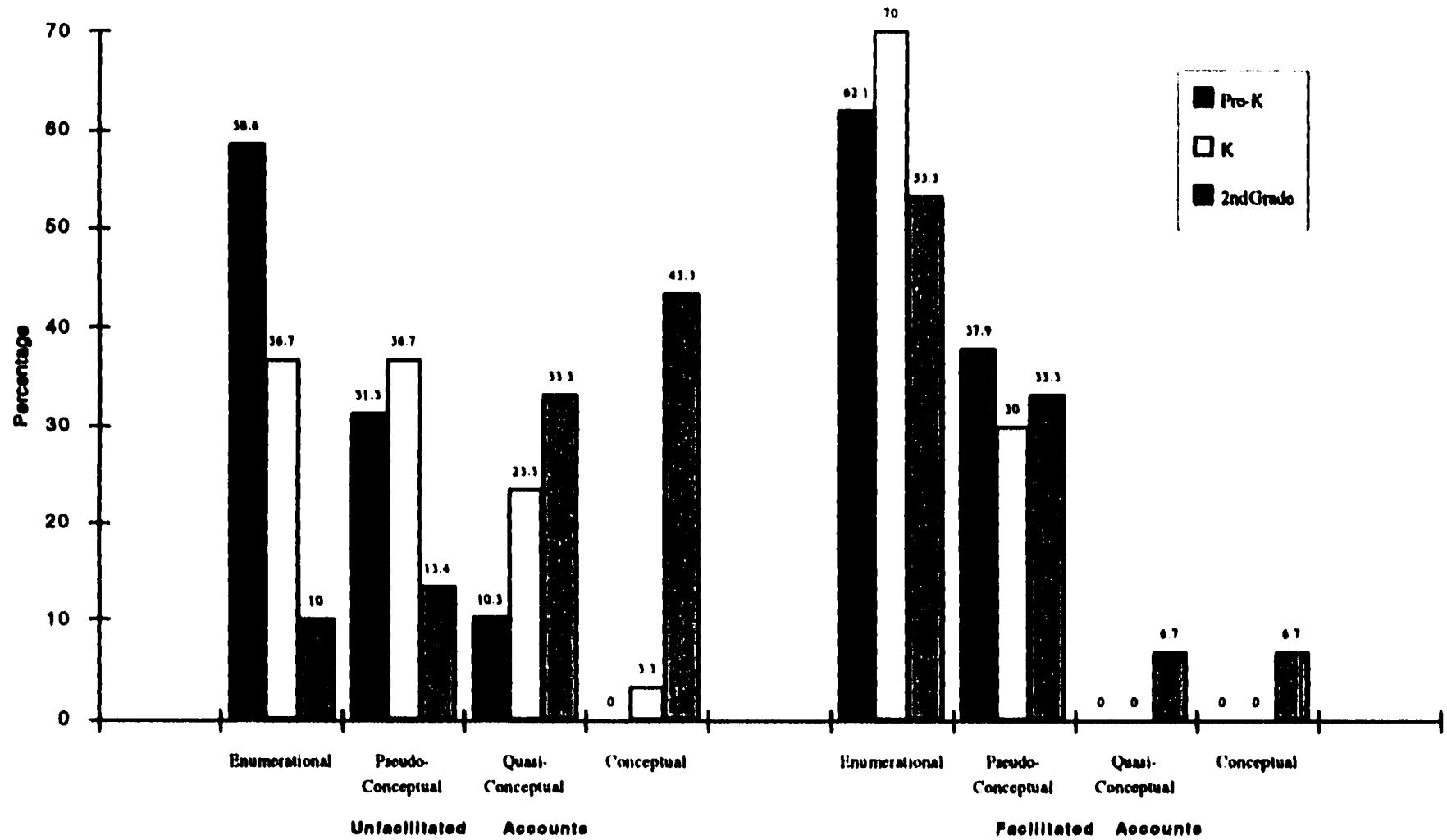


Figure 4a. Levels of thematic integration in the organization of content in children's unfacilitated and facilitated accounts across the three grades in segment 1.

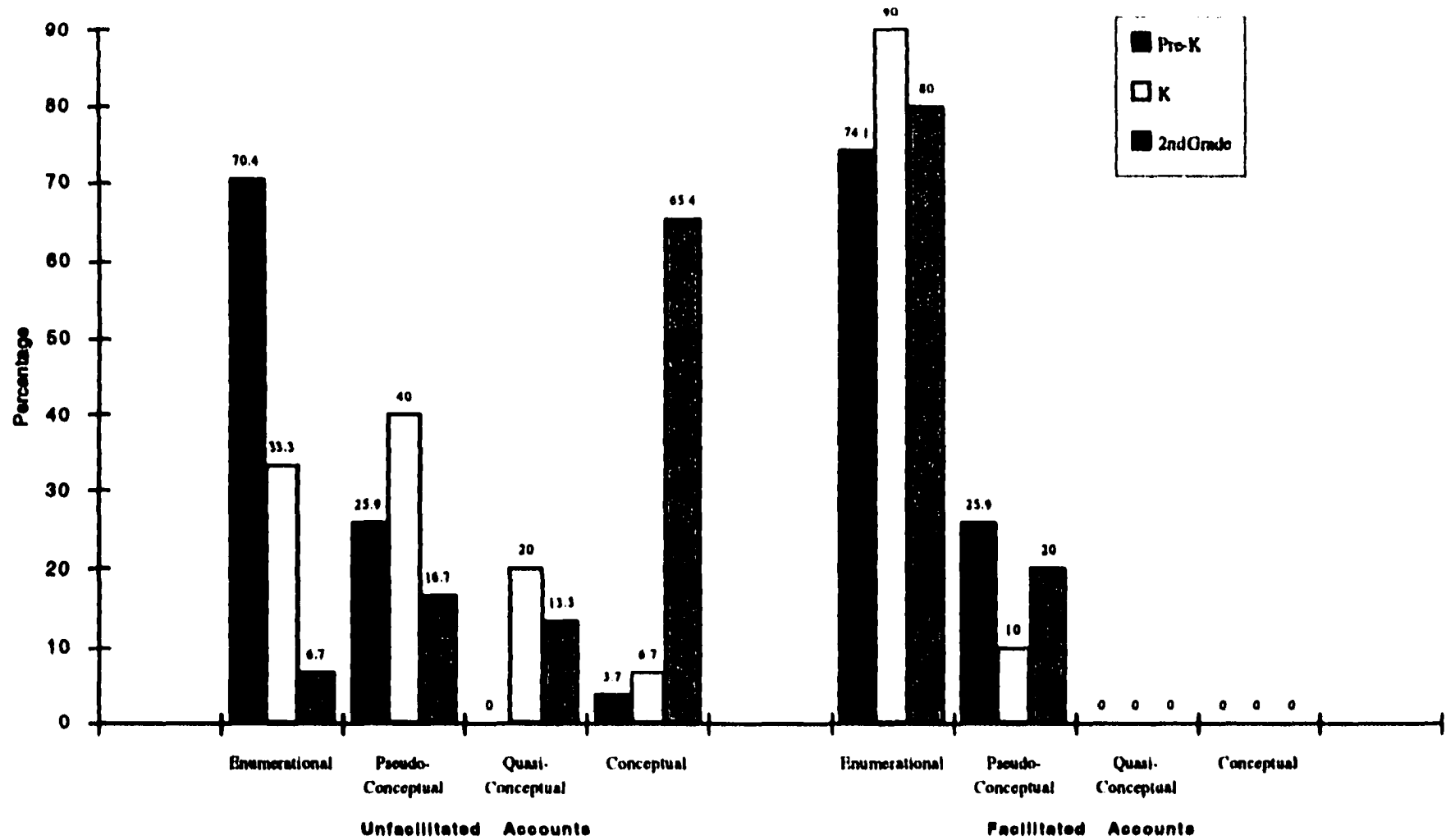


Figure 4b. Levels of thematic integration in the organization of content in children's unfacilitated and facilitated accounts across the three grades in segment 2.

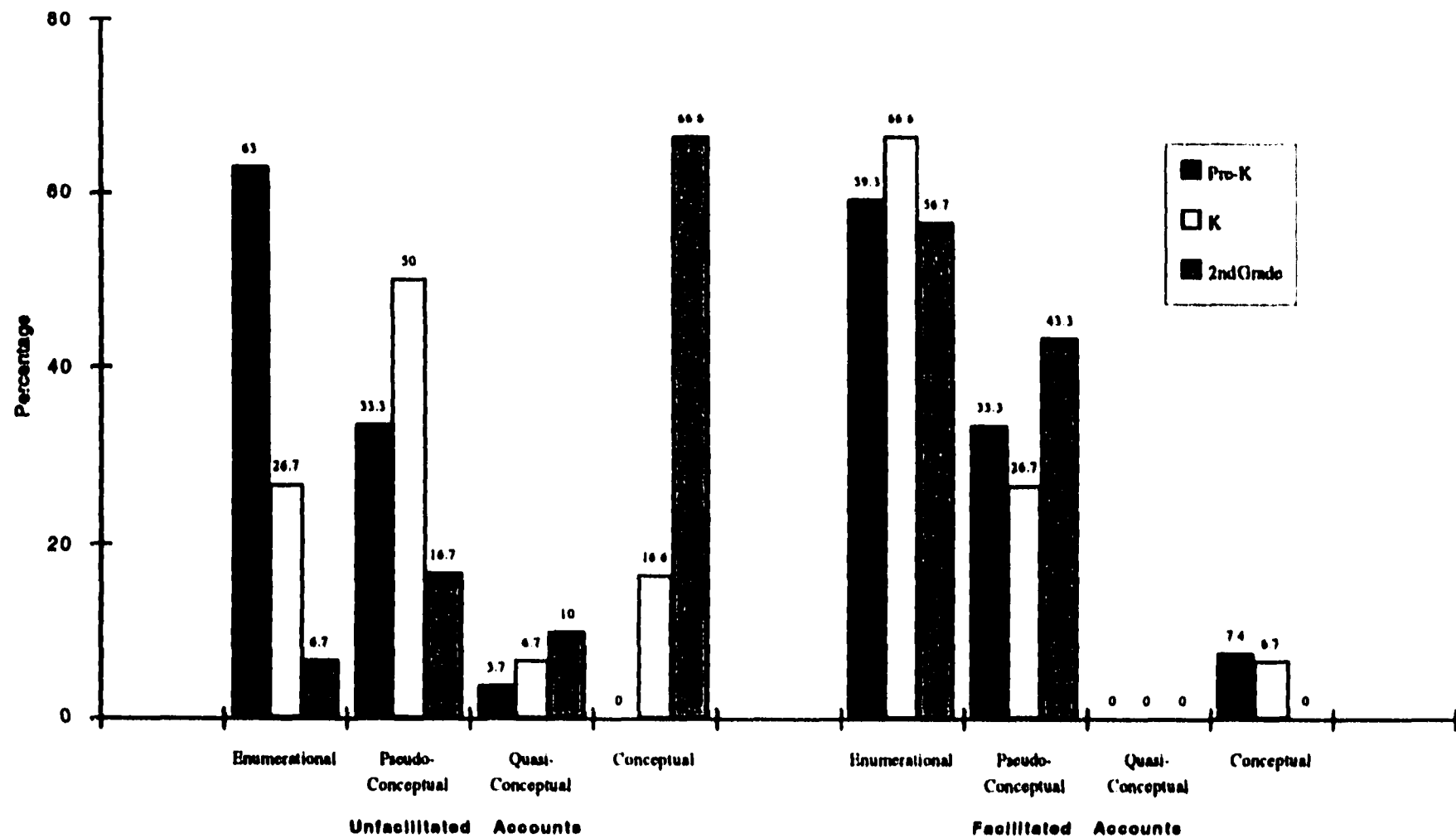


Figure 4c. Levels of thematic integration in the organization of content in children's unfacilitated and facilitated accounts across the three grades in segment 3.

As Table 8 and Figures 5a-c shows, a significant relationship exists between these two variables in all three segments ($X^2 (6) 22.46, p < .001$).

Thus, both the conceptual frame of reference on which children relied and the processing strategies they used had an impact on the degree of continuity in the narrative representations. In fact, in all segments, the children in all three grades who relied on a sequence-driven processing strategy were more likely to integrate the content in their accounts at a higher level. However, because processing strategies are interdependent with children's conceptual frame of reference, significant grade-level differences occurred even in the sequentially organized accounts.

As Figure 6 illustrates, when pre-kindergartners organized their accounts sequentially, they were more likely to integrate the content at a pseudo- or quasi-conceptual level than at the enumerational level. Similarly, in the first and second segments, most of the kindergartners who organized their accounts sequentially were more likely to organize their accounts at a higher level than expected. They did not, however, consistently produce conceptual narrative representations of content. Thus, despite the sequential organization of content, these children did not integrate the thematic connections across narrative clusters with consistency. On the other hand, in the sequence-driven accounts of the second-graders the content was organized at

Table 8

Frequency distribution of the levels of thematic integration by the processing strategies the children used to organize the content in their unfacilitated accounts.

Processing Strategies	Levels of Thematic Integration	<u>Segment 1</u>		<u>Segment 2</u>		<u>Segment 3</u>	
		Unfacilitated Accounts*		Unfacilitated Accounts*		Unfacilitated Accounts*	
		n	%	n	%	n	%
Detail Driven	Enumerational	30	60.0	31	60.8	27	51.9
	Pseudo-Conceptual	19	38.0	20	39.2	24	46.2
	Quasi-Conceptual	1	2.0	-	-	-	-
	Conceptual	-	-	-	-	1	1.9
Sequence Driven	Enumerational	1	2.8	-	-	-	-
	Pseudo-Conceptual	4	11.1	3	8.8	6	20.0
	Quasi-Conceptual	19	52.8	10	29.4	6	20.0
	Conceptual	12	33.3	21	61.8	18	60.0
Generality Driven	Enumerational	-	-	-	-	-	-
	Pseudo-Conceptual	1	33.3	1	50.0	-	-
	Quasi-Conceptual	-	-	-	-	-	-
	Conceptual	2	66.7	1	50.0	5	100.0

* $\chi^2(6) = 22.46, p < .001$

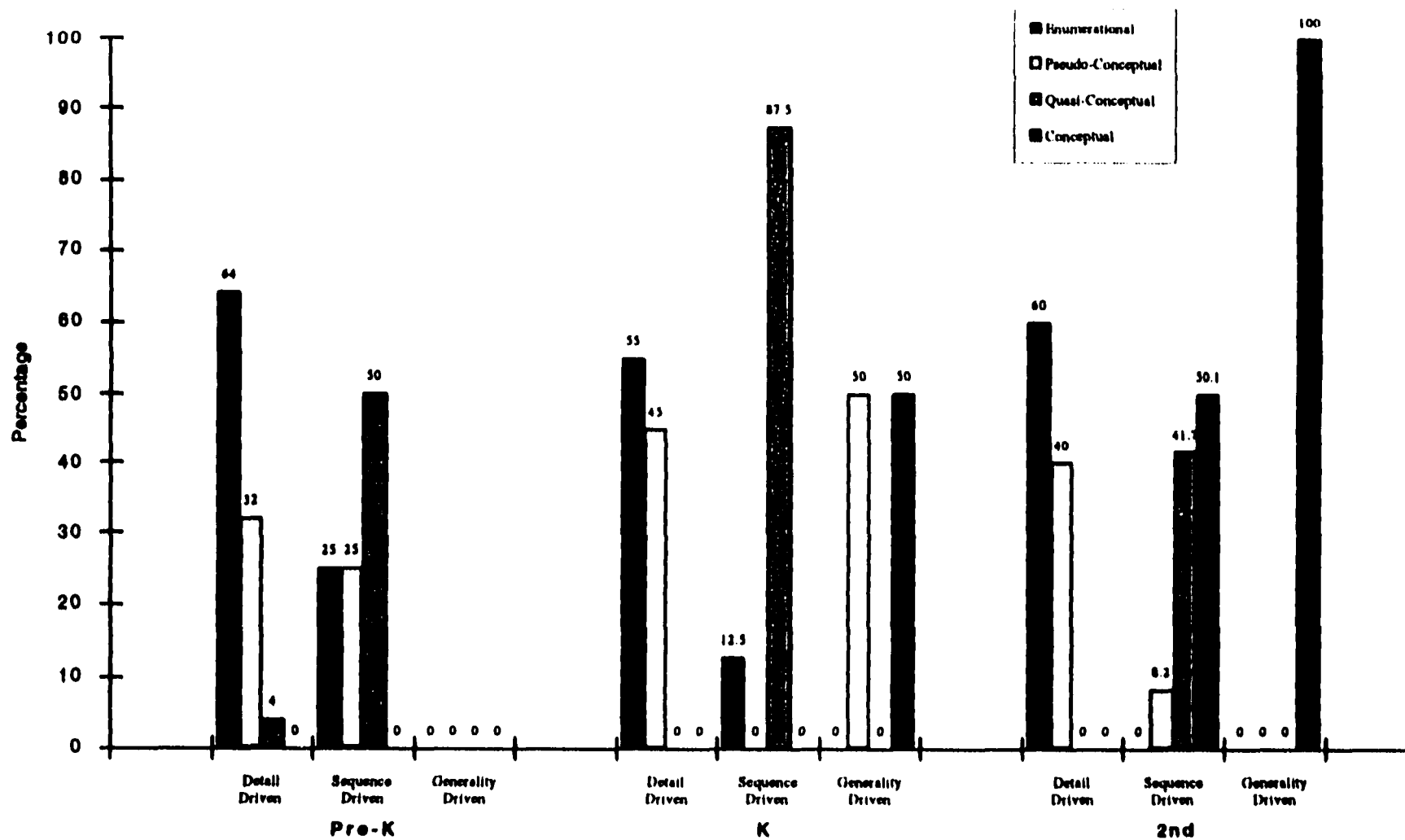


Figure 5a. Levels of thematic integration by types of processing strategies in segment 1 across the three grades.

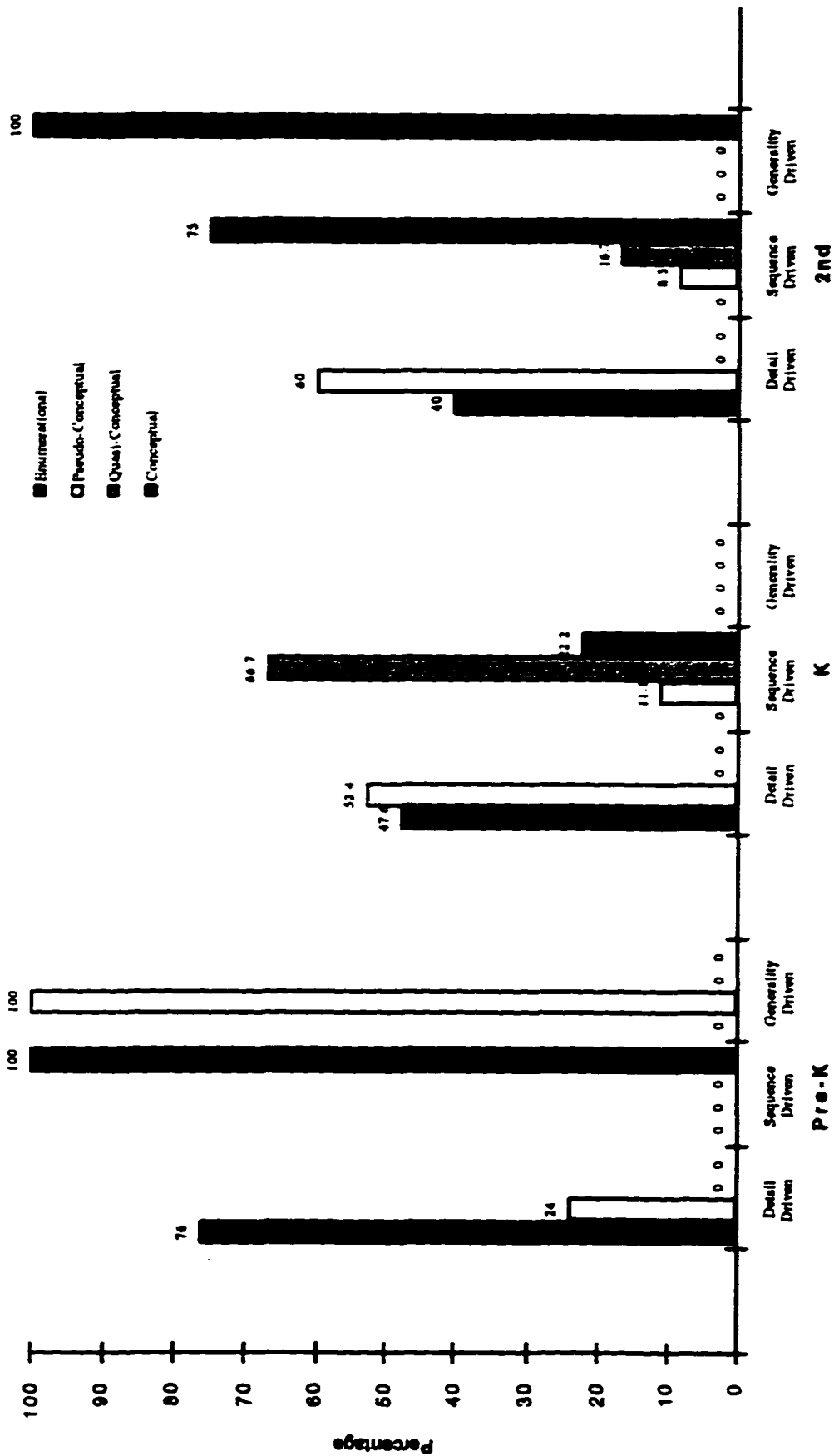


Figure 5b. Levels of thematic integration by types of processing strategies in segment 2 across the three grades.

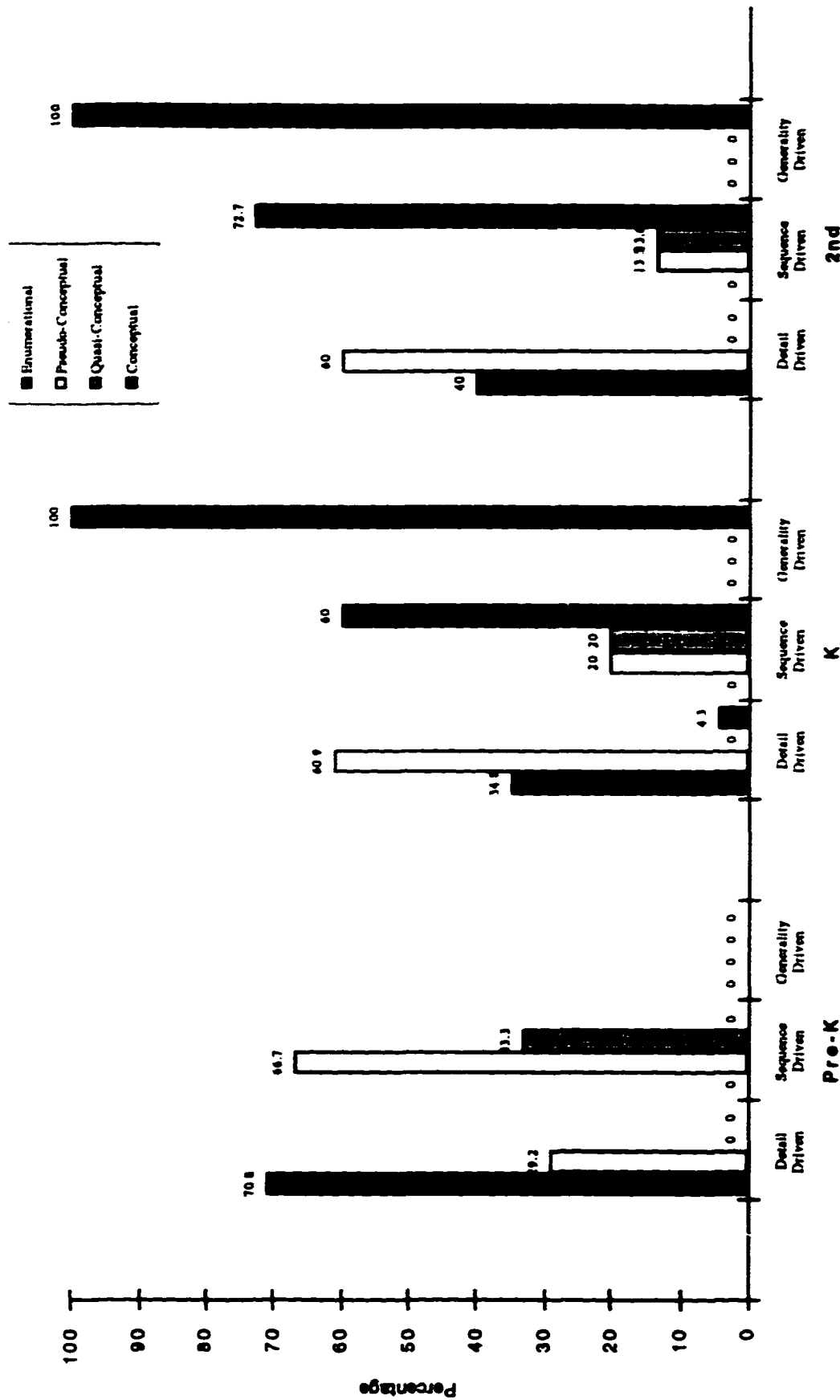


Figure 5c. Levels of thematic integration by types of processing strategies in segment 3 across the three grades.

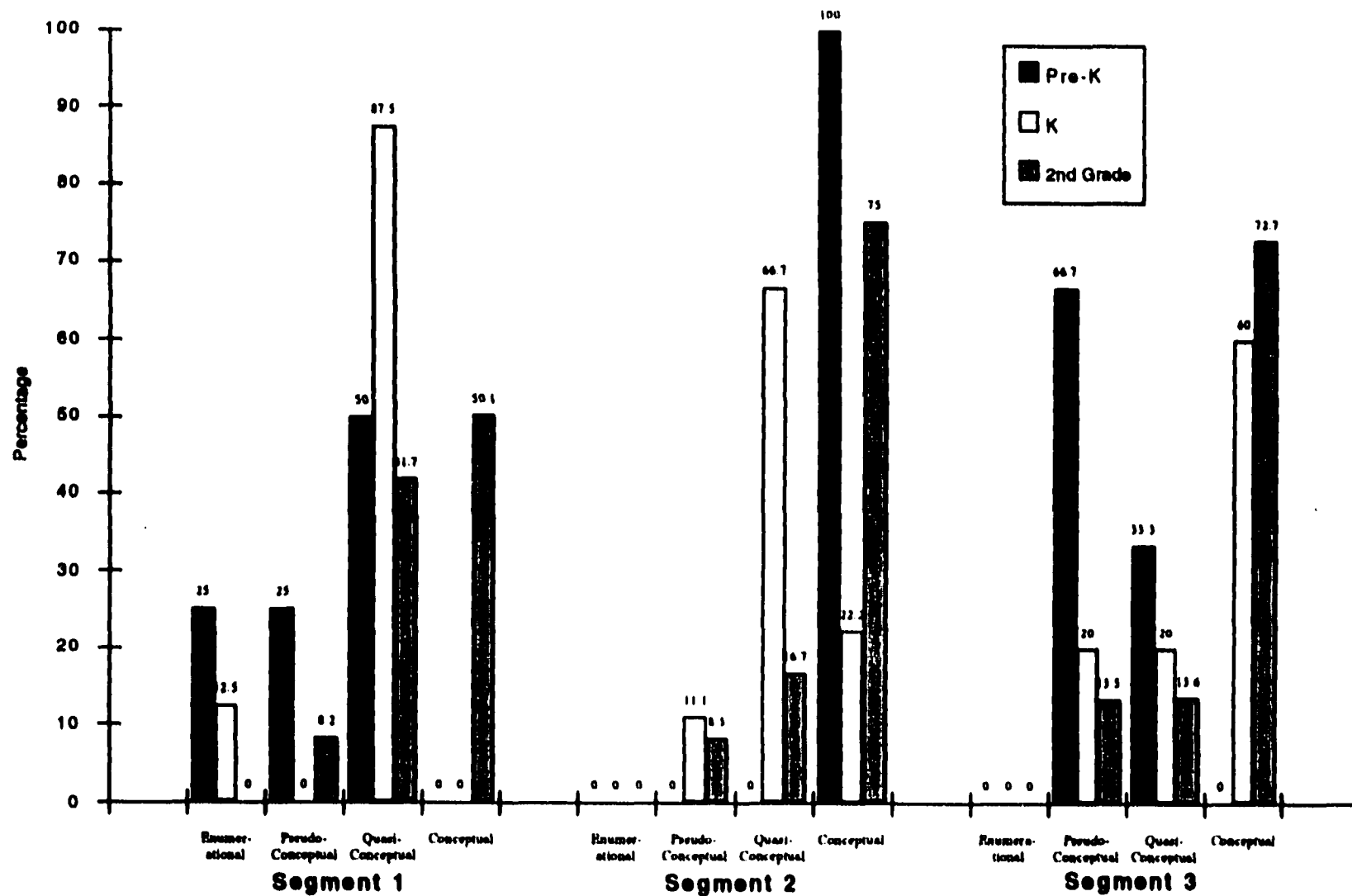


Figure 6. Levels of thematic integration among children across the three grades who used the sequence driven processing strategy in the three segments.

the conceptual level in all three segments. They focused on wider narrative clusters and coordinated the small- and large-scale content into continuous and thematically consistent narrative representations.

These grade- and segment-related differences in the main themes can be explained in terms of children's performance on simple and complex small-scale content. Additional analysis of the small- and large-scale content showed that the children in each grade did not perform uniformly across the three segments. As Table 9 and Figures 7a-b illustrate, a significantly greater number of second-graders who grasped the main theme mentioned complex small-scale content more in the first segment than they did in the second and third segments. Chi square analyses showed significant grade-related differences in the use of simple narrative elements in contrast to both grade-related and segment-related differences in the use of complex narrative elements.

The small-scale content showed with more precision than the large-scale content the points at which children's representations of content break down. The variation in performance across the segments was further reinforced by the analysis of the qualitative data in the local coherence tasks (see Table 10). As the data shows, in the second and third segments, even the second-graders' accounts were fragmented.

Table 9

Percentages of the children who included narrative elements
in their accounts of each segment by grade level.

Grades	Narrative Elements	Segment 1				Segment 2				Segment 3			
		Unfacilitated Accounts		Facilitated Accounts		Unfacilitated Accounts		Facilitated Accounts		Unfacilitated Accounts		Facilitated Accounts	
		n	%	n	%	n	%	n	%	n	%	n	%
Pre-K	Causal Links	2	6.9	1	3.3	-	-	1	3.3	1	3.7	-	-
	Motivations	3	10.3	12	40.0	-	-	-	-	-	-	1	3.3
	Character Attributes	8	27.6	5	16.7	9	33.3	1	3.3	14	51.8	16	53.3
	Emotions	-	-	3	10.0	-	-	-	-	-	-	-	-
K	Causal Links	1	3.3	5	16.7	1	3.3	2	6.7	1	3.3	3	10.0
	Motivations	8	26.7	10	33.3	-	-	1	3.3	-	-	-	-
	Character Attributes	14	46.7	9	30.0	4	13.3	2	6.7	21	70.0	14	46.7
	Emotions	4	13.3	2	6.7	6	20.0	-	-	2	6.7	-	-
2nd	Causal Links	15	50.0**	6	20.0*	4	13.3	2	6.9	6	20.0	3	10.0
	Motivations	12	40.0*	9	30.0	3	10.0*	1	3.4	1	3.3	1	3.3
	Character Attributes	20	66.7*	14	46.7*	15	50.0*	3	10.3	22	73.3	12	66.7
	Emotions	15	50.0**	4	13.3	4	13.3	2	6.9	6	20.0	-	-

* $\chi^2(2) = 5.99, p < .05$

** $\chi^2(2) = 13.8, p < .001$

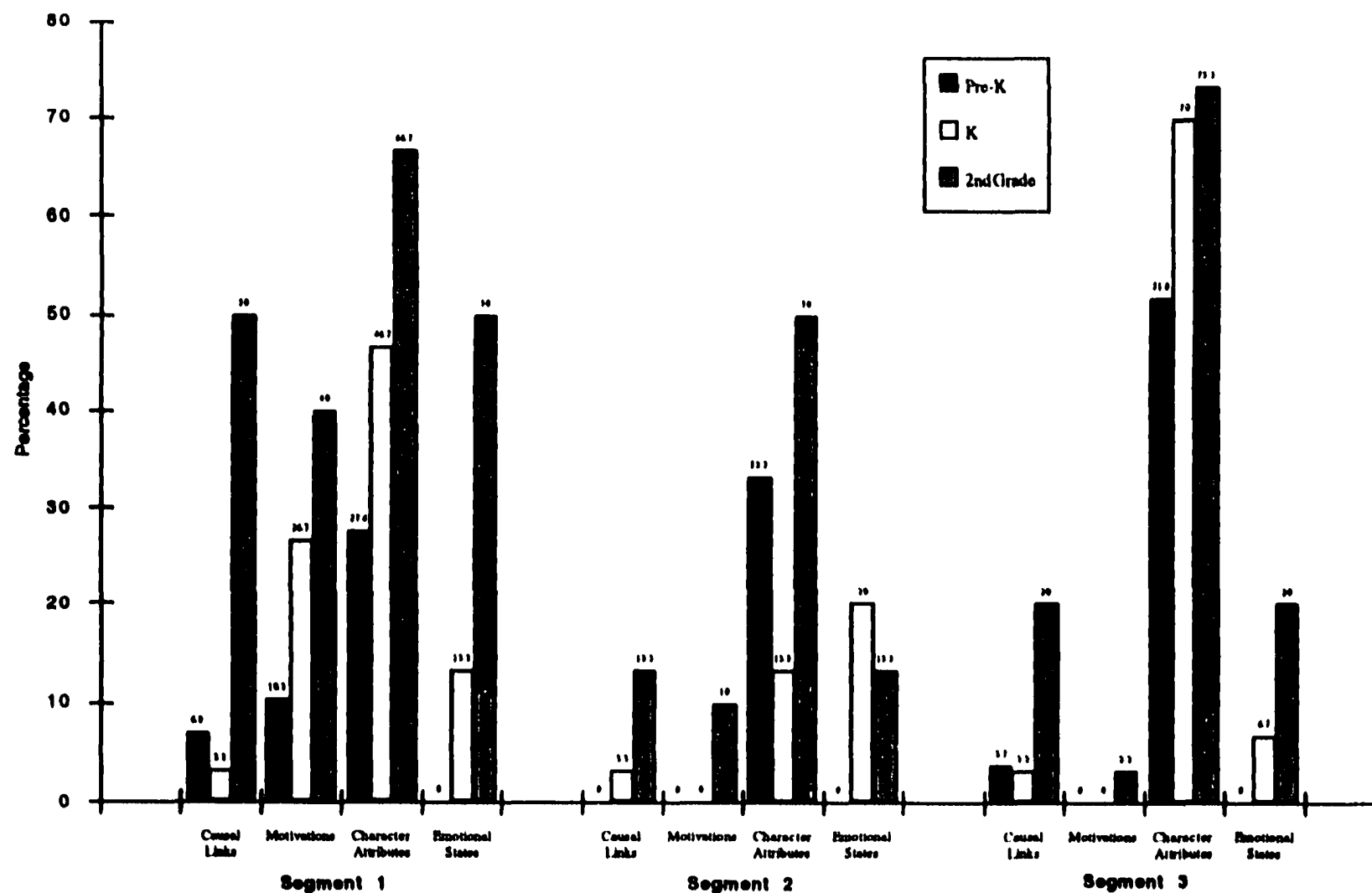


Figure 7a. Types of narrative elements included in the unfacilitated accounts of the three segments by children across the three grades.

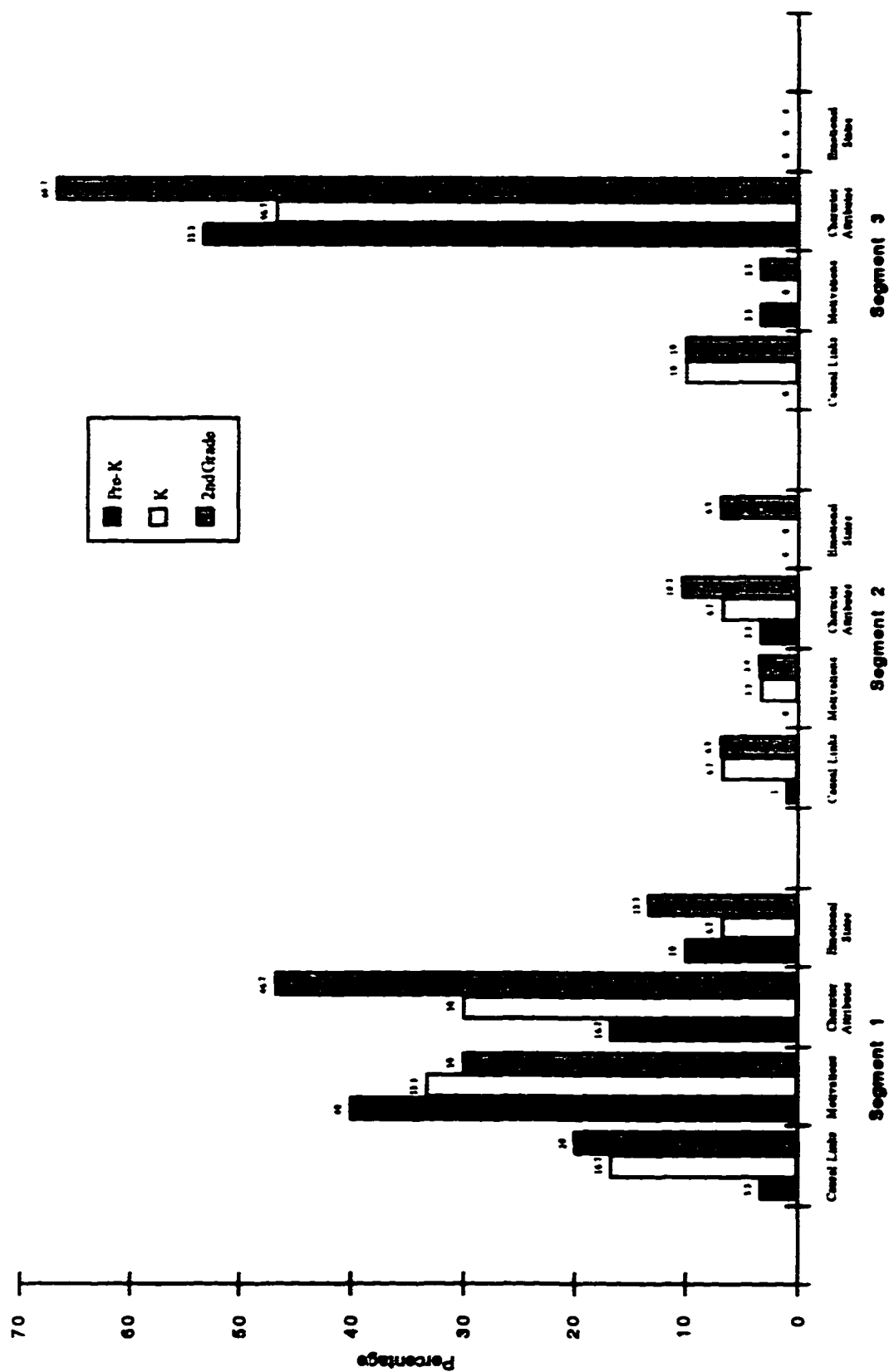


Figure 7b. Types of narrative elements included in the facilitated accounts of the three segments by children across the three grades.

Table 10

Frequency distribution by grade level for the three levels of thematic integration in the pictorial sequences and the object identity tasks in the dissolves in each segment.

First Segment <u>Imagination Dissolve</u>						
Grades	First Pictorial Sequence** <u>Levels of Thematic Integration</u>			Second Pictorial Sequence*** <u>Levels of Thematic Integration</u>		
	Pseudo- Conceptual	Quasi- Conceptual	Conceptual	Pseudo- Conceptual	Quasi- Conceptual	Conceptual
Pre-K	4	4	2	9	1	-
K	3	1	6	5	3	2
2nd	-	-	10	3	-	7

Object Identity Tasks <u>Levels of Thematic Integration</u>															
Grades	<u>Pseudo-Conceptual</u>					<u>Quasi-Conceptual</u>					<u>Conceptual</u>				
	Pictures					Pictures					Pictures				
	1-2 •	2-3 •	3-4	4-5 •	1-5	1-2 •	2-3 •	3-4	4-5 •	1-5	1-2 •	2-3 •	3-4	4-5 •	1-5 •
Pre-K	3	3	3	8	3	3	2	1	1	-	4	5	6	1	7
K	-	-	1	6	-	1	-	-	1	1	9	10	9	3	9
2nd	-	-	-	1	-	-	-	-	1	-	10	10	10	8	10

*X ² (4) = 11.67, p < .02	**X ² (4) = 13.28, p < .01	***X ² (4) = 18.47, p < .001

Table 10 (continued)

Frequency distribution by grade level for the three levels of thematic integration in the pictorial sequences and the object identity tasks in the dissolves in each segment.

Grades	Second Segment Second Time-Dissolve								
	First Pictorial Sequence			Second Pictorial Sequence			Object Identity Tasks 3-4 Pictures		
	Pseudo Conceptual	Quasi Conceptual	Conceptual	Pseudo Conceptual	Quasi Conceptual	Conceptual	Pseudo Conceptual	Quasi Conceptual	Conceptual
Pre-K	5	3	2	7	3	-	5	5	-
K	1	6	3	6	4	-	2	7	1
2nd	-	6	4	4	4	2	-	10	-

Grades	Second Segment Third Time-Dissolve								
	First Pictorial Sequence*			Second Pictorial Sequence			Object Identity Tasks* 1-3 Pictures		
	Pseudo Conceptual	Quasi Conceptual	Conceptual	Pseudo Conceptual	Quasi Conceptual	Conceptual	Pseudo Conceptual	Quasi Conceptual	Conceptual
Pre-K	5	4	1	8	1	1	5	4	1
K	3	6	1	4	4	2	2	8	-
2nd	-	4	6	2	6	2	-	5	5

* $\chi^2(4) = 13.28, p < .01$

Table 10 (continued)

Frequency distribution by grade level for the three levels of thematic integration in the pictorial sequences and the object identity tasks in the dissolves in each segment.

Grades	Third Segment <u>Space-Dissolve</u>								
	First Pictorial Sequence			Second Pictorial Sequence			Object Identity Tasks		
	Pseudo Conceptual	Quasi Conceptual	Conceptual	Pseudo Conceptual	Quasi Conceptual	Conceptual	Pseudo Conceptual	Quasi Conceptual	Conceptual
Pre-K	7	2	1	9	-	1	8	2	-
K	5	1	4	4	3	3	9	1	-
2nd	2	4	4	5	4	1	4	5	1

Grades	Third Segment <u>Spatial Perspective Dissolve</u>								
	First Pictorial Sequence			Second Pictorial Sequence			Object Identity Tasks		
	Pseudo Conceptual	Quasi Conceptual	Conceptual	Pseudo Conceptual	Quasi Conceptual	Conceptual	Pseudo Conceptual	Quasi Conceptual	Conceptual
Pre-K	8	2	-	9	1	-	8	2	-
K	5	4	1	7	3	-	8	-	2
2nd	2	7	1	6	2	2	4	2	4

Therefore, to elaborate on the grade- and segment-related differences found in the main themes, performance in the local and global coherence tasks were analyzed in conjunction with one another.

Social Relevance of Content

The perceptual and conceptual abstractions were related mainly to the denotative operative meanings of content. The social relevance this content had to the children's lives was related to the connotative figurative meanings. When these four types of social relevance were analyzed by grade-level, there were significant grade variations in the integration of textual and socio-idiosyncratic meanings in the first segment's facilitated accounts ($X^2 (6) = 12.59, p < .05$) and the second segment's unfacilitated accounts ($X^2 (6) = 22.46, p < .001$). As Table 11 and Figures 8a-b illustrate the children's integration of textual-conventional and socio-idiosyncratic meanings was influenced by their grade level.

In addition, when grade differences were analyzed separately for girls and boys, the results showed a relationship that was approaching significance only among girls. As girls get older, they tended to draw content from the textual- and social-conventional domains as well as from the textual-conventional and social-personal domains. The boys, however, were more likely to focus on textual-

conventional meanings alone than to integrate these meanings with social-conventional ones. There were no gender differences in the textual-conventional combined with experiential-egocentric meanings among pre-kindergarten girls and boys. However, the kindergarten and second-grade boys were more likely than the girls to use experiential-egocentric meanings.

In the second segment's unfacilitated accounts, however, there were significant grade-level differences that demonstrate a developmental pattern across the grades. About two thirds of the pre-kindergartners relied on the textual-conventional domain, and the remainder showed a similar distribution across the three socio-idiosyncratic domains. While the same number of pre-kindergartners as kindergartners drew meanings from the experiential-egocentric domains, more pre-kindergartners relied on textual-conventional meanings alone, and more kindergartners relied on textual-conventional combined with social-personal meanings. In contrast, none of the second-graders used experiential-egocentric meanings. Rather, most of them used meanings from the textual- and social-conventional domains, and a few from the social-personal domain.

Furthermore, when grade differences were analyzed separately for girls and boys the results showed significant grade-level effects only among the girls in the unfacilitated account. About two-thirds of the pre-kindergarten and

Table 11

Frequency distribution of the types of social relevance which the content of the first and second segment had to the children's lives.

<u>Segment 1</u>												
Relevance	<u>Unfacilitated Accounts</u>						<u>Facilitated Accounts*</u>					
	Pre-K		K		2nd		Pre-K		K		2nd	
	n	%	n	%	n	%	n	%	n	%	n	%
Textual	14	48.3	17	56.7	13	43.3	13	43.3	19	63.3	18	60.0
Textual Social	5	17.2	8	26.7	9	30.0	3	10.0	5	16.7	8	26.7
Textual Personal	2	6.9	2	6.7	5	16.7	4	13.3	2	6.7	3	10.0
Textual Egocentric	8	27.6	3	10.0	3	10.0	10	33.3	4	13.3	1	3.3

<u>Segment 2</u>												
Relevance	<u>Unfacilitated Accounts**</u>						<u>Facilitated Accounts</u>					
	Pre-K		K		2nd		Pre-K		K		2nd	
	n	%	n	%	n	%	n	%	n	%	n	%
Textual	17	63.0	15	50.0	17	53.0	21	70.0	25	83.3	24	82.8
Textual Social	2	7.4	1	3.3	10	33.3	1	3.3	1	3.3	3	10.3
Textual Personal	3	11.1	9	30.0	4	13.3	4	13.3	3	10.0	2	6.9
Textual Egocentric	5	16.5	5	16.7	-	-	4	13.3	1	3.3	-	-

* $\chi^2(6) = 12.59, p < .05$ ** $\chi^2(6) = 22.46, p < .001$

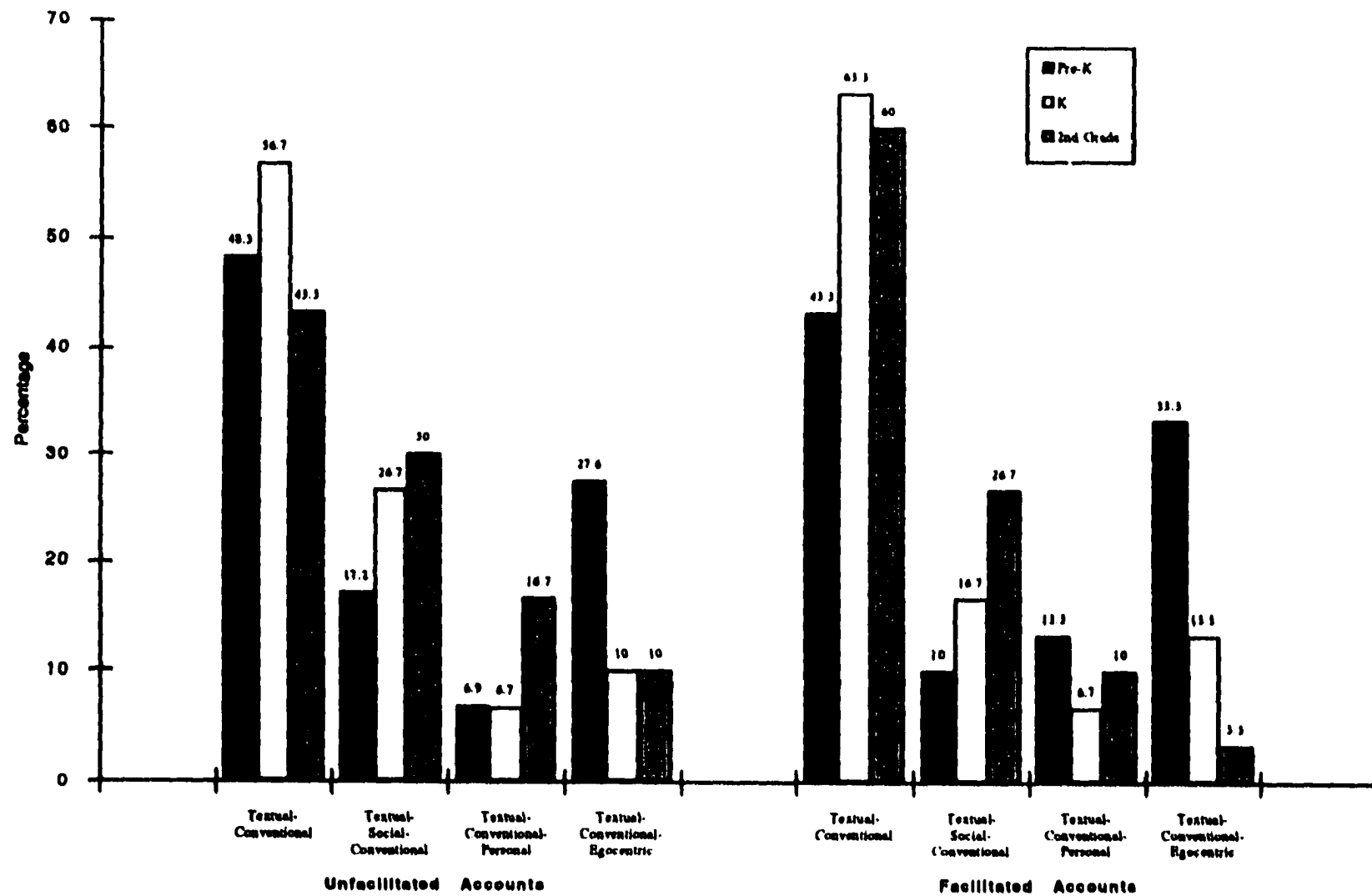


Figure 8a. Types of social relevance across grade levels in the unfacilitated and facilitated accounts of segment 1.

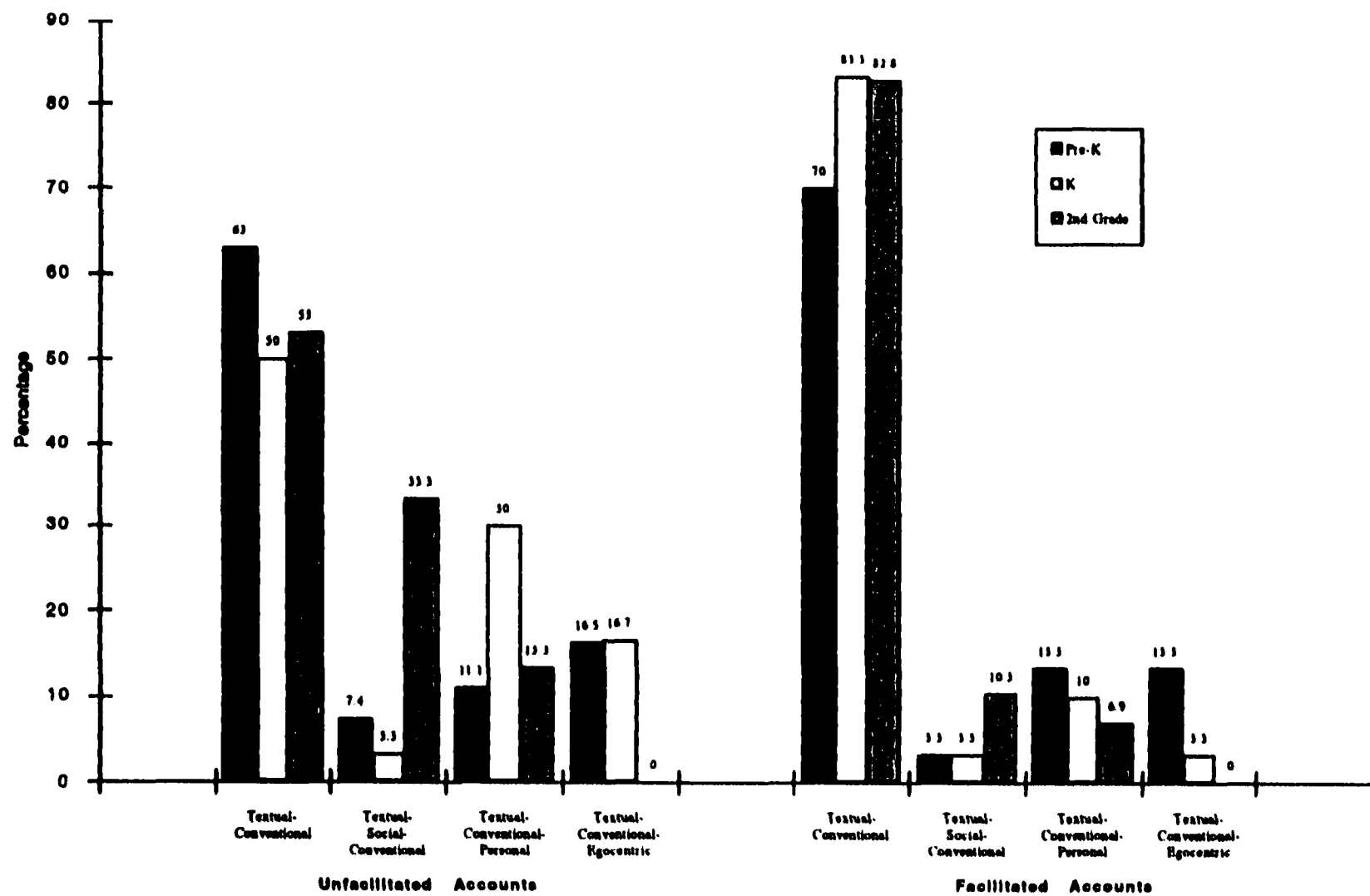


Figure 8b. Types of social relevance across grade levels in the unfacilitated and facilitated accounts of segment 2.

kindergarten girls used the textual-conventional domain alone. While the remaining pre-kindergartners used content from the textual-conventional combined with either social-personal or experiential-egocentric domains, the remaining kindergartners used content mostly from the textual-conventional and social-personal domains. In contrast, about half the second-grade girls used meanings from only the textual-conventional domain. The other half combined textual-conventional with social-conventional meanings.

Even though there were no grade-level differences in the third segment, there were significant gender differences both in the unfacilitated ($X^2 (3) = 7.82, p < .05$) and facilitated ($X^2 (3) = 11.34, p < .01$) accounts. Table 12 and Figure 9 illustrate the gender differences in social relevance of the content in the unfacilitated and facilitated accounts of the third segment.

In the third segment's unfacilitated account when boys used socio-idiosyncratic content, they were more likely to focus on meanings from the experiential-egocentric than the social-conventional or social-personal domains. In contrast, the girls were more likely to focus on content from the social-conventional and social-personal domains. The gender differences became even sharper in this segment's facilitated account. The number of boys using textual-conventional content was the same in the facilitated and the unfacilitated accounts. With facilitation, however, a greater number of

Table 12

Distribution of the types of social relevance on which girls and boys relied in the unfacilitated and facilitated accounts of the third segment.

Relevance	<u>Third segment</u>							
	<u>Unfacilitated</u>				<u>Facilitated</u>			
	<u>Accounts*</u>				<u>Accounts**</u>			
	Female		Male		Female		Male	
	n	%	n	%	n	%	n	%
Textual	25	55.6	28	66.7	33	73.3	29	64.4
Textual Social	8	17.8	3	7.1	1	2.2	-	-
Textual Personal	7	15.6	1	2.4	9	20.0	3	6.7
Textual Egocentric	5	11.1	10	23.8	2	4.4	13	28.9
*X ² (3) = 7.82, p < .05				**X ² (3) = 11.34, p < .01				

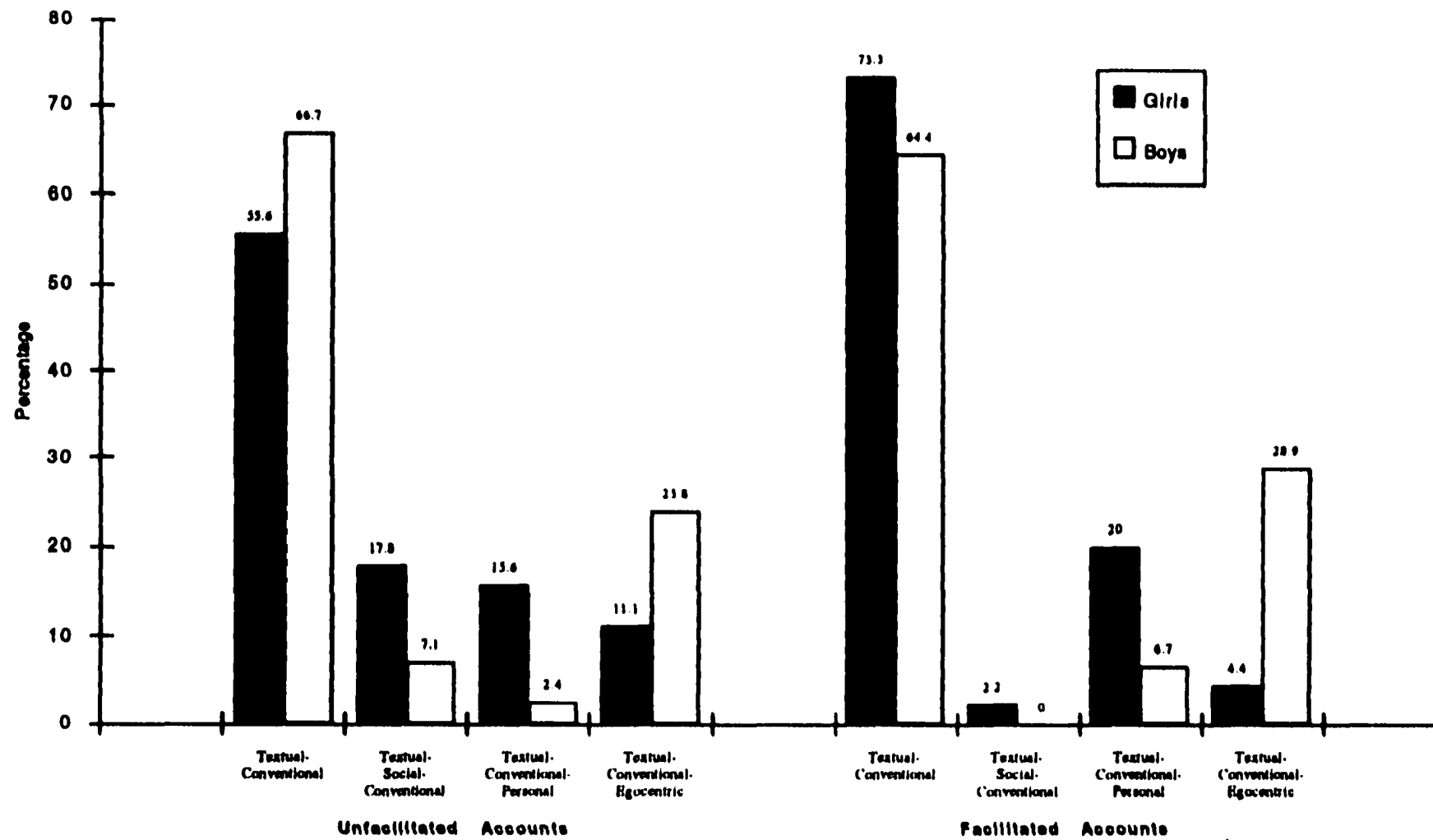


Figure 9. Types of social relevance in unfacilitated and facilitated accounts of girls and boys in segment 3.

boys used idiosyncratic content from the experiential-egocentric domain. In contrast, the experiential content on which the girls relied to make sense of this segment's narrative structure consisted mostly of socially shared meanings. As a result, more girls used content from the textual-conventional or the textual-conventional combined with the social-personal domains when the accounts were facilitated.

These gender effects were related both to cognitive and experiential factors. Thus, to elaborate further on these factors, the data were analyzed separately for gender differences in each grade. The results showed significant gender differences only among the kindergartners in the facilitated account. That is, among the kindergarten boys, 53.3% used the textual-conventional domain and 46.7% used content from the textual-conventional combined with the experiential-egocentric domains. In contrast, 66.7% of the girls used the textual-conventional domain and 26.7% used the textual-social domains.

In addition, the processing strategies on which the children relied were analyzed by the types of social relevance used and the results showed a significant relationship between these two variables in the unfacilitated accounts of the second segment and in the unfacilitated as well as in facilitated accounts of the third segment ($X^2 (6) = 15.03, p < .02$). As the frequency distributions in Table 13 and

Table 13

Frequency distribution of the types of social relevance children used in each type of processing strategy in the unfacilitated and facilitated accounts of the second and third segments.

<u>Segment 2</u>												
Relevance	Unfacilitated Accounts*						Facilitated Accounts					
	<u>Processing Strategies</u>						<u>Processing Strategies</u>					
	Detail Driven		Sequence Driven		Generality Driven		Detail Driven		Sequence Driven		Generality Driven	
	n	%	n	%	n	%	n	%	n	%	n	%
Textual	30	58.8	17	50.0	1	50.0	65	79.3	4	80.0	1	50.0
Textual Social	2	3.9	10	29.4	1	50.0	4	4.9	1	20.0	-	-
Textual Personal	10	19.6	6	17.6	-	-	8	9.8	-	-	1	50.0
Textual Egocentric	9	17.6	1	2.9	-	-	5	6.1	-	-	-	-

<u>Segment 3</u>												
Relevance	Unfacilitated Accounts*						Facilitated Accounts*					
	<u>Processing Strategies</u>						<u>Processing Strategies</u>					
	Detail Driven		Sequence Driven		Generality Driven		Detail Driven		Sequence Driven		Generality Driven	
	n	%	n	%	n	%	n	%	n	%	n	%
Objective	34	65.4	15	50.0	4	80.0	62	72.9	-	-	-	-
Objective Social	2	3.8	8	26.7	1	20.0	-	-	1	20.0	-	-
Objective Personal	3	5.8	5	16.7	-	-	8	9.4	4	80.0	-	-
Objective Egocentric	13	25.0	2	6.7	-	-	15	17.7	-	-	-	-

* $\chi^2(6) = 15.03, p < .02$

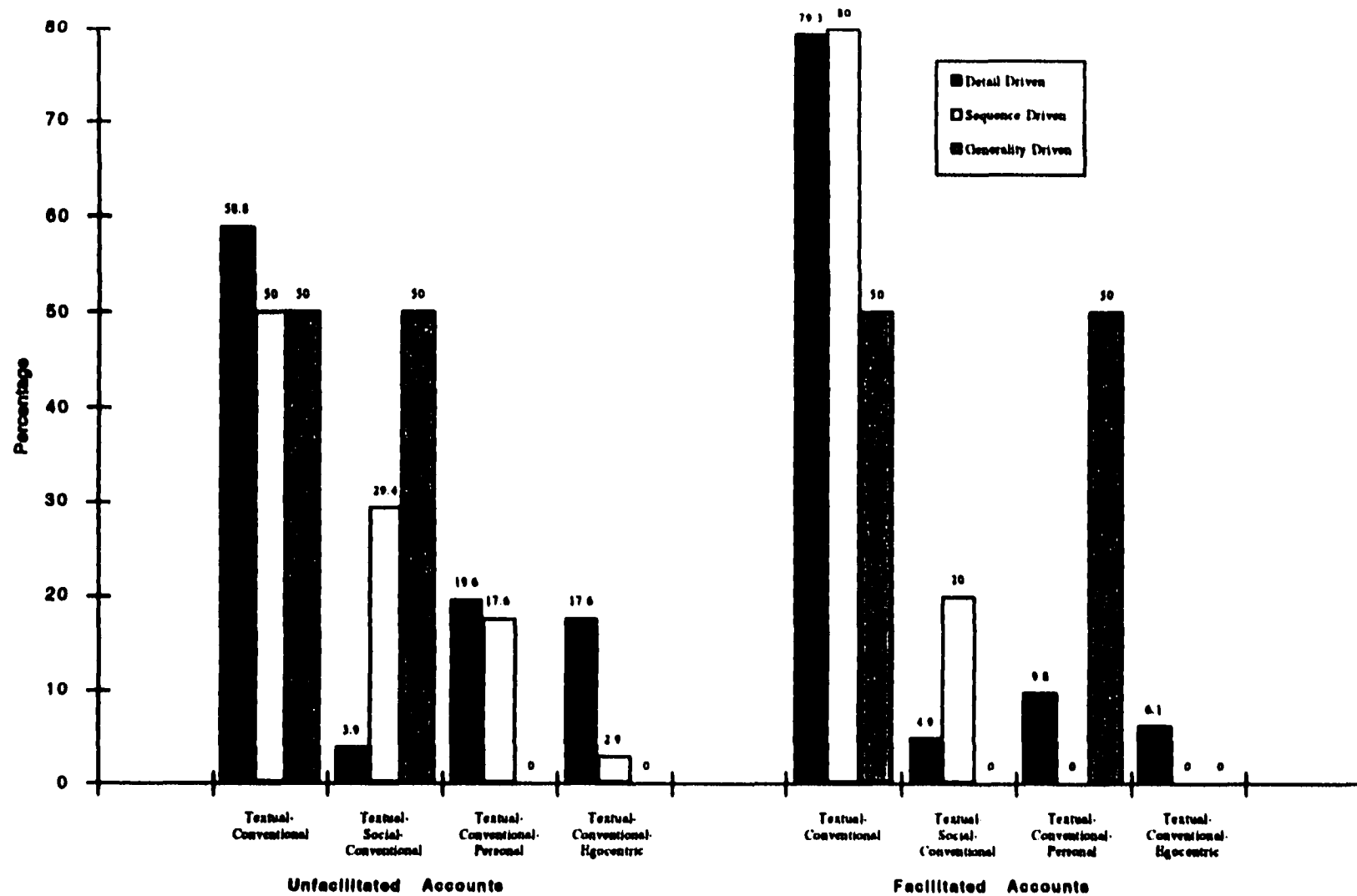


Figure 10a. Types of social relevance across processing strategies used by children in the unfacilitated and facilitated accounts of segment 2.

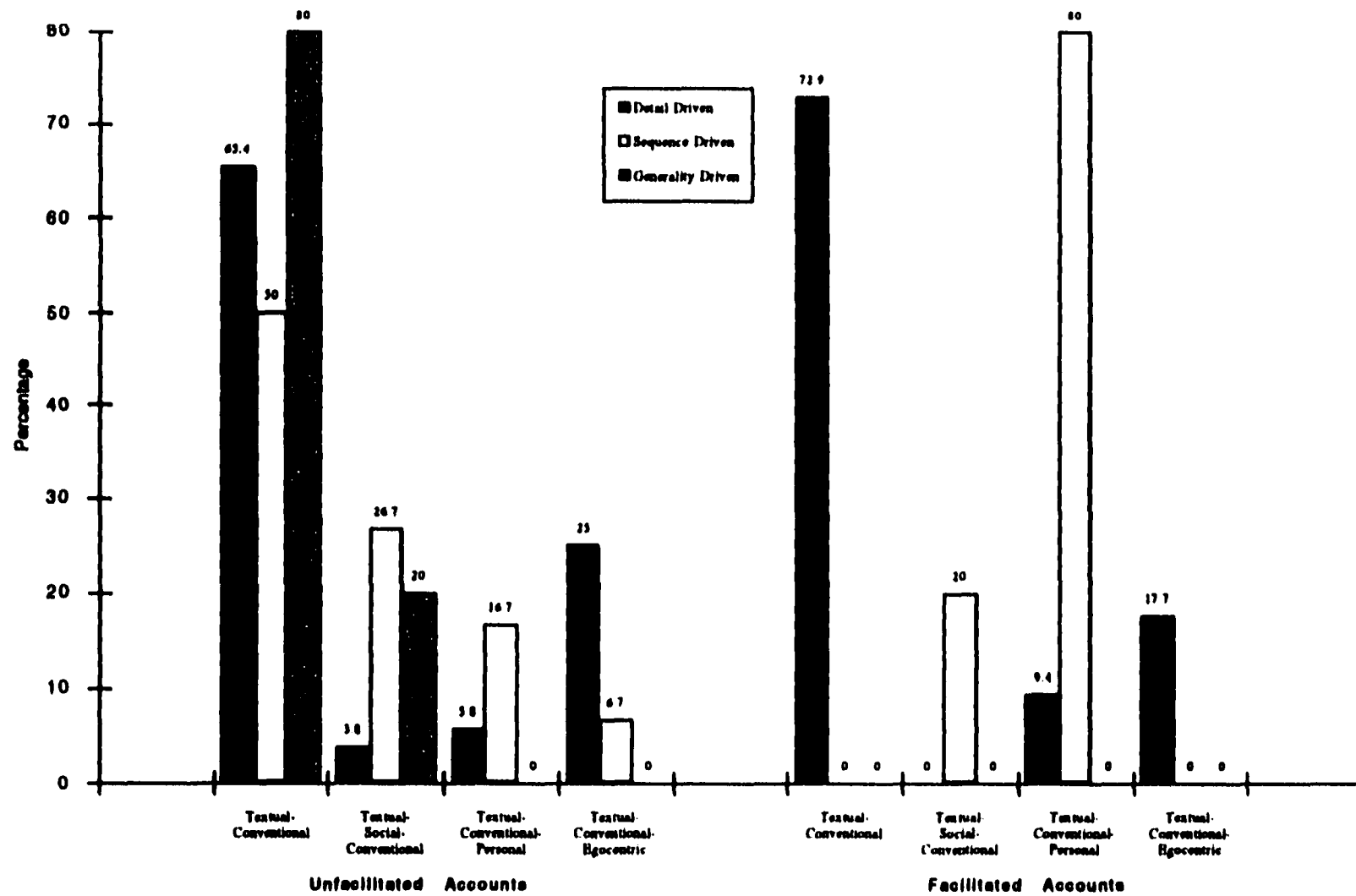


Figure 10b. Types of social relevance across processing strategies used by children in the unfacilitated and facilitated accounts of segment 3.

Figures 10a-b indicate, the processing strategies on which the children relied to make sense of a segment's content were related to the ways in which this content was relevant to their lives. Both in the second and third segments, the children whose narratives were detail-driven and whose comprehension was mainly fragmented were more likely to draw content from the social-personal and the experiential-egocentric domains to make sense of the textual-conventional meanings. On the other hand, the "sequence-driven" accounts were more likely to include textual-and social-conventional meanings.

To elaborate further how these factors influenced the relationship between internal cognitive and external textual forms of organization, the data were analyzed for social relevance by levels of thematic integration. The results showed a significant relationship between these two variables in the unfacilitated accounts of the second and third segments ($X^2 (6) = 22.46, p < .001$). As Table 14 and Figure 11 show, there was no difference in the ways in which children integrated their accounts when they relied on textual-conventional content by itself across the three segments. However, these children were less likely to construct continuous accounts than those who integrated a segment's topical content both textually and socially.

Table 14

Frequency distribution of the types of social relevance used across the four levels of thematic integration in the unfacilitated accounts of the second and third segments.

Relevance	Unfacilitated Accounts															
	Segment 2								Segment 3							
	Levels of Thematic Integration*								Levels of Thematic Integration*							
	Enumera- tional		Pseudo- Conceptual		Quasi- Conceptual		Conceptual		Enumera- tional		Pseudo- Conceptual		Quasi- Conceptual		Conceptual	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Textual	18	37.5	15	31.3	7	14.6	8	16.7	16	30.2	21	39.6	5	9.4	11	20.8
Textual Social	1	7.7	2	15.4	-	-	10	76.4	-	-	3	27.3	-	-	8	72.7
Textual Personal	5	31.3	5	31.3	2	12.5	4	25.0	-	-	4	50.0	1	12.5	3	37.5
Textual Egocentric	7	70.0	2	20.0	1	10.0	-	-	11	73.3	2	16.3	-	-	2	13.3
* $\chi^2(6) = 22.46, p < .001$																

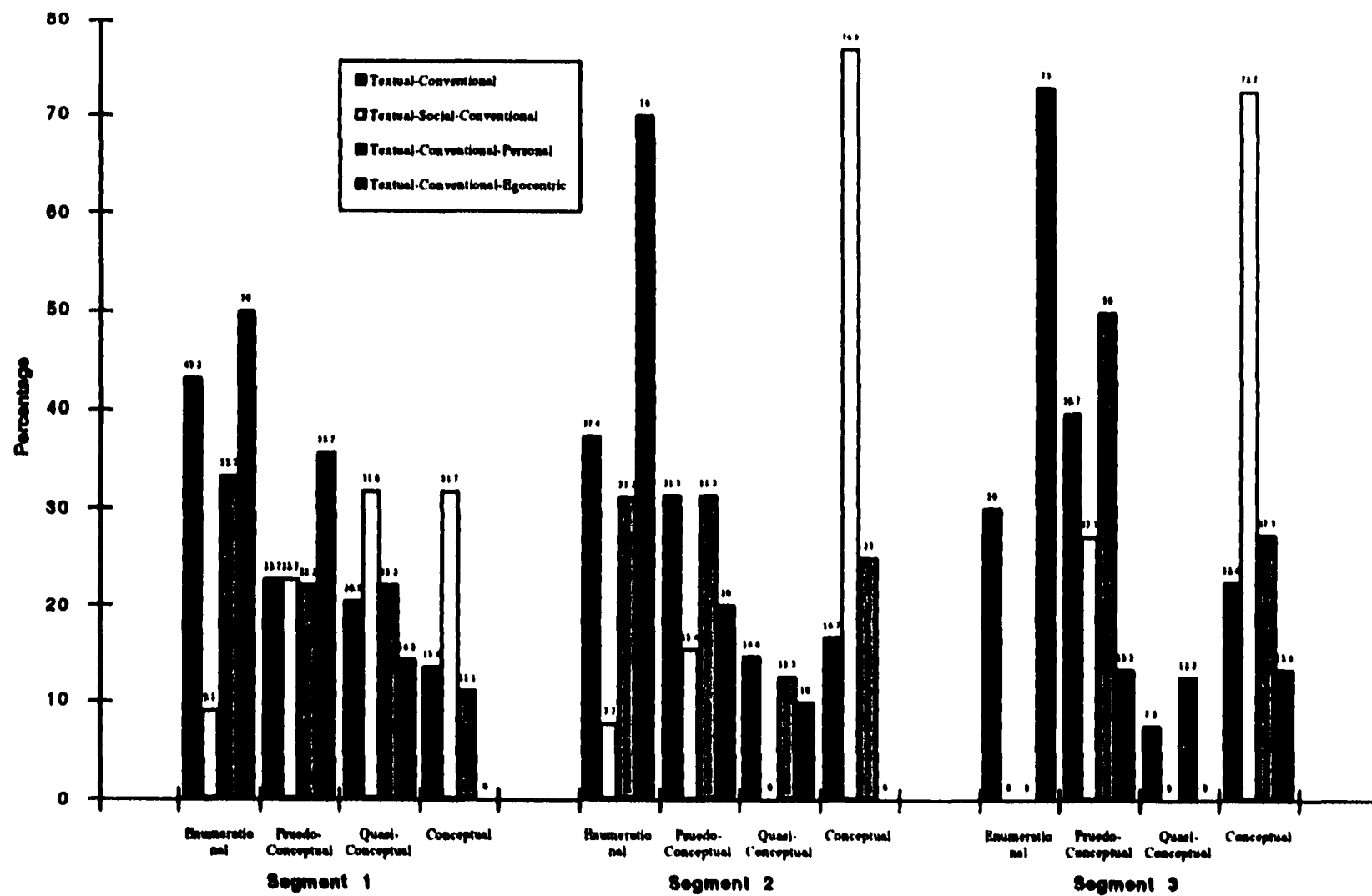


Figure 11. Types of social relevance across levels of thematic integration in the unfacilitated accounts of the three segments.

The accounts with the highest degree of continuity were those that combined the textual-conventional content with the social-conventional, and these were followed by the social-personal combined with the textual-conventional.

CHAPTER 6

Discussion

The grade and segment effects in the global and local coherence tasks demonstrated heterogeneity in children's cognitive behavior. This heterogeneity, in turn, elaborated on the developmental and textual factors that contribute to the bidirectional relationship between internal cognitive and external cultural forms of organization. While performance in the global coherence task showed the impact of developmental factors with more precision, the local coherence tasks showed with more precision the impact of textual factors. The grade and segment interactional effects also demonstrated variations in children's cognitive behavior between the global and local levels of interpretations. That is, while children were able to grasp a segment's overall textual content, they were not able to make sense of specific narrative features that conveyed the topical content.

The lack of condition effects in the global and local coherence tasks disconfirm the first and second hypotheses which state that dissolves are more demanding than cuts, and that the younger children should understand the temporal and spatial relationships of content better when presented by cuts than by dissolves. These results do support the third hypothesis which states that children would not distinguish

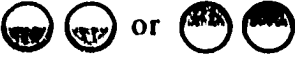
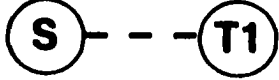
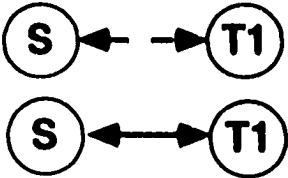
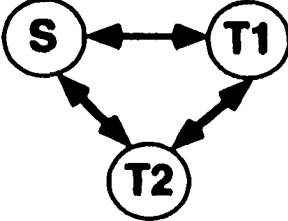
the syntactic properties between the cuts and dissolves. In addition, a closer analysis of the data provides some support for the fourth hypothesis. The quantitative and qualitative data of the local coherence tasks demonstrated that the slower presentation of the dissolves had limited effects. While it enhanced the younger children's attention to content expressed on the presentational level, it did not enhance their comprehension of meanings which this content expressed at the representational level. Accordingly, the slower presentation of the dissolves did not enhance the children's recognition of the thematic correspondences connecting the narrative flow of content.

Finally, the qualitative data of both the global and local coherence tasks confirm the fifth and sixth hypotheses that the complexity of each segment's overall narrative structure as well as the children's cognitive developmental level should affect the degree of continuity in their representations of content.

Variations in Narrative Continuities Ranging from the Pre-conceptual to the Conceptual Modes of Thinking

The four levels of thematic integration revealed a range of narrative continuities found during the transitional period between pre-conceptual and conceptual modes of thinking (see Table 15). The heterogeneity found

Table 15
The four types of narrative continuities identified in children's accounts

	Enumerational	Pseudo-Conceptual	Quasi-Conceptual	Conceptual
SIMPLE SMALL-SCALE CONTENT	Details 	Situational context and 1st textual core theme 	Situational context and 1st textual core theme 	Situational context, 1st and 2nd textual core themes 
	Character Attributes Landscape People			
COMPLEX SMALL-SCALE CONTENT	Causal Links	Inaccurate	Semi-continuous accurate	Complete continuous accurate
	Motivational Intentions	Inaccurate	Semi-continuous accurate vague	Complete continuous accurate
	Emotional States	Inaccurate	Semi-continuous accurate vague	Complete continuous accurate
LARGE-SCALE CONTENT	Setting (S) Theme 1 (T1) Theme 2 (T2) 			



within and across the four levels of thematic integration illustrates that the degree of continuity in children's representation of content was a function of cognitive and experiential factors. Table 15 summarizes the content and the points at which the children's mental representations break down in each level of narrative continuity.

As illustrated in Table 7, four levels of narrative continuity were identified in the transition from the pre-conceptual to the conceptual mode of thinking: enumerational, pseudo-conceptual, quasi-conceptual, and conceptual. The range of narrative continuity in each level was determined by the extent to which children: 1) coordinated explicit with implicit meanings expressed at the presentational and representational levels of signification, and 2) integrated textually and socially relevant meanings. As the data discussed below demonstrate, both internal cognitive and external textual factors influenced the extent to which children integrated the thematic correspondences behind the narrative flow of content.

Enumerational Level of Thematic Integration

In the enumerational accounts, children listed some of the simple small-scale content without organizing them into a story-like form of narration. Sherry's performance (a pre-kindergartner) in the first segment's global coherence

tasks illustrates both the narrow thematic scope of the accounts organized at the enumerational level as well as the degree of discontinuity and vagueness in the narrative representation of content.

Sherry: Pre-kindergartner

Unfacilitated Account

- E: Tell me, what did you just see happening?
 C: Umm, Johnny Appleseed, umm, was, was, in with the carriages but then he went back to his farm.
 E: Johnny Appleseed was in with what?
 C: The carri-, the carriages.

Facilitated Account

- E: Do you know where these carriages were going?
 C: Moving.
 E: Moving. Do you know where they were moving to?
 C: No.
 E: Do you know why Johnny went back to his farm?
 C: No.
 E: Did he want to go with them?
 C: Yeah.
 E: What makes you think he wanted to go with them?
 C: 'Cause he was with them.
 E: Okay.

Sherry's interpretation was based on direct perceptions of pictorial content that were not recognized as an integral element of the segment's overall narrative structure. She relied on her direct perceptions of the "carriages" and the overall activity in which they were used. In addition, she did not recognize the underlying nature of the tasks in which the people engaged; that is, she did not recognize the

travelers as pioneers and did not distinguish them as different from Johnny who had a "farm."

Instead, Sherry grasped the meanings of the objects and actions expressed at the presentational level. This enabled her to describe the setting of the segment vaguely. She focused on the "carriages" and their movement as an isolated event, and she could not make sense of this event within the thematic context of the first segment. The details regarding the movement of the "carriages" became, for her, the segment's overall thematic context. As a result of this narrow thematic scope, she understood neither the motivational intentions behind the characters' actions nor the consequences of their actions. Sherry focused mainly on personal meanings of simple small-scale content and did not integrate them with complex content.

Sherry's interpretation of the imagination dissolve is likewise characteristic of her focus on meanings expressed at the presentational level. That is, when Johnny was pretending that he was a brave man and had joined the pioneers going West, Sherry interpreted his pretend behavior as nonpretend actions and reported that "Umm, Johnny Appleseed, umm, was, was, in with the carriages but then he went back to his farm." In this way, she failed to grasp the symbolic representations of the imagination dissolve's perceptual transformations.

Sherry's performance in the local coherence tasks specifies the restricted thematic scope behind the one-way

perceptual abstractions which guided the organization of the details on which she focused.

Sherry's Justification for the Selection She Made
in the First Pictorial Sequence

- C: [Sherry chose the mid-dissolve picture and placed it in the middle].
 E: Okay. Now tell me, why did you pick that one?
 C: 'Cause...this is orange too.
 E: Because this is orange too. Okay. Is there any other reason why you picked it?
 C: 'Cause, 'cause in the movie he was in the, he was changing, he's going back to his farm.
 E: Because in the movie he's changing, he's going back to his farm. Okay. Uh, Sherry, is there anything in this picture [mid-dissolve 2], that looks the same as in this picture [mid-dissolve 1]?
 C: That.
 E: What is that?
 C: That thing [sapling] that he's planting.
 E: The thing that he's planting. Okay. Is there anything in this picture [mid-dissolve 2] that looks the same as in this picture [mid-dissolve 3]?
 C: Yes.
 E: What?
 C: The thing that he's planting.
 E: The thing that he's planting. Anything else?
 C: [Sherry shook her head "no"].
 E: Okay.

As this justification demonstrates, Sherry chose the mid-dissolve picture " '[c]ause...this is orange too," which suggests that the color of the picture is the feature that unifies the sequence. When the experimenter followed up, Sherry further explained " 'cause in the movie ... he was changing he's going back to his farm." In both cases Sherry's comprehension was restricted to explicit meanings that were immediately observable at the presentational level. Thus, even though the color of the picture is one of the essential

narrative features that the medium uses to represent the transition in Johnny's state of mind, Sherry focused on its explicit meanings and identified it as simple small-scale content. As a result, she neither recognized the thematic correspondences expressed at the representational level nor grasped the thematic relevance of the color as a narrative feature.

As her justification demonstrates, because she did not recognize the representational meanings of the colors, the actional narrative she constructed was based on idiosyncratically-connected pictorial actions such as "the thing he was planting," and "he was going back to his farm." For her, therefore, the pictorial depictions of the metacognitive processes in which Johnny engages were a series of discrete, non-pretend actions with meanings that were vaguely related to the segment and to her social-personal context.

This way, Sherry approached this pictorial sequence as a sorting task that was based only on invariant objects or features with meanings that were derived from her idiosyncratic representation of the dissolve's content. In addition, because she focused on the explicit meanings of these details at the presentational level, she did not recognize the implicit meanings conveyed by the perceptual transformations of these details. This restriction limited her interpretation to one-way perceptual abstractions and

reduced these sorting tasks to pictorial actional narratives with an outline that did not thematically correspond to the imagination dissolve's topical content.

Furthermore, Sherry's justification of the second pictorial sequence and the five object identity tasks further demonstrated the outline of the pictorial actional narrative she followed. That is, while she justified the second pictorial sequence by focusing on the trees that appeared across the pictures, in the object identity tasks she described Johnny's metacognitive pretend activities as a series of actions related to leaving the "carriages" and returning to his farm. Sherry's thematic justification in one of the object identity tasks clearly illustrates the actional narrative that guided her cognitive behavior as well as her idiosyncratic representation of the dissolve's narrative flow of content.

Sherry's Justification on the Object Identity of
the Pre-dissolve and First Mid-dissolve Pictures of
the Imagination dissolve

- E: Now I want you to tell me, is the man in this picture [pre-dissolve] and the man in this picture [mid-dissolve 1] the same man?
- C: [She nodded "yes"].
- E: Then how come he's carrying a gun here and he's not carrying a gun there?
- C: 'Cause it's, it's in his pocket.
- E: Because it's in his pocket. What is in his pocket?
- C: The gun.
- E: The gun, okay. Is this a real gun?
- C: No.
- E: No. Why not?
- C: 'Cause if, in the movie, it, it's, it's in the movie, Johnny Appl-, it's in the movie they make it, it's in the

movie they changed it, umm, it, it, they um, they wouldn't, they wouldn't really want him to shoot people.
 E: Okay. Because in the movie they changed it, they wouldn't want him to shoot people.

The reference Sherry made to the pretend aspects of the "movie" indicates that she recognized the fictional nature of the content presented on the screen. However, she did not recognize the way in which this fictional form of narration was used to convey Johnny Appleseed's pretending that his sapling was a "gun." Rather, she focused on the segment's pictorial actional narrative and tried to make sense of Johnny's metacognitive activities by drawing meanings from her social-personal context. For example, she explained the fake nature of the "gun" by referring to the pretend aspect of the "movie" because "they wouldn't really want him to shoot people."

This reliance on idiosyncratic meanings was further demonstrated in the accounts Sherry gave in the global coherence tasks. Since she grew up in New York City, she was familiar with carriage rides in Central Park but not with covered wagons. She may have associated the covered wagons with carriages and, consequently, equated their use with the rides with which she is familiar. As a result, the content of her account had no relevance to the first segment's topical content. This narrow thematic scope and social relevance coincided with the restricted thematic connections of the one-way perceptual abstractions that Sherry made.

Sherry's accounts both on the local and the global levels of interpretation clearly demonstrate her tendency to make sense of the simple small-scale content of the pictorial actional narratives by keeping her social-personal context as a reference point. As a result, the causal connections she made, the motivational intentions she attributed to Johnny's actions, and her understanding of Johnny's emotional reactions were not based on the segment's narrative context but on the content from her social-personal domain -- that is, her understanding of the medium's fictional nature as well as meanings from her everyday experience.

This type of overlap between the textual-conventional and experiential-egocentric domains suggests that the generality and vagueness in Sherry's narrative representation was due to the fusion or lack of boundaries between meanings from these two domains. Hence, while her thematic scope was textually narrow, the random interweaving of idiosyncratic meanings from her social-personal experiences gave a broad and vague scope to the flow of content. As a result, her interpretation of the simple small-scale content of the actional narratives did not consistently correspond either to the segment's or to the imagination dissolve's core themes.

This fusion of meanings prevented her from recognizing the semantic correspondences between simple and complex small-scale content. Sherry's meanings were derived from her idiosyncratic reconstruction of perceptual similarities of the

pictorial flow of content. As a result, her narrative representation was fragmented with respect to the causal connections of actions, Johnny's motivations behind these actions, and his emotional reaction to the situation. Therefore, although she recognized that some carriages were moving and that Johnny was with them, she did not recognize who the people were in these carriages, where they were going, or what was the purpose of their journey. Moreover, although Sherry recognized that Johnny "wanted to go with them," she knew neither why he wanted to go nor why he did not, in fact, go with them. Consequently, Sherry's narrative representation consisted only of content pertaining to her idiosyncratic understanding of the segment's situational context. Her narrative representation was discontinuous with respect to the two textual core themes.

Pseudo-conceptual Level of Thematic Integration

The enumerational accounts can be distinguished from the pseudo-conceptual in that the latter reported the first theme: in the first segment, Johnny Appleseed is only pretending. The story line of their accounts, however, did not accurately reflect the segment. Below, the performance of another pre-kindergartner (Jimmy) in the unfacilitated and facilitated accounts of the first segment illustrates the narrative

continuity of content organized at the pseudo-conceptual level.

Jimmy: Pre-kindergartner

Unfacilitated Account

- E: Tell me, what did you just see happening?
 C: I saw the, the gun that he had when he was having it up I saw it change it change back to a branch because first he had a branch and then it turned into a gun and then it turned back to a branch, and, I saw him seeing this ... the, the rest of the song and, and, and then ... I saw him climbing up the ladder and, and I saw him putting the wood thing and I saw the horse and buggy and I saw Johnny Appleseed looking over the fence and I saw everything.
 E: Okay. Anything else?
 C: No. I saw every single thing, not even a bit I did not see, I saw every single thing.

Facilitated Account

- E: Do you want to tell me some more of the things you saw?
 C: Uh, no.
 E: Okay now, tell me, you said Johnny Appleseed was carrying a ... what was it that he was carrying?
 C: A branch.
 E: A branch?
 C: Well, there was a brown bag on the bottom because he was carrying some, some dirt I think.
 E: Uh-huh, now, did you see anybody pass by Johnny's farm?
 C: Yes, the horse and buggies.
 E: Do you know where they were going?
 C: No.
 E: Okay now tell me...
 C: Or I think they were going to, to the, to the sand road.
 E: Uh-huh.
 C: So they could drop off people and get some new people.
 E: Uh-huh, now tell me, did Johnny want to go with them?
 C: No, he was just imagining but really he was just looking at them.
 E: How do you know he was just imagining?
 C: Because I didn't see, because I saw his head thinking before I saw the horse and buggy and have him marching with the gun.
 E: Okay.

- C: Because he was really marching on the grass and not on the road, he was, he was just marching because he liked the beat of the song but he wasn't on the road singing, he was just joining timely by singing.
- E: Okay.

The thematic inaccuracy revealed in the story line of Jimmy's facilitated account was related to the conceptual frame of reference as well as the processing strategies on which he relied to interpret and organize this segment's content. As he explained, "the horse and buggies" were "going to, to the, to the sand road. ...So they could drop off people and get some new people." Although Jimmy was verbally articulate, he only partially differentiated and integrated the details on which he focused so that the story line of his accounts did not thematically correspond to the segment's topical content. Consequently, some of the meanings he derived from the segment were *thematically inaccurate* and he only partially recognized the segment's situational context and one of its core themes.

This partial integration of content indicates that, unlike Sherry, Jimmy focused on clusters of details rather than discrete objects and actions. In other words, Jimmy did not merely enumerate a list of objects and actions in the form of perceptual details. Like Sherry, though, he did not focus on the representational level of the symbolic forms of narration, nor did he recognize the semantic correspondences connecting the clusters of content he reported. As a result, his cognitive behavior was based mainly on perceptual

abstractions of one-way semantic correspondences. He neither accurately grasped the narrative relevance of the people in the "horse and buggies" passing by Johnny's farm nor understood who they were, where they were going, the purpose of their journey, or why Johnny was so excited to see them.

The thematic inaccuracy in Jimmy's representation of this segment's content is further demonstrated by his performance in the local coherence tasks. Specifically, although in the global coherence tasks he clearly demonstrated that he knew Johnny was pretending, his justifications of the imagination dissolve's object identity tasks illustrate the points at which the continuity of his content representation breaks down.

Jimmy's Object Identity Task between the Pre-dissolve and the First Mid-dissolve Pictures

- E: Now tell me, is the man in this picture [pre-dissolve] and the man in this picture [mid-dissolve 1] the same man?
- C: Yes, because (silence)
- E: How come he is carrying a gun here and he is not carrying a gun there?
- C: Because, because this one he was left behind and this one he was left behind very far.
- E: Uh-huh, okay, can you tell me what happened to his gun in this picture?
- C: Because he changed.
- E: Do you know how he changed?
- C: Yes, first it was like this and then it changed to this and then it changed to this.
- E: Okay.

Object Identity Task between the First and Second Mid-dissolve Pictures

- E: Now tell me, is the man in this picture [mid-dissolve 1] and the man in this picture [mid-dissolve 2] the same man?
- C: Yes, but this one doesn't have the hat and this one does.
- E: Can you tell me why he doesn't have the hat over here?
- C: 'Cause that was when he left -- when he left very far.
- E: Okay, do you know how, how he lost his hat? Do you know how it happened?
- C: Yes, because when it was like this, he, he, it turned, first it was, was this because it was going to change and then he had the hat again and then, and then he lost it because maybe he was, because I think he was marching a little bit too hard. I'm not sure because, because, because, I wasn't, I was looking one of the pictures while the tape was on and then I looked back at the tape.
- E: Okay.

Jimmy recognized that the man who was wearing different clothes across the pictures was Johnny Appleseed. Yet, he did not recognize that the gradual disappearance of the outfit Johnny was wearing was one of the narrative features that represents the metacognitive processes in which Johnny engaged while he was realizing that he was only pretending to be a brave man like Davy Crockett. Jimmy's explanation of the disappearance of the hat was that "he lost it because, maybe he was, because I think he was marching a little bit too hard." It appears Jimmy believed Johnny went back to his house and put on this outfit in order to pretend to be a pioneer, rather than starting to imagine he was Davy Crockett and then pretending to be dressed like him.

Like Sherry, Jimmy knew Johnny wanted to follow the people and the buggies, but, unlike her, he knew Johnny was only imagining that he went with them. He recognized the

pictorial transformations of the imagination dissolve but did not integrate their semantic properties within the segment's topical relevance. He also did not thematically coordinate the semantic correspondences between simple and complex small-scale content with consistency. He knew that Johnny was pretending and that the pictorial transformations presented on the screen showed the transition in his state of mind. However, the thematic inconsistency in his explanations of these transformations indicate that his representation of content is continuous with respect to the cognitive processes and it breaks down with respect to the metacognitive processes in which Johnny engages.

This pseudo-conceptual account was detail-driven. Jimmy's partial recognition of the first core theme demonstrated the minimum use of some two-way conceptual abstractions and that he relied mainly on one-way perceptual abstractions. His responses in the global coherence accounts demonstrated that Jimmy did not thematically coordinate simple and complex small-scale content. As a result, narrative properties such as motivational intentions behind Johnny's pretending activities were derived from his idiosyncratic context: "...he was just marching because he liked the beat of the song...he was just joining timely by singing." Consequently, Jimmy's accounts consisted of both textual and idiosyncratic meanings he derived from the pictorial actional narratives. The idiosyncratic meanings led to a narrative

representation that was fragmented because it did not consistently correspond to the segment's topical content.

The local and global coherence accounts of both Jimmy and Sherry demonstrate that this thematic inconsistency was related to their conceptual frame of reference and to the social relevance that content had to their lives. Although Jimmy was more articulate than Sherry, he also relied on a detail-driven strategy, and the thematic scope of the narrative clusters on which he focused was restricted to his private idiosyncratic context. To make sense of the content, he drew private meanings from his egocentric experiences that did not correspond to the segment's content.

This semantic misappropriation resulted in the emergence of a restricted and textually discontinuous narrative field of thematic connections. This, in turn, prevented Jimmy from accurately coordinating the semantic properties connecting the clusters on which he focused and to grasp the textual and social relevance of Johnny's pretending activity. Because he had not understood the segment's thematic context, Jimmy identified the covered wagons in which the pioneers were traveling as "the horse and buggies ... [that] were going to, to the, to the sand road ... [s]o they could drop off people and get some new people." The experiential-egocentric relevance that the content had for Jimmy led to confusion both on the objects he observed and their use. His elaboration of the "buggies'" use shows that he associated the westward

journey of the pioneers with buggy rides in Central Park that are constantly picking up new people.

Jimmy's interpretations of the one-way perceptual abstractions were based on both textual and experiential meanings. Thus, the discontinuity in the pseudo-conceptual accounts was not related merely to the heavy reliance on semantic correspondences expressed at the presentational level. Rather, the reliance on experiential-egocentric meanings to make sense of this content also explains the inaccurate story line in children's accounts. For example, even though the experiential meanings on which Jimmy relied were not totally irrelevant, they led to semantic misappropriations that resulted in the emergence of a restricted and discontinuous narrative field of thematic connections. As a result, Jimmy recognized that Johnny was pretending but he did not integrate this behavior within the segment's situational context nor did he recognize its consequence.

Quasi-conceptual Level of Thematic Integration

The quasi-conceptual accounts were thematically accurate and their narrative field encompassed the integration of the segment's situational context and first theme. Below, the sequence-driven account of a kindergartner (Cindy) exemplifies

the range of narrative continuity found at the quasi-conceptual level of interpretation.

Cindy: Kindergarten

Unfacilitated Account

- E: Tell me, what did you just see happening?
 C: I noticed that when Johnny Appleseed noticed that there is a band marching and then he thought he was being a pioneer.
 E: Uh-huh.
 C: Well, he, then he looked a little sad.
 E: Uh-huh.
 C: He really wanted to be a pioneer, I guess.
 E: Uh-huh.
 C: And he was dreaming of being a pioneer, but then, but his hat came off and he just changed back to his regular self.
 E: Anything else?
 C: No.

Facilitated Account

- E: When you said he was dreaming to be a pioneer --
 C: Yes.
 E: What makes you think that he was dreaming?
 C: Well, I think he just fell asleep for one or two minutes.
 E: How do you know though?
 C: I don't know, maybe he did that, I don't know really.
 E: When you say he felt his hat and then he changed, what did you mean?
 C: I don't know really what I mean.
 E: Okay, how do you know he wanted to be a pioneer?
 C: Well, he was following the pioneers.
 E: He was following the pioneers. Do you know where these pioneers were going?
 C: No.
 E: Okay.

As this dialogue illustrates, Jimmy's and Cindy's accounts can be distinguished by the levels at which the content was integrated and by the processing strategies they used to organize the content. Even though Cindy focused on a

subset of narrative elements, the sequential organization of these elements enabled her to partially recognize the thematic connections between the simple and complex small-scale content. This partial coordination enabled her to explain that "he thought he was being a pioneer...[because] he really wanted to be a pioneer," a statement that captures the pretend state as well as the motivational intentions. However, her responses in the facilitated account demonstrated that she could not elaborate on the motivational intentions behind Johnny's pretending. Furthermore, even though she recognized Johnny's emotional state -- "Well, he, then he looked a little sad" -- she did not effectively connect the sequence of events: Johnny's excitement about pioneering, his disappointment about his life as a farmer, and the sadness behind this disappointment.

More specifically, comparing the two accounts demonstrates her fluctuation between one-way perceptual and two-way conceptual abstractions. Although she appears to have coordinated narrative clusters in the unfacilitated account, her responses to the experimenter's probes demonstrated that she resorted to perceptual abstractions when the content was unfamiliar to her. For example, Cindy stated in the unfacilitated account that "he was dreaming of being a pioneer, but then, but his hat came off and he just changed back to his regular self." When the experimenter probed to determine Cindy's understanding of these transformations, she

explained that "he just fell asleep for one or two minutes" and that she did not "know really" what the disappearance of the hat meant.

Furthermore, when the experimenter asked her how she knew that Johnny "wanted to be a pioneer" she responded, "Well, he was following the pioneers." It appears Cindy interpreted Johnny's intentions and emotional states by relying mainly on her observation of Johnny following the pioneers. She did not infer these narrative properties by integrating the simple and complex small-scale content because she did not make the connection between the excitement behind the pioneers' westward journey and Johnny's desire to participate in this activity. Thus, according to her responses in the facilitated account, the thematic connections which Cindy made in the unfacilitated account were based more on one-way perceptual abstractions than on two-way conceptual abstractions of content. This accounts for the partial coordination of the narrative clusters on which Cindy focused.

Even though both the pseudo-conceptual and quasi-conceptual accounts partially coordinated the content, only the former group made inaccurate thematic connections across the narrative clusters they reported. Both Jimmy's and Cindy's unfacilitated accounts consisted of a thematically accurate story line. In the facilitated account, however, only Cindy's responses remained thematically accurate. In fact, if Cindy did not know the answer to a question, she clearly stated that

she did not know rather than constructing a response using content from her private experiential domain. Although both children grasped a subset of narrative elements, Cindy's reliance on a sequence-driven processing strategy and her partial recognition of thematic correspondences across the narrative clusters, enabled her to effectively integrate Johnny's pretending behavior within the segment's thematic context. Thus, in spite of the partial integration of content caused by her fluctuation between one-way perceptual and two-way conceptual abstractions, she was able to recognize the segment's overall context and derive a *subset of thematically accurate meanings* across its narrative structure.

Cindy's fluctuation between one-way perceptual and two-way conceptual abstractions was clearly demonstrated in the justifications she gave in the local coherence tasks. The precision of the local coherence tasks traced the ways in which her fluctuation between perceptual and conceptual abstractions made her shift between the pseudo-conceptual and quasi-conceptual levels of integration. Cindy's interpretation of the content can be clearly distinguished from Sherry's and Jimmy's in the unfacilitated global coherence account. This is not the case with some of the local coherence tasks.

Cindy's Justification of the First Pictorial Sequence of the Imagination dissolve

- C: [Cindy chose the mid-dissolve 2 picture].
 E: Okay. Now tell me, why did you pick that picture?
 C: Because these two [referring to the other two options: one-dimensional and irrelevant pictures] we didn't see yet, as I said a lot of times.
 E: Yes. Okay, is there anything in this picture [mid-dissolve 2] that looks the same as in this picture [mid-dissolve 1]?
 C: Yes, his thing [referring to the sapling] and his losing thing.
 E: His thing and his losing thing, okay. What about this picture [mid-dissolve 2] and this picture [mid-dissolve 3], is there anything that looks the same?
 C: No, no. He's like checking still, checking three pictures [mid-dissolve 1,2,3] in a row.
 E: Okay, what is he checking in this picture?
 C: His hat [mid-dissolve 2].
 E: And here?
 C: Elbow [mid-dissolve 3].
 E: Okay.

Her justification of the first pictorial sequence elaborated on her reliance of one-way perceptual abstractions that were identified in her global coherence accounts. Cindy, like Sherry and Jimmy, approached this pictorial sequence as a sorting task; she relied mainly on explicit meanings of the pictorial actional narrative. Her cognitive behavior was based mainly on one-way perceptual abstractions of the direct explicit-pictorial content, and she enumerated a series of discrete details such as "his thing ... his losing thing ... elbow ... [and] his hat." The lack of thematic integration of these details demonstrates that she interpreted the imagination dissolve at the pseudo-conceptual level and that she had not recognized the metacognitive processes that the

pictures represented. A similar phenomenon appeared in the thematic justifications she gave in the second pictorial sequence, which reinforces the vagueness identified in the first pictorial sequence of the imagination dissolve.

However, in the five object identity tasks (where the experimenter used the pictures to capture Cindy's understanding of the semiotic variant features of the invariant objects presented across the pictures), Cindy's cognitive behavior fluctuated between the pseudo- and quasi-conceptual levels. For example, in her justification of the object identity task between the pre-dissolve and the first mid-dissolve pictures, she elaborated as follows:

Cindy's Justification on the Object Identity of the
Pre-dissolve and First Mid-dissolve Pictures of the
Imagination dissolve

- E: Tell me is the man in this picture [pre-dissolve] and the man in this picture [mid-dissolve 1] the same man?
 C: Uh-huh.
 E: Then how come here he is carrying a -- what is it that he is carrying here?
 C: A gun.
 E: How come here he is carrying a gun and here he is not?
 C: I don't know. Oh, he's changing.
 E: He's changing. What is he changing to?
 C: His self.
 E: Okay. Is this a real gun, Cindy?
 C: No.
 E: What kind of a gun is it?
 C: It's a pretend gun.

With the guidance of the experimenter and the immediate reference to the pictures, Cindy made the necessary thematic connections to recognize which perceptual transformations

showed a transition in Johnny's state of mind. The facilitation provided by the experimenter's questions and the immediacy of the pictures helped Cindy reorganize her one-way perceptual abstractions into a two-way, thematically connected representation. However, her justification for the object identity task between the second and third pictures shows that her cognitive behavior was mainly based on one-way perceptual abstractions, despite the facilitation she received.

Cindy's Justification on the Object Identity of the First and Second Mid-dissolve Pictures of the Imagination dissolve

- E: What about this picture? Is the man in this picture [mid-dissolve 1] and the man in this picture [mid-dissolve 2] the same man?
- C: Yes.
- E: Then how come here he is wearing a hat, and here he is not wearing a hat?
- C: 'Cause he lost it.
- E: How did he lose it?
- C: Well, it was just blowing away and disappearing.
- E: What, I did not hear you.
- C: It was blowing away with the wind and just disappearing.
- E: Is this a real hat?
- C: No.
- E: What kind of a hat is it?
- C: It's like skunk hat.
- E: What?
- C: It's a skunk hat.
- E: Is a skunk hat not real?
- C: No.
- E: No?
- C: Yes, it's made out of skunks.
- E: Okay.

Cindy did not recognize that the disappearance of the hat represented Johnny's metacognitive processes. Instead of realizing that he believed falsely that he was wearing a hat

like Davy Crockett, she saw it as a real hat: "It's like [a] skunk hat," she said, explaining, "It was blowing away with the wind and just disappearing." Again, Cindy, restricted her interpretation of the content to the explicit meanings that were expressed at the presentational level. In this object identity task, her cognitive behavior was based mainly on one-way perceptual abstractions and thus organized her response at the pseudo-conceptual level. However, her justifications of the subsequent object identity tasks consistently made reference to Johnny's imagination and pretending behavior.

Although in the global coherence task Cindy stated that Johnny "was dreaming of being a pioneer, but then, but his hat came off and he just changed back to his regular self," she did not account for the metacognitive realization processes that lead to the appearance of his "regular self." Thus, even though she recognized that Johnny was pretending, her explanation indicated that she thought Johnny was using a real outfit to pretend he was a pioneer. This misconception about the "realness" of Johnny's outfit illustrated her vague interpretation of the imagination dissolve and that her representation of its content breaks down between the cognitive and metacognitive realization activities in which Johnny engages. According to Cindy's interpretation, Johnny wanted to be a pioneer, so he put on this outfit and was pretending to follow the pioneers. This inaccurate interpretation in the sequential flow of Johnny's

metacognitive activities is consistent with Cindy's need of still pictures and guiding probes to elaborate on Johnny's pretend activities in the five object identity tasks.

However, most quasi-conceptual accounts fluctuated between the quasi-conceptual and conceptual levels of interpretation. These children partially coordinated the variant features of the invariant pictorial objects. As a result, although they systematically integrated these features within the context of one core theme, namely, Johnny's pretending, they unsystematically integrated these features within the context of the second core theme, namely, the metacognitive realization process. Lisa's quasi-conceptual thematic justification of the first pictorial sequence illustrates the gradual shift away from Cindy's representation, fluctuating between the quasi-conceptual and conceptual levels.

Lisa's Justification of the First Pictorial Sequence of the Imagination dissolve

- C: This one [Lisa chose the mid-dissolve 2 picture].
 E: Now tell me, why did you choose this picture?
 C: Because, umm, it, it shows that his hat is not there.
 E: What does that mean?
 C: That means that he was pretending that he was in the back of the people.
 E: Okay. Is there anything in this picture [mid-dissolve 2] that looks the same as in this picture [mid-dissolve 1]?
 C: Yes, sure.
 E: What?
 C: It has this, it has the bag full of apple seeds and this has the bag full of apple seeds.

- E: Okay. And what about this picture [mid-dissolve 2] and this picture [mid-dissolve 3]? Is there anything that looks the same?
- C: Yes.
- E: What, Lisa?
- C: It shows that it has, he has the bag of apple seeds in the bag and this one it shows the same thing.

Without the guidance of the experimenter, Lisa elaborated on Johnny's pretending activities by accounting for the disappearance of the hat. However, her interpretation of the sapling which Johnny was about to plant as a "bag full of apple seeds" indicates that she recognized the invariant objects across the pictures but did not recognize its narrative relevance to the segment's overall thematic context. This partial differentiation and integration of the pictorial content prevented her from understanding Johnny's pretending within the context of his desire to leave his farm and join the pioneers. As a result, she did not recognize that the common element among the pictures was a sapling with burlap-wrapped roots, which Johnny was in the process of planting when he noticed the pioneers passing by his farm.

With the guidance of the experimenter's probes and the immediacy of the pictures in the object identity tasks, however, Lisa's organization of content fluctuated between the quasi-conceptual and the conceptual levels of thematic integration.

Lisa's Justification of the First and the Second Mid-dissolve Pictures

- E: Now tell me, is the man in this picture [mid-dissolve 1] and the man in this picture [mid-dissolve 2] the same person?
- C: Yes, of course.
- E: Then how come he is wearing a hat here, and he is not wearing a hat there?
- C: Because it was his imagination.
- E: Is this a real hat?
- C: No.
- E: What kind of hat is it?
- C: Pretend.
- E: Okay.

Justification of the Second and the Third Mid-dissolve Pictures

- E: Is the man in this picture [mid-dissolve 2] and the man in this picture [mid-dissolve 3] the same person?
- C: Yes.
- E: How come he is wearing different clothes here?
- C: Because he was just pretending that he was marching along with the other people.
- E: Are these his real clothes?
- C: No, his pretend clothes.
- E: How do you know that?
- C: Because it was his imagination.

Justification of the Third Mid-dissolve and the Post-dissolve Pictures

- E: Is the man in this picture [mid-dissolve 3] and the man in this picture [post-dissolve] the same person?
- C: Yes.
- E: How come they look so different?
- C: Because this was starting to fade away.
- E: Okay, why did this start to fade away?
- C: Because it was beginning to be the end of his imagination.
- E: Okay.

The facilitation which the concrete pictures provided in conjunction with the experimenter's probes in object identity tasks helped Lisa to recognize the transition across the cognitive, metacognitive, and back to the cognitive processes

in which Johnny engaged. It did not, however, help her integrate Johnny's cognitive behavior within the context of the entire segment. That is, she did not recognize that Johnny was pretending to be a pioneer and did not understand the consequences of his pretending nor did she integrate the first and second themes in her global coherence accounts.

Finally, these variations in the degree of continuity in the narrative representations among pre-kindergartners and kindergartners are not related solely to the conceptual frame of reference on which they relied or to the processing strategies they used. Rather, as demonstrated with Sherry and Jimmy, these variations were also related to the social relevance which the segment's content had to the children's lives. Sherry and Jimmy relied on a field of thematic connections that were restricted to their experiential-egocentric context. Although Cindy's and Lisa's quasi-conceptual accounts exhibited greater continuity than those of Sherry and Jimmy, their narrative representations were still only partially integrated because their interpretations of the narrative structure were unsystematically interwoven with *idiosyncratic meanings from their social and/or personal contexts*. This prevented them from conceptually coordinating the thematic connections of content within and across the clusters on which they focused.

Cindy organized the story line of her account by borrowing meanings from the textual-conventional and from her

social-personal contexts. Even though she had partially coordinated the segment's content, she was able to effectively integrate these personal meanings within the segment's narrative context. For example, when she said that "Johnny Appleseed noticed that there is a band marching and then he thought he was being a pioneer," she, like Jimmy, noticed the entertaining musical activities of the travelers. However, unlike Jimmy, she borrowed the meaning of a "band" from her personal context, and she integrated it within the context of the pioneers traveling.

Thus, Cindy meaningfully integrated her personal conception of a "band" into the segment's overall textuality because she was familiar with some of the conventional meanings of the terms "band" and "pioneer." The trails of pioneers, who traveled as groups along the road and sang while their children were playful, triggered, for her, the concept of parades that are led by marching "bands" as well as the use of "bands" in entertainment. Thus, the discontinuity in Cindy's cognitive representation was related to: 1) her fluctuation between one-way perceptual and two-way conceptual abstractions; and 2) the ways in which she used her socio-idiosyncratic meanings to link the gap created by this fluctuation in her cognitive behavior. Even though her narrative representation was thematically accurate, it was semi-continuous, and she could not make thematic connections to infer semantic properties concerning the pioneers' westward

journey and their brave acts involved in this activity. While she recognized that Johnny was sad that he could not be a pioneer like them, she did not recognize the motivational intentions that led to this desire.

In general, in the quasi-conceptual accounts, children fluctuated between one-way perceptual and two-way conceptual abstractions. These cognitive processes did not necessarily reinforce one another so that children did not consistently integrate the simple and complex small-scale content. To make sense of the thematic gap created by this fluctuation, the children borrowed meanings from their social-personal context and constructed accounts with accurate story lines. As a result, the quasi-conceptual narrative representations partially corresponded to the segment's textual structure because they did not include the consequences of actions and events. These accounts were fragmented with respect to the semantic correspondences which connect the second core theme to the first theme in particular and the segment as a whole.

Conceptual Level of Thematic Integration

The conceptual accounts also fluctuated between one-way perceptual and two-way conceptual abstractions. But what distinguished these accounts from the quasi-conceptual is that the former used perceptual abstractions to reinforce conceptual abstractions. In addition, these children were

more likely to borrow meanings from the social-conventional domain in order to make sense of a segment's content. Below the performances of two second-graders, Jenny and Erica, in the first segment, illustrate the cognitive behavior of the children who relied on a conceptual frame of reference.

Jenny: Second-grader

Unfacilitated Account

E: What did you just see happening?

C: Umm, first, umm, he was taking his apples and when he put his apples down, umm, well, after he put his apples down he had this, it looked like the tree, but it was sort of a branch attached to this, umm, big things like dirt with, umm, cloth around it. It looked like he was about to plant it and then, umm, all these pioneers started to come with their wagons and Johnny started to sing too. No, umm, before that the children were waving and then Johnny started to sing, but then when they started to leave I think he felt sad because he was just like picking apples and they were like pioneers.

E: Okay, anything else?

C: -- oh, and I also remember when he was going over there I think he pictured himself with like a suit as a pioneer would wear as he was like dancing. Then it sort of like faded away to, umm, to when he was, umm, like the kind of person who would pick apples.

Facilitated Account

E: Okay, you said he was pretending that he went with the pioneers. How do you know that he was pretending?

C: Well, he wasn't pretending, he was like for real but it wasn't real. He was just dancing and acting like a pioneer for that few minutes, but he really wasn't a pioneer. But he was just like acting how a pioneer would act and I think he felt happy --

E: Uh-huh.

C: -- because he was a pioneer at that few minutes. But maybe he wanted to be a pioneer, but he changed his mind to picking apples and suddenly he remembers again, he starts to think about it "Maybe I want to be a pioneer."

E: Okay.

As Jenny's unfacilitated and facilitated accounts showed, she relied predominantly on two-way conceptual abstractions and organized the content sequentially. Jenny, like Cindy, fluctuated between perceptual and conceptual abstractions. But unlike Cindy, Jenny interpreted the perceptual abstractions she made with narrative continuity because she integrated them within the two-way conceptual abstractions. More specifically, the perceptual and conceptual abstractions in Jenny's accounts, at times, appear to work in conjunction with one another; at other times, perceptual abstractions dominate or are dominated by conceptual ones.

As demonstrated in Jenny's unfacilitated account, when the content was unfamiliar to her, she made sense of it by relying mainly on perceptual abstractions, thus subordinating the conceptual ones. For example, when she was describing the sapling that Johnny was going to plant -- a situation with actions unfamiliar to her -- she resorted to perceptual content: "he had this, it looked like the tree, but it was sort of a branch attached to this, umm, big things like dirt with, umm, cloth around it. It looked like he was about to plant it." Jenny had recognized that Johnny was a farmer planting apple trees, so she interpreted the burlap-wrapped sapling's roots as a feature of the objects he uses in his main activity. She recognized something she did not fully understand by connecting what she observed (i.e., the sapling)

in the context of what she understood (i.e., that Johnny was a farmer).

In addition, by focusing on Johnny's overall activities, and those of the pioneers, Jenny recognized the simple small-scale content of character attributes: "he was just like picking apples and they were like pioneers." Through this focus, she made explicit causal connections (a complex narrative element) between Johnny's singing and dancing and the subsequent euphoria: "he was just like acting how a pioneer would act and I think he felt happy." This allowed her to infer Johnny's state of mind and to explain the motivational intentions behind Johnny's excitement and pretend activities (e.g., "[m]aybe I want to be a pioneer") and Johnny's emotional reactions to the pioneers (e.g., "he was just acting how a pioneer would act and I think he felt happy...[but] when they started to leave I think he felt sad.") Jenny coordinated the simple and complex small-scale content by coordinating the two-way thematic connections (the contrast between the simplicity of an apple picker and the bravery of a pioneer) that were related to Johnny's sadness.

Like the quasi-conceptual, the conceptual accounts also showed a range in the degree of narrative continuity. Erica, like Jenny, organized her unfacilitated and facilitated accounts of the first segment at the abstract conceptual level. Unlike Jenny, Erica made sense of the content by

relying more heavily on the interweaving of textual- and social-conventional meanings.

Erica: Second-grader

Unfacilitated Account

- E: Tell me what you just saw happening.
- C: Well, they told that Johnny, he tended to his apple trees, but then he says the first, that the first time he saw people going West called pioneers, and, see, he didn't, at first he thought, "I'm going to have to stay in one place because I don't have anything to do, I don't have a cov-, I don't have a wagon or anything, and I don't have any, there's nothing invented to take," because he didn't know about, I guess he really didn't know about horses and covered wagons, and then when he saw the pioneers, it changed his mind totally about going West. And, see, since, they thought going West, just think, "Oh, going West is a lot of fun," seeing, it's a lot, it's a little bit exciting going West. And, since apple picking isn't exciting for some people, well, for Johnny it was, but for some people, they didn't really pay attention to Johnny because they thought, "Oh, just a plain old apple picker." I guess that's what they thought.
- E: Anything else?
- C: Well, they said in the story that Johnny wanted to be a pioneer, from the cartoon, and he acted like he sure did. 'Cause he wasn't, he wasn't even paying attention to what he loved most when he saw the pioneers. First of all, it was a big commotion, and, second, because he, when he saw that he thought "I want to be a pioneer," and he forgot all about the, umm, the apple tree he was about to plant.
- E: Anything else?
- C: Not really.

Facilitated Account

- E: Okay. You said he acted as though he wanted to be like them. What do you mean when you say that?
- C: He acted like, see, in that picture where it has him wearing a fur cap, and he was marching along behind them, and he acted like he was a pioneer, because, but you could tell, when he was inside the fence, he acted like it, and then, when he realized that, then something hit him and it was like, "Wait a minute, I'm not a pioneer yet. See, I'm a little bit too small, and I've got to finish planting this apple tree." He forgot entirely

about it until, it sounded like, umm, some dust, actually, it looks like some dust blew up and caught his attention and brought him back down to earth. And that's about it. And that's what made him think, "If I am going to be a pioneer," he probably would be thinking, "If I am going to be a pioneer, I do need a covered wagon, don't I?" But the legend from on TV, it said that he never even used a covered wagon. So that's all.

Both Jenny and Erica used a story-like sequential form of organization and integrated the content at a conceptual level. Each girl, however, used a different genre or style of discourse to recount her interpretation of the story. That is, while Jenny adhered to a sequential text-like form, Erica adhered to a conversational style of discourse.

For example, when Jenny omitted a particular action in the sequential flow of content, she corrected herself: "...Johnny started to sing too. No, umm, before that the children were waving and then Johnny started to sing,..." On the other hand, Erica's use of phrases like "see" and "just think" indicate that she felt she was engaged in a dialogue -- a conversation in the form of a socially shared situation -- with the experimenter. Her effort to gauge her responses to fit the experimenter's knowledge while keeping in mind the segment's textuality revealed that she assumed that they each had a textually and socially appropriate understanding of the segment's content. Thus, even though both Jenny and Erica organized the content of their accounts at a conceptual level, Jenny focused more heavily on textual-conventional meanings,

while Erica used both textual- and social-conventional meanings.

Accordingly, Erica's accounts demonstrated that she was reporting on the content of a "story" or "legend" communicated through secondary sources. For instance, the use of the personal pronoun "they" in phrases like "[t]hey told that Johnny" and "they said in the story" indicated she recognized she was talking about something that occurred at a particular time in the past and was collectively communicated by groups of people. In addition, she distinguished between the various perspectives that contributed to the content of the story as a topic of a social discourse. For example, when Erica referred to the collective "they" and the individual storyteller with phrases like "but then he [narrator] says" and "but the legend from on TV it said that..." indicated her awareness that the story was communicated by yet another perspective. She distinguished between the fictional and nonfictional aspects of the content in the first segment.

In addition, like the two quasi-conceptual accounts, the two conceptual accounts included content from the children's social-personal domains. However, unlike the quasi-conceptual, the conceptual accounts also included social-conventional meanings. These children integrate their social-personal meanings effectively within the segment's topical content. For example, both Jenny and Cindy drew meanings from their social-personal context and attributed an exciting,

entertaining nature to the pioneers. Jenny referred to Johnny's marching in the pretend state as "dancing," while Cindy referred to the trail of pioneers singing as "a band marching." On the surface, these terms reveal a similar association of content. However, the use of these personal meanings distinguishes the quasi-conceptual from the conceptual narrative continuity. That is, Jenny focused her discussion of Johnny's "dancing" within the context of the excitement behind pioneering and Johnny's pretending to be a pioneer. Her personal association with this segment's content enabled her to recognize the excitement, while her awareness of the conventional meanings enabled her to make thematic connections that corresponded to the segment's content. In this way, the personal meanings on which Jenny relied while operating in the conceptual mode did not interrupt the continuity of her narrative representations. Hence, Jenny's reliance on two-way conceptual abstractions along with her richer context of conventional and personal meanings helped her recognize semantic correspondences that unified the segment's flow of content.

Furthermore, this richer context from which the second-graders drew meanings helped them recognize causal connections and effectively integrate simple and complex small-scale content. Children producing both quasi-conceptual and conceptual accounts understood that Johnny was "sad" because he could not be a pioneer. However, only the latter group

recognized the factors contributing to this emotional reaction. For example, both Jenny and Cindy reported that Johnny became sad because he could not be a pioneer, but only Jenny clearly articulated a distinction between Johnny as "an apple picker" and the pioneers as travelers. She recognized the two-way thematic connections (the contrast between the simplicity of an apple picker and the bravery of a pioneer) that were related to Johnny's sadness. The distinctions she made between these two terms helped her recognize the underlying social forces behind Johnny's emotional reactions.

Erica more explicitly articulated the social forces behind Johnny's emotional reactions in the first segment. She illustrated the concept of courage and bravery assigned to the pioneers' westward journey when she elaborated that "apple picking isn't exciting for some people" and that the pioneers thought that Johnny was "just a plain old apple picker," which is not exciting or courageous. Erica recognized the social pressures Johnny faced and, as a result, she assumed he saw himself as a weak man who might have thought -- as she expressed it -- "see I'm a little bit too small" to be a pioneer and to join these strong, brave men in their journey.

Along with this textual- and social-conventional sophistication, the reliance of Jenny and Erica on conceptual abstractions and their sequential organization of the content enabled them to attend to larger clusters of content and to integrate them thematically. As a result, they coordinated

simple and complex narrative elements, capturing and contextualizing both of the segment's core themes.

Erica's detailed conversational style can help illustrate the narrative features and production conventions on which children producing conceptual accounts were likely to focus in the local coherence tasks. As on her global level of interpretation, Erica's justification shows she did not restrict her interpretation of content to the technical aspects of the medium's narrative conventions.

Erica's Justification in the First Pictorial Sequence of the Imagination dissolve

- C: [Erica chose the mid-dissolve 2 picture]. He's finding out that he doesn't have a fur cap anymore.
- E: Uh-huh. So, what does that mean?
- C: And it's also in the dust again, like these three pictures over here. It looks like about in the middle he lost his fur cap but first loses his gun thinking, "I lost my gun, well, at least I have my fur cap" and then he feels his head, he's like "what's going on here?" That's what he must have been thinking --
- E: Okay.
- C: -- and then he found out that he, and, I guess, he probably reached for his clothes [mid-dissolve 3] and then he was, like, in this picture [post-dissolve]. So, he lost his fur cap before he lost, see, the hat here [mid-dissolve 2]. See, it matches.
- E: Okay.
- C: Alright, let's see, would this picture look right? No dust, it doesn't look anything like it has dust in it. It's got animals, but in all three, these three pictures, there are people. Why do you, don't you think that would be a silly thing to do? And this one, he's pointing a stick. That, he put a pot on his head. The pot's inside the house isn't it? Shouldn't it be? E: Uh-huh.
- C: And if the pot's inside the house, well, all these other pictures are outside. Wouldn't that be silly? He'd have to go all the way and race back out and, wouldn't that be dumb, because he would forget about what happened before, so it would have made the cartoon just not very good. I

- don't think anybody would take it if it had this picture in the middle of these four.
- E: Okay, now tell me, is there anything in this picture [mid-dissolve 2] that looks the same as in this picture [mid-dissolve 1]?
- C: It's the same because there is the apple-, the apple branch and the bag. And in both pictures he's, like, he's wondering why he has that [sapling] and then in this picture he finds out he doesn't have a fur hat. And it's also the same in these two [mid-dissolve 3 and post-dissolve] because now he's finding out that he's a real boy, that he's, he's not a pioneer, uh-uh, uh-uh, no way.
- E: Okay, now tell me, is there anything in this picture [mid-dissolve 2] that looks the same as in this picture [mid-dissolve 3]?
- C: Well, he doesn't have his fur hat on, not in either one, and he has the apple branch and a bag and, see, after he's returning to his own self, and now he finds, now he remembers that he never had, that he doesn't even have a suit like that and he's wearing normal, everyday, regular, clothes.
- E: Okay.

Erica consistently contextualized her responses within the segment so that, instead of referring to an "orange mist," she referred to the "dust" raised by the trail of pioneers. In addition, because she consistently contextualized the content, she elaborated on the medium's narrative conventions by attending to the dialogic functions of the medium's textual structure. Other viewers' expectations were an integral component of her response. As a result, she objected to including content that did not correspond to the imagination dissolve's topical content (e.g., "I don't think anybody would take it if it had this picture in the middle of these four").

Her responses consistently took into account this dynamic tension between the medium and its viewers, and she projected this tension in the content of Johnny's thinking. She made

sense of this pictorial, actional narrative by tracing the content of Johnny's thinking as it was displayed by the metacognitive processes the pictures depicted, namely, imagining, pretending, falsely believing, and gradually realizing his non-pretend identity. She inferred this dialogue between Johnny, herself and the experimenter by focusing on the meanings represented by the semiotic variant features of the invariant objects (Johnny, his clothes, his sapling, the dust) that are presented across the pictures. For her, this multiple-choice task was a pictorial representation of the imagination dissolve that had textual, social, and personal relevance.

Erica's accounts, like the pre-conceptual accounts, focused on pictorial-actional narrative, but, unlike them, it focused on the syntactic properties expressed at the representational level. Therefore, like the pre-conceptual accounts, the conceptual ones focused on pictorial features such as color and texture. But, unlike the pre-conceptual accounts, the conceptual justifications were based on the meanings of such features at the representational level. For these children, the pictorial sequences were representations of symbolic actional narratives. Because they used and manipulated meanings expressed at the presentational and representational levels, their justifications of the pictorial tasks in the imagination dissolve maintained continuity by

focusing on Johnny's realization processes as a thematic component.

Thus, even though all conceptual accounts did not display the same conversational tone as Erica's, they maintained narrative continuity across the pictorial sequences of the imagination dissolve. Peter's justification shows that although he operated at a conceptual level he restricted his interpretation of content to the technical and textual aspects of the medium's narrative conventions.

Peter's Justification of the First Pictorial Sequence of the Imagination dissolve

- C: Probably the third one [Peter chose the mid-dissolve 2 picture].
- E: Okay.
- C: Because, then he is still imagining [referring to the pre-dissolve and mid-dissolve 1 pictures] and now [mid-dissolve 2] he is losing more of it [imagination]. He just seems to have lost his raccoon hat.
- E: Okay. Now tell me, is there anything in this picture [mid-dissolve 2] that looks the same as in this picture [mid-dissolve 1]?
- C: Yes. You see the same costume that Johnny Appleseed has on. You see the same stick that he had with him and you see the, uh, just orange that makes it look like no background. So that you know it's kinda like his imagination.
- E: Okay. Is there anything in this picture [mid-dissolve 2], Peter, that looks the same as in this picture [mid-dissolve 3]?
- C: Uh, you see Johnny Appleseed's face and hand and stick which makes you know the same part of the scene. And you can still see some of the orange mist to show that it's his imagination.
- E: Okay.

Peter's statement "he is still imagining and now he is losing more of it" indicates he had effectively differentiated and integrated the variant features of the invariant objects that conveyed the metacognitive processes in which Johnny engaged. The level at which Peter interpreted the syntactic properties of these dissolves is related both to his cognitive sophistication and to his experience with and understanding of the medium's narrative conventions.

For example, Peter's explanation of the flow of content in terms of the medium's narrative conventions, "which makes you know [it is] the same part of the scene," indicates he closely followed the medium's narrative devices. Like Sherry, Peter made sense of the content by applying his understanding of the medium. Unlike Sherry, he did not merely focus on its fictional aspects. Rather, he focused on the representational aspects of the medium's narrative features and recognized the sequential flow of content. In addition he, like Sherry, focused on the color of the pictures. However, his interpretation of this feature was not restricted to its explicit meanings. Rather, his explanation of "the orange mist to show that it's his [Johnny's] imagination" demonstrates that he focused on both explicit and implicit meanings.

In fact, Peter's justification of the object identity judgment he made between the pre-dissolve and the first mid-dissolve pictures provides additional insights into the ways

in which he integrated understanding of the medium's narrative conventions with experiential meanings.

Peter's Justification of the Object Identity
Judgment between the Pre-dissolve and the First
Mid-dissolve Pictures

- E: Now tell me, is the man in this picture [pre-dissolve] and the man in this picture [mid-dissolve 1] the same person?
- C: Uh, yes they do look the same.
- E: How come he is carrying a gun here, and he is not carrying a gun there?
- C: Umm, well, in the first picture he is carrying a gun because this is the very beginning of his imagination. And, then he is losing it, he is still fairly in his imagination but he is losing his imagination so he doesn't have a gun.
- E: Is this a real gun?
- C: Uh, I don't think so. It doesn't exactly look like one. I mean again Johnny Appleseed is a kid and kids aren't trained to use guns. So, I don't think it would be a real gun, no.

Peter used content from both these pictorial sequences and his sociocultural context to reinforce his interpretation of the pictorial transformations. Like Sherry, Peter referred to cultural factors to explain why the gun could not be "real." Sherry, however, restricted this cultural reference to her overall understanding of the medium's fictional context: "in the movie they changed it, umm, ... they wouldn't really want him to shoot people." Peter, on the other hand, used the fact that "Johnny Appleseed is a kid and kids aren't trained to use guns" to disqualify the possibility of "realness." While both children relied on cultural knowledge to make sense of the segment's narrative structure, Peter's

understanding of both the segment's topical content and the medium's narrative conventions enabled him to integrate textually and socially relevant content.

Summary

As these accounts showed, the degree of continuity ranging from pre-conceptual to conceptual modes of thinking was influenced both by internal cognitive and by external experiential factors. The conceptual accounts contextualized justifications either within the scope of the dissolve or within the story as a whole. This contextualization enabled the children to recognize this dissolve's syntactic properties and its narrative relevance. As a result, these children recognized both the transitional (meta)cognitive processes represented in the imagination dissolve and the textual relevance of Johnny Appleseed's pretend activities.

However, the thematic scope of the pre-conceptual accounts restricted the context of justifications to the dissolve or either the pre- or the post-dissolve picture. Although the quasi-conceptual accounts displayed a recognition that Johnny Appleseed was pretending, they did not distinguish between the metacognitive processes in which Johnny engaged at either end of the pictorial sequence. These children did not recognize the finer details indicating the realization processes Johnny underwent, namely: (1) from pretending to

falsely believing that he was Davy Crockett, and (2) from partially realizing that he was not Davy Crockett to subsequently becoming fully cognizant of his nonpretend identity. The pseudo-conceptual accounts, however, showed an understanding that this dissolve was about pretending, but their interpretation of the variant features was restricted to explicit meanings expressed at the presentational level. Finally, the enumerational accounts interpreted the pictorial depictions of the metacognitive processes in which Johnny Appleseed engaged as discrete, nonpretend actions. Therefore, the shift from the presentational to the representational level of interpretation was gradual, driven both by cognitive and experiential factors.

Grade-level Variations in Operative and Figurative Meanings

The four levels of thematic integration revealed a range of narrative continuities illustrating the gradual transition from the pre-conceptual to the conceptual modes of thinking. The heterogeneity found within and across these four levels illustrates continuity in children's representations as a function of both cognitive and experiential factors.

The one-way perceptual and/or two-way conceptual thematic connections pertained mainly to denotative operative meanings and described the perceptual and cognitive processes in which the children engaged. In contrast, the four types of social

relevance pertained to sociocultural experience and connotative figurative meanings. Processes in the perceptual, conceptual, and social-affective domains worked in concert and influenced the children's interpretation and re-presentation of content. The four levels of narrative continuity were distinguished by the ways in which psychological processes in these domains constantly interacted and influenced one another.

This interplay of psychological processes, in turn, revealed the multilinear and complex nature of children's cognitive behavior as well as the multidimensionality of their narrative representations. A multiple-theoretic approach, integrating the perspectives of Piaget, Werner and Vygotsky, can account for this complexity in cognitive behavior.

Piaget's structural theory of genetic epistemology can be used to describe the operational criteria behind the denotative meanings the children derived from each segment. Even though Piaget considered language subsidiary to thought or (nonlinguistic) cognition (Beilin, 1992, p. 96), and although he made a distinction between the "operative lawfulness" of mental activity and "verbal explanations," he states: "it is clear that the subject needs a logicomathematical framework even to 'read' facts" (Voelin, & Rappe-du-Cher, 1992, p. 138). Accordingly, the accounts that the children gave for each segment should reflect: 1) the operative processes behind cognitive interpretive activities

and 2) the narrative continuity of their mental representations.

Adhering to Piaget's formal criteria, the one-way perceptual abstractions can be described in terms of the "one-way" *constitutive functions* of the pre-operative thinking and the two-way conceptual abstractions in terms of the "two-way" *constituted functions* of the operative thinking (Beilin, 1992). As the enumerational and pseudo-conceptual accounts showed, perceptual abstractions were based on perceptual similarities of discrete objects and/or cinematic features without coordinating their (in)variant thematic properties. Such one-way perceptual abstractions are similar to the one-way mappings (or one-directional functions, as they are referred to by Piaget (1953), and they lack the mental reversibility (logical or semilogical relations) that is a necessary condition for the understanding of causal connections. The children's cognitive behavior in pre-operative narrative representations was based on successive correspondences (that is, comparisons of perceptual similarities of objects, actions, and events).

Likewise, the two-way conceptual abstractions used in the conceptual accounts are similar to the two-way mappings of operative thinking. The behavior behind this level of narrative representation is operational because it is based on the recognition of symbolic configurational patterns established by the composition of textual correspondence. The

conceptual representations were continuous and thematically accurate because they coordinated the formal and qualitative semantic properties of the first segment.

As a result, these conceptual accounts integrated the implicit and explicit semantic correspondences behind the *simple and complex small-scale content*, incorporating textually and socially relevant meaning. From the Piagetian perspective, these conceptual accounts reflect an operative narrative continuity. Piaget would explain children's cognitive interpretative behavior as though it was a conservation task. Operational structures themselves create operative continuity in the same way that conservation tasks create their own "continuity." This continuity results from new correspondences that the child derives from direct operations (one-way mappings) and their inverse.

As Figures 4a-c illustrate the gradual transition from one-way perceptual to two-way conceptual abstractions demonstrated by the relationship between grade level and degree of thematic integration. The one-way perceptual and two-way conceptual abstractions pertained to the denotative operative meanings depicted by the complex small-scale content (such as causal links, motivational intentions, and emotional states) that the children reported. As Table 9 illustrates, there were grade-level differences both in simple and complex small-scale content. However, children across the grades mentioned complex small-scale content less frequently than the

simple small-scale content. This occurred because the former requires the coordination of complex, two-way semantic correspondences that must be inferred from explicit and implicit levels; the latter can be obtained by simple, one-way semantic correspondences.

The recognition of complex narrative elements was more demanding for all children, especially pre-schoolers. The simple small-scale content is expressed at the presentational level through explicit pictorial forms of communication. The perceptual immediacy of the details and the characters' physical attributes made this content more accessible to all children, enabling them to include in their accounts significantly more of this content than any of the complex narrative elements. The presentation of physical character attributes through pictorial forms brings this narrative element to the same level as actional narratives. A greater number of children report character attributes because they have less difficulty comprehending pictorial narrative forms (Hayes et. al., 1984; Stoneman et. al., 1983) in particular and actional narratives in general than linguistic forms of narration (Gibbons et al., 1986).

Table 9 shows that children mentioned character attributes more frequently than any of the other narrative elements in all three segments. However, when character attributes were analyzed in relation to the complex small-scale content, the understanding of pre-kindergartners and

some of the kindergartners was restricted to explicit pictorial meaning. The second graders and those kindergartners who relied on two-way conceptual abstractions made sense of character attributes by integrating the explicit-textual with the implicit-social meaning.

Because the pre-schoolers were less likely to report complex small-scale content than the second-graders, their descriptions of character attributes were based on surface perceptual properties (without capturing their thematic textual and social relevance). This perceptual immediacy was demonstrated by Cindy's reference to the "pioneers" without knowing the purpose and direction of their journey. Because Cindy relied mainly on explicit meaning, she could not integrate the simple and complex small-scale content. This prevented her from capturing the denotative operative and connotative figurative meanings articulating the narrative flow.

In contrast, the interpretation of complex small-scale content requires a systematic coordination of bi-intentional (reversible) semantic correspondences articulated across a segment's narrative structure. This involves the coordination of two-way semantic correspondences expressed explicitly and implicitly. The second graders (who were more likely to use complex small-scale content) recognized thematic connections within and across narrative clusters, and they were more likely to grasp causal connections between actions and events

such as the bravery and excitement behind pioneering and Johnny's desire to become a pioneer. This coordination of complex narrative elements enabled the second-graders to recognize the various layers of thematic connections constituting what Bruner calls the "landscape of consciousness" (1986, 1990). This in turn enabled them to coordinate operative with figurative meaning and to integrate the content within a textually and socially relevant context. The conceptual accounts concentrated on the relationship between implicit and explicit meaning articulated by small-scale content.

However, the heterogeneity of thematic integration showed that the transition from pre-conceptual to conceptual modes of thinking did not involve a fixed hierarchical progression from one-way perceptual to two-way conceptual abstractions. The accounts of Jenny and Erica show that variations in a segment's narrative complexity and content familiarity influence the organization of processes in the perceptual and conceptual domains. Specifically, although Jenny relied mainly on conceptual abstractions, she sometimes -- when the content was unfamiliar -- also relied on perceptual abstractions. The perceptual and conceptual abstractions in Jenny's account at times appeared to work in conjunction with one another; at other times, perceptual abstractions dominated or were dominated by conceptual ones. The patterns of cognitive behavior illustrated across the four levels of

thematic integration revealed the continuous organization and re-organization of psychological processes. The analogous processes postulated by Werner's comparative-organismic approach help to explain this re-organization. A comparison of Jenny's conceptual account with Cindy's quasi-conceptual account illustrates the developmental progression of these *analogous processes*. Jenny, like Cindy, fluctuated between perceptual and conceptual abstractions. But unlike Cindy, Jenny interpreted these perceptual abstractions with narrative continuity because she integrated them within the two-way conceptual abstractions behind her overall interpretation.

However, the heterogeneity in performance within each grade level showed that children's cognitive behavior cannot be distinguished simply in terms of one-way perceptual or two-way conceptual abstractions. Processing strategies were influential (see Table 8). For instance, most of the pre-schoolers (who according to Piaget's theory function at the pre-operative level) relied on a detail-driven processing strategy. They also based their cognitive behavior mainly on one-way perceptual abstractions of discrete details and/or narrative clusters. A characteristic of these pre-operative perceptual abstractions is that their coordination is based on a unidirectional relationship of the perceptual similarities connecting the discrete details or clusters. The operative narrative continuity constructed by the second graders is

based predominantly on two-way conceptual abstractions and depicts the logical flow of content.

Thus, both the conceptual frame of reference on which children relied and the processing strategies they used had an impact on the degree of continuity in the narrative representations. In all segments, the children who relied on a sequence-driven processing strategy (see Table 8) were more likely to integrate the content at a higher level. However, because processing strategies are interdependent with conceptual frames of reference, significant grade-level differences occurred even in the sequentially-organized accounts (Figure 6).

When pre-kindergartners organized their accounts sequentially, they were more likely to integrate the content at a pseudo- or quasi-conceptual level than at the enumerational level. Similarly, in the first and second segments, the kindergartners producing sequence-driven accounts (like Cindy and Lisa) were more likely to organize their narratives at a higher level than expected. However, they did not consistently organize their accounts at the conceptual level. On the other hand, second graders constructing sequence-driven accounts (like Jenny, Erica, and Peter) organized content at the conceptual level in all three segments. They focused on wider narrative clusters and coordinated the small- and large-scale content into continuous and thematically consistent narrative representations.

The grade-related differences among sequentially organized accounts indicate interactional effects between the children's conceptual frame of reference and the sophistication behind their narrative skills. These interactional effects enabled the second-graders to focus on larger narrative clusters and to integrate effectively the small- and large-scale content while keeping the segment's overall textual structure as a reference point. These interactional effects enabled the pre-kindergartners and kindergartners to recognize semantic correspondences restricted to the discrete details and/or clusters on which they focused. As a result, the sequence-driven accounts of the pre-schoolers were more continuous than detail-driven narratives with respect to simple small-scale content.

This relationship between the levels of thematic integration and processing strategies indicates that the complexity behind the children's cognitive behavior is related both to their cognitive development and to their experience with the arts of communication in general and their linguistic narrative skills in particular. One of the experiential characteristics that distinguished the second-graders from the pre-schoolers is that the former were systematically exposed to formal school instruction of content organized in a written story-like format whereas the latter were mainly exposed to the story-telling format in the oral tradition (that of a secondary orality, Ong, 1982). Consequently, the second-

graders like Jenny and Erica were more likely to follow a sequential, story-like format and to systematically integrate small- and large-scale content in their accounts.

Variation in children's experience with the story-like format as a discourse genre influenced interpretation of the cartoon. Such experiential differences influenced the ways in which the children approached the task as well as their thematic expectations guiding their interpretation. Children's cognitive behavior cannot be described only in terms of the perceptual and/or conceptual abstractions behind the denotative operative meanings. Instead, the children's interpretation was influenced both by their experience with this genre of communication and their familiarity with the content they viewed (Table 13). The extent to which the children were familiar with the content influenced their organization of the accounts they produced. Accordingly, the transition from pre-conceptual to conceptual narrative representation depended on the interaction and mutual influence of cognitive processes in the perceptual, conceptual and social-affective domains. The one-way and/or two-way thematic connections pertained mainly to operative meanings and described perceptual and cognitive processes. The four types of social relevance pertained mainly to connotative figurative meanings and described the social-affective processes rooted in the children's cultural experience.

Furthermore, the relationship established by the four types of social relevance and level of thematic integration in Table 14 is one more indication that the degree of narrative continuity in children's accounts was influenced both by the extent to which the content they viewed was socially relevant to their lives and by the extent to which they relied on one-way perceptual or two-way conceptual thematic connections. Figure 12 illustrates that most pre-conceptual accounts relied on a detail-driven strategy while using experiential-egocentric meanings, and most conceptual accounts relied on a sequence-driven strategy while using social-conventional meanings. The socio-idiosyncratic meaning that the children brought to the viewing experience helped them to create a field of thematic connections. This, in turn, influenced their recognition of semantic correspondences connecting the flow of content.

That is, the ways in which the detail-driven pre-conceptual accounts integrated experiential and textual meanings led to discontinuous accounts that did not correspond to the segment's topical content. As illustrated in Table 5, while most of the pre-kindergartners and kindergartners used detail-driven strategies, most of the second-graders used sequence-driven strategies. The second-graders, as they cultivated narrative skills that captured a story-like sequential flow, drew meanings from socially shared domains and focused simultaneously on the various operative and

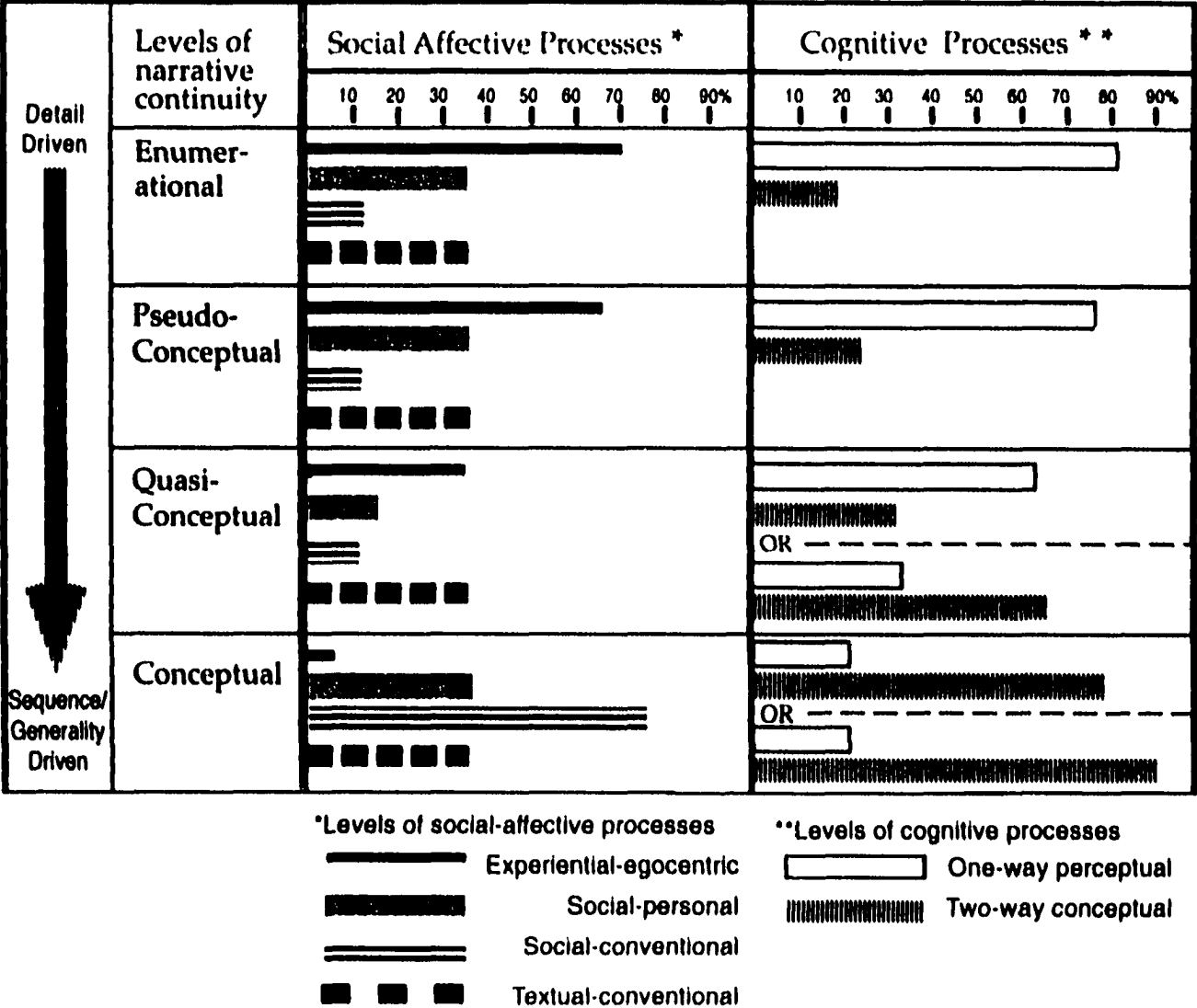


Figure 12 .
 Experiential and cognitive factors which influence the continuity in children's narrative representations of content.

figurative meanings articulated within and across narrative clusters.

More precisely, as Table 14 shows, in the second and third segments, the content's social relevance influenced the degree of continuity in children's narrative representations. When children relied on textual-conventional content by itself there was no difference in the ways in which they integrated their accounts in the three segments. However, these children were less likely to construct continuous accounts than those who integrated textual- with social-conventional content. The accounts with the highest degree of continuity were those that combined the textual-conventional content with the social-conventional, and these were followed by the social-personal combined with the textual-conventional. According to these results, the children drew meanings from their social-conventional and personal domains to interpret both operative and figurative textual content.

This integration of denotative operative and connotative figurative meanings found in children's accounts indicate that children used sociocultural normative meanings to make sense of the abstract operative ones. These two types of meanings are integral parts of the content in children's accounts and their cognitive behavior cannot be described merely in terms of the "one-way" *constitutive functions* of the pre-operative thinking or the "two-way" *constituted functions* of the operative thinking. These results do not support the abstract

objectivism assumed in Piaget's theory of logical operative thinking. Rather, they support Werner's comparative-organismic approach which avoids this abstract objectivism by addressing the ways in which these perceptual and conceptual processes constantly interact with one another and with social-affective processes. In fact, the grade-level effects on the level of thematic integration (see Table 7) and the ways in which these variables interact with the social relevance of content (see Tables 11 and 14) suggest that the transition from the pre-conceptual to the conceptual narrative representations evolved through the *fine-tuning* of the *organismic tie* between experiential-cognitive and cultural-textual meanings.

Summary

While the grade-related differences in the level of thematic integration showed cognitive developmental variations, the grade-level differences in the processing strategies and in the social relevance of content showed experiential variations. These results support the hypothesis stating that the performance of younger children should be significantly different from that of older children. Moreover, the interaction of processes in the perceptual, conceptual, and social-affective domains indicated the complex and multilinear nature of narrative viewing competencies. The

degree of continuity in children's narrative representations was a function of both developmental and experiential factors. That is, when children effectively integrated textual and experiential meanings, they were more likely to recognize semantic correspondences that connect the narrative flow of content. This consistent use of textual-conventional together with socio-idiosyncratic content across the segments suggests that the variation in continuity of cognitive representations was related both to the socio-idiosyncratic meaning that children brought to these tasks and the objective textual content. It is as though various semantic systems interacted in the interpretation process. Younger children, who relied on one-way perceptual abstractions of explicit pictorial meanings, confused their narrative representation of content by inappropriately *interweaving these systems*. However, when second-graders (who relied mainly on two-way conceptual abstractions) interwove these systems, they produced textually and socially relevant narrative representations.

These grade-level differences in the integration of denotative operative and connotative figurative meanings demonstrate that narrative viewing competencies are indeed a developmental social phenomenon and are related both to cognitive and experiential factors. In addition, the variations (within and across the three segments) found in the simple and complex small-scale content (see Table 9) suggest

that the children's experiences with and understanding of the medium's forms of signification and production techniques also influence their comprehension.

Textual Variations in Operative and Figurative Meanings

While the grade effects discussed above indicated cognitive variations in children's performance, the grade-by-experience interactional effects indicated a relationship between internal cognitive and external cultural representations of content. The textual effects found in this study elaborate this relationship further by explicating how narrative features mediate children's interpretation of content. As the textual effects on the global and local coherence tasks demonstrated, the medium's semiotic mediation depended on: 1) the complexity of each syntactic feature, 2) the complexity of the segment as a whole, and 3) the type of content presented.

Textual Effects of Specific Formating Features in Relation to the Overall Narrative Structure

The textuality of the audiovisual discourse mode consists of the synthesis of diverse systems of signification into culturally-laden forms of content representation. The results showed that although the medium's specialized production

conventions can make content more accessible to all children, the enhancement they provide on the level of interpretation was both grade- and experience-specific.

According to Vygotsky's semiogenetic perspective, the grade- and segment-related variations found in children's narrative representations reflect the heterogeneity in their cognitive behavior in relation to the diversity of the medium's semiotic mediation. The textual effects in this study can be explained in terms of the scaffolding of psychological processes stimulated by the medium's facilitative narrative features. Using this project's text-mediational adaptation of Vygotsky's conception of the ZPD, the heterogeneity in the stimulation of these scaffolding processes can be explained in terms of the diversity and dialogicality intrinsic to the forms of representation both in the internal cognitive and external textual domains.

The textual variations in performance on both the local and global levels of interpretation showed that all children produced accounts with greater continuity in the first segment than they did in the other two. While the first segment systematically integrated explicit and implicit forms of narration to make its content accessible, the other two did not (see Chapter 3).

As the analysis of the *large-scale content* showed (see Table 7), the pre-schoolers performed uniformly across the three segments. Most of the pre-kindergartners performed

consistently either at the enumerational or pseudo-conceptual levels; the kindergartners performed consistently at the enumerational, pseudo-conceptual, or quasi-conceptual levels. On the other hand, while most of the second-graders organized the content of their accounts at the conceptual level, their performance varied across the three segments. Specifically, in the first segment, the second-graders went beyond the information presented on the screen and integrated the content in their accounts at the abstract conceptual level. As a result, they were able to grasp the first segment's main theme along with its textual and social relevance. They recognized that when Johnny experienced the excitement of the pioneers, the social pressures that came along with that experience made him dissatisfied with himself and his occupation, making him "sad."

In the second and third segments, however, the second-graders' narrative representations were restricted to the concrete operative mode of thinking. They could not go beyond the information presented on the screen to deduce thematic inferences and to derive textually and socially relevant meanings. Their accounts illustrated a comprehension of the passage of time presented in the second segment and Johnny's travel across the land in the third segment. However, they did not recognize, in the second segment, Johnny's contribution to the transformation of the wilderness into settlements or his influence on the lifestyle of the pioneers;

nor did they grasp, within the third segment, Johnny's undaunted courage in fulfilling his mission to plant apple trees across the country.

These grade- and segment-related differences in the main themes can be further explained in terms of children's performance on *simple* and *complex small-scale* content. The small-scale content showed with more precision than the large-scale content the points at which children's representations of content break down. As Table 9 illustrates, a significantly greater number of second-graders mentioned complex small-scale content in the first segment than they did in the second and third segments. While there were only grade differences in the simple narrative elements, there were both grade-related and segment-related differences in the use of complex narrative elements.

Accordingly, as Table 9 shows, children mentioned character attributes more frequently than any of the other narrative elements in all three segments. However, there were significant grade-level differences both in the unfacilitated and facilitated accounts of the first segment, as well as in the unfacilitated account of the second segment. The number of children who mentioned the characters' attributes in these two segments showed a developmental pattern across the three grades. There were no significant grade differences on the number of children who mentioned character attributes in the third segment -- where Johnny Appleseed becomes an older man,

and the medium presents this transformation of his physical appearance as he gets older.

When character attributes are analyzed in relation to the complex small-scale content, the presence or lack of significant grade-level differences becomes relevant to the segment effects on the large-scale content. In fact, the grade and segment effects on the complex small-scale content, illustrated in Table 9, corresponded to those on the large-scale content. That is, in the first segment, all children were more likely to use complex small-scale content. While in this segment a significantly greater number of second-graders used complex small-scale content, in the second and third segments, even these children were less likely to mention complex small-scale content. This, in turn, enabled the second graders to coordinate operative with figurative meanings and to integrate the first segment's content within a textually and socially relevant context. As a result, they performed in the first segment at the abstract conceptual level, and in the other two segments at the concrete conceptual level.

The second-graders' abstract conceptual accounts in the first segment concentrated on the relationship between the implicit and explicit meanings articulated by simple and complex small-scale content. The narrative discontinuity of their concrete conceptual accounts, in the second and third segments, appeared in the semantic correspondences of complex

small-scale content expressed implicitly at the representational level. In these segments, the second graders did not report the main themes and they restricted their thematic inferences to meanings expressed by the "landscape of actions and physical objects." This, in turn, restricted their integration of narrative elements within the segments' thematic context explicitly articulated by the pictorial narrative forms. That is, they recognized narrative concepts concerning passage of time and movement in space, but they could not go beyond the information presented on the screen to deduce thematic inferences within a socially relevant context.

Thus, the segment's narrative complexity influenced the extent to which the second-graders integrated the explicit and implicit semantic correspondences of *simple* and *complex small-scale* content. In accordance with this project's text-mediational adaptation of Vygotsky's conception of the ZPD, the heterogeneity in the second-graders' performance can be explained in terms of the scaffolding stimulated by the first segment's facilitative narrative features. These features scaffolded the cognitive behavior by bringing the presentation of its content within the reach of most children. The pictorial presentation of the activities and actions in which the characters engaged rendered the content with immediacy, helping the children recognize its socially relevant context. This made the content more familiar and provided the children with a wider field of thematic expectations. Also, the

emphasis provided by actional narratives further enhanced this field because it gave direct pictorial reinforcement to the first segment's implicit textual meanings, making its content more accessible to all children. This interweaving of the pictorial-explicit and linguistic-implicit levels of communication scaffolded the children's cognitive activities and enhanced their recognition of the semantic correspondences across its narrative structure.

The first segment's systematic pictorial reinforcement of its part-whole textual relationship was another facilitative feature which scaffolded the children's cognitive behavior by enhancing their recognition of the thematic flow of content. This reinforcement helped most children to make thematic connections while keeping the segment's textual core content as reference points (that is, Johnny's farming activities, the excitement of pioneering, and Johnny's desire to join the pioneers in their journey). This way, even some of the pre-kindergartners, who were "pre-conceptual," were able to grasp some thematic connections within the discrete narrative clusters that pertained to Johnny's pretending activities.

Action dissolves. The systematic use of actional narratives in the first segment had the greatest degree of facilitation both on local and global levels of interpretation (see the mean scores of the quantitative data in Table 2 and the frequency distributions of the qualitative data in Table

10). In the imagination dissolve of the first segment, all the children made the optimal selection (the mid-dissolve picture) to complete the first pictorial sequence. However, the grade effects of their thematic justifications were comparable to those found in the global coherence tasks. The children's cognitive behavior shifted from one-way perceptual to two-way conceptual abstractions that resulted in pseudo-conceptual, quasi-conceptual, and conceptual levels of thematic integration among the pre-kindergartners, kindergartners, and second-graders, respectively.

As the justification of Erica and Peter demonstrated, the second-graders, like the pre-kindergartners and kindergartners, focused on the actional narrative of the pictorial sequences. However, as demonstrated in the accounts discussed above, although the second-graders coordinated explicit and implicit meanings expressed at the representational level, the kindergartners fluctuated between explicit and implicit meanings, and the pre-kindergartners restricted their interpretations to explicit meanings expressed at the presentational level.

The kindergartners' fluctuation between explicit and implicit meanings led to narrative discontinuities in their recognition of the metacognitive processes in which Johnny engaged both at the beginning and the end of the pictorial sequence. Although most kindergartners recognized that Johnny Appleseed was pretending, they did not recognize the finer

details indicating the realization processes that Johnny underwent, namely: (1) from pretending that he is Davy Crockett to falsely believing it, and (2) from partially realizing that he is not Davy Crockett to subsequently becoming fully cognizant of his non-pretend identity. The kindergartners recognized neither Johnny's state of false belief nor his partial recognition of himself as a farmer.

The pre-kindergartners' reliance on explicit meanings restricted their interpretations mainly to the absolute qualities of the invariant features. When they attended to variant features their interpretations were again restricted to their explicit meanings and they did not recognize the transitional cognitive processes as Johnny was shifting states of mind. As a result, while some pre-kindergartners recognized that Johnny was pretending, most of them interpreted pictorial depictions of metacognitive processes as discrete, non-pretend actions.

The narrative relevance which the pre-conceptual and conceptual accounts attributed to the imagination dissolve was an additional characteristic distinguishing the viewers' interpretative activities. Also, these results demonstrated that the syntactic features fulfill their organizational function as integral parts of the segment's narrative structure.

The second-graders who recognized this dissolve's syntactic properties succeeded in contextualizing their

justifications within the dissolve and/or the story as a whole. They meaningfully accounted for the transitional (meta)cognitive processes represented in the imagination dissolve and grasped the textual relevance of Johnny Appleseed's pretend activities. On the other hand, the thematic scope in which the pre-kindergartners and kindergartners contextualized their justifications was restricted either to the dissolve or one of the pre- or post-dissolve pictures. In those cases in which some of the pre-schoolers integrated their justifications within the segment, only the pre-kindergartners, like Sherry and Jimmy, were thematically inaccurate.

Landscape dissolves. The pictorial sequences that the children completed and the justifications that they gave showed distinctive behavioral patterns in the action dissolves of the first segment and in the landscape dissolves of the other two segments. The grade-related patterns found in the quantitative data (see Table 2, 3, and 4) illustrate that while children showed the highest degree of continuity in their interpretations of the two dissolves in the first segment, they showed the lowest degree of continuity in the third segment. These quantitative data support the grade and segment interactional effects (see Tables 3 and 4) found in the global coherence tasks and demonstrated that children did not perform uniformly across the three segments.

In the second and third segments there were neither systematic pictorial reinforcements of part-whole textual relationships nor were the segments' linguistic implicit forms of narration reinforced by pictorial explicit ones. With the absence of such facilitative features, the content became more abstract and the textuality of these segments became more demanding. The children had to infer the long passage of time and spatial distance mainly from implicit-linguistic and implicit-pictorial meanings expressed across the perceptual transformations of the landscape. Also, they had to infer the activities and events in which Johnny engaged as he set out to fulfill his mission of planting apple trees across the country.

Performance on the landscape dissolves of these two segments was distinguished by those that included textual features providing thematic closure to the narrative flow and those that did not. The children's justifications indicated that the presence of these facilitative features scaffolded their cognitive behavior by providing explicit pictorial reinforcement to the dissolves' implicit formal and qualitative syntactic properties. On the other hand, the lack of such facilitative features reduced the children's interpretations of the pictorial sequences to the level of sorting tasks that had some relevance within the segment as a whole.

Specifically, in the landscape dissolves of the second segment, as the quantitative and qualitative data showed, even the second-graders' representations of content were not consistently continuous within each and across the four time-dissolves studied. While the quantitative data showed significant grade-level differences in the object identity tasks for all the time dissolves, the qualitative data showed such differences only on two of the time dissolves. That is, when the quantitative data was analyzed in conjunction with the qualitative data, the second-graders demonstrated continuous narrative representations on the first pictorial sequence and the object identity tasks of only the first and third time dissolves (i.e., those including thematic closure features).

Peter's justification of the third dissolve's first pictorial sequence demonstrates the ways in which 60.0% of the second-graders coordinated the semantic correspondences between the invariant and variant pictorial content.

Peter's Justification of the First Pictorial Sequence of the Third-time Dissolve

- C: Umm, let's see. Probably this second one [mid-dissolve].
 E: Uh-huh.
 C: Because, umm, it's the same picture as the bottom one. The trees are fully grown and it's still windy except the only thing different is that it's snowing and it seems to be the night-time in here [mid-dissolve] though.
 E: Okay. Is there anything in this picture [mid-dissolve] that looks the same as in this picture [pre-dissolve]?
 C: Uh, yes. You can still see the trunks of the trees here and the trunks of the trees here.

- E: Okay. Is there anything in this picture [mid-dissolve] that looks the same as in this picture [post-dissolve]?
- C: Uh, yes, actually everything does. It is the same scene. So, umm, you know, all the trees do that are in it and umm, the ground does.
- E: Uh-huh.
- C: And the hills.
- E: Uh-huh.
- C: Those are, that's the ground and, umm, the trunks of the new trees that are growing.
- E: Uh-huh.
- C: Those are the apple trees and trunks that, umm, have grown now.
- E: Are these trees and these trees the same trees?
- C: Yes.
- E: How come they look so different?
- C: Umm, because here they are not even [pre-dissolve], they're only about half way grown [mid-dissolve] kind of and here they are fully grown [post-dissolve] and they have leaves on them.
- E: Are these trees and these trees the same trees?
- C: Yes, they are.
- E: Then why do they look so different?
- C: Umm, here they are all white because it's snowing.
- E: Uh-huh.
- C: So, you can't clearly see them. And here you can clearly see the trunks and the leaves have a very more colorful color. Little bit more colorful.
- E: Okay.

As Peter put it: "... actually everything does [look the same]. It is the same scene [entire pictorial sequence]. So, umm, you know, all the trees do that are in it, and umm, the ground does. ... And the hills." Peter's justification showed that he made sense of the dissolve's variant features by keeping the outer frame as a reference point: "... it's the same picture as the bottom one [post-dissolve]. The trees are fully grown [side mid-range] and it's still windy [the branches of the mid-range trees across the pictures are bending in the same direction] except the only thing different

is that it's snowing and it seems to be the night-time in here [mid-dissolve] though."

Peter's justification clearly demonstrated that the maintenance of the outer frame across the sequence had a facilitative function because it helped him make sense of the variant features by integrating them within the context of the dissolve's temporal flow. The thematic closure provided by this facilitative device helped most second-graders coordinate the (in)variant features of both core themes and to elaborate on the growth of the apple trees and the change of seasons.

The facilitative function of this pictorial narrative feature was more apparent when the quantitative data were analyzed in conjunction with the qualitative data and when performances in the first and second sequences were compared. The analysis of the first sequence showed that most of the second-graders made the optimal selection: they organized the pictorial content at a conceptual level and contextualized their justifications within the scope of the dissolve. On the other hand, most of the pre-schoolers chose the one-dimensional picture. They coordinated only a subset of pictorial (in)variant features at the quasi-conceptual level and contextualized them within the scope of the dissolve. The younger children chose the one-dimensional picture and focused on only one of the two core themes (either the change of season or the growth of trees).

Although the level of interpretation varied, the contextualization of content remained consistent. This demonstrates the points at which the children's narrative representations of content broke down. Most of the pre-schoolers interpreted the content of the third time dissolve either at the pseudo-conceptual or quasi-conceptual levels because they used the pre-conceptual narrative representations in their global accounts as a reference point. Specifically, the kindergartners who organized their justifications at the quasi-conceptual level restricted their coordination of content to one-way narrative relationships, mainly those referring to the change of seasons. However, the second-graders used their concrete conceptual narrative representation in their global accounts as a reference point to manipulate the semantic correspondences between explicit and implicit pictorial forms of narration. This enabled them to derive textually relevant meaning. Therefore, the second-graders used this dissolve's pictorial invariant features as facilitative narrative devices to help them coordinate the two-way semantic correspondences across the pictorial content.

When the first and second pictorial sequences were compared, however, the second-graders did not maintain thematic consistency. Most children in all three grades organized the content in their justifications at the pre-conceptual level. In the second pictorial sequence, the performance of the pre-schoolers was distinguished from the

performance of the second-graders by the choice of the one-dimensional picture. The second-graders, however, chose the mid-dissolve picture. Despite these different selections there were no significant grade differences in the level at which they integrated the content of this pictorial sequence. This regression in the performance of the second-graders was related to the absence of the outer frame in the one-dimensional picture. Thus, this facilitative narrative device provided explicit reinforcement to the implicit linguistic and nonlinguistic forms of narration. Without this reinforcement, the performance of most second-graders regressed to a level similar to that of the pre-schoolers.

The justifications of the second and fourth time-dissolves made more apparent the narrative features which caused the regression in the performance of the second-graders. While both dissolves expressed the passage of time through the perceptual transformations of the landscape, the second one conveyed a leap of several months and the fourth conveyed a leap of many years. In the former one, the scope of transformations addressed minute changes, while in the latter, large overarching changes.

Without the thematic closure of the outer frame, the children relied on their idiosyncratic interpretations of the segment as a whole and focused on general, overall pictorial themes. For example, one of the kindergartners organized the first pictorial sequence into two subsets based on their

colors and the personal meanings these colors had for her: "because they're both like hot colors [mid-dissolve 2 and post-dissolve] and these [pre-dissolve and mid-dissolve 1] are both cool colors. ... And they're both leaves on it [mid-dissolve 2 and post-dissolve]." Because her interpretation was restricted to explicit meanings expressed at the presentational level, she did not recognize that the "cool colors" represented winter and the "hot colors" (and the falling leaves) represented autumn.

As Table 10 illustrates, most of the second-graders interpreted this dissolve at a quasi-conceptual level, and they partially coordinated the formal and semantic properties connecting the pictorial sequences. As the justification of a second-grade boy indicates, these children took into account a subset of narrative clusters which represented only one of the core themes, that is, either the change of seasons or the growth of the saplings: "Well, because over here it shows spring, umm, like rain [pre-dissolve], rain [mid-dissolve 1], then like fall [mid-dissolve 2], fall [post-dissolve]."

In addition, the thematic scope within which pre-schoolers and second-graders contextualized their justifications revealed a distinct developmental pattern. Most of the pre-schoolers contextualized their thematic justifications within either the dissolve as a whole or the post-dissolve picture. The second-graders, on the other hand, showed a greater degree of narrative continuity, as half of

them contextualized their thematic justifications within the segment as a whole and the other half within the dissolve. The focus of the second-grader discussed above indicates that he made sense of this sequence by contextualizing it within the story as a whole: "The wagon's wheel tracks and the brown colors, here [mid-dissolve 2 and post-dissolve pictures] you have the brown color." That is, this second-grader thought the wagons the pioneers were using for their journey in the first segment made the furrows that Johnny Appleseed had plowed to plant apple seeds.

This overall contextualization was related to his focus on only the first core theme -- passage of time expressed through the change of seasons. That is, this second-grader did not maintain the semiotic (in)variant features referring to the growth of saplings (second core theme). Nevertheless, even though this second-grader, like most of them, integrated the content at the quasi-conceptual level on the local level of analysis, he was able to contextualize the pictorial sequences meaningfully within the story as a whole because his narrative representation on the global level of interpretation was integrated at the concrete conceptual level.

That was also the case with the fourth time dissolve, which presents the transformation from the wilderness into a settlement consisting of apple orchards and cabins. Most children, including the second-graders, focused on the explicit meaning and did not recognize the implicit meaning

expressed at the representational level (Johnny's contribution to the lives of the pioneers). The analysis of the quantitative and qualitative data demonstrated that even the second-graders did not recognize either of the core themes articulated by this time dissolve. They interpreted the transition from the pre-settlement to the settlement period as a change of season. They recognized neither the explicitly-presented changes of the landscape (the cultivation of apple orchards and the construction of cabins) nor did they infer the activities that had transpired during this transition.

In fact, when the quantitative data were analyzed separately for each grade, there were partial condition effects in the fourth time dissolve. All children performed better when the dissolves were either presented at a slower pace or transformed into cuts than when the dissolves were presented at their normal pace. However, since the analysis of the qualitative data showed neither grade nor gender effects on these pictorial sequences, most children relied predominantly on one-way perceptual abstractions. They focused only on qualitative invariant pictorial features (the perceptual similarities of discrete objects) without attending to the configurational semantic pattern of the (in)variant features. Thus, even the justifications of the second-graders were based on perceptual abstractions that were integrated according to the change of season, one of the segment's core themes. The speed manipulations, for all children, became a

salient feature that guided the children's attention across the perceptual transformations of the dissolves.

Therefore, when the perceptual transformations concentrate either on minute detailed changes of a small, restricted space, or on overall changes of a large space, the thematic contextualization of these dissolves becomes more demanding. It is as though the textual relevance of these syntactic features is articulated implicitly. Without explicit reinforcement of the implicit organizational properties, the content of the dissolves is not as accessible to the younger viewers. When the dissolves were this demanding, the speed manipulations became a salient feature that helped them by guiding the children's attention across the perceptual transformations. This, in turn, helped children to recognize the flow of the invariant pictorial objects but not the formal and qualitative syntactic properties expressed by the configurations of the (in)variant objects.

Similar textual factors influenced the children's interpretations of the landscape dissolves in the third segment. The perceptual transformations of this segment's landscape showed Johnny traveling across the country over a long period of time. To achieve this, the medium used more diverse pictorial and linguistic forms of narration. This diversity does not provide opportunities for consistent use of pictorial features which can help the children to integrate

the content across the perceptual transformations of the dissolves. Therefore, in the third segment, the children had to more actively maintain explicit and implicit meanings of semiotic (in)variance pertaining both to movement in space and time. Thus, both the type of content presented in the third segment and the narrative complexity of its text made its interpretation more demanding and at times more confusing.

As a result, despite the selections they made to complete the pictorial sequences, most of them approached the multiple-choice tasks in the third segment as pictorial sorting tasks. Their cognitive behavior was based on one-way perceptual abstractions of the concrete invariant details (such as Johnny and/or other objects of the landscape) that connect the pictures. The predominant reliance on one-way perceptual abstractions made the children's thematic scope narrow, and they could not recognize the narrative relevance of the third segment's dissolves to its textuality. The children could not make the necessary thematic connections to recognize the weather changes, Johnny's movement in space, and the change in spatial perspective as Johnny traveled across the land.

Familiarity of Content Effects. Hence, as the results showed, the optimal performance in the second segment was based on the facilitative function in the general outer frame across the pictorial sequences which gave it a thematic closure. However, the type-of-content main effects and the

interactional type-of-content-by-grade effects (see Table 5) demonstrate the impact of experiential factors that were related to the children's familiarity with content. The textual effects, thus, were not merely related to the narrative complexity of the dissolves or segment but also to the topical content. For example, the children's performance on the weather dissolve of the third segment showed that their familiarity with the objects used consistently across the pictures also influenced the extent to which they provide thematic closure. In the weather dissolve, the landscape across the pictures consisted of a valley or canyon in which Johnny is walking through at night while it is thundering and lightning. The unfamiliarity of content led to vague and inaccurate thematic connections even among the second graders.

Thus, the familiarity of content further scaffolded the children's cognitive behavior by increasing the field of thematic connections they could recognize and enhancing the degree of continuity in their cognitive representations. That is, the first segment's pictorial actional narratives made the content accessible and socially relevant to the children. However, the absence of the actional narratives in the second and third segments eliminated the pictorial immediacy of the characters' activities. The reliance of these segments mainly on implicit forms of narration attenuated the cultural relevance of the content and led to a more restricted field of thematic connections. In addition, the children who

participated in this study live in New York City and therefore they may not have been as familiar with the type of content presented in these segments, that is, farming activities and country lifestyle. The scaffolding processes stimulated by the accessibility and familiarity of content are further elaborated by the ways in which the children used socio-idiosyncratic meanings to make sense of each segment's textual core theme. Even though there were no significant differences in the socio-idiosyncratic meanings that the children used across the segments, there were differences in the ways in which children used these meanings. In the unfacilitated accounts of the second and third segments, there were significant grade effects both on the types of socio-idiosyncratic meaning (see Table 11) and on the level at which the children integrated these meanings with the textual content (see Table 14).

In the first segment, each type of social relevance appeared to a similar extent across the four levels of thematic integration. That is, even the children who combined textual-conventional meanings with the experiential-egocentric ones were more likely to integrate the content at the pseudo-conceptual level and to grasp one of the core textual themes, Johnny's pretending. However, in the second and third segments, more than 70.0% of these children's narrative representations regressed to the enumerational level.

Thus, the lack of significant differences in the socio-idiosyncratic meanings which the children used in the first segment reflects the meaningful field of thematic expectations they were able to create. The medium's accessibility of content, therefore, helped the children to integrate effectively their publicly shared meanings as well as their personal or private ones, with the segment's textual content. However, the fields of thematic expectations that were created in the second and third segments did not help the children to completely integrate the explicit and implicit semantic correspondences of the content. Even the second-graders, who relied mainly on two-way conceptual abstractions and used both textual- and social-conventional meanings, organized their accounts at the concrete conceptual level and did not go beyond the information presented on the screen to deduce socially relevant thematic connections.

Table 16 illustrates the cognitive processes which could have been scaffolded within the *Zone of Proximal Development* (ZPD) by a segment's facilitative narrative features and the type of content presented. That is, the grade effects within each segment showed that the first segment's facilitative narrative devices had differential effects among the second-graders, who operate at the conceptual mode of thinking, and the pre-schoolers, who operate at the pre-conceptual mode of thinking. The second-graders were able to go beyond the information presented on the screen and derive both textually

Table 16
Cognitive processes which can be scaffolded within the zone of potential development
by a segment's facilitative narrative features and the type of content presented

Mediation		Pre-Kindergarten	Kindergarten	Second Grade
Implicit ↓ Explicit Implicit ↑ Explicit	Cognitive Processes	Enumerational 1-way perceptual abstractions	Pseudo-Conceptual 1-way perceptual randomly interwoven with some 2-way conceptual abstractions. Perceptual similarities integrated into vague configurations	Concrete Conceptual 2-way conceptual abstractions dominating 1-way perceptual abstractions. Configurational narrative patterns based on concrete conceptual abstractions
	Content	Enumerations of details and character attributes	Constructions of topically inaccurate narrative clusters	Construction of textual core themes integrated within the segment's situational context
	Topical Content	Situational context	Theme 1 inaccurately integrated within the segment's situational context	Textual core themes 1 and 2 integrated within the segment's situational context
	Cognitive Processes	Pseudo-Conceptual 1-way perceptual randomly interwoven with some 2-way conceptual abstractions	Quasi-Conceptual Fluctuate between some 2-way conceptual and 1-way perceptual abstractions. Perceptual similarities integrated into accurate but partial configurations	Abstract Conceptual 2-way conceptual abstractions dominating 1-way perceptual abstractions. Configurational narrative patterns based on both concrete and formal conceptual abstractions
	Content	Constructions of topically inaccurate narrative clusters	Constructions of topically accurate narrative clusters	Construction of both textual core and main themes integrated within the segment's overall narrative structure
	Topical Content	Theme 1 inaccurately integrated within the segment's situational context	Theme 1 accurately integrated within the segment's situational context	Textual core themes 1, 2 and main theme integrated within the segment's narrative structure and socially relevant context, i.e. the moral of the story

and socially relevant meanings. The kindergartners, however, restricted their interpretations to concrete meanings presented on the screen and they were able to only partially coordinate the segment's topical content. Although both the kindergartners and pre-kindergartners produced pre-conceptual accounts, there were differential effects between these two groups. That is, even though the medium's facilitation helped some pre-kindergartners to recognize thematic correspondences between some events, the integration of the content did not accurately reflect the segment's topical content.

The grade and segment effects found in this study, therefore, demonstrate that while a segment's narrative organization can make the thematic connections across its textuality more accessible to all children, the enhancement it provides on the level of interpretation was grade- and experience-specific. The grade effects found in the first segment's small- and large-scale content demonstrated that the medium's facilitation scaffolded the children's cognitive behavior to make thematic connections within the range of processing determined by the children's *ZPD*. For example, the facilitative narrative features used in the first segment stimulated a wide range of cognitive processes within the *ZPD* and it enhanced the children's interpretations of content. The lack of such facilitative narrative features in the second and third segments, however, stimulate a narrow range of cognitive processes within the *ZPD*.

Summary

These results support the hypothesis that the complexity in a segment's narrative structure should influence the degree of continuity in children's representations of content. The fluctuation in children's performance indicates the impact that the medium's textual forms of organization had on children's interpretations and re-presentations of content. More specifically, in the local coherence tasks, the results demonstrated that while the variations in the speed at which the dissolves were presented had limited effects, their narrative complexity and the type of content they presented had greater effects.

The limited condition effects found in the local coherence tasks suggest that the speed manipulation did not influence the children's performance when the narrative complexity of the dissolves was within their understanding. However, when the complexity of the dissolves was far beyond their understanding, the speed manipulations helped the children recognize the content expressed at the presentational level. Although these textual manipulations did not produce the anticipated cognitive effects, they still facilitated children's cognitive behavior on the perceptual level.

The speed manipulations of the dissolves did not serve the facilitative functions that were expected in the four relevant hypotheses; rather, speed manipulations became a

salient feature that guided the children's attention across the perceptual transformations of the dissolves. In other words, the presentation of the content at different speeds helped the children notice that the dissolves were not moving at the same pace as the rest of the segment. Although this incongruity made them pay closer attention to the flow of pictorial content, it did not help them interpret the dissolves' syntactic properties.

Hence, on the local level of interpretation, although these textual manipulations did not produce the anticipated effects, they still facilitated children's cognitive behavior. They functioned as salient features that guided children's attention by highlighting a segment's content. However, this cueing effect had an impact on children's comprehension by summoning cognitive activities only on the perceptual level. To enhance comprehension, these textual features would have had to influence children's interpretive activities on both the perceptual and the conceptual levels. Even though the shift in speeds of presentation activated perceptual processes to draw children's attention to the concrete details of the dissolves, they did not stimulate the necessary conceptual processes to help children coordinate their formal and qualitative semantic properties.

These results raise questions regarding Salomon's (1979; Salomon & Cohen, 1977) notions of the medium's mediational capacity through "supplanting" (or modeling) and "eliciting"

(or cueing) mental operations. Salomon bases these supplanting and eliciting functions on the cinematic editing techniques composing televisual flow of content. As the limited condition effects showed, the medium's scaffolding of cognitive processes was not merely a function of particular cinematic techniques (such as particular forms of dissolves, cuts, zooms, or pans). Rather, their facilitative function depended on the complexity of the narrative structure in which they were embedded or nested. This distinction of textual effects was demonstrated by the degree of continuity in children's narrative representations of the first segment in relation to the other two.

Contrary to the four hypotheses related to the dissolves, the data showed that the transformation of the dissolves into cuts failed to reduce their narrative complexity. Nor did the slower presentation of their content enhance the younger children's comprehension of their syntactic properties. These results do not support findings in television research that suggest that children tend to learn more when the flow of content is presented slowly (Rice, 1979; Tower, et. al., 1979; Wright, et. al. 1982). The pace of the flow is not the only narrative feature that facilitated children's comprehension. Rather, the pace along with other textual features (such as actional rather than linguistic forms of narration, sound effects, diversity of musical accompaniment and so on)

contributed to the children's overall interpretation of a program's content.

Accordingly, in the first segment, in which multiple facilitative narrative devices were used to make the content accessible, the speed manipulations of the dissolves had no effect. In the first segment, the medium systematically used cinematic techniques to demonstrate part-whole textual relationships. These techniques were enhanced by explicit forms of communication. That is, the interweaving of the pictorial actional narratives with diverse dramatic music and lyrics helped the children make the necessary thematic connections across the segment's flow of content. This, in turn, enhanced their recognition of semantic correspondences articulated across the pictorial transformations of this segment's dissolves.

Furthermore, the limited condition effects found in the second and third segments suggest that children's cognitive behavior cannot be explained only in terms of the influence of the individual dissolves and cuts. These syntactic features are an integral part of the overall narrative structure. Each is influenced by the complexity of the segment's overall textuality. As the results showed, all children had the least difficulty in recognizing the perceptual similarities in the object identity tasks for the imagination dissolves. In contrast, all children found the shift in spatial perspective the most difficult to interpret, followed by the shift in time

and space. Specifically, even the second-graders' representations of content did not show the same degree of continuity across the landscape dissolves.

Therefore, while the condition in which the dissolves were viewed had limited or no effect, their narrative complexity and the type of content they presented had different grade-level effects. Children were more likely to recognize the syntactic properties of the dissolves when they could perceive them as an integral element of the narrative structure in which they were embedded. There were limited condition effects only in the landscape dissolves in the second and third segments, which did not include facilitative features giving them thematic closure and narrative relevance. Since the textual structures of these segments relied heavily on implicit forms of communication, their narrative relevance was not made explicit and this hindered children's comprehension.

These textual and type-of-content effects raise questions to research suggesting that pre-schoolers show significantly greater retention of televised information presented visually rather than aurally (Calvert et. al. 1982; Gibbons et al. 1986; Hayes et. al. 1984; Stoneman et. al. 1983). The mode of presentation, alone, does not determine the level of comprehension or recall. Rather, the complexity of pictorial narrative features influences the accessibility of semantic correspondences connecting the flow of these features. As the

variations in the accounts children gave (in the first and third segments) demonstrated, when the medium's compositional structure does not reinforce part-whole relationships of content, pre-schooler's interpretations are limited to one-way perceptual abstractions of explicit meanings. Thus, young viewer's comprehension of content is not a function of the modality in which this content is presented. Nor is it enhanced, as research suggests (Gibbons et. al, 1986; Hoffner et. al. 1988,) by merely the use of both visual and auditory forms of articulation. Rather, young viewer's comprehension is influenced by: 1) the complexity of the medium's intermodal narrative textuality, and 2) the children's experiences with and understanding of the medium's compositional techniques (production conventions).

As the results in the global and local coherence tasks showed, the facilitative narrative features of the first segment had differential effects on the comprehension of pre-schoolers and second-graders. That is, this segment's facilitation scaffolded the second-grader's cognitive behavior by eliciting or cueing cognitive integrative activities. However, the representations of the kindergartners and pre-kindergartners, who operated at the pre-conceptual mode of thinking, remained fragmented. They did not make accurate causal links to recognize implicit narrative elements such as motivational intentions and emotional states.

These results demonstrate that when children operate in the pre-conceptual mode, the medium's facilitative cinematic techniques do not enhance comprehension by supplanting or modeling mental operations that they have not yet acquired. Rather, the medium's facilitation enhances thematic scope so that children are able to recognize semantic correspondences of content with which they were unfamiliar. For children operating in the conceptual mode, however, the first segment's facilitative features "elicited" a higher level of thematic integration by "cueing" semantic correspondences across the narrative flow of content. With the medium's facilitation, these children were able to recognize denotative and connotative meanings expressed at the representational level (indexical and symbolic signs) and derive both textually and socially relevant meanings. When children operated at the conceptual level, the medium's facilitation was more likely to enhance their viewing behavior beyond the anticipated, age-appropriate level.

Therefore, the scaffolding of this medium's facilitative devices depends on the complexity of the narrative structures in which they are embedded, as well as on the cognitive sophistication behind the children's narrative viewing competencies and their familiarity with the content presented. These cognitive, experiential and textual effects on children's viewing behavior demonstrate that narrative competencies in the televisual discourse mode, like the oral,

evolve developmentally. However, these results also suggest that narrative viewing competencies develop more slowly than linguistic ones. The special challenge of television, is that children have to integrate the complex and diverse content presented in its textual montage so that they can "read" or interpret its narrational meanings.

Sociogenetic Constructions of Mental Representations in the Audiovisual Mode of Discourse

All children responded to the multiple semantic levels of textual structure. However, variations were found in the recognition of meaning expressed at the presentational and representational levels as well as in the degree to which children coordinated their accounts on pre-conceptual and conceptual levels. That is, the structural relations that connected the thematic elements were less completely elaborated on by the pre-conceptual accounts. As a result, these narrative representations were fragmented; the meanings that children derived were vague and, at times, irrelevant to and inconsistent with the segment's topical content.

The results of this study demonstrate that the degree of continuity in children's narrative representations reflects the relationship between the internal psychological and external cultural forms of representation. The textual variations demonstrated heterogeneity in children's

representations of content both within and across each grade. Even children that had attained certain levels of cognitive sophistication showed performance at lower levels when the textuality of a segment was more demanding and the content was unfamiliar. In addition, the grade and textual effects on the operative meanings and the ways in which children integrated them with figurative ones demonstrated that heterogeneity in performance was related to the interaction and mutual influence of cognitive, experiential and textual-mediational factors.

Furthermore, the relationship established in each segment between social relevance and the conceptual level of interpretation demonstrated that all children's narrative representations of content are influenced both by cognitive development and by participation in various forms of social discourse (see Figure 13). For example, most children operating in the pre-conceptual mode relied on a detail-driven strategy and used experiential-egocentric meanings, while most children operating in the conceptual mode relied on a sequence-driven strategy and used social-conventional meanings. The transition from the pre-conceptual to the conceptual narrative representations entails the continual organization and re-organization of psychological processes in the perceptual, conceptual, and social-affective domains.

This relationship also demonstrated that operative and figurative meanings interacted and influenced one another

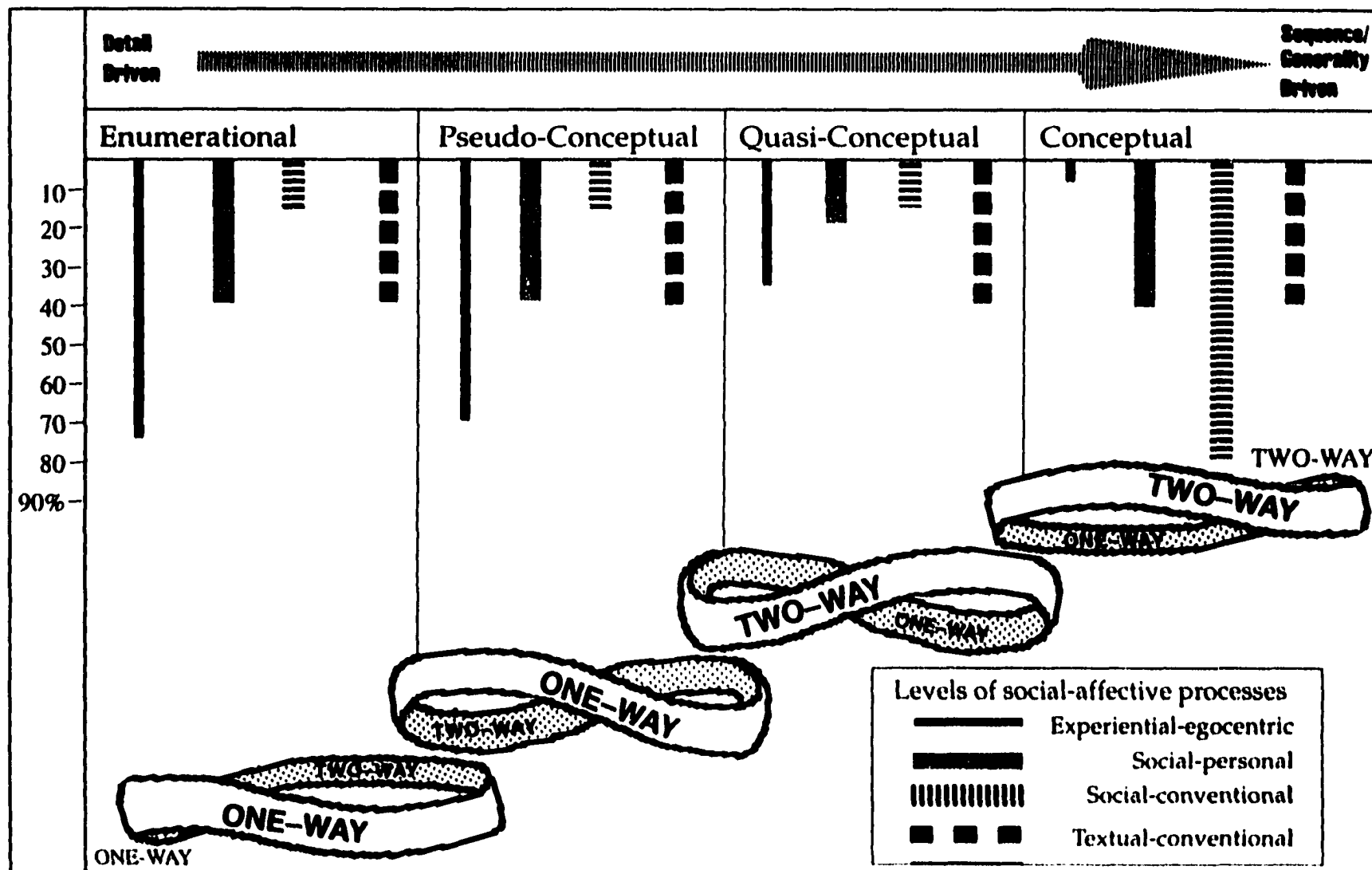


Figure 13. Pictorial representation of the one-way perceptual and two-way conceptual abstractions in conjunction with the social-affective processes depicting the transition from the pre-conceptual to the conceptual narrative representations of content.

and that the degree of continuity in children's accounts was not based on the mere "abstract objectivism" of denotative content. Consistent with the *coexistence of the analogous processes* assumed in Werner's comparative-organismic approach, the heterogeneity in mental representation was related to the *organismic tie* established between experiential-cognitive and cultural-textual meanings. The degree of continuity in children's narrative re-presentations cannot be explained merely in terms of one-way perceptual and/or two-way conceptual abstractions. These cognitive processes pertained to denotative operative meanings only. However, the results showed that children's cognitive behavior was more complex than that.

The impact of the content's social relevance on the continuity of children's narrative representations suggests that the multiple interpretations of symbolic actions are attributable to the connotative figurative meanings conveyed by the content. This interweaving of denotations and connotations is aptly described by Cirillo and Kaplan (1983) in their discussion of "Figurative Action from the Perspective of Genetic Dramatism." The general form of figurative actions "foster[s] the free play of the imagination...[and] invite[s] us to see the gaps in what we thought was seamless and to grasp the connection where we suspected only division" (1983, p. 249).

The textually and socially relevant meanings that the children derived from each segment are inconsistent with the abstract objectivism assumed in Piagetian theories of logical operative thinking. Children drew experiential meanings from their social-conventional and personal domains to interpret the figurative and operative textual content. The reliance on such socio-idiosyncratic meanings led the children to multiple interpretations. The extent to which the children were familiar with the content influenced the organismic tie that was established between experiential and textual meanings. The transition from the pre-conceptual to the conceptual narrative representations, therefore, evolved through the fine-tuning of the organismic tie between experiential-cognitive and cultural-textual meanings.

Werner's dynamic process viewpoint suggests that heterogeneity in performance demonstrates that variation in the organization of the perceptual, conceptual, and social-affective processes is the result of the fluidity of "a system that assembles itself to solve a task at hand" (Glick, 1985, p. 114). This fluidity in the organization of the multilinear psychological processes accounts for the heterogeneity in children's performances within and across each grade. Also, as the textual effects showed, the mental organization behind the children's narrative representations formulates an open cognitive system that shifts according to the tension created between the internal cognitive and external textual forms of

presentation. And, as the grade- and experience-specific effects revealed, the resolution of this tension becomes the driving force propelling the gradual transition from pre-conceptual to conceptual modes of thinking.

While Wernerian conceptions of *analogous* psychological processes explain quite effectively heterogeneity in performance in terms of the organismic tie behind experiential-cognitive and cultural-textual meanings, they do not explain the semiotic mediation of textual forms of narration. To identify the dynamic processes behind textual mediation, Wernerian conceptions of analogous psychological processes would have to be integrated with a text-mediated adaptation of Vygotsky's semiogenetic processes.

This integration of Werner's comparative-organismic approach with a text-mediated adaptation of Vygotsky's semiogenetic perspective captures more effectively the dynamic interplay between social-communicative and internal psychological processes. Accordingly, fluctuation in cognitive behavior reflects shifts in the organization of multilinear psychological processes and demonstrates a correspondence between the multidimensionality of the text and children's mental representations of that text. The semiotic processes behind this fluctuation are related to the experiential and textual effects which can be understood in terms of Bakhtin's general phenomena of voice and *dialogicality*, and *hybrid construction*.

In this multiple theoretic perspective, the genetic dramatism of figurative action is explained in terms of the the phenomenon of voice as "the speaking personality, the speaking consciousness" (Holquist and Emerson, 1981). The four types of social relevance identified in this study correspond to the phenomenon of voices and they represent the cultural-conventional meanings articulated by the medium's symbolic forms of narration. They function as points of intersubjectivity present within the ZPD and help the children to derive both textually-denotative and socially-connotative relevant meanings. Thus, with development and experience (inside and outside the classroom) the cultural knowledge base of children increases and they become familiar with various forms of discourse.

As a result, children become sensitive to the complexity behind figurative meaning of content and "learn to speak with and to hear many voices and to integrate them in harmony and in counterpoint" (Cirillo and Kaplan, 1983, p. 249). Each segment's content can be considered "polysemic" and each utterance (i.e., narrative account) can likewise be considered "polyphonic." In each segment, at least two voices (textual-conventional and socio-idiosyncratic) could be heard interanimating one another. This dialogicality of voices indicated that the textuality of each segment the children viewed conveyed meanings on various levels and that there were

multiple ways of approaching the interpretation and representation of its content.

The children's narrative representations, thus, must be explained in terms of their cognitive development and their familiarity with the type of content they viewed as well as their understanding of various forms of social discourse. The interplay of these factors accounts for the greater narrative complexity and thematic continuity that were found in those sequence-driven accounts that included meanings from the textual-conventional, social-conventional, or social-personal contexts. Along with their cognitive development, school instruction, and experience with the communication arts, children learn to participate in the various forms of discourse and recount the content in culturally appropriate ways.

This interaction between developmental, experiential, and textual factors was made evident by the relationship established between social relevance and processing strategies as well as the level at which children integrated this content. Thus, the socio-idiosyncratic meanings scaffolded the semiogenetic social processes behind the children's recognition and manipulation of sign systems presented on the screen. The grade-level and textual variations in children's accounts, therefore, reflect the diversity in their narrative representations of content. This diversity, in turn, reflects the multivoicedness and dialogic properties behind their

communicative processes and the multilinearity of psychological processes behind their cognitive behavior.

Therefore, the children's mental representations of content cannot be described simply in terms of pre-conceptual or conceptual cognitive stages. Experiential concepts (or as Vygotsky would call them "spontaneous concepts") dominate the cognition of the pre-conceptual mode of thinking, and pave the way for the conceptual mode. With the cultivation of the latter, the two are integrated into a broader frame of reference and help the growing child make sense of cultural content. Cognitive viewing behavior, thus, cannot be divorced from the social-affective processes behind the experiential-connotative meaning that helps children make sense of abstract denotative content. The complexity found in children's narrative representations questions the unilinearity and abstract objectivism in Piaget's theory of logical operative thinking.

As the multivoicedness found in children's hybrid constructions demonstrates, all symbolic action is constructive or creative and as a result has the potential for multiple interpretations (Bakhtin, 1981; Burke, 1966; Cassirer, 1944; Geertz, 1973; Kaplan, 1962, 1983; Mead, 1934; Vygotsky, 1987; Werner, 1963). Thus, the developmental differences found in the degree of continuity cannot be explained merely in terms of one-way perceptual and/or two-way conceptual abstractions. This would require considering

symbolic actions as univocal (textual-conventional), constant in meaning and reference, and fixed in connotation and denotation. On the contrary, the multilinear psychological processes identified in these hybrid constructions revealed developmental variations related to fine-tuning of communicative and psychological processes. Specifically, in the psychological domain there are variations in the ways that processes in the perceptual, conceptual, and social-affective domains interact and influence one another. On the other hand, in the communicative domain there are variations in the interanimation of voices reflecting sociocultural normative meaning. In television viewing, therefore, as a semiotic moment, the children actively participate in the construction of semantic meanings; the medium as a social institution and the children as active viewers negotiate the interpretation of content.

Thus, instead of describing cognitive viewing behavior in terms of developmentally distinct qualitative stages, one must consider why certain forms of speaking and thinking (voices) rather than others are elicited in certain situations or tasks. As Donaldson (1978) demonstrated in a series of studies, when a task makes *human sense* it enhances children's cognitive behavior and they can carry it out successfully at an earlier developmental stage than that predicted by Piaget. In this study, when the content was familiar and the medium's production conventions made the content accessible (i.e., in

the first segment), children in all grades performed optimally.

As the grade effects demonstrated, the impact of the facilitative narrative devices was different across the three grades. This medium's facilitation enhanced the performance of the second-graders, who operated at the conceptual mode of thinking, to a greater extent than the kindergartners and pre-kindergartners, who operated at the pre-conceptual mode. That is, the second graders' cognitive behavior ranged from the concrete conceptual to the abstract conceptual modes of thinking. The kindergartners' performance ranged from vague to precise narrative representations of a subset of narrative clusters. The pre-kindergartners' performance ranged from fragmented enumerations of details to inaccurate combinations of narrative clusters. These results further demonstrate that the social formation of narrative viewing competencies evolves developmentally and is related to cognitive, experiential, and textual factors.

Therefore, the results of the present study suggest that for the audiovisual media (television, cinema, cartoons) to fulfill their facilitative role as a social institution, their specialized production conventions must take into account the following developmental and social factors.

1. Narrative viewing competencies are related to both cognitive and experiential factors and evolve developmentally.
2. Children at all ages rely on cultural medium-constructs or paradigms that help determine the reasons for viewing and develop a context of program expectations.
3. Familiarity of content (language used and events presented) enhances the scope of thematic connections the children can make across the narrative flow of content.
4. Although young children show a pictorial preference, auditory features such as music, singing, and other sound effects can be used to guide their attention and to enhance their recognition of textual semantic correspondences.
5. Younger children are better able to comprehend pictorial actional narratives than verbal ones, when they are explicitly presented, because they are closer approximations to their representations of life experiences.
6. The interweaving of explicit-pictorial and implicit-auditory forms of communication reinforce one another and facilitate the recognition of semantic correspondences connecting the narrative flow of content.
7. When explicit pictorial and auditory forms of narration systematically reinforce part-whole textual relationships, they can elicit mental operations by suggesting or cuing the use of those operations for the children who operate at the conceptual mode of thinking.
8. When cinematic techniques serve a "supplanting" rather than an "eliciting" function, the degree of enhancement is limited to a narrow range of concrete textual-conventional and social-personal meanings.
9. Children who operate at the pre-conceptual mode of thinking, their thematic scope of interpretation is restricted to connotative meanings from their experiential-egocentric and social-personal domains. However, those who operate at the conceptual mode, their thematic scope is wider, encompassing both social-conventional and social-personal content.

Thus, the former group cannot go beyond the information presented on the screen, while the latter can do so and as a result integrate effectively denotative and connotative textual content.

10. With specialized production conventions, children operating at the pre-conceptual mode of thinking, recognize semantic correspondences restricted to a subset of narrative clusters and their thematic scope is confined to a concrete contextualization of content. However, for those who operate at the concrete conceptual mode, the medium's facilitation help deduce thematic connections and integrate the content within a textually and socially relevant context.

Thus, with or without facilitation, the accounts of the pre-schoolers are embedded in an experience-driven thematic scope and their representations of content are narrow. However, with facilitation, the second-graders' accounts are broader in scope, and their mental representations include both concrete and abstract textual and social content.

Appendix A

Parental Questionnaire for children's viewing program
preferences and viewing styles.

Please answer the following questions with your child so that I can determine her or his program preferences and viewing style.

Child's Name: _____ Birth Date: _____

Child's School: _____

Parent's Occupation(s): _____

Your child's eligibility to participate in this study will not be determined by the way in which you answer the following questions:

1. Does your child watch:

Television?	Yes _____	No _____
Video Tapes?	Yes _____	No _____

2. What type(s) of programs does your child watch?

Cartoons	_____
Live Drama	_____
Documentaries	_____
Other	_____

3. For approximately how many hours each day does your child watch televisions or video tapes? (fill in appropriate number)

Television	Videos
on weekdays _____	on weekdays _____
on weekends _____	on weekends _____

4. Does your child usually watch television (or video tapes) alone?

Yes _____ No _____

5. With whom does you child watch television (or video tapes)?

adult family members	_____
older siblings	_____
younger siblings	_____
older friends	_____
peers	_____
younger friends	_____

6. Does your child engage in conversation concerning the content of the program while he or she is watching television (or video tapes)?

Yes _____ No _____ Sometimes _____

7. With whom does he or she usually engage in conversation while he or she is watching television (or video tapes)?

adults _____ older siblings or friends _____ peers _____
younger siblings or friends _____

8. Please list the name of some of your child's favorite cartoons or other types of programs:

9. Is there anything else especially interesting about your child's viewing habits you would like to share with me?

Appendix B

Summary of the three experimental segments the children
viewed in this study.

First Segment

Textuality

Formal features and compositional cinemantic techniques

- **Direct forms of presentation:** Pictorial immediacy of people's thoughts, emotions, and actions.
- **Direct-indirect forms of presentation:** The overlap between explicit-pictorial and implicit-linguistic forms of articulation reinforces and facilitates the interpretation of the segment's narrational meanings.
- **Composition of cinematic techniques:** The organization of the various pans, cuts, dissolves, and zooms systematically reinforce part-whole narrational relationships.

For example, the concept of distance traveled is conveyed by presenting the pioneers at different locations with continuous reference to the point where Johnny watches them. Also, Johnny's excitement in pioneering is conveyed through the continuous return of Johnny's emotional and intellectual involvement with the situation.

Content

Main theme: The excitement surrounding the pioneering activities and Johnny's change of attitude towards his occupation.

Context Sequence 1 Situates Johnny in a socio-historical context with respect to his character, lifestyle, and occupation. That is, a context displaying the predominance of agriculture during the preindustrial era, Johnny's love and enthusiasm in his farming activities, the courage and excitement behind pioneering during this period, and the distance traveled by the pioneers.

Core Theme 1 Sequence 2 Johnny's looking at the pioneers going West and pretending that he was a courageous man like Davy Crockett and has joined them.

- Core Theme 2** Johnny's change of attitude towards his work, i.e. planting apple trees, as a result of his witnessing the pioneers going West and pretending that he was one of them.

Second Segment

Textuality

Formal features and compositional cinemantic techniques

- **Indirect forms of presentation:** Characters, their activities, intentions, and passage of time are articulated implicitly. Children had to infer the passage of time and the character's activities through the changes in the landscape and of the seasons, as well as through the narrator's linguistic forms of communication.
- **Composition of cinematic techniques:** The composition of the various cinematic techniques: cuts, pans, dissolves, and zooms are organized in a linear form. There is no explicit-pictorial reinforcement of the implicit-linguistic forms of communication. Nor is there systematic reinforcement of the part-whole narrational relationships articulated in the segment. That is, the flow of content progresses in time without returning to a reference point.

Content

Main Theme: Johnny's contribution to the transformation of the wilderness into settlements and his influence on the lifestyle of the pioneers.

Context Sequence 1 Presents the wilderness where Johnny was planting apple trees.

Core Theme 1 The passage of time as shown through the growth of the apple trees that Johnny plants and as shown through the seasonal changes.

Core Theme 2 Sequence 2 Johnny's making friends with pioneers as a result of his kind and generous contributions to their settlements.

Third Segment

Textuality

Formal features and compositional cinemantic techniques

- **Direct forms of presentation:** Graphic immediacy of Johnny's actions and activities.
- **Direct-indirect forms of presentation:** The pictorial and linguistic forms are integrated and overlap but they are not explicitly connected. As a result, the former neither reinforces nor facilitates the interpretation of the latter.
- **Composition of cinematic techniques:** The various pans, cuts, dissolves, and zooms are organized in such a way that they present a dynamic flow of content. However, there is no explicit reinforcement of the part-whole narrational relationships among the thematic elements presented in this segment's flow of content. For example, the concept of distance traveled is conveyed by presenting Johnny walking across the wilderness and becoming an old man.

Content

- Main Theme:** Johnny's undaunted courage in fulfilling his mission to plant apple trees under adverse conditions across the country.
- Context:** Johnny's walking in the wilderness and planting apple trees across the country.
- Core Theme 1:** Sequence 1 Johnny's traveling, under severe conditions, through the wilderness and planting apple trees across the country.
- Core Theme 2:** Sequence 2 Johnny's aging and becoming a tired old man after a lifetime's work.

Appendix C

Transcription of the segments used in the practice condition
and in the three experimental segments.

Practice Condition

Camera Techniques and Iconic FormsFade in:

A blue and green pastel background dotted with stylized apple trees; "A Walt Disney Production".

Pan downward:

To credits, technical credits.

Dissolve:

Dark background. A brush comes across and light blue paint spreads down the screen. "Presenting Dennis Day".

Slow pan down:

"Portraying the characters of THE OLD SETTLER, JOHNNY APPLESEED and JOHNNY'S ANGEL".

Fade out:Fade in:

A tan leather volume--American Folklore. The book opens: Paul Bunyan's ax. The page turns: John Henry's hammer. The page turns: Davy Crockett's gun.

Zoom in and pan up:

The page turns: a tin pot, a bible and a sack in a stylized apple tree.

Verbal Symbolic FormsNarrator (N):

On the pages of American folklore, a legion of mighty men have left the symbols of their greatness. There was Paul Bunyan's axe, John Henry's hammer, Davy Crockett's rifle,

and then, quite unexpectedly, one comes across a tinpot hat, a bag of apple seed, and a holy book. And strangely enough, these are the symbols of one of the mightiest men of all,

Camera Techniques and Iconic Forms

Pan up:

The page turns and we see a plaque:

"IN MEMORY OF
JOHN CHAPMAN
PIONEER
B 1774 - D 1845".

Zoom out:

Printed on the page below plaque:
"The Legend of Johnny Appleseed".

Continue zoom out:

An emblem: a sunset over Pittsburgh,
with apple trees in blossom in the
foreground. Below are printed the
words, "Among the early settlers of".

Slow zoom in:

The emblem

Cut to long shot (C/TR):

Pittsburgh beneath a cloudy sky, with
apple trees in blossom.

Slow zoom in:

Clouds, pictured against a sunset.

Verbal Symbolic Forms

John Chapman, a
real-life
pioneer.

With the passing
years, however,
reality has given
way to legend,
until

today we know
this remarkable
man simply as
Johnny Appleseed.
This is his
story,

told by an old
settler who knew
Johnny well.
Listen:

Settler (S):

Well sir, every
time I see an
appleblossom sky,
I think of Johnny
Appleseed.

'Cause of course
them clouds up
thar, they ain't
really clouds at
all. No, sir.
By shucks, there
wouldn't be no
appleblossom sky
if it weren't for
the fact that
Johnny...

Camera Techniques and Iconic FormsPan down:

Apple trees in foreground, modern-day
Pittsburgh beyond with smoke rising
from chimneys.

Dissolve:

Old Pittsburgh. The apple trees are
now green, not in blossom. Trees in
background now bear yellow and orange
leaves.

Verbal Symbolic
Forms

But now hold on
here--guess I'd
better start back
to the beginning.
And that's when
Johnny lived on a
farm near
Pittsburgh town.

The year was
eighteen-six or
maybe there
around.

Camera Techniques and Iconic FormsStationary camera:

Johnny Appleseed's farm with Old Pittsburgh in the background. Johnny wheels a wheelbarrow into the foreground.

Cut to medium shot (C/DR):

Apple tree, the river and Pittsburgh. Johnny, with a basket balanced on his head, starts to climb the ladder into the apple tree.

Slow zoom in:

Johnny in the apple tree.

Cut to closer medium shot (C/DR):

Johnny in the apple tree. Two birds land on his basket. Johnny is picking apples.

Cut to close-up (C/DR):

Johnny pours apples that he has gathered in his apron into the basket. Two birds hover over the basket.

Pan across:

Johnny's hands and finally his head emerge from the tree as he picks apples. He balances an apple on his finger

Cut to medium shot (C/SQ):

Basket in the tree. Johnny slides into view and dumps more apples into the basket.

Quick pan up:

Apples silhouetted against the sky.

Verbal Symbolic Forms

Now, just to look at him you'd say Johnny Appleseed never would make a pioneer. He was such a sawed-off, scrawny little fella.

'Course that didn't faze Johnny none.

Shucks, he had his apple trees in the mornin' sun and the evenin' breeze.

(whistling)

Johnny (J):

(singing) The Lord is good to me, And so I thank the Lord,

For givin' me the things I need,
The sun and rain
and an apple seed, yes, He's been good to me!
(whistling)

I owe the Lord so much, For

ev'rything I see,

Camera Techniques and Iconic FormsVerbal Symbolic Forms

Cut to medium shot (C/SM):
Johnny.

I'm certain if it
weren't for Him,

Pan to follow:
Johnny climbs along a limb. He
bounces once on the limb.

Cut to medium shot (C/EL):
Apples silhouetted against the sky.
Johnny comes up into frame, finishing
the bounce from the previous shot.
He grabs an apple and falls back out
of frame. The whole branch shakes
and many apples go up in the air.

There'd be no
apples on this
limb, He's

Cut to medium shot (C/EL):
Johnny has landed back on the limb.
The apples from the previous shot
fall down into frame. Johnny gathers
them out of the air.

been good to me!

Pan to follow:
Johnny as he walks along the limb.

Oh, here am I
'neath the blue,
blue

Zoom in slightly:
Johnny pours the apples into the
basket. The two birds fly back into
frame.

sky, A-doin' as I
please:

Cut to close-up (C/SQ):
Johnny takes out a knife. As he
peels the apple in his hand, the
birds grab the peel and pull it away.

Singin' with my
feathered
friends,

Short pan across:
As Johnny turns, bees fly in and eat
the apple, leaving only the core.

Hummin' with the
bees!

Cut to medium shot (C/SQ):
The apple tree. Johnny picks up the
basket and prepares to descend from
the tree.

I wake up ev'ry
day,

Transcription of the first experimental segment.

Camera Techniques and Iconic FormsPan to follow:

Johnny starts down the ladder.
Suddenly he falls out of frame with
the basket. The apples remain in
frame.

Cut to medium shot (C/EL):

Johnny stands on the ground. He
holds out the basket and the apples
from the previous shot fall into
frame, and Johnny catches them in the
basket.

Pan to follow:

Johnny as he puts the basket on the
wheelbarrow atop two other baskets.

Continue pan:

Johnny pushes the wheelbarrow.

Verbal Symbolic
Forms

As happy as can
be,

Because I know
that with His
care, My apple
trees they will
still

be there, Oh, the
Lord is good to
me!

(whistling)

Camera Techniques and Iconic FormsVerbal Symbolic FormsCut to long shot (C/SQ-TR):

Apple tree with Pittsburgh and river in background. Johnny pushes the wheelbarrow with the baskets.

Pan to follow:

Johnny crosses the orchard, goes behind a building, and emerges from the other side of the building, where there are many baskets

Dissolve to medium shot:

Apple orchard. Underneath the apple trees in the background is a fence. Johnny is kneeling near his wheelbarrow. He is planting an apple seedling. He looks up and looks around.

Cut to long shot (C/SQ-DR):

Pittsburgh in the background, multi-hued orange and yellow treetops, with apple trees in the foreground. Back among the trees, tops of Conestoga wagons move along in file from left to right.

Slow zoom back:

Apple trees in foreground.

Continue zoom:

Base of the apple trees and the fence. Beyond the fence is a road along which wagons move from right to left. Johnny goes to the fence in the foreground to watch them pass.

Cut to close-up (C/SQ):

Cattle walking among the passing wagons, which carry men and children. All is obscured by a cloud of dust. Children in one wagon wave.

S: Workin',
singin', carefree
and gay. That's
how Johnny spent
each day:
attending to his
apple trees.

(music)
But lately little
Johnny here would
feel a stirrin'
in the air;
(singing in the
background)

A rumblin',
rollin' underbeat
of restless men
and restless
feet.

(pioneers
singing)
"...plenty of
room for you...

"Get on a wagon
rollin' west,

"Out to the great
unknown, Get on
the wagon rollin'
west

Camera Techniques and Iconic FormsCut to close-up (C/SM):

Johnny is at the fence, the cloud of dust in front of him. He waves back to the children from the previous shot.

Cut to medium shot (C/SM):

Wagons carrying singing women move forward.

Cut to close-up (C/SM):

Wagons, pioneers, men on horseback, dust. The men sing as they pass.

Cut to close-up & slow zoom in

(C/SM):

Johnny Appleseed stares intently.

Zoom in to extreme close-up:

Johnny singing.

Dissolve to long shot:

Trees, mountains in the background with wagons traveling along a road through the trees and into the foreground.

Dissolve to another long shot:

River in foreground, dark forest in background. In the middle distance are wagons and a cloud of dust going straight across the screen.

Slow zoom in and pan:

Wagon train.

Verbal Symbolic Forms

"Or you'll be left alone! We made a home before,

"We're startin' out again,

"We ain't afeared of [...],

"We're strong-hearted men!

"So, get on the wagon rollin' west,

"Seein' a land that's new, Here on the wagon rollin' west, There's plenty of room for you! Get on the wagon rollin' west, Out to the great unknown,

"Get on the wagon rollin' west,

"Or you'll be left alone! The rivers may be wide,

Camera Techniques and Iconic FormsDissolve to close-up:

Wagons, pioneers and a cloud of dust which slowly overtakes the entire screen. Emerging out of the cloud of dust comes a silhouette of Johnny. He wears a coonskin cap and carries a gun. He marches through the dust into the foreground, singing, as the gun transforms into an apple seedling. As he looks at the seedling, his hat disappears from his head. He reaches for the hat and pats his head. He looks down at himself, and his buckskin shirt dissolves back into a white shirt with a vest.

Dissolve:

The cloud of yellow in the background dissolves to reveal the apple orchard.

Pan down slightly:

Johnny turns and stumbles backward into the fence. He looks around in wonder.

Cut to long shot (C/SQ):

The end of the wagon train recedes down the road with mountains in the background.

Verbal Symbolic Forms

"The mountains may be tall, But nothin' stops the pioneers, We're trailblazers all!"

(Johnny's voice emerges as chorus fades low)

"So, get on the wagon rollin' west, Out to the great unknown! Get on the wagon rollin' west, Or you'll..."

(Johnny's voice stops as chorus continues low)

"...be left alone, You'll be left alone, You'll be left alone..."

S: Poor Johnny.

He warn't no pioneer and he knowed it. It was all just pretend. And them folks goin'

west to build this nation sure made pickin' apples look like a plum useless occupation.

Transcription of the second experimental segment.

Camera Techniques and Iconic FormsCut to long shot & slow zoom back
(C/DR):

The clearing at the edge of the forest. All the animals look on as Johnny turns and walks into the forest.

Dissolve & slight zoom back:
Wider shot of the clearing with trees framing the foreground. A blue sky looms above the forest in the background.

Dissolve to long shot:
The same scene at night. Rain starts coming down on the clearing. Colors fade to dark purples and greens.

Cut to close-up & slow pan across
(C/DR):
The furrows are now long puddles of water.

Dissolve & continue pan across:
The color of the earth changes from muddy gray-green to brown in the clearing. Apple tree sprouts appear, and the water disappears from the furrows. The rain has stopped.

Slow zoom back:
A wind comes up. The young trees sway in the wind as orange and yellow leaves fly across the scene.

Dissolve to long shot & zoom back:
The river in the foreground, with rows of young apple trees beyond. In the background is a forest of trees with red leaves.

Dissolve & continue zoom back:
Snow falls as the autumn scene becomes a winter scene. The field is white with snow, dotted by the bare trunks of the young apple trees.

Verbal Symbolic Forms

J (singing): The Lord is good to me, And so I thank the Lord,

For givin' me the things I need,

The sun and rain and an apple seed, yes, He's been

good to me!

(music rises)

(harp glissando)

(string descent & bells)

S: Well, as time went by, Johnny kept right on a-plantin' his apple trees

Camera Techniques and Iconic FormsDissolve & continue zoom back:

The young apple trees in the foreground bear green leaves again. The trees sport puffs of pink blossoms.

Cut to high angle & zoom back

(C/TR-DR):

The river runs by rows of apple trees. In one corner of the clearing sits a tiny log house with smoke coming out of the chimney. As the frame widens, many small clearings appear along the river and in the forest. Each clearing is planted with rows of blossoming apple trees. A few of the clearings feature little log houses. Mountains appear in the background.

Stop zoom.Dissolve:

The color of the apple trees changes from pink to a light green. Patches of the forest disappear so that the clearings are larger, and a few are now connected. More houses appear.

Zoom in slightly.Cut to long shot & zoom in (C/DR):

A log house with a stone chimney in a clearing. Benches and tables are laid out next to the house. Settlers walk around among the apple trees.

Verbal Symbolic Forms

and makin' friends everywhere. And his best friends was

the pioneers, for of course John was plantin' more than an apple tree: he was plantin' his own boundless faith and courage, too. And that give folks new heart,

new hope for the job they had to do.

And as more and more pioneers come to push back the forest,

the kindly deeds of little Johnny Appleseed

spread throughout the land.
(fiddle music)

Camera Techniques and Iconic FormsContinue zoom in:

Women set food out on long wood tables.

Cut to close-up & pan across (C/DR):

Table set with apples, apple pickles, apple dumplings, apple fritters, jugs of apple cider and mugs. A woman's hands appear and place a pie on the table. A barrel sits at the end of the table.

Continue pan into long shot & stop pan:

A ring of people surrounds a group of square dancers in a clearing amid the apple trees. The people all clap their hands with the rhythm.

Cut to medium shot & zoom in (C/DR):

Square dancers.

Stop zoom.Verbal Symbolic Forms

And more than once, with a good old-fashioned jubilee, folks would honor Johnny Appleseed

and the fruit of the apple tree.

(square dance music and caller)

(square dance music and caller)

Transcription of the third experimental segment.

Camera Techniques and Iconic FormsCut to close-up (C/SQ):

Johnny looks to the right, with chipmunk eating a fritter on his shoulder. Johnny reaches up and plucks an apple, looks at it with pleasure, polishes it on his shirt, takes a bite, turns to the left and starts to move out of frame.

Cut to medium shot (C/SQ):

Johnny walks into the forest. The small animals gather around him. He gives a rabbit a bite of his apple as he walks out of frame.

Dissolve to long shot & pan to follow:

The dark forest, with large trees in silhouette. Walking out of the forest in silhouette is Johnny, surrounded by animals.

Continue pan:

Johnny emerges onto a panoramic view of the forested wilderness.

Continue pan to extreme long shot:

A river snakes off toward distant hills.

Zoom back & dissolve to long shot:

Johnny fords a river, with rapids in the background.

Dissolve to long shot:

Johnny trudges through a winter scene, with heavy snow & trees bending in the strong winds.

Verbal Symbolic Forms

some applesass?

Settler G: Yes, thanks!

(light music)

S: Yep, Johnny did bring folks a heap of happiness. But shucks, he warn't looking for thanks--

didn't have time for it. He knowed a man can't take

no rest if he aims to plant the whole darn wilderness in apple trees.
(music darkens)

(horn flourish)

And so it was, for more'n forty year

Johnny walked and planted that old frontier.

(horn flourish; cymbals)

Camera Techniques and Iconic FormsVerbal Symbolic FormsDissolve to long shot:

Johnny, in silhouette, comes forward along a narrow path lined by steep rock cliffs. Flashes of lightning and pelting rain prove no obstacle to Johnny, who continues on his path. Fade to black.

(horn; thunder)

Dissolve to medium shot:

Johnny leans over, tending a young apple tree on a hilltop. Animals come up around him. The foreground brightens as the sun rises in the background.

(music softens)
Yessir, forty
years of walking
and planting. In
the space of two
score year this
(chorus rises)

Cut to long shot (C/DR):

Johnny stands atop the hill. The sky behind him is yellow. Johnny's shadow expands rapidly down the hillside.

little man,
(chorus rises)

Pan down:

Shadow continues to expand down the hill.

he throwed his
shadow clear
across the land,

Pan across:

Shadow continues to expand over acres of apple trees in bloom and a lone log cabin.

across a hundred
thousand miles
square.
(chorus rises)

Continue pan:

Shadow falls across a river, across hills and past houses and apple orchards.

(chorus swells)

Continue pan to extreme long shot:

The countryside is divided into squares of farmed land. Johnny's enormous shadow expands to cover these plots, a forking river, and finally the shadow swells to cover the land to the horizon.

And in that
shadow
everywhere,

Camera Techniques and Iconic FormsStop pan & zoom in:

A large apple orchard sits at the fork of a river.

Dissolve to medium long shot & pan down:

Tops of apple trees in blossom, with a gold and pink sky behind the mountains in the background. The apple trees rise in the frame until pink and white apple blossoms fill the frame.

Continue pan down & zoom in:

At the base of the apple trees, a smiling, white-bearded Johnny sits sleeping beneath the centermost tree. Several animals lie sleeping around him.

Verbal Symbolic Forms

you'll find he
left his
blessings three:

Chorus (singing):
Love, and
faith...

and the apple
tree....

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