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An investigation into the drawing plans of children.

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AN INVESTIGATION INTO THE DRAWING PLANS OF CHILDREN

by

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ABSTRACT

Seventy-two children from 12 Junior-grade classrooms across a border city in Ontario were observed as they planned and executed drawings thematically generated by the subjects. Six of the classrooms were classified by teacher report as having greater emphasis on a process-conference writing instruction while survey results indicated that the other six had a more traditional approach to writing. The drawing process, the plans, and the final products were carefully documented so that the planning strategies used by these students could be compared to past research on planning during the writing process.

An analysis of the data collected revealed that most of the drawing plans are at what has been called the content generation stage with indications of conceptual planning beginning in the higher grades. Contrary to expectation, the students in the more traditional writing classes spent more time talking about and planning their drawings. Comparisons by gender indicated that girls at this age in this study take a more careful or cautious approach to drawing plans . A Taxonomy of Planning Categories for Children's Drawings (Grades 4-6) was developed using the data gathered.

DEDICATION

This paper is dedicated to my friend and colleague, Jean Tesolin, whose love, encouragement and support sustained me through the many hours of hard work required to complete this study and the other courses for my Masters degree. I also want to thank my husband, Philip, and daughter, Kerri, for their love, support and patience during these many months. They often had to "make do" in my absence or while I was working. Finally, I want to thank my whole family for their interest and encouragement.

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CHAPTER I

Introduction and Background

Children's drawings have been studied from many perspectives. One of the most recent, comprehensive, annotated bibiliographies on children's drawings (Verteramo, 1988) examined thirty-one studies for the purpose of shedding light on issues of developmental stages, perceptual problems, instructional methods that influence learning in children's drawings, and the influence of age and sex on differences in development. In summary, the research indicated that: (1) children pass through different stages of development in their drawings; (2) strategies used by children for drawing become more complex as they mature; (3) spatial relationships are depicted in various ways by children; and (4) methods used by instructors in drawing classes included training in self-instruction and stimulation through verbal, graphic, or sensory means.

One recommendation from this review was that children should be observed as they plan and execute their drawings in order to compare the growth they have made relative to previous work they have produced. By becoming more aware of each child's developmental level, Verteramo argues, teachers would be better equipped to select stage appropriate tasks and incorporate a variety of methods in drawing instruction.

A search of two relevant databases, the Education Resource Information Centre and Psychological Literature, regarding relevant literature revealed two research studies in the area of drawing plans. One study (Golomb & Farmer, 1983) attempted to document the early graphic planning strategies employed by children, ages three to seven, when a theme is specified. The researchers paid careful attention to recording drawing sequences for single and multiple objects. They found that the spatial and

temporal sequences employed by the subjects, such as the top-to-bottom sequence used to draw a human and the bottom-to-top sequence used to draw flowers, were task-dependent and flexible. Although the researchers found that some compositional strategies, such as pictorial balance, required abilities beyond the capacities of children in this study, they observed that most abilities to organize spatially became progressively more complex with age. Another study (Morra, Moizo, & Scopesi, 1988) presented a conceptual framework and a process-structural model of the planning of drawings by children, ages 6 to 11. The aims of Morra, Moizo, and Scopesi were to: (a) explore the development of children's ability to plan their drawings, and (b) provide some evidence that when analyzing children's drawings the limitation of the human-information-processing system should be taken into account. The drawing task they designed allowed for the study of quantitative relationships between the capacity of working memory and the ability to plan in advance a complex drawing. Subjects were asked to: (a) give a verbal description of the scene they intended to draw, (b) point on a white sheet at the positions where they would draw each element of the scene, and (c) finally draw it. Two experiments proved the model's prediction that the different patterns of results were a function of the working memory capacity of the subjects. Apart from these two studies, little research appears to have been done specifically on the planning strategies of children when drawing.

Significance of the Problem

Gardner (1982) considers the preadolescent stage a crucial time in the child's development since it is during these years that rules and conventions governing the realms of symbols become mastered. Gardner believes that it is during the preadolescent phase that education must assume a more active role in the instruction and appreciation of drawing. Skills need to be acquired

at a rapid rate so that by adolescence students can express themselves competently through graphic symbols or, more importantly, are able to evaluate critically their own work and the visual imagery that daily assaults their perceptions. When children are presented with problems, exposed to various solutions, and given practice in evaluating and improving them, criticism becomes for them a familiar tool that can be applied judiciously and accepted graciously.

Similarly, Sless (1981) stresses the importance of visual education in the curriculum for children:

> If our general education does not, in the formative years, develop and enlarge the expectations students have of visual material, we lose a potential method of understanding which higher education cannot fully take advantage of without engaging in remedial activity. Incorporating visual education into the general curriculum must be the long-term consequence of the realisation that vision is an intellectual process. (p.180)

Unfortunately, it is during early adolescence (Grades 7 to 8) that the instruction of drawing becomes most challenging for teachers. From ages 2 through 7 children's capacity to use, manipulate, transform, and comprehend various symbols matures at a ferocious pace (Gardner, 1976). Specific instruction has little effect on what children do at this time and they seem propelled by a dynamism all their own. By age 7 or 8, children appear to have a basic grasp of the major symbolic media of the culture, such as an understanding of what makes a story, and they appear to possess the raw materials to construct a work of art. However, by the time most students enter the junior level, ages 9 to 11, the spontaneity and creativity brought to their drawings in early childhood have disappeared. Colouring books, picture books, magazine art, newspapers, comics, and television's animated cartoons contain adult-devised formulas for representing objects and are offered as models for young children to emulate at home and in school settings. The

naturally made art symbols that are part of the young child's visual language often do not coincide with these adult representations (Kellogg, 1969). As a result, students lose interest in drawing because methods of art instruction are more concerned with these adult images and consequently frustrate or confuse children. Feldman (1970) observed that preadolescents who are overly concerned with differences in representational ability may copy to compete with or win approval from peers, and may participate in art with less inner direction than younger children. Gardner (1976) attributes adolescents' lack of enthusiasm for art to a development of critical reasoning skills that may cause them to compare their work unfavourably to more highly skilled individuals.

One possible solution to this challenge may be found in a recent book, Envisioning Writing (Olson, 1992), which outlines a teaching methodology that integrates drawing and writing. The author suggests that very few teachers are aware of the similarities between drawing and writing or using them to develop skills in both. The foundation for this book was a visual-narrative drawing program piloted during 1978-1979 at a public school in Massachusetts (Olson & Wilson, 1979). All the art classroom activities and projects for the year were based upon telling stories visually or upon developing graphic vocabulary and grammar skills needed for visual narration. Through drawing, the storytelling components of character, setting, plot, and special effects were stressed. All the classroom and special education teachers were shown how visual narrative could become a central part of other subject areas -- particularly writing, literature, social studies, music, and drama.

Olson (1992) states that, "For most children, their words feed their drawings and their drawings feed their words. Through this continual

transaction between two symbol systems, both systems grow in amazing ways" (p. 30). In order to help educators develop a clearer understanding of the interdependence of drawing and writing, Olson describes the historical development of written language as it evolved from pictorial pre-writing systems to phonetic scripts. Brief summaries of the educational practices of Rousseau, Froebel, and Alcott, as well as the theories of Vygotsky, are provided because all emphasized the natural connectedness between drawing and writing.

It seems worth asking whether the visual expression that children of the primary level seem to employ so effortlessly could continue to develop past the junior grades, if the generalist teachers of the Windsor Roman Catholic Separate School Board (WRCSSB) at the junior level were given a methodology for drawing instruction that takes advantage of writing and drawing similarities. This methodology could follow the model of writing process instruction, which has been the thrust of writing in-service programs for teachers within the WRCSSB for the last few years. By using this methodology, teaching in both areas conceivably would benefit and be reinforced. In effect, if the educational goals, beliefs, and instructional strategies for teaching visual and verbal expression could be viewed as being complementary rather than different, supportive rather than competitive, the learner would benefit a great deal.

However, before extending the methods of writing process instruction into drawing, it is necessary to observe carefully how children plan and execute their drawings. These observations could then be compared to studies of how children plan and compose during writing. This will provide support for the view that certain processes and strategies used in the instruction of writing could apply to drawing instruction.

Purpose

The purpose of this study is to examine the strategies children in Grades 4 to 6 employ when planning a drawing in which the theme of the drawing is self-generated by the subjects being observed. The focus is on the nature of the planning children do before executing a final product and the appearance of the plans during the composing process. Previous research has been conducted on children's writing plans and is employed as our basis for comparison. The definition adopted for planning in this study is that of Bereiter and Scardamalia (1987); that is, "the predetermination of a course of action aimed at achieving a goal" (p. 193). In their model planning is viewed both as an orderly sequence carried out before actual composing and as a much less orderly process characterized by the planner's willingness to follow opportunities as they occur during composing. This definition thus covers every aspect of planning, from situations in which the problem is analysed and goals are set previous to writing, to instances where goals are established or altered during the course of writing as various obstacles occur.

Definitions

Conceptual planning- the type of planning that deals with goals, strategies, organization, etc.

Content generation planning- the type of planning that results in the creation of material or ideas which is reproduced more or less intact in the final drawing.

Junior grades- in Ontario, Grades 4, 5, and 6 are classified by the Ministry of Education as the junior division and are thus often referred to as the junior grades.

Planning- "the predetermination of a course of action aimed at achieving a goal" as adopted by Bereiter and Scardamalia (1987).

Prewriting - One stage in a three-stage linear model of composing posited by Rohman and Wlecke's (1964) investigation of the effects of "pre-writing exercises". The other stages in this popular composing process model were "writing" and "re-writing" and all three have been the focus of later research. It was once thought that the generation of ideas, plans and preparations for writing took place mostly during this prewriting stage which preceded the writing phase.

Process-conference writing instruction- a methodology of writing instruction that involves students in the processes of prewriting, composing, revision, and editing in the actual classroom. In this method the teacher provides support and instruction through conferences with an individual student or small groups.

Traditional writing instruction- This writing methodology emphasizes that the mechanics of writing, such as spelling, grammar, punctuation and handwriting be taught primarily through exercises and drills apart from the actual writing of student compositions.

Secondary school- applies to schools in Ontario which provide education from grade 9 to the Ontario Advanced Credit year, following which students are eligible for university entrance.

Review of the Related Literature

In a study by a team of researchers at Harvard Project Zero, an attempt was made to clarify the relationships across different symbol systems (Gardner & Wolf, 1983). The patterns of growth that appear restricted to a particular symbolic domain were referred to as "streams of symbolization", while other features that seemed to cut across a range of symbol systems were characterized as "waves of symbolization" (1983, p. 26). It is these "waves of symbolization" that have more application to this current study.

Gardner and Wolf (1983) define a wave as being a psychological process which develops at a certain time in childhood and is observed initially in one or perhaps two symbolic domains. Like waves, these processes have the tendency to flow over wide areas and ultimately appear in other symbol systems where they were not anticipated. They believe that four waves of symbolization emerge at approximately year-long intervals in the period between age 2 to age 5. These waves consist of: (1) event or role structuring, (2) topological mapping, (3) digital mapping, and (4) notational symbolization. At about age 2, a child develops the ability to structure events or roles. This is first observed as the child acquires language or engages in imaginary play, pretending that an object represents something else. However, evidence of this process being inappropriately used was discovered when a two year old in the study was asked to draw a truck or a car. He was observed moving the drawing marker like a toy truck and pantomiming the appropriate sounds and movements. Here the pyschological process of role-structuring appeared to invade the domain of drawing, or topological mapping, converting the task into an event structuring occasion. Similarly, in studies by Dyson (1983,1986a & 1986b, 1987), when young children were asked to write a story, the end product more closely resembled a drawing. In these cases a process involving topological mapping was called upon to solve a task that required the use of notational symbolization.

What appeared peculiar to human beings in this research was the ability to transfer certain core psychological processes from one domain to another, whether appropriately or inappropriately. "Thus, the capacity to structure events, which we see as part of the linguistic domain, has the potential during the third year of life to be mobilized by other intellectual domains such as drawing or dancing"(Gardner & Wolf, 1983, p. 36).

Strengthening the view that capacities developing in one domain may influence development in others are those studies that have revealed the differing roles that speech, drawing, play and gesture assume in the development of literacy for different children (Caldwell & Moore, 1991; Daiute, 1990; Dyson, 1983, 1986a, 1986b, 1987, & 1988). Research has also shown that young children convey meaning through many different communication systems, using what they know about one system to support the understanding of another (Harste, Woodward & Burke, 1984; Karnowski, 1986; Olson, 1992). Influenced by these studies, an increasing number of researchers and educators have prescribed interesting models for curriculum. By integrating many forms of communication, they have used one symbolic form to enhance another while language was being developed. (Daiute, 1990; Dyson, 1986a & 1986b; Harste, Woodward & Burke, 1984; Moffett & Wagner, 1983; Olson, 1992; Thaiss & Suhor, 1984; Caldwell & Moore, 1991).

In the most relevant example for the present study, Harste, Short and Burke (1988) describe the "Authoring Cycle" as a model for curriculum in which meaning generation is regarded as the essence of learning and authoring becomes a metaphor for a more general process of meaning construction. They suggest that drawing, drama, movement, music, and math be at the core of the curriculum along with reading and writing on the grounds that all these areas involve authoring and the processes of origination, negotiation, and revision. They argue that if curriculum includes only those systems that emphasize language, many types of meanings may be overlooked, simply because they are not possible through linguistic expression.

Although it is difficult to find many arts educators who have advocated teaching art through reading, writing, or talking, a few have

believed that it would be beneficial to examine current "literacy models" and apply appropriate strategies from them to the teaching of various processes belonging to the arts domain, such as drawing, art criticism and aesthetics. Hagaman (1990) described how the Philosophy for Children Programme in critical thinking, which employs the community of inquiry and sociocognitive learning theories, could be used as a pedagogical model for developing collaborative learning approaches in art education, especially aesthetics. In another paper, Houser (1991) proposed a "Collaborative Processing Cycle of Art Education" (p. 34) which was inspired by Harste's Authoring Cycle. Murdick and Grinstead (1989) employed the collaborative learning most commonly used in modern writing classes in a beginning drawing class at California University of Pennsylvania. Students were paired and asked to produce a single drawing of a still life three times. Through collaboration, students shared insights that increased their visual perceptions, which they may not have developed alone. The experiment resulted in improvements in the students' work and changes in their understanding of how to accomplish a still-life drawing.

Planning in Writing

Much recent research in writing comes from a cognitive view of composing (Faigley, Cherry, Jolliffe, & Skinner, 1985). This view is popular with teachers because it assumes that the goal of composing is communication, that writing abilities follow a developmental sequence, that composing is an orderly process from which principles can be abstracted, and that these general principles can be used to teach writing. Although some research rejects the position that planning and production are distinct (Emig, 1971; Flower & Hayes, 1981b), studies of composing often deal with only one part of the writing process, either planning, producing text, or revising. By

examining studies that have been conducted on the planning process in writing we may come to a better understanding of how children plan while drawing.

The planning phase in writing has been examined from many perspectives. Different studies have looked at when planning occurs, the timing of planning, the nature of planning, and planning strategies. The subjects of these studies have ranged from professional writers or experts to young children and novices. From these studies it is apparent that children's writing plans are quite distinct from the plans of expert writers.

Some researchers have claimed that most plans for writing occur before individuals begin to put words on paper during what has been termed the stage of "invention" (Winterowd , 1975), "the pre-writing phase" (Emig, 1971) and "rehearsal" (Graves, 1975). Winterowd used the term invention when referring to the process whereby the writer discovers subject matter. In her study of Grade 12 students, Emig (1971) defined prewriting as

> that part of the composing process that extended from the time a writer began to perceive selectively certain features of his inner and/or outer environment with a view to writing about them--usually at the instigation of a stimulus--to the time when he first puts words or phrases on paper elucidating that perception (p. 39).

On the other hand, Graves (1975) sees the drawing and role-playing children do before writing as the beginning of compositional planning or a rehearsal of the writing process.

Early researchers also focused on the duration of planning by writers of various ability. They noted that prewriting sessions of secondary and post-secondary students tended to be very brief (Pianko, 1979; Stallard, 1974; Perl, 1979), lasting from 1.00 to 4.00 minutes. Mischel (1974) found that although the high school subject in his study spent little time planning before writing, the length varied with the writing task. Planning an autobiographical

assignment took less than one minute, while a memoir-writing task took 20 minutes. According to research by Bereiter & Scardamalia (1987) young children can hardly be said to plan at all as they typically begin writing as soon as they are given a writing topic.

Emig (1971) reported that although the Grade 12 students in her study did little prewriting planning, they did pause during writing, apparently to plan. Subsequent research on pause length during writing (Flower & Hayes, 1981a; Matsuhashi, 1981) confirmed that planning occurs during the composing process. Matsuhashi's work (1981) showed that sentence-level planning was present and sensitive to the complexity of the writing task. For example, pause lengths were longer before more abstract statements and before paragraph openers. The study by Flower and Hayes (1981a) with competent college student writers indicated that pausing occurred more often at the beginning of episodes, thus indicating goal-related planning. The planning at these times focussed on rhetorical concerns beyond text generation and on the monitoring of the writer's process.

Most importantly Flower and Hayes (1981b) argued that goal-setting, an important component of planning, was not limited to the prewriting stage. All the sub-processes of goal-setting, that involve idea generation, organization and goal-setting, interact with each other throughout the composing process. Flower and Hayes also established the importance of plans and along with other researchers pointed out that weaker writers spent very little time in planning compared to skilled writers (Perl, 1979; Pianko, 1979; Stallard, 1979).

Research on the nature of planning has led to discoveries about what strategies are involved in planning and how the strategies are employed to create goals, generate content, and organize the content to create a final text.

Again a distinction between young children, novice writers, and experts is apparent when we examine their planning strategies.

In Graves' study (1975), a single writing episode was considered to consist of three phases of observation: prewriting, composing and postwriting. The prewriting phase immediately preceded any writing by the children and the behaviours observed consisted mainly of drawing accompanied at times by talk or appropriate noises. The researchers intervened during this phase to elicit information from subjects in order to gain an understanding of the children's rationale for a previous operation or insight into their strategies for future courses of action. For example they might say to a subject, "Tell me what you are going to write about when you have finished your drawing" (p. 233). Upon being interviewed, the girls in this study stressed more than boys that prethinking and organizational qualities were requirements for good writers.

Further research by Graves, Calkins, and Sowers funded by the National Institute of Education attempted to develop an understanding of children's writing processes through the case study method. The focus of Sowers' (1979) case study, six year-old Sarah, used daily life as the source of her writing topics. Sowers claimed that Sarah, like all writers, went through a prewriting phase before putting words on paper. Her favourite prewriting activities involved drawing and talking. Eventually, Sarah's prewriting behaviours grew to include planning ahead and composing aloud. This strategy involved telling the story in chronological order. After this, Sarah would draw. Previously, Sarah did not know what she was going to write before she drew it.

After a while, Sarah's sketches changed in the prewriting rehearsal phase as she began drawing people in profile. Before her people consisted of

inactive figures facing forward. Sowers suggests that this drawing modification was related to an alteration in writing style. Because the profile figures allowed Sarah to show characters in action, her writing came to include more action-sequence books. By drawing figures in motion she may have been given access to information through rehearsal which she previously did not have.

Two major teaching implications of this research by Sowers (1979) are that children should choose their own topics for writing from the wealth of their daily experience and that children should be given the chance to rehearse through drawing, playing, or talking. Calkins (1980) elaborated on this when she described writers as needing to make choices as they sort through their experiences, list ideas, jot down memories, and sketch what they want to write about. In fact, she stated that in order to focus their topic, children may require more concrete techniques than listing and interviewing, such as drawing.

Research by Flower and Hayes (1980a) found that expert writers can be distinguished from inexpert ones not only by the compositions they produce but also by the amount and nature of planning they do. Their approach was to study writing as a problem-solving, cognitive process. They collected thinking-aloud protocols or verbalizations of the thinking processes of both professional writers and college students as they wrote. With these data they were able to create a model of the rhetorical problem that people represent to themselves while engaged in writing. One important unit in this problem was the set of goals established by the writer. Good writers, they maintained, set goals involving the audience, their own persona, and the text that help them generate new ideas. Good writers also develop their image of the reader, the situation, and their own goals with increasing detail and specificity as they

write. On the other hand, poor writers are more concerned with the features and conventions of a written text, such as number of pages, format, spelling, and grammar. The flat, undeveloped, conventional representation of the problem with which they begin remains throughout the entire composing period. This study's main conclusion was that good writers are solving a different problem than poor writers because poor writers have an underdeveloped understanding of their rhetorical problem.

There are two implications in this work of Flower & Hayes (1980a) with strong relevance for the present study. First, in the area of research, comparisons to a long-range study of the development of creative skill in fine art showed similarities between successful visual artists and expert writers. What seemed to distinguish any successful artist was not technical skill, but "the ability to envision, pose, formulate, or create a new problematic situation" (p. 31). This, the researchers pointed out, suggests that problem-finding is a cognitive skill which can lead to creativity in both the areas of writing and drawing. Secondly, they maintain that this ability to explore rhetorical situations by setting problems or goals can be taught.

Other findings by Flower and Hayes (1981b) related to strategies used by their subjects in the three major processes of composing they have described as: planning, translating, and reviewing. According to these researchers, "in the planning process writers form an internal representation of the knowledge that will be used in writing" (1981b, p. 372). This representation may be more abstract than the eventual prose will be and may not necessarily be made in language, but could be held as a visual or perceptual code. Planning involves a number of sub-processes, such as, generating ideas, organizing, and goal-setting.

The act of generating ideas includes retrieving pertinent information

from long-term memory that is relevant to the topic and audience. The sub-process of organizing takes on the task of assisting writers to build a meaningful structure from their ideas. It plays an important role in creative thinking and discovery since it is possible to group ideas and form new concepts with this strategy. Organizing is often guided by the process of goal-setting. Goals are often related to procedures and content. Most goals are generated, developed, and revised by the same processes used to generate and organize ideas. In summary, over a series of studies (1980a, 1980b, 1981a, 1981b) Flower and Hayes have shown convincingly that the act of defining one's rhetorical problem and setting goals is an important part of being creative and accounts in large part for the differences between good and poor writers.

The concept of planning apparent in the research by Flower and Hayes is consistent with a level of cognitive development in which writers work through a task at an abstract level and set goals, before working through it concretely. This is distinguishable from Graves' rehearsal phase, in which writers work through a task at approximately the same level of concreteness as will eventually be used. Graves' subjects rehearsed for writing by drawing or role-playing, in forms different from writing but just as concrete. Investigations undertaken by Bereiter, Scardamalia and associates (1980, 1982) further clarify the distinction being made here. They set out to discover how the planning process evolves from the concrete level to the more abstract by analyzing the production factors of young writers from age 10 to 14. They examined those processes used in generating topics and ideas for writing, setting goals for writing, and organizing content.

In one study to investigate how children generate ideas for their compositions, the researchers (Scardamalia, Bereiter, and Woodruff ,1980)

interviewed fourth- and sixth-grade children. Upon asking their subjects to provide topics for writing about which they knew a lot or a little, they found that children had difficulty identifying three familiar and three unfamiliar topics. Accordingly, they settled for fewer topics. However, the researchers discovered that the children could provide more content for their familiar topics.

At the conclusion of another set of studies, Bereiter and Scardamalia (1982) found that young writers experience difficulty in memory searches which could help them generate content for their stories. They then conducted various experiments to determine methods that would help students learn how to initiate and maintain their own memory searches. One of these (Anderson, Bereiter, & Smart, 1980) was based on "listing", a common writing process strategy advocated by some teachers of writing to activate memory (Graves, 1983). Following a training session involving this strategy, it was found that the experimental group wrote twice as much and used three times as many uncommon words. However, no differences in quality of writing were discerned between the experimental and control groups. Bereiter and Scardamalia (1982) concluded from these studies that children must learn how to do memory searches and that writing requires this ability. In order to produce writing of higher quality, students need to be taught the general requirements of written schemata as well as particular criteria for selecting content.

These preliminary observations by Bereiter and Scardamalia showed that few writers before adolescence developed the type of plans containing properties and elements that have a direct bearing on the final contents of the text. Any pauses during writing were too short to allow much planning or goal-setting in respect to the text as a whole to occur and were seen to be

dominated by concerns of producing content in sequential order. The fact that children did little advance planning did not negate the possibility that they planned during the course of composing the text or could plan if they were so induced.

Of particular relevance to this study on children's drawing plans is an investigation whereby Bereiter and Scardamalia (1987) set out to involve students from Grades 4, 6, and 8 in planning and note-taking activities before they actually produced a text. The children in the study were given planning guides designed to encourage a range of activities in the form of general verbal instructions, cue cards, and/or video-taped segments of an adult planning an essay. The instructions tried to induce students to set goals, establish an audience, organize content, and identify writing problems. Students were asked not to begin writing their text until they had done as much planning as possible.

Results indicated that for younger students, the planning notes represented a first draft of a composition. For the older students, the notes represented ideas that were later worked into a composition. A larger variety and quantity of transformations took place between the plans of older students and their final texts as compared to the younger students. The planning products of younger children were their texts with no intermediate products. For the older students, the product of planning was a plan bearing little structural or stylistic characteristics of the final text. The younger students, in effect, used note-taking as a way to produce continuous text.

Bereiter and Scardamalia (1987) went on to distinguish between two types of planning that appeared in this research. The type that dealt with goals, strategies, and organization was referred to as "conceptual planning". The term "content generation" was used in referring to the plans that

resulted in the creation of material used directly in the text. It was only the Grade 8 students who demonstrated a response revealing comprehension to videotaped modeling of conceptual planning. The younger students who received the same instruction, distorted the planning task in a highly systematic manner, using note-taking and brainstorming as a way to produce text because to them planning is in fact the generation of content. Only by disrupting the continuity of production by using formal procedures, such as a list of questions, was it possible to get younger students to generate ideas apart from the final text.

In an attempt to further verify these results the researchers (1987) replicated the Control condition of the main planning study with six university undergraduates. The adult writers were similar to one another yet markedly different from the children and adolescents observed in the main study. The adults explicitly planned out the organization of the entire essay. The relation of their planning notes to the text was quite distinct in appearance, being more diagrammatic, structural, complex, and condensed. The adults' whole approach to content was more oriented to establishing structure and goals and overcoming difficulties.

The work of Bereiter and Scardamalia (1987) shows that as writers mature their planning becomes increasingly differentiated from actual text production. At the metacognitive level this was evidenced by an increasing ability to recognize a variety of planning activities distinct from content generation. At the level of thought tapped by thinking-aloud protocols it was demonstrated by the slow emergence of conceptual planning. At the level of the product it was shown in the appearance of the plan as formally and substantively distinct from the composition.

Although the experimental procedures forced planning to take place,

10-year old writers tended not to produce plans that were distinct from the text. For children of this age planning was not differentiated from production. This finding led to the following analysis of planning development by the researchers:

1. At first, the young child's conscious attention is involved in the immediate written expression. Global intentions, world knowledge, experiences have a tacit and unconscious influence.

2. As the child enters early adolescence, thought becomes sufficiently separated from immediate expression so that the young writer can manipulate and abbreviate text, creating a distinct plan.

3. In late adolescence the plan takes on conceptual properties of its own. Text organization, intentions, problems, strategies, etc., are clearly represented and can be operated upon.

In some situations, however, this pattern appears not to hold. Bereiter and Scardamalia (1987) reported evidence of school situations that feature a great deal of social support for the composing process -- peer discussions, cooperative writing, and conferencing between teachers and students. In these classes rather sophisticated planning appears to be carried out by children of ages younger than those in the populations of their studies. Consequently, they proposed that the group planning process may force planning to a more conceptual level where alternatives are explicitly weighed and analyzed so that students become more reflective in their writing.

Although little research has been undertaken involving the study of plans in drawing, the same cannot be said concerning plans that occur during writing. If we assume that processes occurring in writing and drawing are similar and mutually supportive, then perhaps the body of writing research on planning previously outlined can be used as a basis for comparing the

plans children make when asked to draw.

Statement of Hypothesis

Using the writing research on planning outlined in the previous studies as inspiration, this research was undertaken to examine the plans students in Grades 4, 5, and 6 would produce in order to draw a picture in which the theme is generated from the subjects' imaginations or experiences. The plans and process documented on videotape would be analyzed to see whether age or sex would influence the level of planning taking place. The teachers of the various classrooms in which the research took place were surveyed in an attempt to discern whether their approach to writing instruction may have had a transferring effect on strategies used to plan drawings.

Based on the available research into children's planning in drawing and writing, the following positions appear plausible: 1) the plans of the drawings by students in this study would resemble the plans in the writing study described as the generation of content; 2) the sex of the subjects would have no influence on the complexity of planning strategies; 3) the variable of age would have a significant effect because as individuals develop cognitively, they are capable of higher levels of planning; and 4) in classrooms where process-conference was the approach to teaching writing, a greater degree of conceptual planning can be expected to occur since students may transfer behaviours learned in the symbolic domain of writing to the domain of drawing (Gardner & Wolf, 1983). Also, familiarity with group planning might induce higher level planning activity as reported by Bereiter and Scardamalia (1987).

CHAPTER II

METHOD

Subjects

A field-tested survey was sent to all junior teachers in the WRCSSB in order to determine their approach to writing instruction (See Appendix A) Responses to the survey were tabulated and scores were arranged in descending order so that those at the top were classified as the high process classrooms while those at the bottom were labelled low process classrooms. Twelve classrooms were selected in all, two each from Grade 4, 5 and 6, from both the high and the low end based on similarity of socio-economic representation. The median score for the high process classrooms was 38.5 (range = 36 to 39) and for the low process classrooms 29.5 (range = 24 to 30).

Upon receiving parent consent, all students in twelve classrooms (n=303) were asked to participate in the study by drawing. For closer study, three females and three males, were selected randomly from each classroom. In one split grade 5/6 room there were only two boys in the selected grade five group so a female from the same class was chosen to take the place of the male. The composing and drawing processes of this selected group of 72 students, 37 girls and 35 boys, were documented by means of video-taping.

Procedures

The researcher initiated each drawing session with a brief explanation of the study and expectations. Students were given three sheets of paper, 8.5 x 11 inches in dimension. One paper was lined newsprint, one unlined newsprint, and the third a better quality bond paper . Each student was also given one set of Crayola markers to complete their final drawings.

Students were asked to draw a picture from their imagination or memory based on personal experiences. They were advised that both sheets

of newsprint paper were to be used for any plans or preparations they might wish to execute before completing a final picture on the white drawing paper. Plans could be made using pencil and/or marker, depending on student preference, but the final product was to be completed in marker only. They were also allowed to use erasers, rulers and any available reference materials to create the plans for their final drawing.

In order to alleviate any concerns students might have about their drawing ability, they were told that the focus of this study was on the plans they were making before completing a final picture. These plans could take a graphic and/or written form. Students were asked to take as much time as necessary to complete their plans and were told not to worry about completing the final drawing. A minimum of 35 minutes and a maximum of 90 minutes was spent in individual classrooms. Students were asked to number the pages and, in some cases, specific ideas or sections within their plans, to indicate the order in which they were executed. All sheets of paper handed out to each student were returned to the researchers stapled together, and then labelled with the student's initials, gender, and grade.

Documentation of 3 male and 3 female students in the process of planning their drawings was done by two camcorders in most classrooms. In one classroom (Grade 5/6) there were only 2 boys in Grade 5, the grade being observed. In this instance, 4 girls and 2 boys were taped. In most situations two researchers were present to handle the video-taping and make classroom observations (See Appendix B).

Analysis Procedures

Observations of Process

The drawings and videotapes of the seventy-two selected students were analyzed and observable behaviours and characteristics were compiled (See

Appendix C). The list of observed behaviours and planning traits included the following: (a) the start-time, which represented the amount of time that passed before plans were initiated; (b) the planning time, which stood for the amount of time involved in working on the plans before beginning a final product; (c) the selection of initial media and paper to plan drawings --media included pencil, marker, or both pencil and marker and paper included lined or unlined newsprint (the order in which the above were used was also tabulated); (d) the strategies used in planning, such as writing, drawing (the order in which students began using them), tracing, reflecting, moving, monitoring, erasing (the number of times they were used) and speaking (whether they spoke to a peer or partner [differentiated by proximity], to themselves or to the teacher, and the number of times they did so); (e) the number of pages and ideas in the plans; (f) the use of references, such as magazines, textbooks, and student drawing files.

At times, only one researcher was present to record observations in the classrooms, which necessitated watching 6 subjects. Also, the first moments of planning by several subjects were not captured on tape due to inexperience with video equipment. As a result it was difficult to record the start-times accurately, so this behaviour was eliminated from the data analysis.

Drawing Products

Initially, the principal researcher reviewed the 303 products collected from all the students in the twelve classrooms in order to identify and describe the different characteristics of the submitted work. As characteristics were listed, similarities between some of the products became apparent. Some of these planning characteristics included the following: (a) one idea sketched in the plan, (b) a written list of different ideas to draw, (c) a written description

of details to include in one drawing, (d) sketches that explored more than one topic or idea, (e) investigations of how to sketch a particular part of the drawing, and (f) instructions for the spatial arrangement of colour and/or objects.

This first analysis of the submitted work resulted in the plans being collated into 21 different descriptions or categories, based only on product. An attempt was made to order these categories from those indicating the least amount of reflection to those that revealed more investigation and planning on the part of the subject. In the original ranking, plans containing any written information were grouped at the higher end because they seemed so different in appearance from the final drawings.

After viewing the video-tapes, some strategies which were not always obvious from the products alone, such as the use of pencil before marker in the plans or whether writing preceded or followed drawing, became apparent. This resulted in a second, closer examination of the 303 plans and final drawings. The categories were narrowed to 18, with 0 representing the one submission that contained no visible plans or drawings. Then an attempt was made to sort these categories into three different levels of planning based on the degree of conceptualization, whether graphic or verbal, evident by the subjects' explorations on the newsprint and the choices made for the final drawing in marker on bond paper.

The next section provides an outline or taxonomy of the 18 planning categories and the 3 levels into which they were placed. In order to clarify these descriptions, examples of drawing plans and final products follow the categories. An explanation of how the planning levels were formulated is presented immediately following the Taxonomy of Planning Categories in Children's Drawings.

Taxonomy of Planning Categories in Children's Drawings

Level 1

No Planning Indicated

Category 0

The subject returned all the paper without making any plans or doing a final drawing.

Category 1

The subject worked first on a final product using markers on the bond paper, then made more subsequent drawings on more bond paper. In some cases these different drawings were related. See Figure 1 for an example of this category.

Category 2

The subject worked first on a final product using markers on the bond paper, then used the newsprint paper to make more drawings that were different from this final product. See Figure 2 for an example of this category .

Category 3

The subject drew the final product in pencil first on the bond paper, then coloured it with markers. No drawing on rough paper was apparent. See Figure 3 for an example of this category.

Level 2

Low level of planning related more to content

Category 4

One pencil drawing on rough paper was submitted as the final product. The plan may have been too detailed to do in marker or the student ran out of time to do it in marker. Comments like, "I don't like to use marker", were sometimes expressed. See Figure 4 for an example of this category.

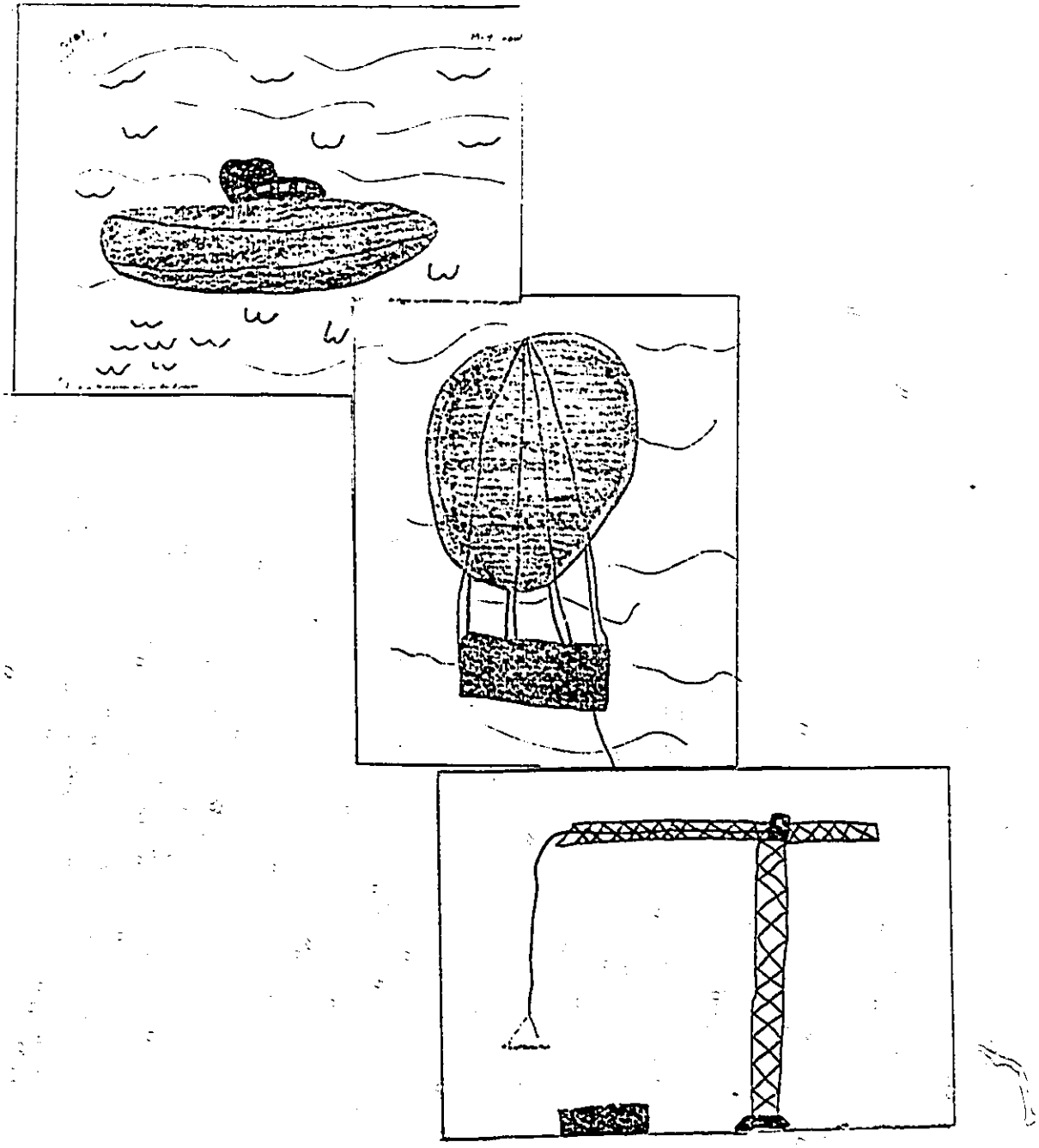


Figure 1. This is an example of Category 1. The subject drew with marker on bond paper for each of these three drawings. He did not use the newsprint sheets at all.

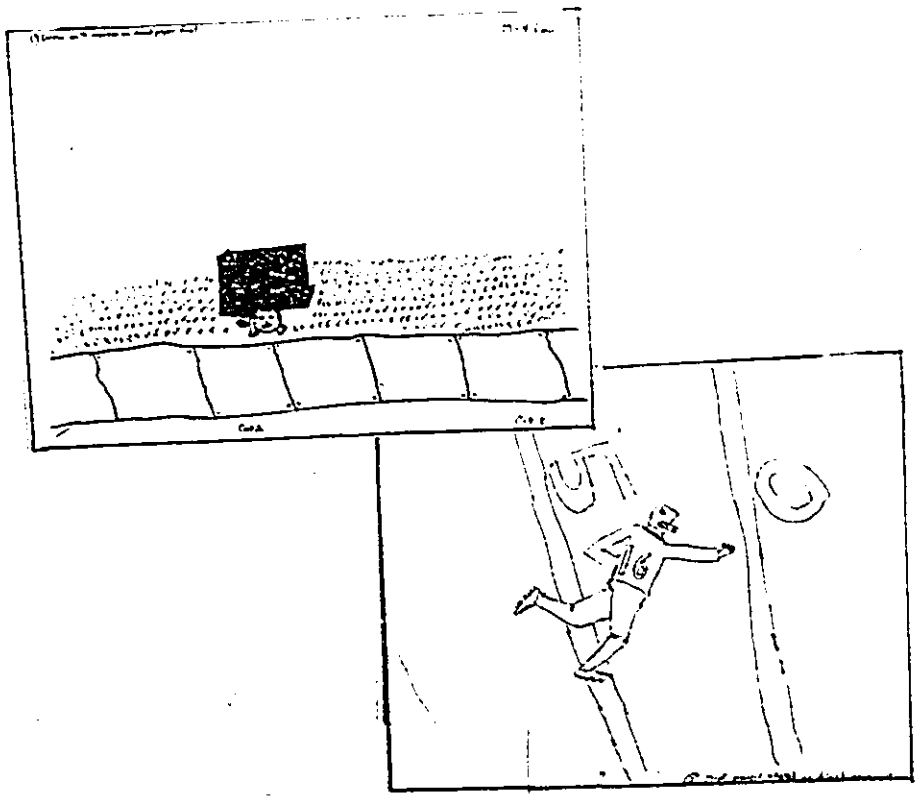


Figure 2. This is an example of Category 2. First the subject drew with marker on bond paper, then did a pencil sketch on blank newsprint.

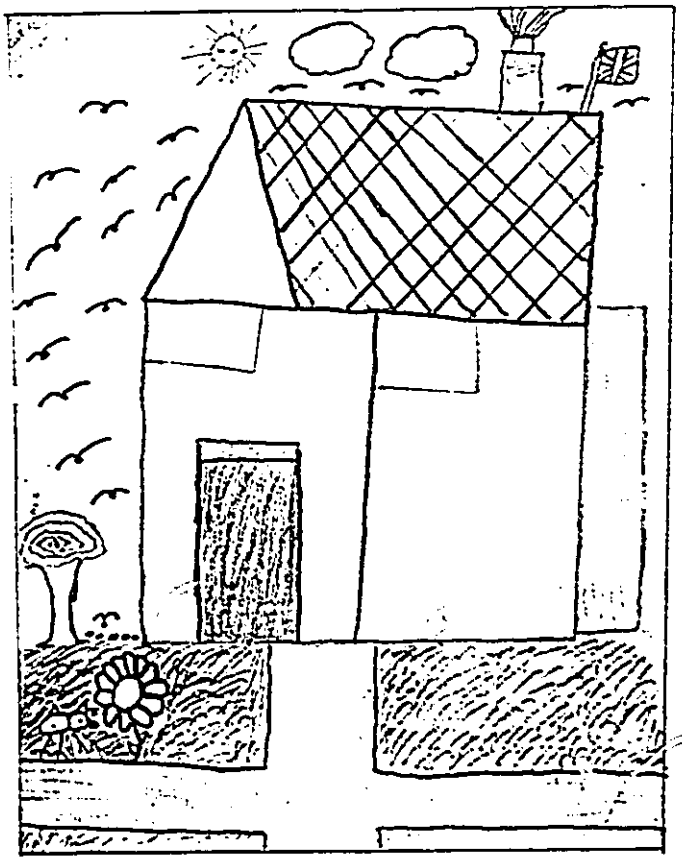


Figure 3. This is an example of Category 3. The subject drew only on the bond paper in pencil first, then outlined and coloured with markers. No drawing on the newsprint was apparent.

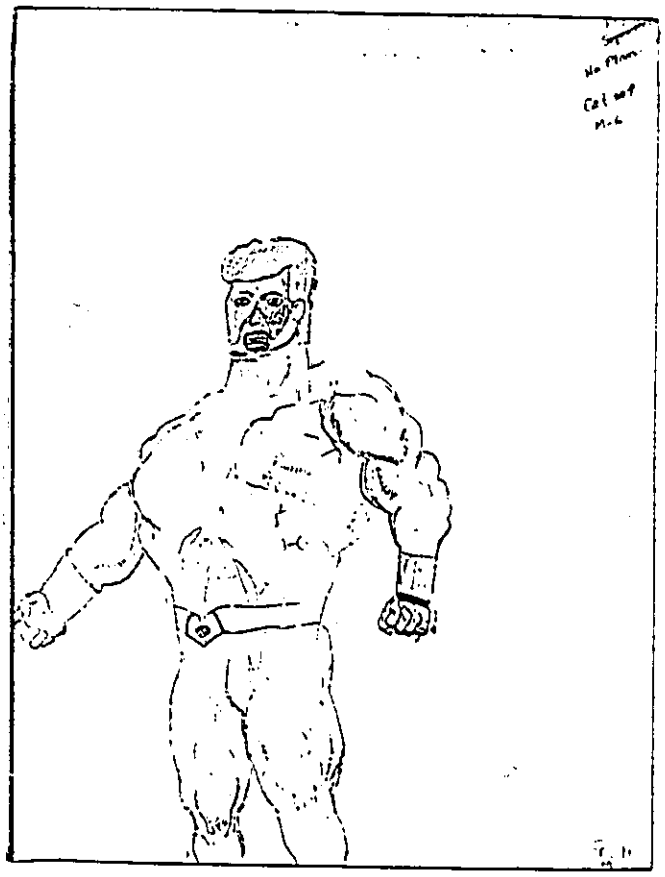


Figure 4. This is an example of Category 4. A pencil sketch on blank newsprint was all this subject submitted.

Category 5

The subject explored one or more ideas on rough paper using (a) a pencil, or (b) markers, or (c) both, and (d) included written directions. No final product was submitted. In some cases they indicated verbally that they did not have enough time to finish a final product or that they preferred not to use markers for this particular drawing. See Figure 5 for an example of this.

Category 6

One or two focussed, similar sketches were done on rough paper first. A final product in pencil on good paper was submitted similar in topic to the preliminary plan(s). See Figure 6 for an example of this category.

Category 7

The plan consists of one or more preliminary sketches and investigations that explore different ideas. The final product presents a different visual idea, although topic may remain the same. The final product was completed in: (a) markers only or (b) pencil then markers. See Figure 7 for an example of this category.

Category 8

The plan consists of one sketch done in (a) pencil, or (b) markers, or (c) both. the final product, done only in marker, almost reproduces the plan with very minor changes. In some instances the product was drawn in pencil first, then coloured with marker. See Figures 8, 9, and 10 for examples of this category.

Category 9

The plans consist of more than one sketch and appear to be first drafts or dress rehearsals of the final product. The plans are done in: a) pencil and coloured with marker or b) marker only. The final marker product resembles these plans almost exactly as far as composition, details, and colour. See Figure 11.

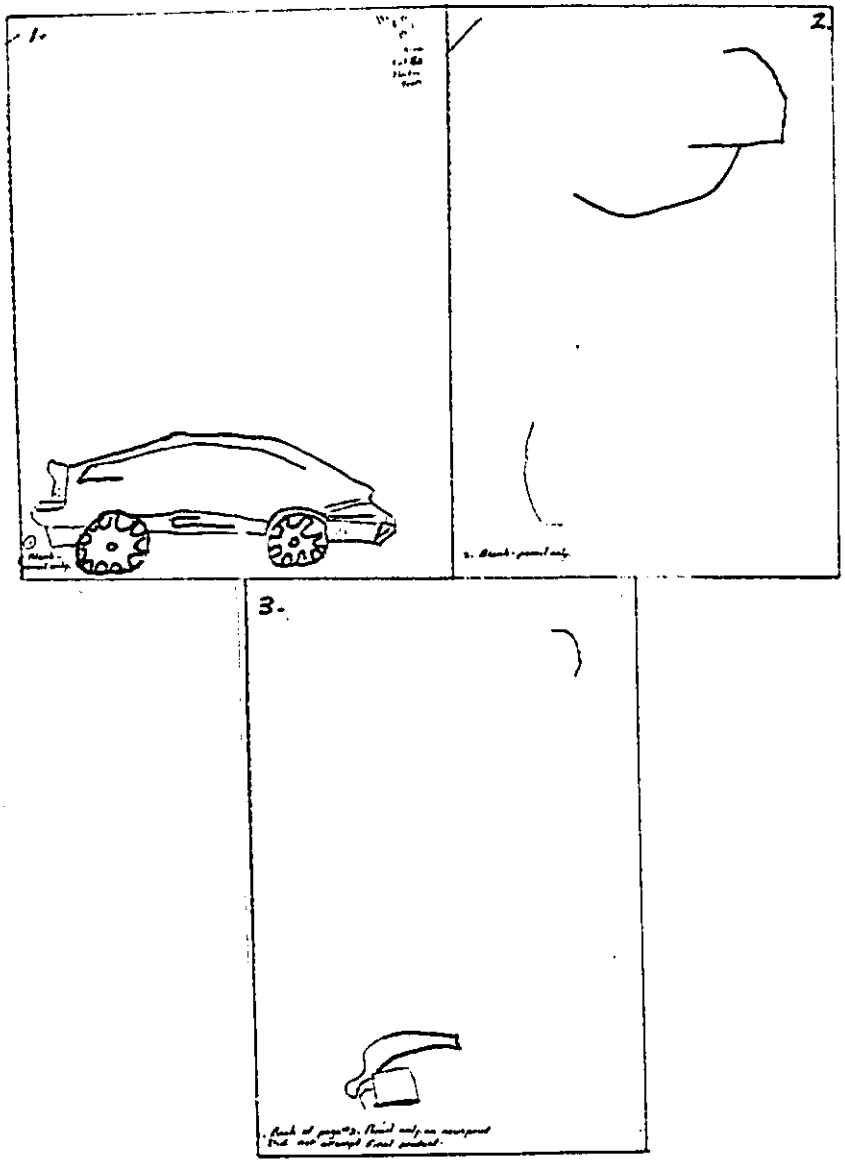


Figure 5. An example of Category 5. In this particular instance, the subject attempted to sketch a car using pencil with little success. After a certain length of time he gave up without doing a final drawing.

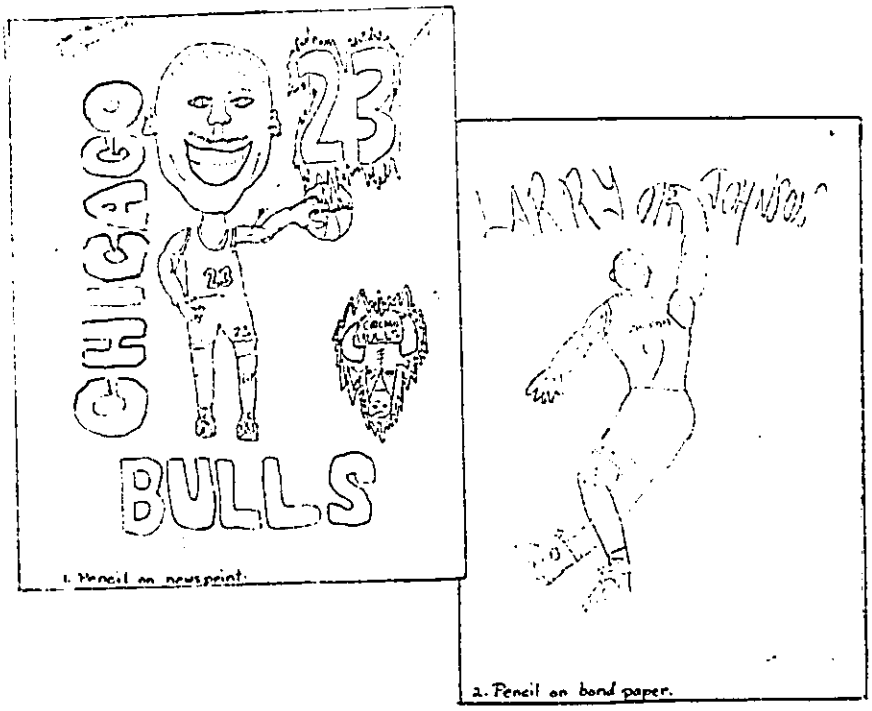


Figure 6. An example of Category 6. The subject began on unlined newsprint with pencil, then drew with pencil on the bond paper. He indicated he ran out of time and could not complete the drawing.

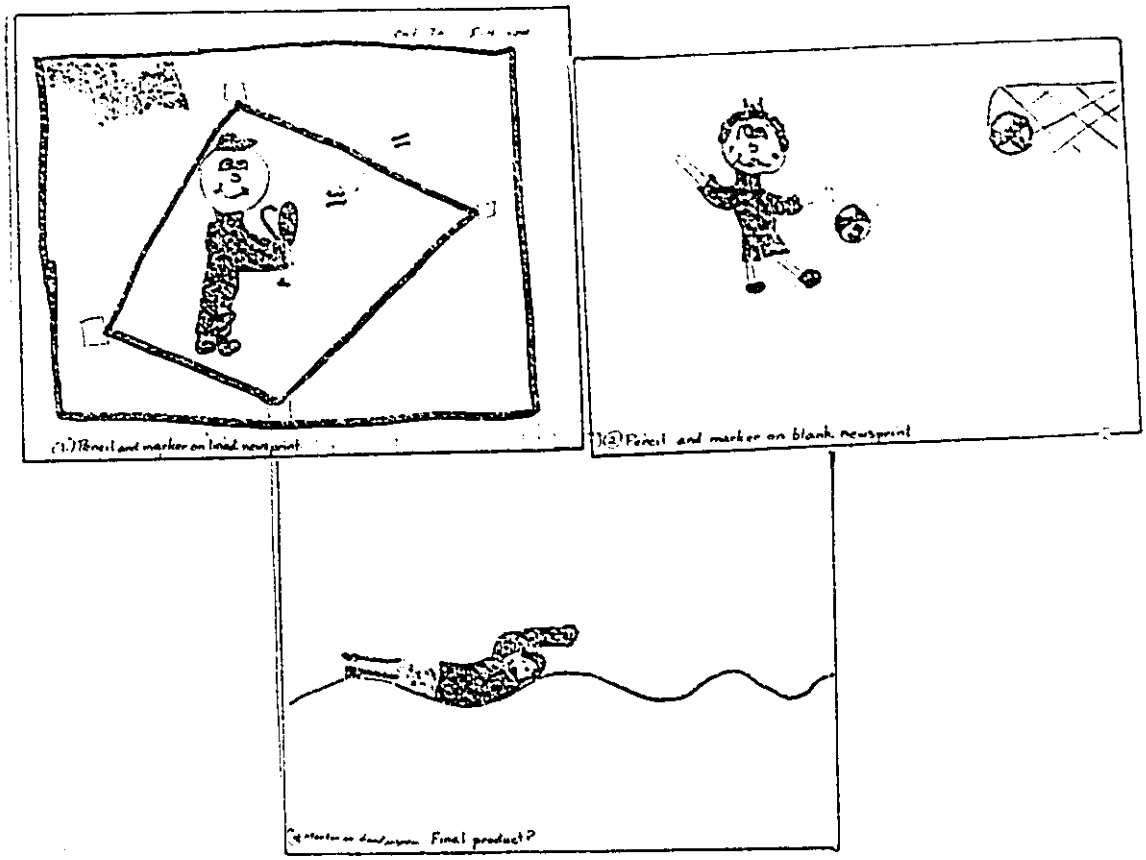


Figure 7. The following is an example of category 7a. First the subject sketched in pencil on the lined newsprint and coloured areas with marker. The second sketch on unlined newsprint was also coloured. The final drawing was drawn quickly with marker showing less care than the first two because time was running out. All three sketches concern sports activities.

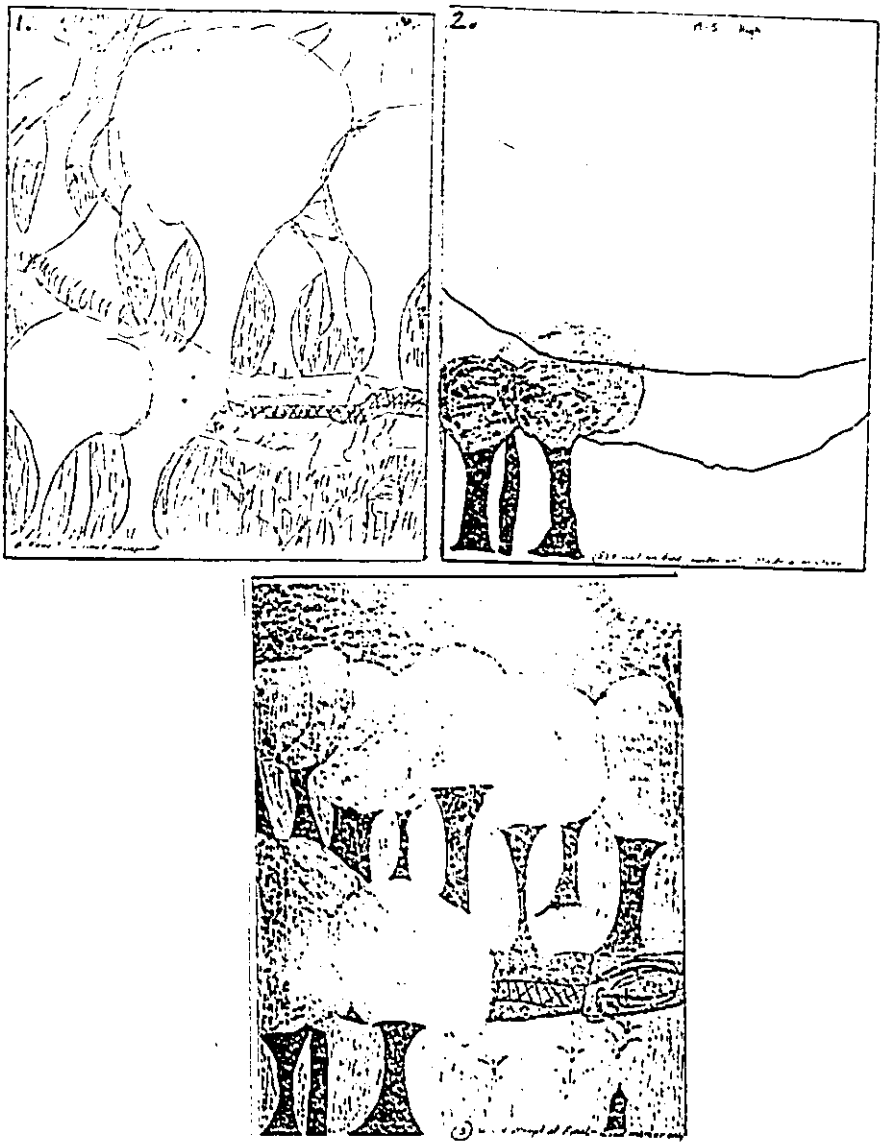


Figure 8. An example of category 8a. This subjects first sketch was on lined newsprint with pencil. When attempting to copy the sketch with marker on bond, problems arose. A second attempt at a final produced better results.

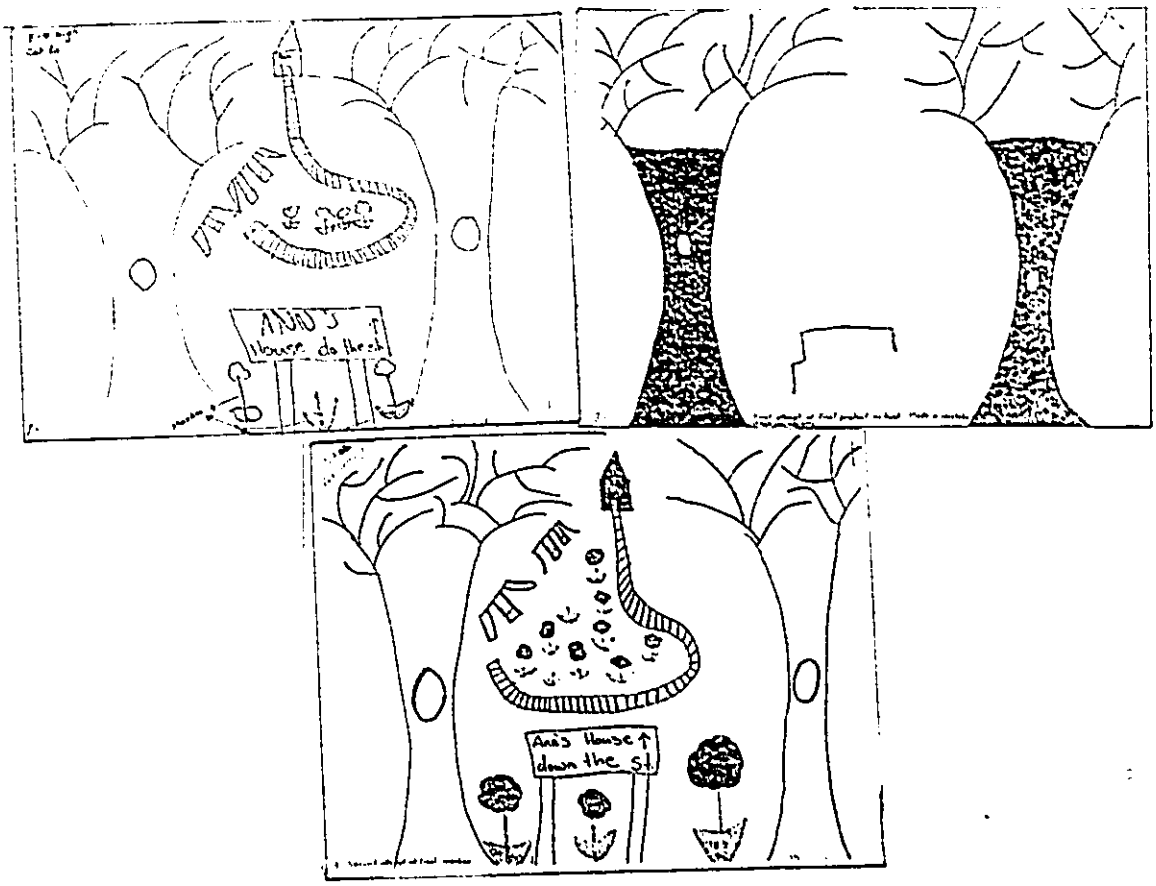


Figure 9. An example of category 8c. The subject tested the marker on the flowers in the first sketch, however the first attempt to use markers was not successful.

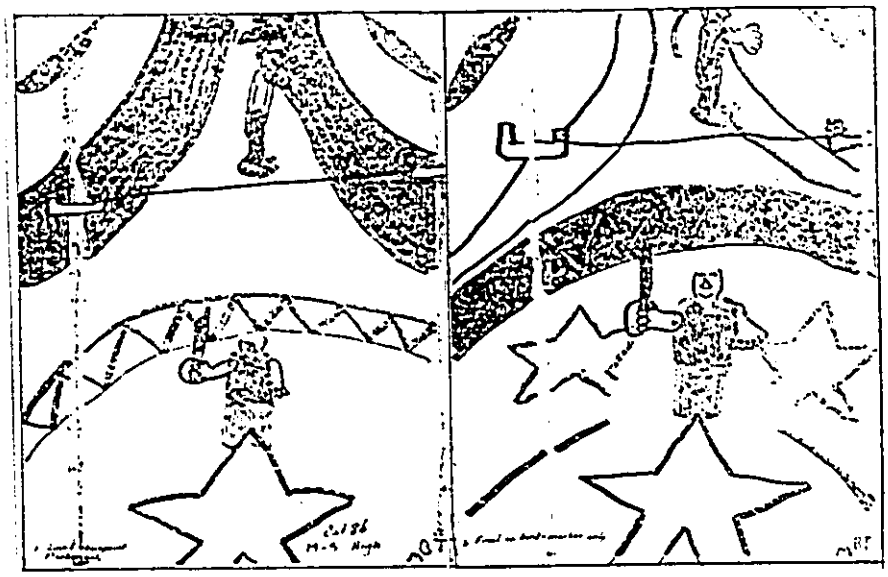


Figure 10. An example of 8b. The subject drew the picture in marker on lined newsprint first. Then the same picture with minor changes was drawn on bond paper using only markers. The subject referred to the initial sketch a number of times to complete the final product.

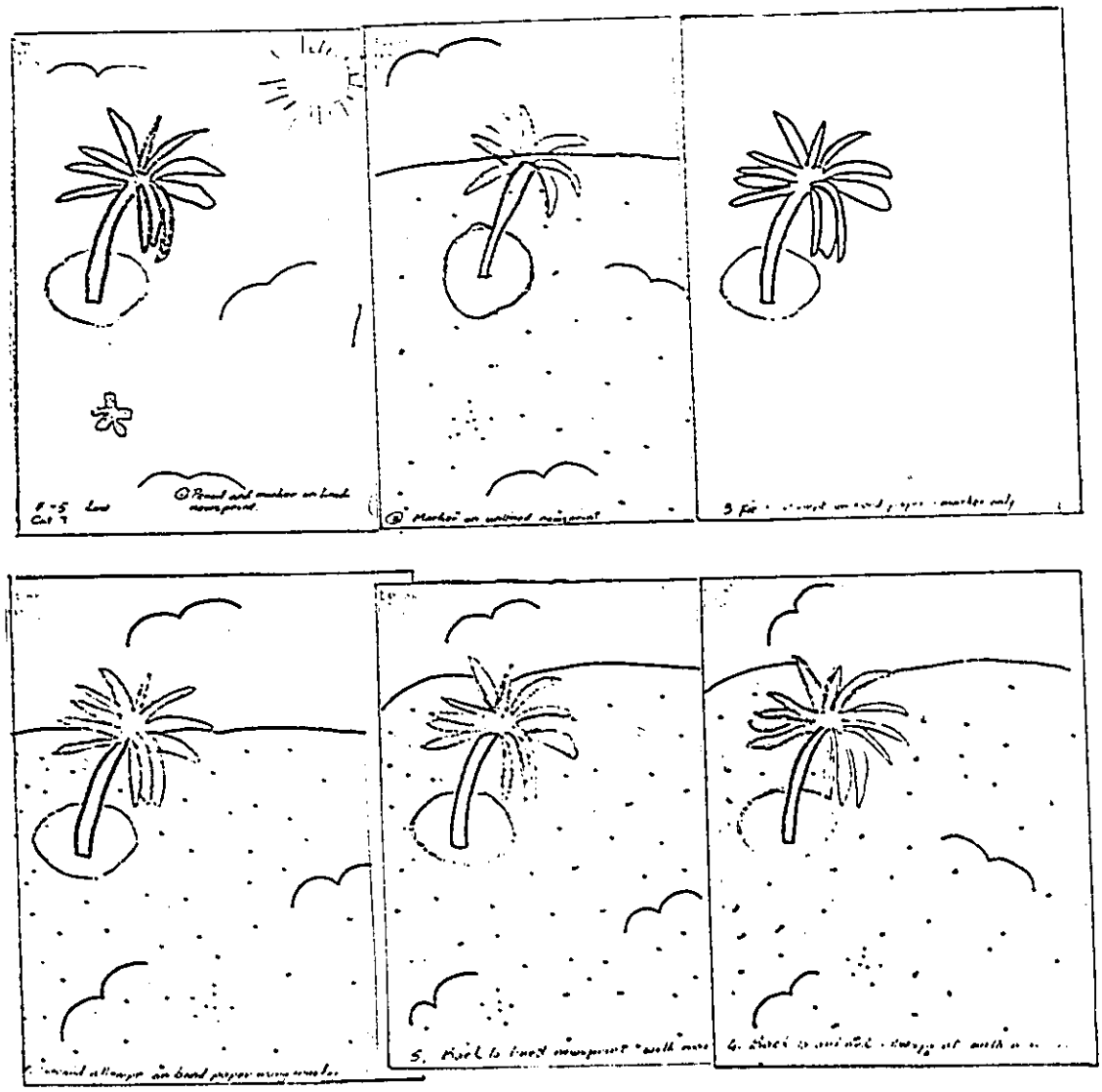


Figure 11. An example of Category 9. This subject repeated her plan a number of times beginning with pencil on lined newsprint then applied marker. Her second sketch was on unlined newsprint using only marker. In her third drawing, marker was used on bond paper unsuccessfully. A second try on bond with marker proved successful. Two subsequent sketches on newsprint with marker followed. It is not unusual to see very young children draw the same image over and over again with little change, especially a new schema in their repertoire. They appear to be trapped at a level of development.

Category 10

This plan consists of two or more focussed preliminary pencil sketches very similar to the final product which was done in (a) markers only, or (b) pencil, then markers. In these plans the artist may have investigated page orientation, composition, and/or placement of images as in Figure 12.

Category 11

The plan consists only of notes that outline or describe. They preceded the final product. See Figure 13 for an example of this category.

Category 12

Sketching with pencil on newsprint was preceded or followed by (a) listing or (b) notes. The final product was related to both. See Figure 14 for an example of this category.

Level 3

Higher level of planning indicating the beginning of conceptual planning.

Category 13

The plans consist of pencil or marker exploratory sketches of different ideas. These may be (a) full page drawings, or (b) thumbnail sketches, or (c) both. the final product is related to one or more of these sketches. See Figure 15 for an example of this category.

Category 14

Similar to category 8, 9, 10, or 11 with the addition of directory notes written on one or more of the plans to indicate placement of colours and objects. See Figure 16 for an example of this category.

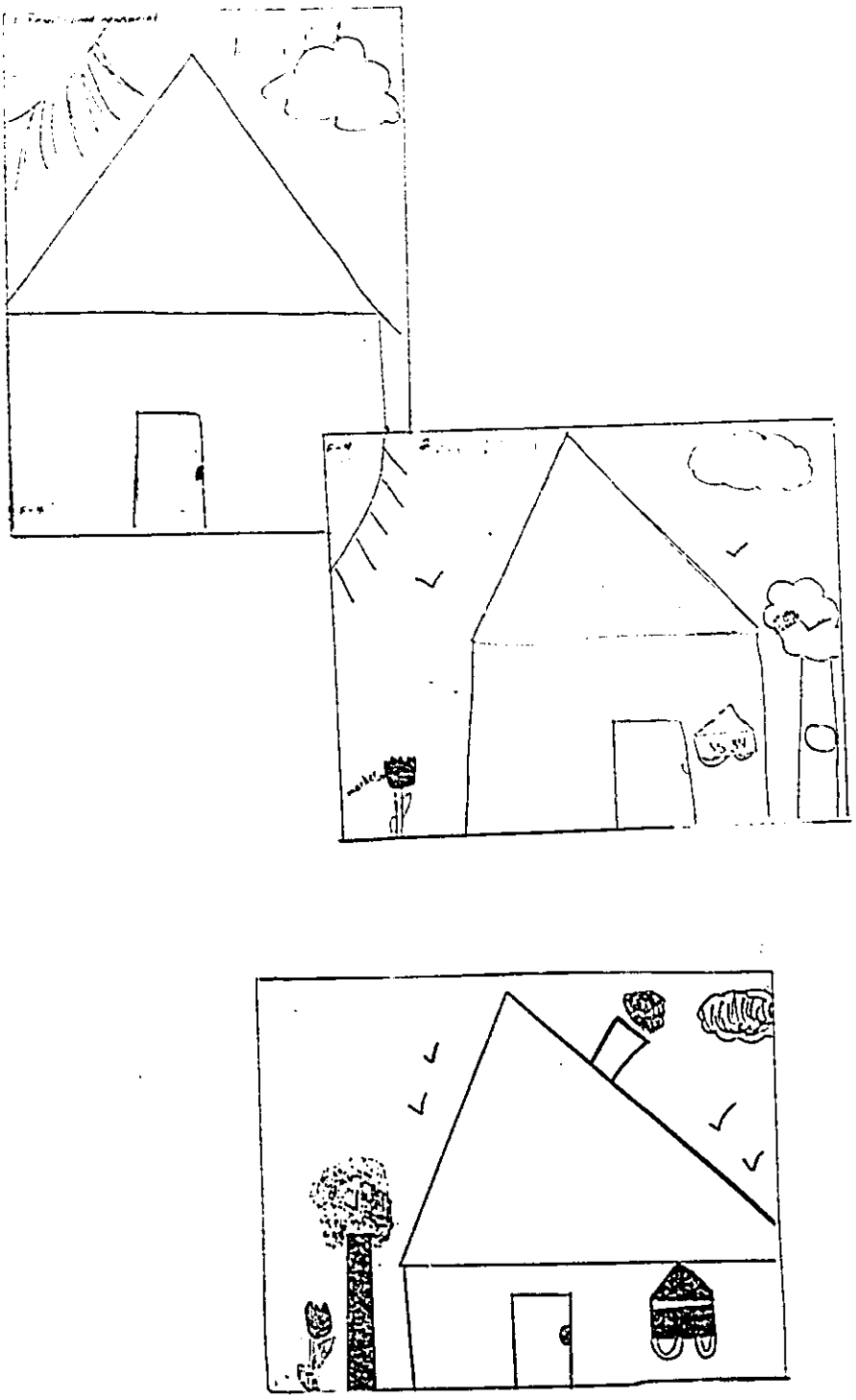


Figure 12. An example of category 10. The first sketch was done on lined paper in pencil with the page in a vertical position. The second sketch was done on unlined paper in the horizontal position.

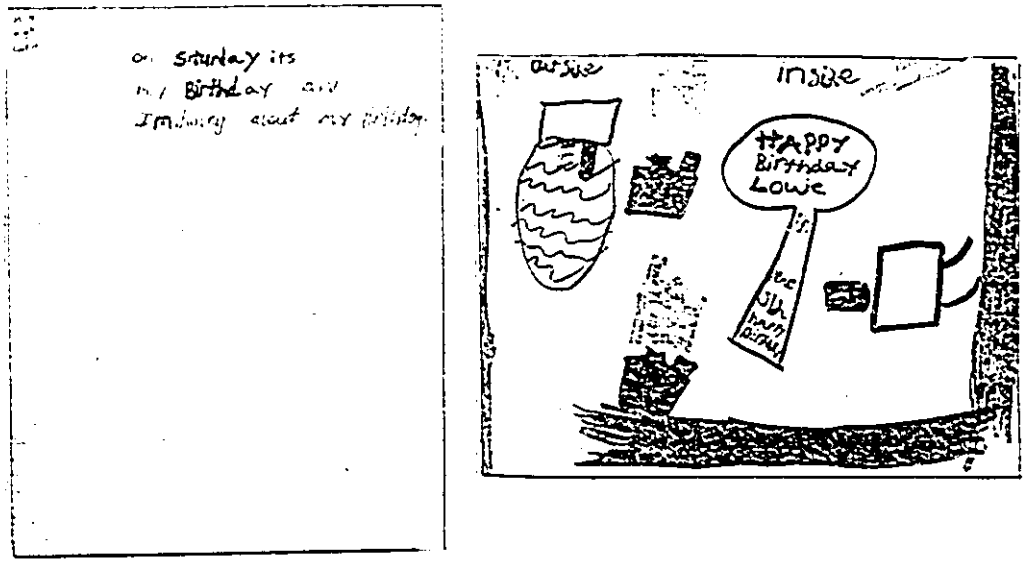


Figure 13. An example of category 11.This subject wrote what he intended to draw first on the unlined newsprint. The final product was completed on bond paper using marker only. As in category 8, the subject's understanding of a plan is limited to putting down one initial idea in rough first; however, writing for this child appears to take precedence over drawing.

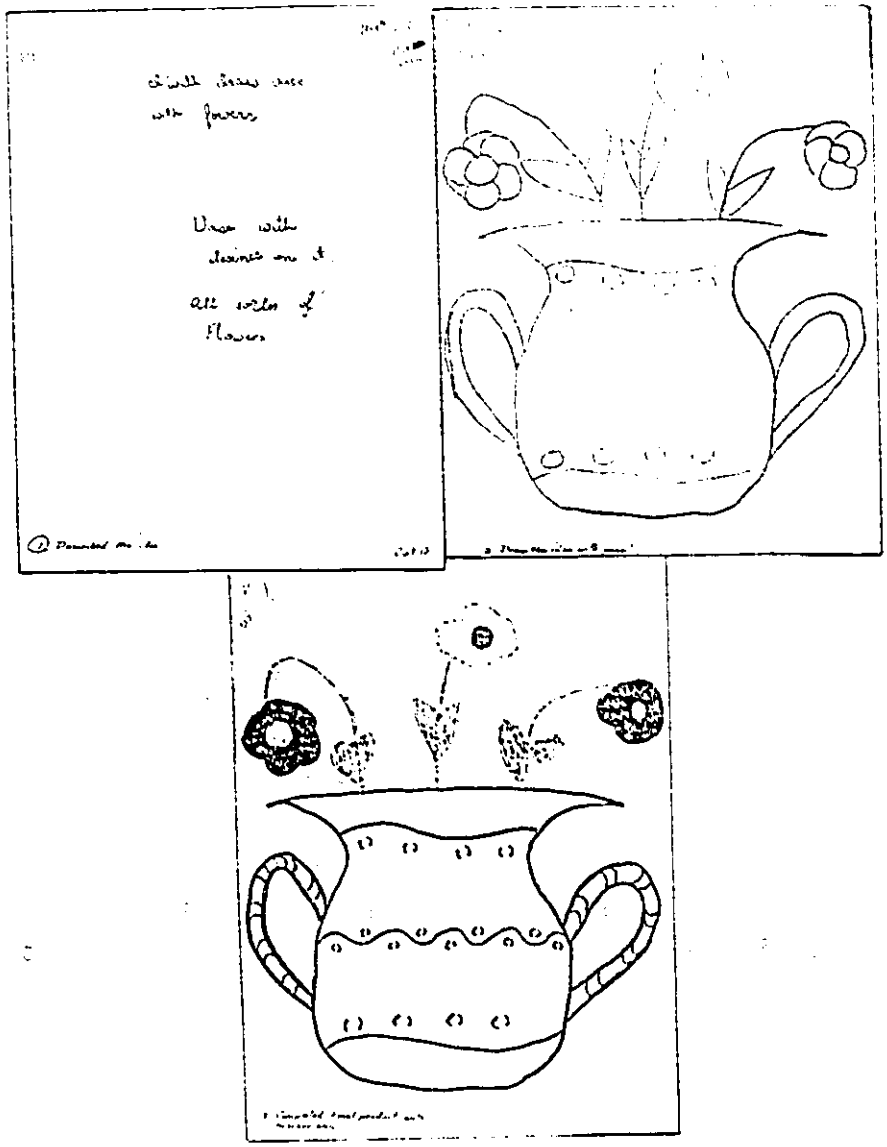


Figure 14. An example of category 12. The first plan contained a written description of the drawing. It was followed by a pencil sketch on unlined newsprint. Only marker was used on bond for the final drawing.

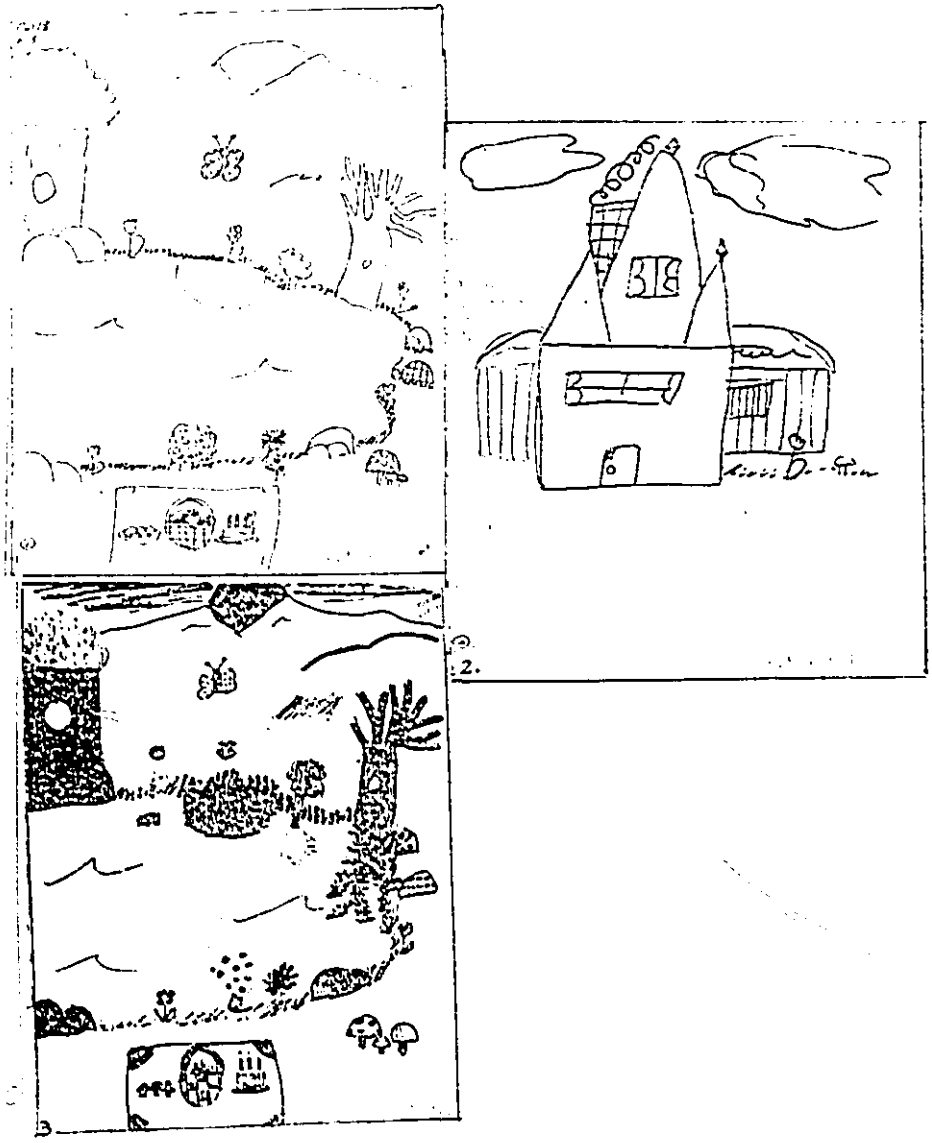


Figure 15. An example of category 13. The first sketch in pencil on unlined newsprint illustrated a picnic scene by a pond. The next sketch on lined is quite different. The final product relates to sketch #1.

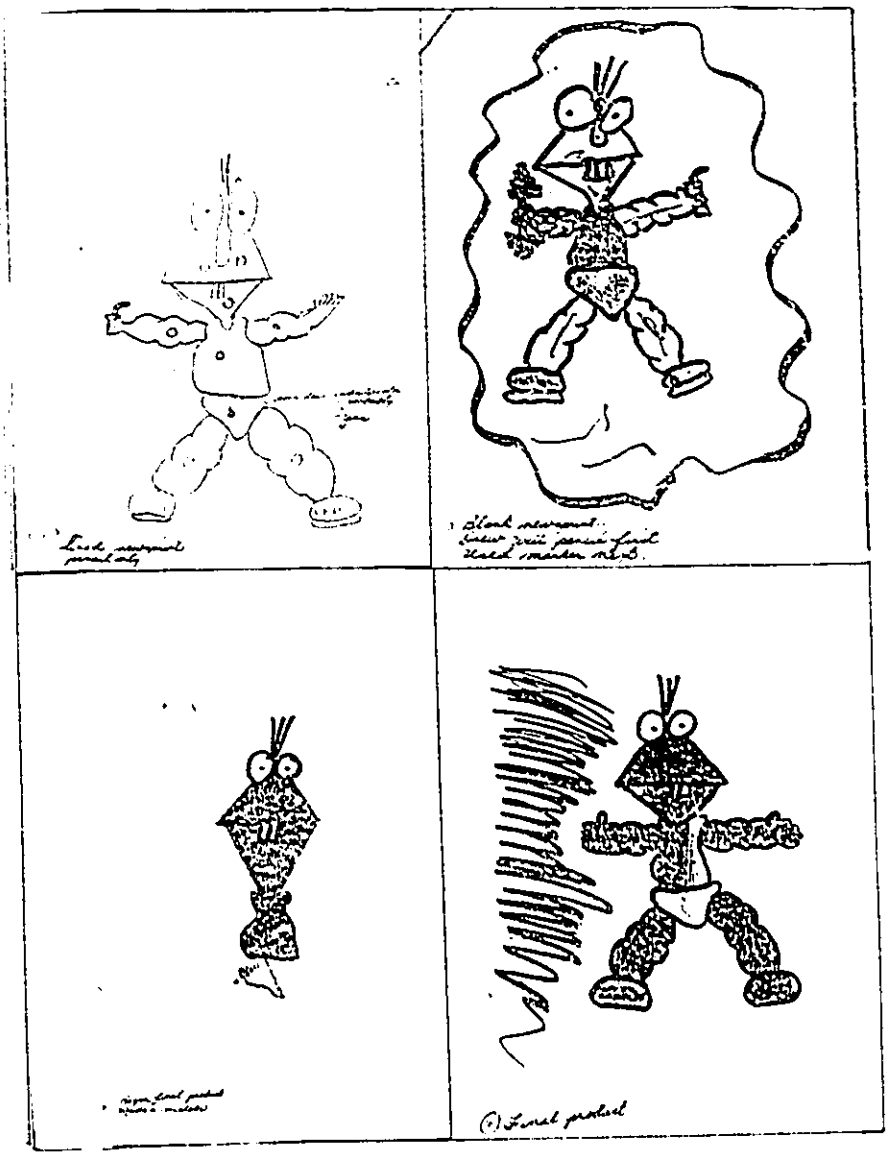


Figure 16. An example of category 14. In the first pencil sketch the subject coded different sections with a letter to indicate colour. The artist tested these selections in the second sketch. In sketch 3 on bond with marker a mistake was made. A second attempt on bond proved successful.

Category 15

Rough sketches include a repeated investigation of one or more parts of the final drawing in order to solve a particular problem the subject is experiencing. See Figure 17 for an example of this category.

Category 16

The plans consist of listing, webbing, or notes that outline ideas followed by one or two exploratory rough sketches. Some of these sketches are related to the written work. The final product is related to one or more of these plans. See Figures 18 and 19 for examples of this category.

Category 17

The plans consist of written work (webs, lists, or notes) followed by sketching, followed by more written work, followed by more rough sketching. The final product is related to one or more of these plans. See Figure 20 for an example of this category.

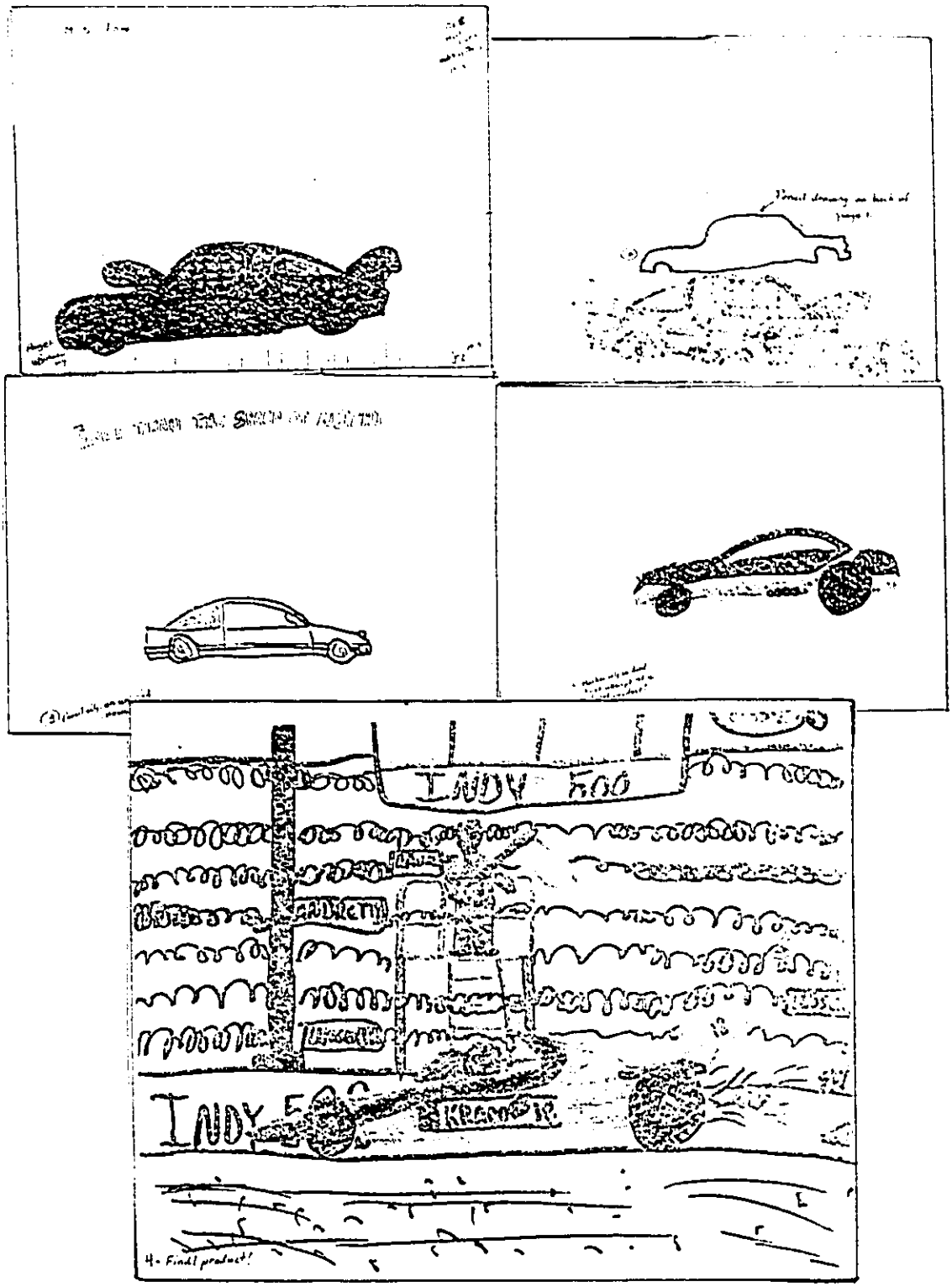


Figure 17. This is an example of category 15. In order to draw a racing scene for the Indy 500, the subject investigated how to draw a racing car using marker, then pencil, then marker. The final drawing included much more information than the plans.

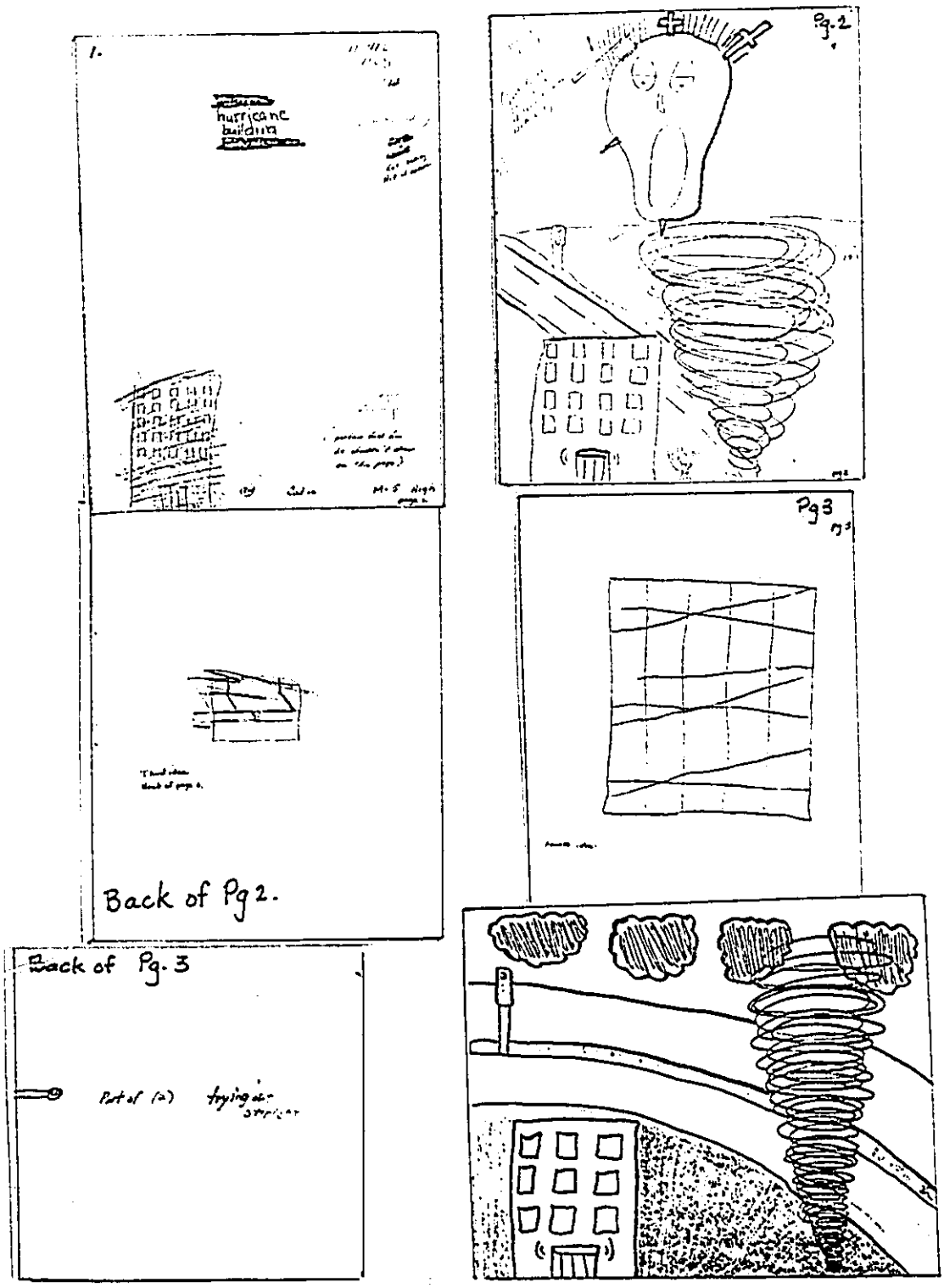


Figure 18. This is an example of category 16.The subject listed some ideas, then eliminated two. On the first sheet of unlined newsprint, two ideas were sketched in pencil. On the back of this sheet another object was sketched then crossed out. On a new sheet of unlined newsprint a new idea was drawn in pencil. While drawing the final in marker on bond, the subject returned to the back of the third sheet and tried to sketch a stoplight.

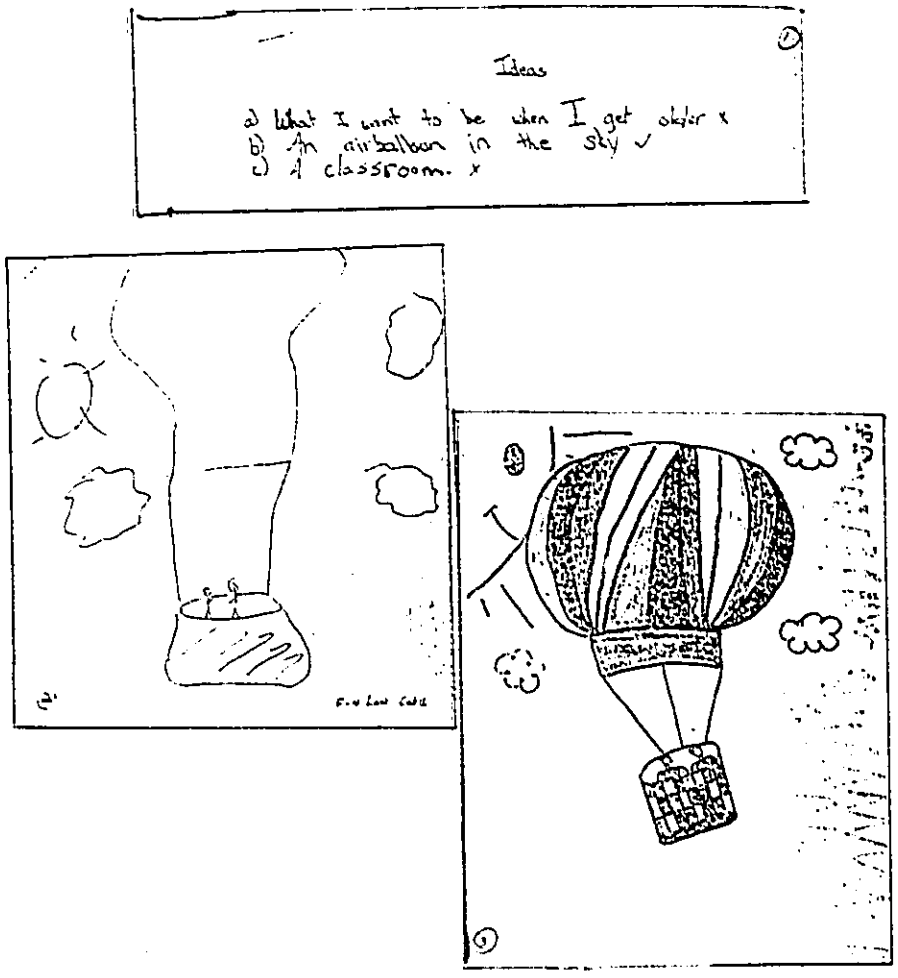


Figure 19. Another example of category 16. This subject listed 3 ideas, sketched one in pencil on the unlined paper, then drew it in marker on bond paper.

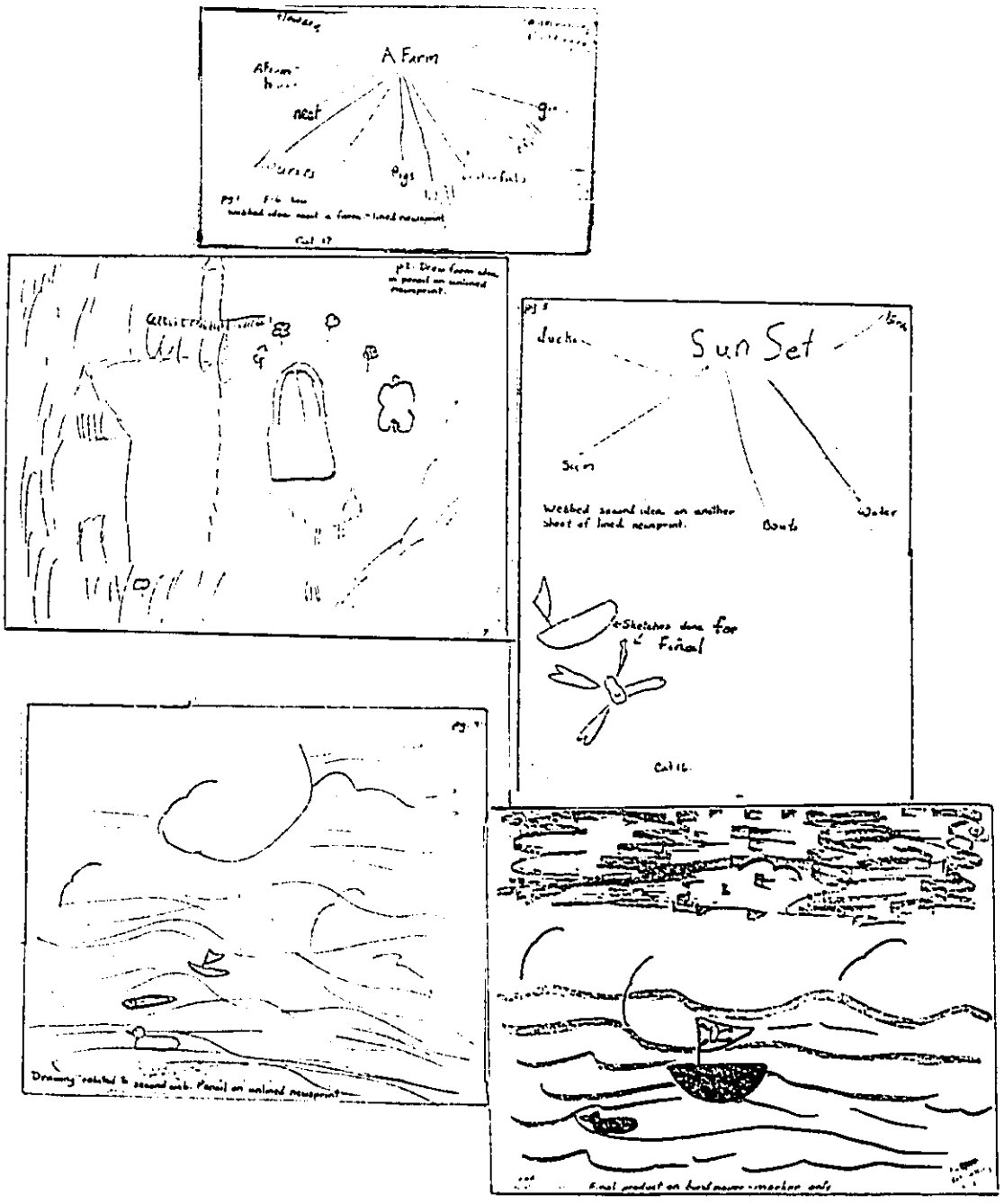


Figure 20. An example of category 17. The subject began by webbing ideas about a farm. This was followed by a pencil sketch of a farm. Then ideas about a sunset were brainstormed, followed by a pencil sketch of it. The final product in marker on bond paper related to the sunset. The subject returned to the planning sheets to explore how to draw a Jolly Roger flag.

Establishment of Planning Levels

The first level represented those categories characterized by an apparent absence of planning. Students in Categories 0 to 2 may have misunderstood the instructions to create plans for a final drawing study. However, some may have decided to ignore them because they possessed little comprehension of the planning process or saw no reason to plan in this situation. See Figures 1 and 2 for examples of plans that fit within this planning level.

The categories in the second level of planning, from 3 to 12, featured an awareness of planning at a very elementary level. These categories consisted of plans, either written or graphic, that (a) did not result in a final drawing, as in Figures 4 and 5, (b) appeared unrelated to the final drawing, as in Figure 7, or (c) were basically a dress rehearsal for the final drawing as evident in Figures 8 to 14.

Students who did not begin a final drawing gave a number of reasons for not doing so. In some cases, they reported that there was not enough time to finish it. In a few instances, students did not allow for the difference between drawing in pencil as compared to drawing in marker. The bluntness of the marker tip and the range of eight colours were aspects that students needed to consider when making their plans for the final drawing. Some students used pencil in their plans and made detailed drawings that contained value ranges which they could not duplicate in their final marker drawing, as in Figure 4. As a result, some students did not attempt a final drawing at all while others made one entirely different from their plans.

A large number of students regarded the planning process as an opportunity to develop their initial idea in pencil or marker before beginning a final drawing. Some students took a tentative approach and sketched in pencil which allowed them to erase any perceived errors. They may or may

not have used marker over the pencil, as in Figure 3. The latter strategy shows the subject took into consideration the difference in medium. Others tested their idea in marker only and copied their plan exactly in the final product, as in Figure 10. In some instances, students were so concerned with duplicating their plans that they traced them. While some students in this rehearsal stage appeared to struggle with the drawn image, erasing and redrawing different parts a number of times, others appeared to know the schema so well that the images flowed with ease from the pencil or marker. These students especially seemed to fit within Bereiter and Scardamalia's (1987) knowledge-telling or content-generation planning stage. Some students seemed fixated on these plans, repeating them more than once on two or more sheets of newsprint, with very little changes, as in Figure 11.

All these plans revealed little investigation or analysis of the drawing problem. The plans may have undergone minor transformations before becoming the final product. A number of categories appeared to fit within the second planning level; however, it was difficult without more knowledge of students' thinking processes to place them in any heirarchical order.

The plans that were placed in the third level indicated more investigation on the part of students into the topic and content of the drawing or into the elements of visual design, such as colour and spatial organization. In these instances, students appeared to realize that the plans allowed them to brainstorm various ideas, as in Figure 21, whether visually or in written form. There were indications that some subjects were experimenting with different aspects of the visual presentation, as in Figure 16, and trying to solve visual problems, as in Figure 17. Some characteristics of these plans were written directions with arrows indicating where to place different objects in the drawing. A few students, unsure of how to draw a particular object, would

attempt a number of small sketches of the item until a visual solution was discovered, as in Figure 19. A few students would web or list ideas first, then attempt to draw them visually, as in Figure 21. Students would analyze these different options and make conscious choices of what to include in the final drawing. These plans indicated some beginning characteristics of conceptual planning (Bereiter and Scardamalia, 1987).

Limitations of the Study

The twelve classrooms in this study were selected by means of a survey (See Appendix A) in order to determine whether the teacher's approach to writing involved process-conference strategies as described by various educators (Graves, 1983; Calkins, 1986). This selection was taken from the limited population of the WRCSSB and the survey was completely optional. It also was based on the respondents' perceptions of their writing instruction and therefore may not represent a true writing process pedagogy. It has been the researcher's experience that most teachers in the WRCSSB system approach writing instruction eclectically, by selecting and combining strategies from a variety of teaching methodologies. They may have students daily write in journals on self-generated topics, while topics for major writing assignments are teacher-generated. Also, teachers may still assume the sole responsibility for editting students' writing assignments. This was substantiated by the 28 survey results where total scores ranged from 14 to 48 out of a possible total of 52. The mean score of all the surveys was 31.9 or 61%.

It was also difficult to equally match, by socio-economic and sexual make-up, the six classrooms from the high process end of the survey to the six low process classrooms because only 29 teachers participated in the survey and so selection was limited. (One survey was unscorable because it was not properly answered.) Also, the characteristics of the WRCSSB's school

populations are in constant flux due to the closing of schools and changes in boundaries. However, every attempt was made to match the six high writing process classes with six lower process classes from comparable schools.

The goal was to observe natural drawing behaviours of children at this age level. Whether or not this can be accomplished in a normal classroom situation was further complicated by the intrusion of researchers and the use of video-taping which may have caused unnatural behaviour. Some teachers mentioned that their students were very excited about the project and a few of the video-tapes revealed students who appeared self-conscious and distracted. Also, in a few classrooms students appeared reluctant to discuss or talk with each other during the study. Perhaps, this was due to the presence of visitors and the video camera. It may have had a bearing on the results, especially any data related to the amount of observable talk between peers or partners. Therefore, one must assume that not all the data gathered are true indications of what the subjects would produce in a normal situation.

It would have been more valid if the Taxonomy of Planning Categories in Children's Drawing had been developed using blind procedures with regard to the age and gender of the subjects. However, due to organizational and managerial necessities, the various plans and final products needed to be labelled with the students age and grade. Attempts were made to validate the Taxonomy by having an independent art educator recategorize 25 of the planning products with all labels removed. However, should this study be repeated in the future, steps should be taken to conceal the identity of the subjects.

CHAPTER III

RESULTS

Quantitative analyses were computed using the various data gathered from observations during the actual study and from the video-tapes to determine whether any significant differences in the students' planning behaviours could be attributed to (a) high versus low writing process programmes, (b) grade level, (c) selection of unlined versus lined paper for initial plans, (d) selection of pencil, marker, or both for drawing medium, and (e) classroom arrangement in rows versus groups. The student behaviours included the instances of various forms of talking, length of time spent planning, the number of planning pages, the number of planning ideas, the number of times students erased, and the number of monitoring events. The selection of medium for planning (pencil, marker, or both pencil and marker) and the frequency of planning categories and levels assigned to the 72 products were analyzed to determine if there were any relationships between these data and the grade and gender of the subjects.

Process

The twelve classrooms observed during this study were categorized by teacher report as either high process and using strategies indicative of a process-conference approach to writing or low process, characterized by a traditional approach to writing. This was determined by points teachers scored out of a possible total of 52 when answering the Junior Level Teacher Survey (see Appendix A). The median score of the six high writing process classrooms was 38.5 ranging from scores of 36 to 39, while the median score from the classrooms classified as low or traditional writing process was 29.5, ranging from scores of 24 to 30.

These scores indicate that the twelve teachers in the study do not

handle writing instruction from a purely traditional or process-conference approach. However, the difference in median scores between the two groups appeared large enough to predict that the different approaches to writing instruction might influence the behaviours of students in each situation as they plan their drawings. Refer to Table 1 for a summary of the mean planning behaviours and standard deviations for low and high process groups.

Collaboration

Because collaboration is an important strategy in high writing process classrooms, the talking students did while drawing was carefully observed and documented by the researcher while reviewing the videotapes of the seventy-two subjects. Four types of talking were observed (Refer to Table 1).

The number of times students stopped sketching and spoke to another person sitting within close proximity, whether directly in front, behind or on either side, was categorized as partner talk. These conversations usually related to the drawing task.

Talking to peers was another form of collaboration documented during the study. It consisted of the amount of times the subjects spoke to any other classmate who did not sit within their group or immediately around them if the class was arranged in rows. Students either raised their voices or left their seats to engage in peer talk.

Some subjects during the planning process addressed their comments to the researchers or classroom teacher. Often these remarks took the form of questions to clarify directions or to gather opinions of the work in progress. This was categorized as teacher talk.

The final form of talk was observed in some students who were very focussed on their work. Their lips would move and they appeared to be

Table 1.

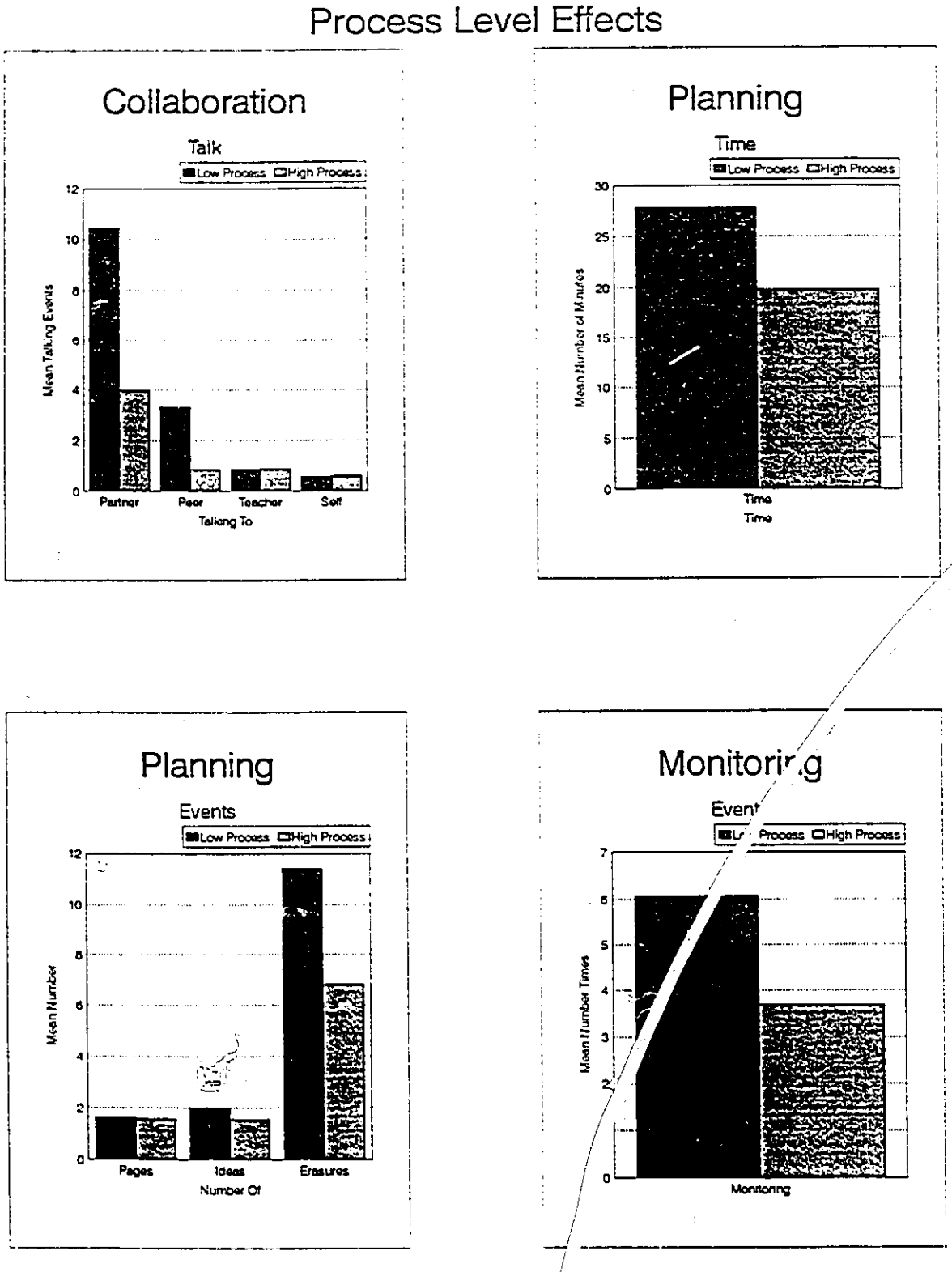
Comparison of mean planning behaviour scores for low and high process classrooms.

Planning Behaviours	Low Process		High Process		
	Mean	SD	Mean	SD	p
Partner Talk (occurrences)	10.45	9.49	4.00	5.45	<.001
Peer Talk (occurrences)	3.33	3.66	0.86	1.22	<.001
Teacher Talk (occurrences)	0.88	1.05	0.89	1.49	NS
Self Talk (occurrences)	0.58	1.13	0.61	1.81	NS
Planning Time (minutes)	27.80	15.40	19.80	7.78	<.01
Number of Pages	1.67	.79	1.58	.73	NS
Number of Ideas	2.03	1.40	1.56	1.36	NS
Number of Erasures	11.44	12.94	6.83	6.85	NS
Monitoring (events)	6.08	5.77	3.69	2.66	<.05

Note 1. Statistical comparisons are based on one way Analyses of Variance.

Note 2. NS = Not significant

Figure 21.


Process Level Effects
Collaboration
Talk
Low Process
High Process
Mean Talking Events
Partner
Peer
Teacher
Self
Talking To
Planning
Time
Low Process
High Process
Mean Number of Minutes
Time
Time
Planning
Events
Low Process
High Process
Mean Number
Pages
Ideas
Erasures
Number Of
Monitoring
Event
Process
High Process
Mean Number Times
Monitoring

talking to themselves. These observations, recorded as self talk, can be compared to the data collected in a study (Dyson, 1986) of beginning writers who often engaged in self-directed talk.

Partner Talk. A oneway Analyses of Variance (ANOVA) was tabulated on the number of times the subjects spoke to a partner using process as the independent variable. The results indicated that a significant main effect, $F(1, 67) = 12.25$, $p < .001$, existed when comparing the amount of partner talk between low and high writing process classrooms. Contrary to expectations, the students in low or more traditional writing process classrooms spoke more to partners (mean =10.45, SD = 9.49) than did those in high writing process classrooms (mean = 4.00, SD = 5.45).

Peer Talk. A oneway ANOVA was computed on peer talk using process as the independent variable. The results indicated a significant main effect, $F(1, 67) = 14.64$, $p < .001$ for peer talk. Students in low process classrooms spoke to peers more often (mean = 3.33, SD = 3.66) than students in the higher process-conference writing situation (mean = .86, SD = 1.22).

Talk to Teacher. When a oneway ANOVA was computed on the number of times students questioned or directed comments to teachers using process as the independent variable, no significant main effect was recorded, $F(1, 67) = .001$, $p > .05$. The number of times students in high process classrooms spoke to teachers (mean = .89, SD = 1.49) was similar in the low process (mean = .88, SD = 1.05).

Self Talk. When a oneway ANOVA was computed on the number of times students spoke to themselves using process as the independent variable, no significant main effect was recorded, $F(1, 67) = .006$, $p > .05$. The instances of self-directed talk in the high process classroom (mean = .61, SD = 1.81) were similar in the low process (mean = .58, SD = 1.13).

Planning Time

The amount of time students spent writing or drawing on the lined and unlined newsprint paper was recorded for each of the seventy-two subjects. A oneway analysis of variance (ANOVA) was computed on the planning time using process as the independent variable. Contrary to expectations, the results indicated a significant main effect, $F(1,70) = 7.74$, $p<.01$, with students in the more traditional or low process writing classrooms spending more time planning (mean = 27.80 minutes, SD = 15.40) compared to students in the high process classrooms (mean = 19.80 minutes, SD = 7.78).

Number of Pages

In order to discover whether complexity of planning might produce a larger quantity and variety of plans, the number of pages used in each of the plans was counted and recorded. The number of pages used by students in the high process classrooms (mean = 1.58, SD = .73) was similar to the number used by subjects in low process classrooms (mean = 1.67, SD = .79). When a oneway ANOVA was computed on these results using process as the independent variable, no significant difference was indicated, $F(1, 70) = .21$, $p > .05$.

Number of Ideas

When generating topics for a drawing, individuals can use a variety of strategies to explore ideas. While most made full page drawings similar to the final product, some students wrote their ideas in lists or web, and others explored possibilities with small rough sketches drawn all over the page. In the latter case, only one or a few of these small sketches were found in the final product. These plans indicate that the subject's initial idea underwent many transformations before becoming a final product. Accordingly, the

drawing plans were analysed to determine the number of ideas explored by the subject before beginning the final product. Contrary to expectations, the number of ideas found in the plans of students from the low process classrooms (mean = 2.03, SD = 1.40) seemed higher than those in the high process (mean = 1.56, SD = 1.36). However, when a oneway ANOVA was computed on these results using process as the independent variable, no significant main effect was seen, $F(1, 70) = 2.10$, $p > .05$.

Erasures

The instances of erasing in low process classrooms seemed to occur more frequently (mean = 11.44, SD = 12.94) than in the high process (mean = 6.83, SD = 6.85). When a oneway ANOVA was computed on these results, a significant main effect was not indicated, $F(1, 70) = 3.57$, $p > .05$.

Monitoring

Monitoring was the term used to describe the tendency students have of looking around the classroom to determine what their peers are doing. A oneway ANOVA was computed on the amount of times a student monitored the classroom using process as the independent variable. A significant main effect was seen in the results, $F(1,70) = 5.08$, $p < .05$. Students in the low process classrooms surveyed other students more often (mean = 6.08, SD = 5.77) then students in high process classrooms (mean = 3.69, SD = 2.66).

Grade

As students mature intellectually, they become more capable of producing the types of plans described by Bereiter and Scardamalia (1987) as conceptual. Therefore, it was important to analyse the data collected to discover whether grade level would have any effect. Refer to Table 2 for a summary of the mean planning behaviours of students in Grade 4, 5, and 6.

Table 2.

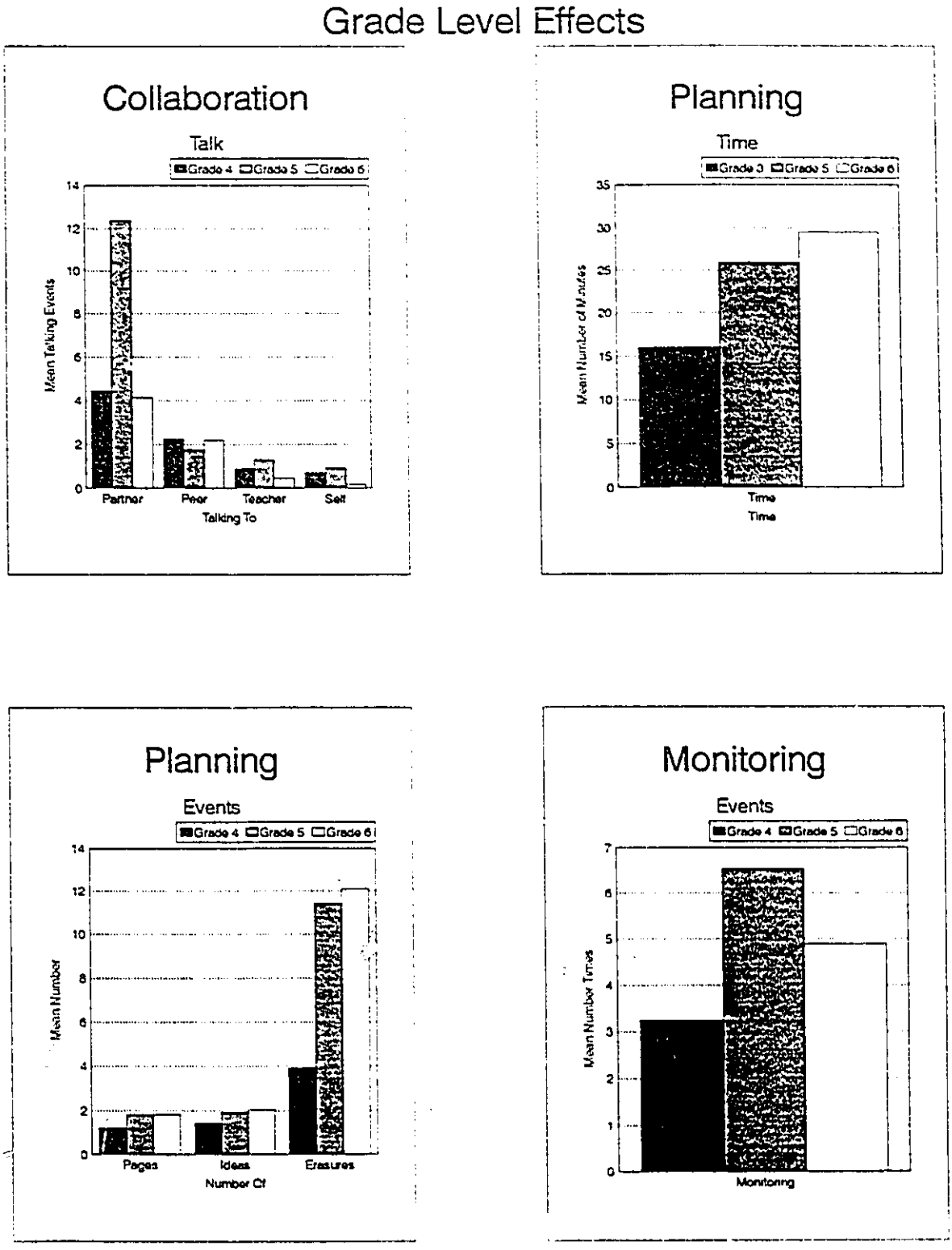
Comparison of mean planning behaviours for students in Grade 4, 5, and 6.

Planning Behaviours	Gr. 4		Gr. 5		Gr. 6		
	Mean	SD	Mean	SD	Mean	SD	p
Partner Talk (occurrences)	4.43	6.94	12.38	10.02	4.13	3.84	<.001
Peer Talk (occurrences)	2.24	2.79	1.75	2.89	2.17	3.20	NS
Teacher Talk (occurrences)	.90	1.60	1.29	1.73	.46	.59	NS
Self Talk (occurrences)	.71	1.60	.92	1.98	.17	0.38	NS
Planning Time (minutes)	16.00	10.19	25.92	11.17	29.50	13.14	<.01
Number of Pages	1.21	0.66	1.83	0.76	1.83	0.70	<.01
Number of Ideas	1.42	0.65	1.92	1.74	2.04	1.52	NS
Number of Erasures	3.92	4.69	11.42	12.70	12.08	10.80	<.01
Monitoring (events)	3.25	2.72	6.54	5.03	4.88	5.25	<.05

Note 1. Statistical comparisons are based on one way Analyses of Variance.

Note 2. NS = Not significant

Figure 22.


Grade Level Effects
Collaboration
Talk
Grade 4 Grade 5 Grade 6
Mean Talking Events
Partner
Peer
Teacher
Self
Talking To
Planning
Time
Grade 4 Grade 5 Grade 6
Time
Planning
Events
Grade 4 Grade 5 Grade 6
Mean Number
Pages
Ideas
Erasures
Number Of
Monitoring
Events
Grade 4 Grade 5 Grade 6
Mean Number Times
Monitoring

Collaboration

Partner Talk. A oneway ANOVA was computed on the amount of times students spoke to partners using grade as the independent variable. The results recorded a significant main effect, $F(2, 66) = 9.42$, $p<.001$. A post hoc analysis indicated that Grade 5 students spent significantly more time talking (mean = 12.38, SD = 10.02) than Grade 4 students (mean = 4.43, SD = 6.94) and Grade 6 students (mean = 4.13, SD = 3.84).

Peer Talk. A oneway ANOVA was computed on the number of times subjects spoke to peers using grade as the independent variable. No significant differences were seen between the occurrences of talk to peers in Grade 4 (mean =2.24, SD = 2.79), Grade 5 (mean = 1.75, SD =2.89), or Grade 6 (mean = 2.17, SD = 3.20), $F(2, 66) = .18$.

Talk to Teacher. A oneway ANOVA was computed on the number of times subjects spoke using grade as the independent variable. No main effects were recorded between the instances of teacher talk between Grade 4 (mean = .90, SD = 1.60), Grade 5 (mean =1.29, SD = 1.73), or Grade 6 (mean =.46, SD = .59), $F(2, 66) = 2.63$, $p> .05$..

Self Talk. A oneway ANOVA was computed on the number of times subjects spoke to themselves using grade as the independent variable. No main effects were seen in the number of times students spoke to themselves in Grade 4 (mean = .71, SD = 1.60), in Grade 5 (mean = .92, SD = 1.98), or in Grade 6 (mean = .17, SD =.38), $F(2,69) = 1.63$, $p > .05$.

Planning Time

Results also indicated a significant main effect when a oneway ANOVA was computed on the planning time using grade as an independent variable, $F (2,69) = 8.78$, $p< .001$. A post hoc analysis indicated that Grade 4 students spent less time planning (mean = 16.00, SD = 10.19) than Grade 5

students (mean = 25.92, SD = 11.17) and Grade 6 students (mean = 29.50, SD = 13.14). This may be an indication that the older students were more involved with conceptual planning than the younger students.

Number of Pages

A oneway ANOVA was computed on the number of sheets of paper students used in their drawing plans using grade as the independent variable. A significant main effect was recorded, ($F(2, 69)= 6.23$, $p<.005$. A post hoc analysis demonstrated that the students in Grades 5 and 6 both used significantly more pages (means = 1.83, SD =.76 and .70) to plan their final drawings than did the students in Grade 4 (1.21, SD = .66). This may be an another sign that the older students were more capable of conceptual planning than the younger students.

Number of Ideas

A oneway ANOVA was computed on the number of ideas found in the plans of subjects using grade as the independent variable. No significant differences were found in the average number of ideas between students in Grade 4 (mean = 1.42, SD =.65), Grade 5 (mean =1.92, SD = 1.74) or Grade 6 (mean = 2.04, SD = 1.52), $F(2, 69)= 1.37$, $p > .05$.

Erasures

When a oneway ANOVA was computed on the amount of erasing done by students using grade as the independent variable, a significant main effect was indicated, $F(2, 69)= 4.94$, $p<.01$. A post hoc analysis showed that the students in Grades 5 (mean = 11.42, SD = 12.70) and Grade 6 (mean = 12.08, SD = 10.80) erased more often than the students in Grade 4 (mean = 3.92, SD = 4.69). This may be due to the fact that students in Grade 4 more often used marker only to plan and demonstrated a less tentative approach to drawing.

Monitoring

A oneway ANOVA was computed on instances of monitoring using grade as the independent variable. The results showed a signficiant main effect, $F(2, 69) = 3.23$, $p<.05$. A post hoc analysis indicated that the students in Grade 5 did the most monitoring (mean = 6.54, SD = 5.03) compared to students in Grade 4 (mean = 3.25, SD = 2.72) and students in Grade 6 (mean = 4.88, SD = 5.25). This could signify that Grade 5 students are less confident in their drawing abilities than students in Grade 4, yet possess fewer planning strategies than students in Grade 6.

Gender

Some writing studies (Graves, 1975; Sowers, 1979) have indicated differences between the writing behaviours of males and females. Accordingly, a oneway ANOVA was computed on the planning behaviours of the subjects in this study using gender as the independent variable. See Table 3 for a summary of the results. With respect to collaboration, some differences were discovered.

Collaboration

Partner Talk. No significant main effect was seen between the number of times boys spoke to partners (mean = 6.97, SD = 7.33) and girls spoke to partners (mean =7.19, SD = 9.09), $F(1, 67) = .01$, $p > .05$.

Peer Talk. A significant main effect was recorded for the amount of talk to peers by girls and boys, $F(1, 67) = 4.67$, $p<.05$. Boys spoke significantly more often to peers (mean = 2.84, SD = 3.74) than did girls (mean = 1.35, SD = 1.78). Since this type of talk was characterized by a higher voice volume or movement from the student's normal seating arrangement, results may indicate that boys possess fewer inhibitions regarding behaviour than girls.

Table 3.

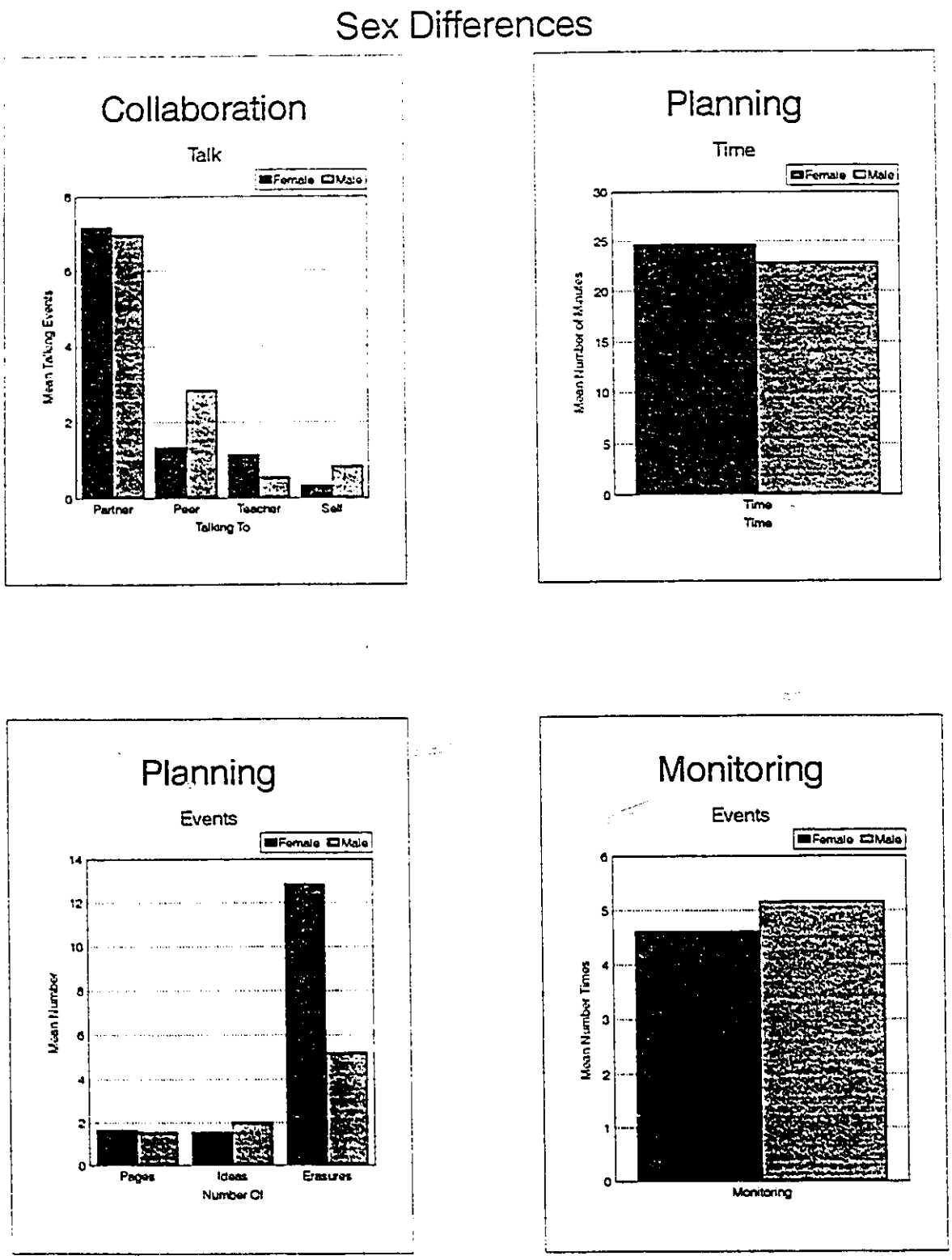
Comparison of planning behaviours for girls and boys.

Planning Behaviour	Female		Male		
	Mean	SD	Mean	SD	p
Partner Talk (occurrences)	7.19	9.09	6.97	7.33	NS
Peer Talk (occurrences)	1.35	1.78	2.84	3.74	<.05
Teacher Talk (occurrences)	1.16	1.59	0.56	0.72	<.05
Self Talk (occurrences)	0.35	0.95	0.86	1.90	NS
Planning Time (minutes)	24.70	12.40	22.86	13.26	NS
Number of Pages	1.68	0.63	1.57	0.88	NS
Number of Ideas	1.57	1.09	2.03	1.64	NS
Number of Erasures	12.86	10.81	5.20	8.78	<.01
Monitoring (events)	4.62	4.19	5.17	5.08	NS

Note 1. Statistical comparisons are based on one way Analyses of Variance.

Note 2. NS = Not significant

Figure 23.


Sex Differences
Collaboration
Talk
Female
Male
Mean Talking Events
0
2
4
6
8
Partner
Peer
Teacher
Self
Talking To
Planning
Time
Female
Male
Mean Number of Minutes
0
5
10
15
20
25
30
Time
Time
Planning
Events
Female
Male
Mean Number
0
2
4
6
8
10
12
14
Pages
Ideas
Erasures
Number Of
Monitoring
Events
Female
Male
Mean Number Times
0
1
2
3
4
5
6
Monitoring

Talk to Teacher. Girls on the other hand spoke more often to teachers (mean = 1.16, SD = 1.59) than did boys (mean= .56, SD = .72). The main effect recorded for talk to teacher using gender as the independent variable was significant, $F(1,67) = 3.87$, $p < .05$. Results may indicate that girls are more concerned with following instructions correctly than boys.

Self Talk. When a oneway ANOVA was computed on the number of times students spoke to themselves using gender as the independent variable, no significant differences were indicated, $F(1, 70) = 2.08$, $p > .05$. Boys spoke to themselves about as often (mean = .86, SD = 1.90) as females (mean = .35, SD = .95).

Planning time

A oneway ANOVA was computed on the amount of time spent planning using gender as the independent variable. No significant difference was seen in the planning time of the girls (mean = 24.70 minutes, SD = 12.40) and that of the boys (mean = 22.86, SD = 13.26), $F(1, 70) = .37$, $p > .05$.

Number of Pages

A oneway ANOVA was calculated on the number of pages using gender as the independent variable. No significant main effect was indicated between the number of pages used by boys (mean = 1.57, SD= .88) and girls (mean = 1.68, SD = .63), $F(1, 70) = .34$, $p > .05$.

Number of Ideas

The number of ideas produced by the boys (mean = 2.03, SD = 1.64) was not signficantly more than the ideas generated by the girls (mean = 1.57, SD = 1.09); $F(1, 70) = 2.00$, $p > .05$.

Erasures

When a oneway ANOVA was computed, results indicated a significant main effect in the behaviour of erasing using gender as the independent

variable, $F(1, 70), = 10.83, p < .005$. The girls (mean = 12.86, SD = 10.81) erased significantly more often than the boys (mean = 5.20, SD = 8.78). This result may be due to the fact that the girls selected the medium of pencil for planning far more often than the boys. See Table 7 for these results.

Monitoring

The amount of monitoring done by boys in this study (mean = 5.17, SD = 5.08) was not significantly higher than that done by the girls (mean = 4.62, SD= 4.19), $F(1, 70) = .25, p > .05$.

Paper

In order to accommodate both the visual and verbal planning styles of subjects, they were given the option of using two types of paper, lined or unlined newsprint for their planning. Surprisingly, the lined newsprint was often used for sketching. Upon interviewing students who began their visual plans on the lined paper, the researchers learned that they considered this the "roughest" paper to use. Unlined paper was considered more appropriate for final stages of planning. Some students not using lined paper, upon being questioned, related that they considered it inappropriate for drawing. It should be noted that some students did use the lined paper to write a description about their drawing activity after finishing their final picture. Refer to Table 4 for a summary of mean planning behaviours in relation to the initial type of paper, lined or unlined, students used in planning.

Collaboration

Partner Talk. When a oneway ANOVA was computed on the amount of partner talk using paper as the independent variable, no significant differences were indicated, $F(1, 67) = 1.9, p > .05$. Students who began working on the lined paper spoke to their partners as often (mean = 8.19, SD = 9.59)

Table 4.

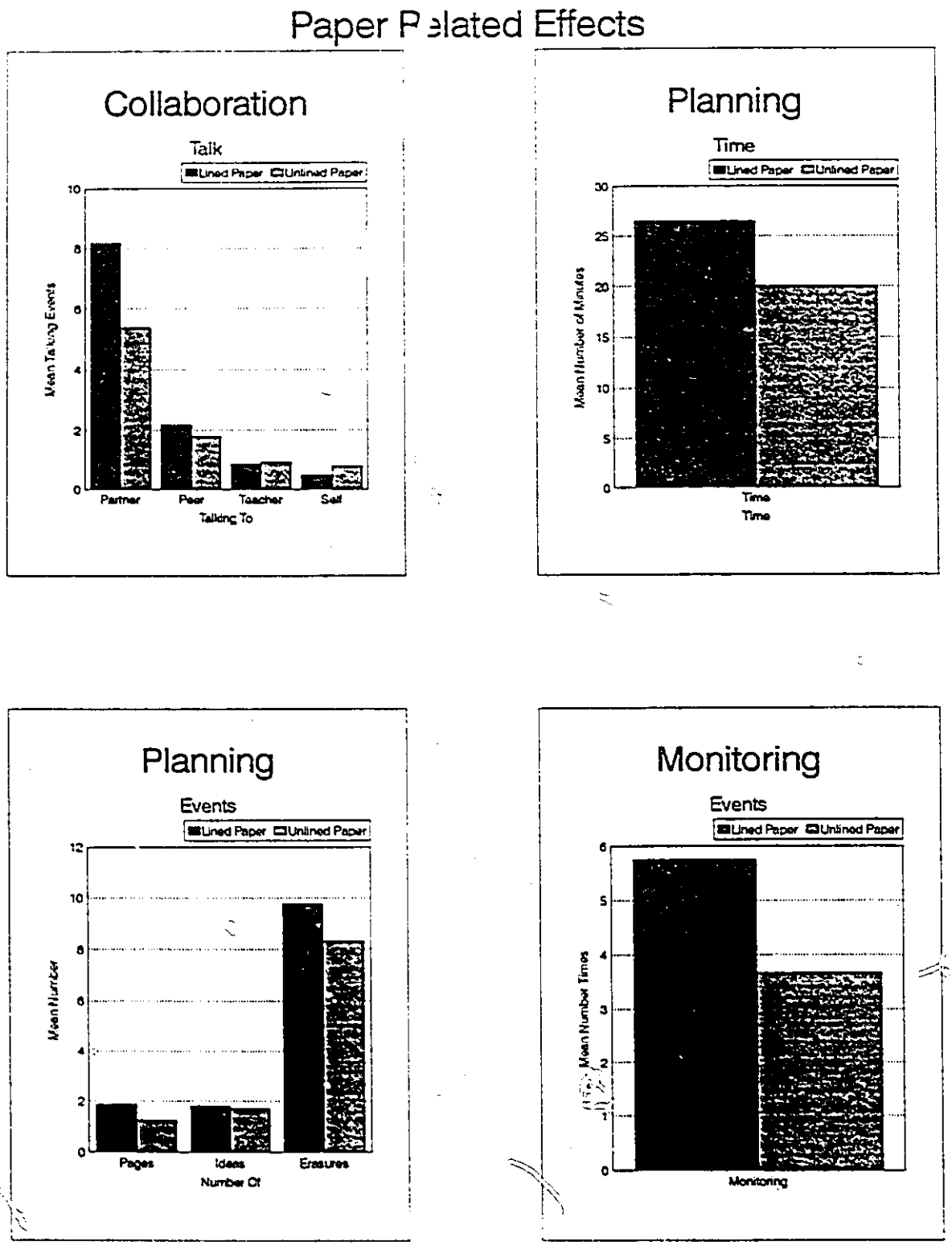
Comparison of the mean planning behaviours for students using the lined or unlined paper first in their plans.

Planning Behaviour	Lined Paper		Unlined Paper		
	Mean	SD	Mean	SD	p
Partner Talk (occurrences)	8.19	9.59	5.37	5.34	NS
Peer Talk (occurrences)	2.19	3.16	1.81	2.60	NS
Teacher Talk (occurrences)	0.86	1.14	0.93	1.52	NS
Self Talk (occurrences)	0.48	1.06	0.77	1.96	NS
Planning Time (minutes)	26.50	13.55	20.03	10.70	<.05
Number of Pages	1.88	0.74	1.27	0.64	<.001
Number of Ideas	1.83	1.51	1.73	1.23	NS
Number of Erasures	9.79	11.49	8.32	9.16	NS
Monitoring (events)	5.76	5.30	3.67	3.17	NS

Note 1. Statistical comparisons are based on one way Analyses of Variance.

Note 2. NS = Not significant

Figure 24.


Paper Related Effects
Collaboration
Talk
Lined Paper
Unlined Paper
Mean Talking Events
Partner
Peer
Teacher
Self
Talking To
Planning
Time
Lined Paper
Unlined Paper
Mean Number of Minutes
Time
Time
Planning
Events
Lined Paper
Unlined Paper
Mean Number
Pages
Ideas
Erasures
Number Of
Monitoring
Events
Lined Paper
Unlined Paper
Mean Number Times
Monitoring

as students who began on unlined paper (mean = 5.37, SD = 5.34).

Peer Talk. It appeared that students who began on lined paper spoke to peers slightly more (mean= 2.19, SD = 3.16) than students who started their plans on the unlined paper (mean = 1.81, SD =2.60). When a oneway ANOVA was computed on the amount of peer talk using paper as the independent variable no significant difference was indicated, $F(1, 67) = .27$, $p > .05$.

Talk to Teacher. Students who selected unlined paper as the initial planning paper spoke about the same amount to the teachers in the class (mean = 0.93, SD = 1.52) as students beginning on lined paper (mean = 0.86, SD = 1.14). No significant main effect was recorded, $F(1, 67) = .05$, $p > .05$, when a oneway ANOVA was computed on teacher talk using paper as the independent variable.

Self Talk. When a oneway ANOVA was tabulated on the amount of self talk using paper as the independent variable, no significant differences were indicated, $F(1, 70) = .65$, $p > .05$. Students beginning on unlined paper spoke to themselves as often (mean = 0.77, SD = 1.96) as students beginning on lined paper (mean = 0.48, SD = 1.06).

Planning Time

A oneway ANOVA was computed on initial paper students used with planning time as the independent variable. Students who began planning on lined paper (mean= 26.50 minutes, SD = 13.55), took a significantly longer period of time, $F(1, 70)= 4.73$, $p<.05$, doing their plans than did students who began on the unlined paper (mean = 20.03 minutes, SD = 10.70). Students who began on unlined paper often did not use the lined paper at all during their planning times. However, students who did begin on lined paper often proceeded to use the unlined paper before doing their final drawing. Perhaps that is why the average amount of planning time for the students using lined

paper first was longer than those beginning on unlined paper.

Number of Pages

Accordingly, when a oneway ANOVA was computed on the number of sheets of paper using the initial type of paper as the independent variable, a significant main effect was also noted, $F(1, 70) = 13.49$, $p<.001$. Students who began their plans with lined paper used more sheets of paper in their rough work (mean = 1.88, SD = .74) as compared to those beginning with the unlined (mean = 1.27, SD = .64). Students who began on lined paper were more likely to also use the unlined paper, while those beginning with the unlined often did not use the lined paper.

Number of Ideas

When a oneway ANOVA was computed on the number of ideas subjects generated for their plans using initial type of paper as the independent variable, no significant main effect was recorded, $F(1, 70) = .09$, $p > .05$. Students who began their plans on lined paper had the same number of ideas (mean = 1.83, SD = 1.51) as students who began on unlined (mean = 1.73, SD = 1.23).

Erasures

When a oneway ANOVA was computed on the amount of erasing done by the subjects using paper as the independent variable, no significant difference was indicated, $F(1, 70) = .38$, $p > .05$. Those students who began on lined paper had erased as often (mean = 9.79, SD = 11.49) as those beginning on unlined paper (mean = 8.23, SD = 9.16).

Monitoring

Subjects who began on lined paper apparently monitored more often (mean = 5.76, SD=5.30) than those who began on unlined (mean = 3.67, SD = 3.17). But when a oneway ANOVA was calculated on the monitoring using

paper as the independent variable, no significant difference was indicated, $F(1, 70) = 3.73, p > .05$.

Planning Medium

Students were given the option of using pencil, markers, or both in their plans. Those using pencil during planning appeared to possess a more exploratory, tentative drawing approach or style. Making mistakes appeared a concern to these students so pencil, which can be easily corrected, was more often their choice of medium for planning. In contrast, the students who planned with marker seemed to work more confidently and spontaneously. They appreared very focussed on their work and did it quickly. When comparing the choice of planning medium to other variables, some interesting and significant results emerged. Refer to Table 5 for a summary of mean planning behaviours of students who used pencil, marker, or both in their plans.

Collaboration

Partner Talk. A oneway ANOVA was computed on the amount of talk to partners using medium as the independent variable. The results indicated a significant main effect, $F(2, 65) = 3.34$, $p<.05$. A post hoc analysis showed that students who worked only in pencil spent significantly more time talking to partners (mean = 9.24, SD = 9.36) than did students using marker (mean = 3.33, SD = 5.69) or both pencil and marker (mean = 4.89, SD = 5.94). This result seems logical, since the students using pencil appeared to have a more cautious or exploratory approach. As a result, they might feel a need to discuss and try out their plans with their peers more than other students.

Peer Talk. The amount of talk between peers seemed highest for those using both pencil and marker in the plans (mean = 2.44, SD= 3.68). Those using only pencil spoke to peers (mean = 1.97, SD=2.51) as often as those

Table 5.

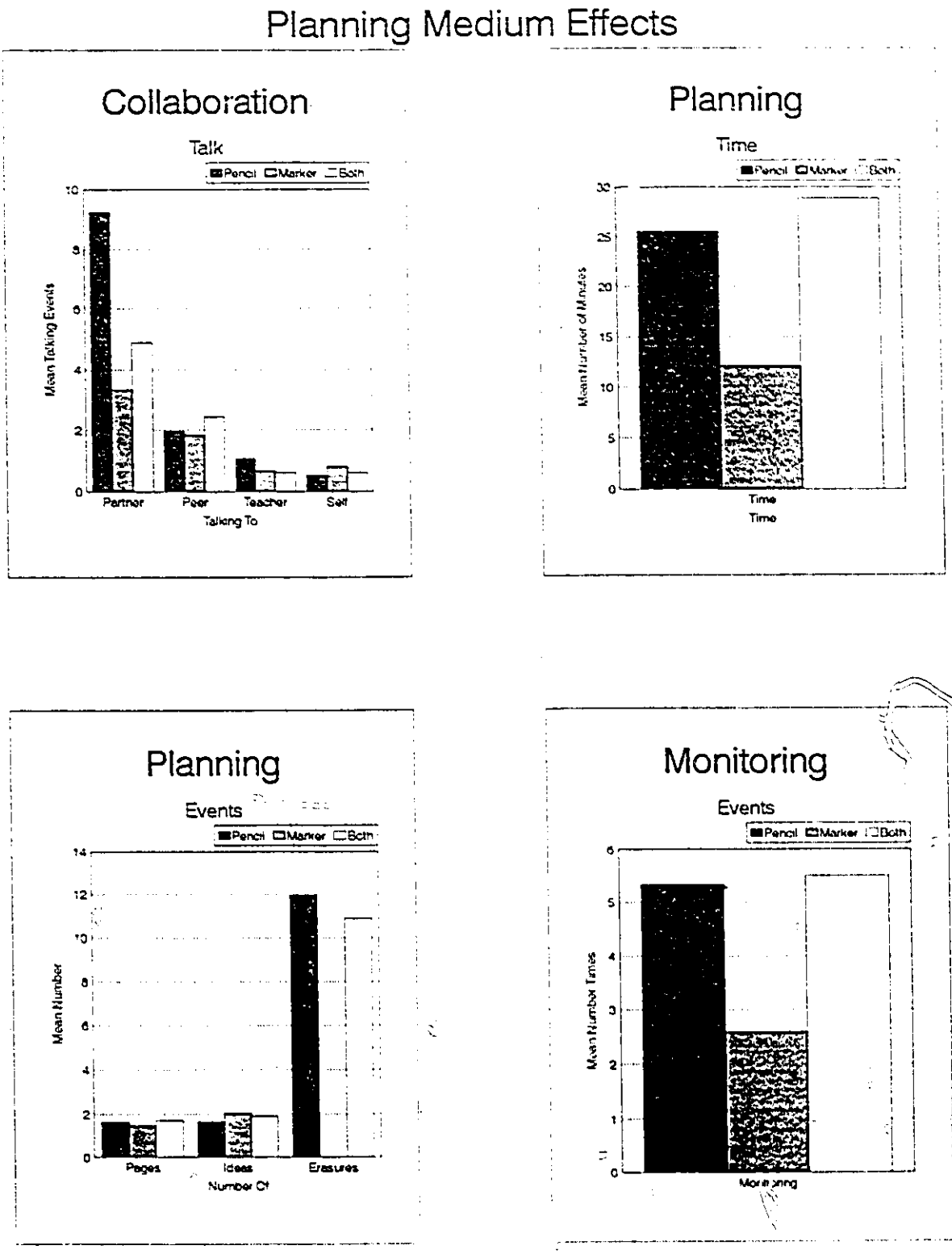
Comparison of mean the planning behaviours for students using pencil, marker, or both pencil and marker in their plans.

Planning Behaviours	Pencil		Marker		Both		
	Mean	SD	Mean	SD	Mean	SD	p
Partner Talk (occurrences)	9.24	9.36	3.33	5.69	4.89	5.94	<.05
Peer Talk (occurrences)	1.97	2.51	1.83	3.24	2.44	3.68	NS
Teacher Talk (occurrences)	1.08	1.60	0.67	0.78	0.61	.70	NS
Self Talk (occurrences)	0.53	1.47	0.80	1.74	0.61	1.46	NS
Planning time (minutes)	25.58	10.48	12.13	10.36	28.89	13.55	<.001
Number of Pages	1.63	0.79	1.47	0.99	1.72	0.46	NS
Number of Ideas	1.66	1.24	2.07	1.39	1.89	1.75	NS
Number of Erasures	11.95	10.69	0.00	0.00	10.88	10.98	<.001
Monitoring (events)	5.34	4.18	2.60	3.18	5.50	5.93	NS

Note 1. Statistical comparisons are based on one way Analyses of Variance.

Note 2. NS = Not significant

Figure 25.


Planning Medium Effects
Collaboration
Talk
Pencil
Marker
Both
Mean Talking Events
Partner
Peer
Teacher
Self
Talking To
Planning
Time
Time
Time
Planning
Events
Mean Number
Pages
Ideas
Erasures
Number Of
Monitoring
Events
Mean Number Times

using only marker (mean = 1.83, SD=3.24). When a oneway ANOVA was computed on the amount of peer talk using planning medium as the independent variable, no significant main effects were recorded, $F(2, 65) = .2$, $p > .05$.

Talk to Teacher. Students who used only pencil in their plans spoke as often to teachers (mean = 1.08, SD=1.60), as did those who used only marker (mean = 0.67, SD= .78) or those using a combination of both (mean = 0.61, SD = .70). No significant differences were indicated when a oneway ANOVA was calculated on teacher talk using planning medium as the independent variable, $F(2, 65) = .99$, $p > .05$.

Self Talk

Subjects who used marker in the plans spoke more to themselves (mean = 0.80, SD = 1.74) than did students using pencil only (mean = 0.53, SD= 1.47) or a combination of media (mean = 0.61, SD= 1.46). When a oneway ANOVA was computed on self talk using planning medium as the independent variable, no significant differences were seen, $F(2, 68) = .17$.

Planning Time

The choice of planning medium appeared to affect the amount of time it took for students to complete their plans. A oneway ANOVA was computed on the planning time using medium as the independent variable. Results showed a significant main effect, $F(2, 68) = 10.28$, $p<.0001$. A post hoc analysis indicated that the planning time of students who used just pencil (mean = 25.38 minutes, SD = 10.48) and students using pencil and marker (mean = 28.89 minutes, SD = 13.55) was significantly longer than those using only markers (mean = 12.13 minutes, SD = 10.36).

Number of Pages

When a oneway ANOVA was computed on the number of pages using planning medium as the independent variable, no significant main effects

were seen, $F(2, 68) = .46$, $p > .05$. Subjects who used both pencil and marker in their plans used the same amount of paper (mean = 1.72, SD = 0.46) as those using pencil (mean= 1.63, SD = 0.79) and those using marker only (mean = 1.47, SD = 0.99).

Number of Ideas

Subjects using only marker in their plans generated the same amount of ideas (mean = 2.07, SD =1.39) as those using a combination of pencil and marker (mean =1.89, SD = 1.75) and those using pencil only (mean = 1.66, SD = 1.24). When a oneway ANOVA was computed on the number of ideas using planning medium as the independent variable, no significant main effects were recorded, $F(2, 68) = .50$, $p > .05$.

Erasures

Logically, the type of medium used also related to the amount of erasing done by students. The same amount of erasing was done by students who used only pencil (mean = 11.95, SD =10.69) as those using both pencil and marker (mean = 10.88, SD = 10.98). But students using only marker could not erase (mean = .00, SD = .00), so a significant difference was noted between students in this group and those in the the other two, $F(2, 68) = 8.71$, $p < .001$.

Monitoring

A oneway ANOVA was computed on the amount of monitoring using choice of media as the independent variable, no significant main effect was recorded, $F(2, 68) = 2.27$, $p > .05$. Students using both pencil and marker in their plans monitored other students as often (mean = 5.50, SD = 5.93) as students using pencil only (mean = 5.34, SD = 4.18) and students using marker only (mean = 2.60, SD = 3.18).

Planning Medium and Grade

A test of independence was computed to explore the relationship

between choice of planning medium and grade. Results indicated that the students in the higher grades used pencil or a combination of pencil and marker significantly more often than marker alone ($x^2(4) = 10.73$, $p<.05$). In Grade 4, 9 students executed their plans with marker only. Only 2 students in Grade 5 used markers alone, and 4 students in Grade 6 choose markers. See Table 6 for a display of these selections by grade.

Planning Medium and Gender

When a test of independence was computed on the planning medium using sex as the independent variable, a significant main effect was recorded ($x^2(4) = 9.19$, $p<.01$) for the use of pencil. Pencil was used more often by the girls (25) than the boys (13). More boys (12) used markers than girls (3). Almost the same number of girls (9) as boys (10) used both pencil and markers in their plans. See Table 7 for a summary of these selections by gender.

Planning Medium, Grade, and Gender

A cross tabs procedure on the choice of planning medium was computed for grade while controlling for gender. Results indicated a significant difference for the females but not the males, ($x^2(4) = 15.40$, $p <.01$). Refer to Table 8 for a summary of the distributions of planning medium over grade and gender.

Plannning Medium and Process

A test of independence was used to compute the choice of medium with process as the independent variable. No significant relationship between medium and process was indicated.

Classroom Arrangement

Graves (1975) in one study, sought to relate various aspects of writing behaviours to differences in classroom settings, which he labelled as "formal and informal". One finding that was particularly significant was that the

Table 6.

The distribution of planning medium over grade level.

	Grade		
Planning medium	4	5	6
Pencil	9	18	11
Marker	9	2	4
Both	6	4	9

Table 7.

A distribution of planning medium by gender.

	Gender	
Planning medium	Female	Male
Pencil	25	13
Marker	3	12
Both	9	10

Table 8.

A distribution of planning medium over gender and grade.

Planning Medium	Female			Male		
	Gr. 4	Gr. 5	Gr. 6	Gr. 4	Gr. 5	Gr. 6
Pencil	4	13	8	5	5	3
Marker	3	0	0	6	2	4
Both	5	0	4	1	4	5

informal classroom environments gave the children greater choice so that they came to produce more writing over a period of time. Consequently, in this study, we noted whether or not students' desks were lined up in rows, a more formal, traditional approach to seating arrangement, or if their desks were paired or placed together in groups of larger size, which is often considered more informal and should encourage more collaboration.

Oneway ANOVAs were calculated on the various planning behaviours using classroom seating arrangement, as the independent variable. See Table 9 for a summary of the mean planning behaviours of the students in which the classroom seating arrangement was in rows or groups. The results indicated that whether students were seated in rows or groups in the classroom, had no significant effects on the following behaviours:

i) the amount of talk between partners, peers, teacher and students, or the students and themselves

ii) the length of planning time

iii) the number of pages used in the plans

iv) the number of ideas found in the plans

v) the amount of erasing done

vi) the amount of monitoring

When teachers were questioned about seating arrangement, they explained that they were very flexible with their student groupings. They indicated that students were moved from rows to groups depending on the dynamics of the planned task or activity which may be why no main effects were recorded.

Planning Categories and Levels

The principal researcher reviewed the drawing plans of the 72 video-taped subjects on three separate occasions using the Taxonomy of Children's

Table 9.

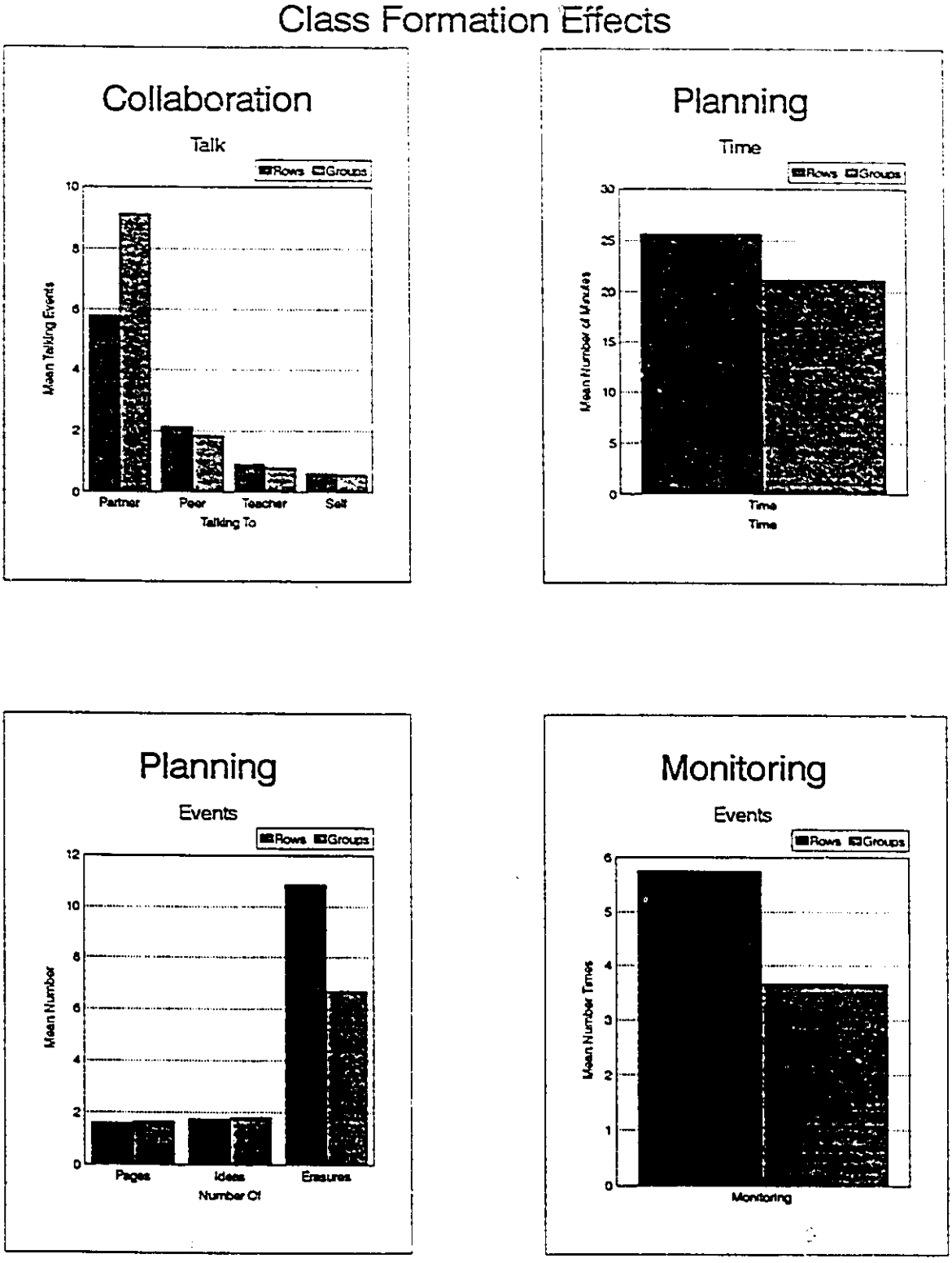
Comparison of the mean planning behaviours of students seated in rows and groups.

Planning Behaviour	Rows		Groups		
	Mean	SD	Mean	SD	p
Partner Talk (occurrences)	5.79	6.62	9.11	10.11	NS
Peer Talk (occurrences)	2.16	3.11	1.85	2.70	NS
Teacher Talk (occurrences)	0.93	1.40	0.81	1.10	NS
Self Talk (occurrences)	0.62	1.70	0.57	1.19	NS
Planning time (minutes)	25.67	13.39	21.20	11.56	NS
Number of Pages	1.60	1.45	1.67	0.88	NS
Number of Erasures	10.88	11.99	6.70	7.61	NS
Monitoring (events)	5.76	4.97	3.67	3.84	NS

Note 1. Statistical comparisons are based on one way Analyses of Variance.

Note 2. NS = Not significant

Figure 26.


Class Formation Effects
Collaboration
Talk
Rows
Groups
Mean Talking Events
Partner
Peer
Teacher
Self
Talking To
Planning
Time
Rows
Groups
Mean Number of Minutes
Time
Time
Planning
Events
Rows
Groups
Mean Number
Pages
Ideas
Erasures
Number Of
Monitoring
Events
Rows
Groups
Mean Number Times
Monitoring

Drawing Plans in order to assign an appropriate category to each one. Of the eighteen categories initially established when all 303 drawing plans were analysed, four were not represented in the plans by the 72 subjects. These were categories 0, 3, 4, and 11. Twenty-one of the 72 drawing plans or 29.17% were established as belonging to category 8 which was the one most frequently found among these 72 drawing plans. Second in order of frequency was category 13 which was assigned to 15 different plans, representing 20.83% of the drawing plans. See Table 10 and 11 for a complete summary of the planning categories assigned to subjects in the study.

Of the 72 drawing plans, 45 or 62.5%were characteristic of Level 2, 24 or 33.3% to Level 3, and 3 or 4.2% to Level 1. As indicated in Table 12, the majority of the plans were found in Level 2, which indicates a low level of planning taking place in the drawing plans of the subjects. It should be noted that the 3 plans assigned to Level 1 were done by male students in Grade 4.

Twenty-five out of the 72 drawing plans and final products made by the selected subjects were given to a visual arts education instructor to rate using the Taxonomy of Drawing Plan Categories. The principal researcher briefly clarified the differences between these categories to the independent rater, using the work of other students in the study as guides. Twenty of the 25 plans were classified exactly the same as in the rating by the principal researcher, indicating an 80% level of agreement between raters. Of the five disagreements, two were quickly resolved after a brief discussion in which the validator was provided with some information obtained from the videotapes concerning the planning processes of these particular subjects. This raised the inter-rater agreement level to 88%.

Three plans were assigned to new categories and two of these remained in the same Planning Level as before. The one remaining plan was changed

Table 10.

Distribution of planning categories across grade level. The percentage of plans in each category across grades is also given.

Category	Gr. 4	Gr. 5	Gr. 6	Total percent
0	0	0	0	0%
1	1	0	0	1.4%
2	2	0	0	2.8%
3	0	0	0	0%
4	0	0	0	0%
5	1	1	2	5.6%
6	0	0	1	1.4%
7	4	2	2	11.1%
8	10	7	4	29.2%
9	0	1	3	5.6%
10	1	3	2	8.3%
11	0	0	0	0%
12	0	1	0	1.4%
13	1	6	8	15%
14	2	0	1	4.2%
15	1	1	0	2.8%
16	1	2	0	4.2%
17	0	0	1	1.4%

Table 11.

The distribution of planning categories over grade and gender.

Planning	Grade 4		Grade 5		Grade 6	
Category	Female	Male	Female	Male	Female	Male
0	0	0	0	0	0	0
1	0	1	0	0	0	0
2	0	2	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	1	0	0	1	1	1
6	0	0	0	0	0	1
7	3	1	0	2	0	2
8	6	4	4	3	3	1
9	0	0	1	0	1	2
10	0	1	3	0	2	0
11	0	0	0	0	0	0
12	0	0	1	0	0	0
13	1	0	4	2	3	5
14	0	2	0	0	1	0
15	0	1	0	1	0	0
16	1	0	0	2	0	0
17	0	0	0	0	1	0

Table 12.

The distribution of planning levels across subjects.

Planning Levels	Frequency	Percentage
1	3	4.25%
2	45	62.5%
3	24	33.3%

from Category 13 in Level 3 to Category 10 in Level 2 after a small alteration was made in the wording of Category 13. The words "and ideas" was eliminated from the sentence, "the plans consist of pencil or marker exploratory sketches of different topics and ideas".

The degree of inter-rater reliability suggests that this drawing plan taxonomy could be used in future research as a basis for developing a more refined and comprehensive instrument. Further studies could extend the taxonomy to the secondary grades and be a useful indication of student planning abilities.

When a frequency test was computed on the planning levels using grade and sex as the independent variables no significant main effects were recorded for grade (x^2 (4) =7.88, p> .05) or sex(x^2(4) = 6.57, p > .1). See Table 13 for the distribution of planning levels over grade and sex.

Table 13.

The distribution of planning levels over grade and gender.

Planning Levels	Grade 4		Grade 5		Grade 6		Total	
	Female	Male	Female	Male	Female	Male	Female	Male
1	0	3	0	0	0	0	0	3
2	10	6	9	6	7	7	26	19
3	2	3	4	5	5	5	11	13

CHAPTER IV

DISCUSSION

Although children in this drawing study appeared to possess a basic understanding of the planning process in which some management of composing was revealed, it was not the mature metacognitive activity of adults documented in past writing studies (Flower & Hayes, 1980a; Bereiter & Scardamalia, 1987). In many instances (41 out of 72 plans or 56.94%) we observed students generating one topic for their final drawing and illustrating their various ideas related to it on the rough paper provided. Then this plan was redrawn with very few changes using marker for the final product.

In these drawing situations, the artists' final image of their work was arrived at with few documented instances of experimentation, brain-storming, or problem-solving. Most of the subjects worked quite quickly and seemed satisfied with their first and only efforts. This is generally the case of all the plans that fell within Planning Level 2.

In the 24 drawing plans (33.33%) assigned to Planning Level 3, we saw evidence that students were more aware of the content because they were trying out different ideas or topics in their sketches. Also, a concern for the visual concepts they were trying to present was evident in their attention to drawing details, experimentation with colour and space, and an awareness that their sketched ideas, if in pencil, may require adjustments in order to be drawn with marker.

The results relate to the studies of young writers by Bereiter, Scardamalia, and associates in three obvious ways:

1. the fourth- and sixth- grade students in one investigation (Scardamalia, Bereiter, & Woodruff, 1980) found it difficult to generate three familiar topics for a writing assignment. Similarly, in many of the drawing

plans by these junior students we observed only one topic or idea being generated.

2. They noted that preadolescent writers tended to start writing almost immediately when given an assignment doing little advance planning (Scardamalia & Bereiter, 1981). This was also true of a majority of our young artists whose plans were characteristic of the "content generation stage" and appeared to be visual summaries of selected topics.

3. Just as the written planning products of children in another study (Scardamalia & Bereiter, 1987) were very similar to the final text, the final drawing products of the subjects in this study were almost exact replicas of their drawing plans. There was little evidence of the changes or transformations that occur between the plans and final products of more mature writers taking place in the plans and final drawing products of these young students.

The hypothesis that writing methodology would have an influence on the strategies students use to plan a drawing was not supported in this study. This result may be explained in a number of ways. The classrooms in the study may not have been sufficiently immersed in a process-conference approach to writing to the extent that students would apply the behaviours they used in writing to a drawing situation. In fact, it was difficult for researchers to determine strictly from observation any difference between the classroom arrangement, atmosphere, or resources of high and low writing process classrooms in this study. This may be why no main effect on planning strategies was recorded using process as a variable.

However, if students in the high writing process classrooms did possess these strategies, their apparent lack of transference may also be due to the fact that they do not see any connection between the processes of writing

and drawing. Although teachers may view drawing as a vehicle to produce writing, they often do not see the connections between both or recognize both as composing processes that could be taught in similar ways (Olson, 1992).

There was little evidence that students in the high writing process classrooms were using conferencing skills to plan their drawings. Surprisingly, the students in the low process, or traditional writing classrooms, tended to exhibit the behaviour one would expect from students fully engaged in a process-conference approach to writing by spending more time talking to partners and peers. It may be that this drawing situation was so different from what the students in the low process classrooms were used to that it resulted in more discussion than what was normally allowed by the classroom teacher. Also, there were few instances of strategies like brainstorming, webbing, listing, or outlining being used to generate ideas in either writing environment.

That more talking was recorded in low writing process classrooms does not mean that it was the type of discussion that addressed drawing problems or produced more reflection. A study by Higgins, Flowers, and Petraglia (1990) pointed out that peer collaboration does not necessarily lead to the type of reflection necessary for good planning to take place, especially if it has not been properly modelled or guided by the teacher.

The videotapes clarify these observations. A Grade 6 girl in a low writing process classroom never began her final product because she spent all her time planning. For 56 minutes she sketched two separate ideas on two sheets of unlined paper. This time included a long period of indecision, lasting about 15 minutes, in which she attempted to select one sketch for a final product. During this period, she spoke to a number of peers and spent a great deal of time reflecting or gazing into space, erasing, and looking around.

It was difficult to determine if these attempts to discuss and reflect were productive since her conversations with friends and her thoughts are unknown. One can only assume this subject's collaborative and reflective skills were inadequate because of the length of planning time and absence of a final product.

Most researchers who have studied planning in writing (Pianko, 1979; Stallard, 1974; Perl, 1979) believe that it is not the quantity but quality of planning time that positively affects results. A closer look at some of the children in the study who spent the longest time planning revealed behaviours that might be considered off-task, such as leaving the room or engaging in other classroom activities. These activities along with talking and erasing often contributed to an increase in their planning time.

One boy in another Grade 6 low writing process classroom also spent approximately 56 minutes planning. He seldom spoke to peers, but at times appeared to be avoiding the planning process altogether by looking around the room and gazing into space which may or may not represent time spent on reflection. All his planning time was spent on only one idea or sketch. He appeared frustrated by the whole process, often sighing openly. This boy also did not submit a final drawing based on his plans indicating that he was lacking the appropriate planning strategies or drawing skills in this situation.

Although the gender and the grade level of the subjects in this study appeared to have no significant effect on the complexity of planning strategies for drawing, some differences in how girls approached the drawing task were noted. First, girls erased more than boys, a tendency noted also in writing research. Graves (1975) found girls wrote less than boys when writing topics were not assigned and that the writing accomplished by the boys dealt more with what Graves termed as "extended territory" or removed from home,

school and neighborhood. It could be that girls prefer having topics assigned and are uncomfortable about generating their own topics. Girls tend to be more eager to please the teacher and when they cannot ascertain how to do this perhaps the result is a frustrating cycle of erase, draw and erase.

This view is supported by Daiute (1990) who found young prepubescent girls were more concerned with doing things right, which may be why they tended to erase more than the boys and were so attentive to details. The fact that more girls than boys began their plans with pencil instead of marker because it is a medium that can be easily altered further emphasizes this point. In summary, the results imply that the girls in this study are either more careful or cautious than the boys.

Teaching Implications

The results of this study imply that certain characteristics of planning that were observed in this drawing situation are similar to those documented in writing research. However, the hypothesis that a process-conference approach to writing instruction would influence how a person generates ideas and organizes content in a drawing situation was not supported. This may be because the process-conference approach to writing is not as completely understood as I believed or because teachers are not making the connections between drawing and writing clear to their students. As Olson (1992) points out in her book, Envisioning Writing,

> It is generally assumed that if teachers specialize in one subject area, they will automatically understand how that subject relates to other areas. It is further assumed that they will facilitate the integration of knowledge for their students. These are very large assumptions. The responsibility for making connections between subjects is most often left to the students themselves. (p. 147)

The connections between different disciplines and subject areas must be made for students by teachers. If teachers want students to become better composers,

the important stage of planning must be emphasized in all areas of the curriculum in which composing takes place.

The work of Bereiter and Scardamalia (1978) points out that it is difficult for students to develop a knowledge-transforming model of composing because schools are failing to promote intentional cognition (Bereiter & Scardamalia, 1983). They argue that it requires more than an abundance of relatively unrestricted writing experiences and are quick to add that the innovations by Clay, Graves, Calkins, and Newman all took shape before there was any substantial research on the composing process. The new knowledge of the underlying cognitive processes in writing should help develop these initial innovations beyond these beginning stages.

In place of the current writing pedagogy, children and teachers need to be made aware that composing consists of "setting goals, formulating problems, evaluating decisions, and planning in the light of prior goals and decisions" (Bereiter and Scardamalia, 1987, p. 362). Students need to be working towards independence in managing the whole process of creating throughout their school years. The thinking that goes on in composition, the problem-solving and planning, needs to be modelled by the teacher in every subject discipline. Students also have to share these processes so that they can observe and discuss each others' mental efforts.

Along with a supportive environment, students need to experience the struggles that are part of the composing process, by not always writing or drawing what is easiest or most interesting to them, but by being given challenging goals to pursue. Students need to understand the purpose, nature and function of the knowledge-transforming process they are trying to acquire. The development of internal cognition can be fostered best by teaching the required strategies in every composing activity whether it is

writing or drawing.

If students develop powerful knowledge-transforming skills, it will help them to become more active builders of their own knowledge in all domains. Knowledge-transforming should be an instructional goal.

Through this research and various readings, it has become clearer to me that teaching should focus on conceptual learning and the processes of inventing and discovering. A large part of the school day should be devoted to various composing, meaning-making activities which occur when people write stories and poetry, create music compositions, sketch, draw, paint, photograph, dramatize, and create films. Students need to be in control of this learning process and should be allowed to express their learning through the language and discipline that best suits their skills and interests, whether it is writing, drawing, designing, or composing a musical score.

The skills and techniques that are part of the creative process need to be reinforced in every discipline that involves inventing and composing. Strategies like brainstorming, webbing, listing, and visualization need to be taught in order to activate long-term memory. Students need to feel comfortable exploring, researching, and planning the many possible ways to express an idea. Teachers must come to realize that in every composing activity, the process is more important than the product and not every experience should result in a final product.

For this to be possible, students should be given opportunities to compose in a variety of meaning-making processes and taught the necessary skills inherent in each so that they have a basic appreciation and understanding of all. Shuman, Baird, and Wolfe (1990) give deBono (1976) credit for defining operacy as the process of doing/making and the thinking it fosters. They feel that this process has been sadly neglected in school

curriculum due to its emphasis on literacy (reading and writing) and oracy (talking and writing). In fact, they believe that it may be through operacy that these other processes can best be taught for it has been argued that humans learn best by using the hand, eye, and brain simultaneously (Emig, 1978; Bruner, 1969).

The Ministry of Education and Training in Ontario, through its working document, The Common Curriculum (1993), is directing educators to end fragmentation of the curriculum into separate subject disciplines that focus more on content than process. This document points out that teachers and students need to perceive connections between one subject discipline and another. Learning to think metaphorically and make meaning creates solvers of problems and thinkers of complex and coherent thoughts, exactly the type of individuals who will make a difference in the world of tomorrow.

Teachers need to think through the connections between all subject disciplines, use them to integrate curriculum and give students sufficient opportunities to make these same links. For example, students and teachers need to understand that all composing activities, whether writing, drawing, or making music have to do with invention and the organization of the elements of that discipline's particular language. They all assist in the process of clarifying and ordering thought and feeling, in creating and understanding concepts. Setting down these ideas and feelings results in the creation of a product, be it a drawing, a sonnet, or a painting.

Research Implications

It is my belief that this study should be repeated at various grade levels in different stages of development in order to verify the results and understand more fully how planning stages in writing are similar to those in drawing. To determine if strategies taught in writing process-conference

classrooms are being transferred to other subject areas some modifications in our approach are needed.

First of all, the subjects should be closely observed writing as well as drawing. If students had also been documented planning and writing a narrative based on personal experience as well as drawing a visual narrative, we would have had a better base from which to compare the two processes. We would have been able to measure more accurately whether or not certain writing behaviours normally associated with particular writing methodologies were being practised and applied by students in their writing situation. Then, we could have measured which of these strategies students were transferring to the drawing situation.

It is important that documentation by video-taping be consistently planned and coordinated. The actual process of video-taping in a classroom setting proved to be difficult at times and with experience came better results. In some situations, the seating arrangement made it difficult to clearly focus the video cameras on the subjects and their work. Also, it was impossible to record the spoken conversation of three subjects at a time using only the camera's internal microphone. For a process-conference approach, talk is an important variable, and the nature of the talking that takes place should be carefully documented.

Only one person took on the responsibility of analyzing the twelve 6 hour tapes. In every taping situation, three subjects were being recorded. Since many details were being observed it was necessary to watch every taped session three times and focus on each subject separately during each viewing. In any future studies it would be best to have one trained individual doing all the video-taping to ensure consistent quality in results. Also, it is recommended that at least two individuals watch and document the data

from the video-tapes and follow it by a test of inter-rater reliability.

It seems apparent that more research on how children plan during all composing activities is needed. Follow-up research could include individual case studies using thinking-aloud protocols to determine if students are more concerned with content or the visual presentation of their ideas. Also, subjects could be interviewed to clarify some of the decisions they made during the planning process.

By establishing that similar strategies are effective in different composing situations, whether it be writing, drawing, or designing, teaching methodology could be written to take advantage of these connections and relationships. Education must begin to focus more on the concepts and skills students require to become better problem-solvers and decision-makers. If teachers can free themselves from subject boundaries, education may become a truly holistic and integrated experience for all the key players.

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APPENDIX A

Junior Level Teacher Survey

Name_____School_____Grade(s)_____

A. How many hours per week are scheduled for Language Arts?_____

B. Of this time, estimate what percentage is devoted to writing activities?_____

C. In a typical month, how frequently would the following activities take place in your writing program?

0 never
1 rarely (1 - 5 times per month)
2 sometimes (6 - 10 times per month)
3 often (11 - 15 times per month)
4 almost daily (16 - 20 times per month)

Please circle the appropriate number for each:

1.	Students use pre-writing strategies (eg. brainstorming, webbing, and listing) to establish topics and generate ideas.	0 1 2 3 4
2.	By engaging in writing activities, you yourself model aspects of the writing process in front of the children (eg. pre-writing, conferencing, revising, and editing).	0 1 2 3 4
3.	You and your students take part in sustained (at least 15 min.) writing.	0 1 2 3 4
4.	Students share drafts with small peer groups or partners.	0 1 2 3 4
5.	Through conferencing with you or their peers, students clarify ideas and seek reassurance about their writing.	0 1 2 3 4
6.	Students revise, alter, and reorganize their writing as they reread or from the feedback they receive from their peers.	0 1 2 3 4
7.	Students work on final drafts to correct grammar, spelling, and punctuation.	0 1 2 3 4
8.	While writing, students stop composing to turn to other sources of information (eg. models, dictionaries, textbooks, encyclopedias, literature books, newspapers, picture files, maps, etc.) to help them solve their writing problems.	0 1 2 3 4
9.	Drawing plays a role for students in the writing process at the pre-writing stage.	0 1 2 3 4
10.	Students take ownership of the written process by making all the final decisions concerning topics, revisions, and publishing.	0 1 2 3 4
11.	Published writings by student authors are shared in class and used in other activities.	0 1 2 3 4

See Back

12. Students write for audiences other than the teacher. 0 1 2 3 4

13. Drawing plays a role for students in the writing process at the publishing stage. 0 1 2 3 4

D. **Briefly describe your Visual Arts Program using the following as a guide if you are responsible for the instruction of this subject area for your own class:**

1. Scheduling (How often? How many times per week?)

_____

2. Estimate the percentage of art time, if any, spent in the following areas:

Drawing _____% Sculpture_____% Printmaking_____%
Painting_____% Crafts_____%

3. How do you determine the topic or subject matter of art lessons that involve picture-making?

_____

_____

4. List and describe some activities you and your students may engage in during a typical art lesson (to motivate, acquire concepts, learn new techniques or skills, evaluate, etc.).

_____

_____

_____

_____

_____

_____

_____

_____

5. Rank-order the following subjects from 1 to 10 (with 10 representing the greatest degree) according to the degree of comfort you experience when teaching:

Writing _____ Reading /Literature_____ Mathematics_____

Social Studies_____ Visual Arts_____ Family Life_____

Physical Ed._____ Music_____ Science_____

Religion_____

Thank you for participating in this survey! Please return this form to Brenda Lanoue, Board Office by December 13th.

Classroom Observation Sheet
Pre-drawing Behaviours

Process:	Form:			School:		Grade:
Date:						
Behaviours	Student:	Student:	Student:	Student:	Student:	Student:
Note-taking						
Schematics						
Reflecting						
Uses ref.						
Start-time						
Begin final pr.						
Rough sketches						
Talk w Part.						
Talk w. peer						
Talk w. teach.						
Avoidance						
Talking aloud						
Tracing						
Return to plan						
Comments						

APPENDIX C

Data Results of Observed Behaviour

Reported approach to writing High Process

Initials J.C. Sex F Grade 4 Room setup rows

Start-time 1min.14.64s. Planning time 22min 03.51 s.

Begins sketching on lined paper ~~✓~~

Begins writing on lined paper _____

Begins sketching on unlined paper ✓

Begins writing on unlined paper _____

Uses more than one paper in planning phase _____ front & back of one page.

Begins sketching with pencil ✓

Begins sketching with marker _____

Returns to plan ✓ to colour it? Concern it matches Final Product?
after F.P.

Uses pencil on final product ✓ erases and begins again with marker.

Traces final product from sketch _____

Keeps plan visible ✓ (copying)

Observed Repeated Behaviour

(Check indicates number of times)

5:57 turned page over

Talking to partner: _____

Talking to peers: ✓✓ _____
Before S.T.

Talking to teacher: ✓ ✓ _____ is it okay to start F.P.?
me me

Reflecting (more than 5 secs.): ✓ ✓ _____
20s. 5s.

Talking aloud to oneself: _____

Erasing: ✓✓✓✓✓✓✓✓ ✓✓ ✓✓✓✓✓

Avoidance: _____

Looking around: ✓✓✓ _____

Other: If you look closely you can see an outline of a sun and clouds. The girl erased almost a complete scene of the outdoors

APPENDIX D

Data Results from Drawings

Reported approach to teaching writing Low process

Sex F Grade 4 Total number recorded 7

Not recorded 1.

Planning Categories

Category 1a) 1 b) 1
Category 2 11
Category 3
Category 4
Category 5a) 3 b) c) 11 d) 1
Category 6
Category 7
Category 8
Category 9a) 111111
Category 10a) 111 b) 2 c)
Category 11a) 1 b) c) 1
Category 12 3
Category 13
Category 14
Category 15
Category 16
Category 17
Category 18a) 1 b) a) 1
Category 19

Themes Illustrated in Final Drawings

Not Recorded 2 11

Reality

Figurative:
Single Person (Me?) /// (3)
Warfare or fighting (1)
Sports 1
Family
School
Playing
Circus 1 (1)
Camping
Friends
Special Occasions
Home
Shopping

Machinery or objects:
Vehicles of Transportation /// (3)
War Related
Musical instruments
Still life
Toy 1 (1)

Settings:
Exteriors/landscapes III - (4)
Interiors

Animals:
Pets
Farm 1 (1)
Wild 1 (1)

Religious

Fantasy

Imaginary Creatures:
Aliens
Animals 1 (1)
Robots
Cartoon characters
Super hero
Knights/castles
Other

Comic Strip Scene:
Original
Take-off from media

Design

Collage
Abstracted from reality
Non-representational 1 (1)
Mainly letterforms

Difficult to classify

VITA AUCTORIS

NAME:	Brenda Lanoue
PLACE OF BIRTH:	Windsor, Ontario
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	University of Windsor, Ontario 1971-1975 B. Ed.
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