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Sensory Stimulation During the
Prewriting Stages of
Creative Writing

by
Randy G. Yarwasky

A Thesis

Submitted in partial fulfillment of the
requirements of the Master of Arts
Degree in the Graduate Division
of Rowan College
1995

Approved by

Date Approved

5/2/95

ABSTRACT

Randy Yarwasky

Sensory Stimulation During the
Prewriting Stages of
Creative Writing

1995

Dr. John Klanderma

School Psychology

Written expression is becoming more and more important in the language arts classrooms of America. Research has shown that sensory stimulation can help students access previously encoded experiences. These encoded representations are viable material to be used in the creative writing process. Fifth grade level 11 readers from Lower Township Elementary School District were employed in this study to determine the role of sensory experience in the language classroom. Students were read a selection and then received either visual stimulation, audio stimulation, audiovisual stimulation, or a control treatment. Hypotheses were that students who received stimulation would perform significantly better on a writing task as measured on a creative checklist and that the audiovisual group would outperform the other groups. A one way ANOVA and Scheffe' yielded statistics at the $p < .01$ level which warranted the acceptance of both research hypotheses.

This supports previous research which shows that sensory stimulation can help students access background knowledge and experience to be used as material on writing tasks.

Consistent results such as these indicate that there is justification for providing teachers with materials and methodology to use sensory simulation in the language arts classroom.

MINI ABSTRACT

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School Psychology

Teachers need methodology to help students improve writing skills. This study utilized sensory stimulation to help students access encoded experiences for use in writing tasks. This warranted acceptance of hypotheses that students exposed to audiovisual sensory stimulation performed significantly better than control groups on creative writing tasks.

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Chapter One

Need

The need to instruct our students to become better and more efficient and effective writers lies in the changing schema of society. Our schools are changing from cookie cutter, textbook driven institutions to modems through which our students will communicate as members of the super information highway. This new emphasis on communication is pressing the school systems to advance instructional methodology through which children will become more adept at expressing ideas, concepts, and feelings.

Our schools are moving in this direction as they are shifting from the interrogate-recite-evaluate syndrome practiced in past generations when our society valued industrial principles. The new areas of concentration in our schools are heading place a heavy emphasis on discourse centered around creativity, integration of thoughts and principles, and interpretation of events and theory. In recognition of these foci, standardized tests such as the HSPT, EWT, and the SAT, now include a written measure of a student's ability to communicate in written text.

As usual, these tests have driven the education industry to develop new teaching models in order to prepare students for said tests. Unfortunately, large standardized programs

such as whole language, content area writing techniques, Great Books programs, and process writing have taken a canned approach to the writing process. Although these programs are highly structured, they are still an improvement over the grammatically centered approach to writing used in earlier decades.

Therefore, since there is a need for our students to become better writers, and many large scale programs have tried to address this issue with limited success; it is up to teachers and psychologists to develop new methodologies based on empirical observation and experimentation both in the lab and the classroom. This current study attempts to develop another tool for teachers to increase their student's ability to be better writers. Since children are innately creative; the area of creative writing seems to be a valid taxonomical starting point for this research.

Purpose

The purpose of this study is to demonstrate the potential of integrating distinct sets of audio, visual, and audiovisual stimuli in conjunction with students internalized representations in order to generate significantly improved creative writing. Descriptive elements of literature are critical implements in a writer's ability to express ideas, thoughts, and feelings. The style of creative writing is regarded as important by standardized tests of written expressions and most school writing programs. This study will

attempt to identify sensory stimuli that are related to the creative writing process. Results of this study may be integrated with instructional methodology in a parsimonious and inexpensive manner. Also the identification of distinct sets of sensory stimuli that can increase creative writing scores will serve as a launching point for further research about how to use cognition and sensory experience as a storehouse of content.

Hypotheses

This study will attempt to examine the relationship between sensory stimuli and creative writing. There will be two research hypotheses. First, students who are exposed to sensory stimulation during the treatment will have a significantly different mean than the control group which will receive no sensory stimulation. Secondly, the treatment group that receives audiovisual stimulation will score significantly higher than any other treatment group. Measure of creative written expression.

Theory

According to Jean Piaget and other cognitivists (Myers, 1985) "the learning of language is an interaction between external stimuli and an organism's internal structure"(p.5). This theory underlies the general tenants of this study. There is a direct relationship between language and internalized representations of an event within an individual. This give

and take between language expression and encoded sensory events provides for a mental construct that interprets and assimilates language expression.

This interplay occurs via two separate systems of memory labeled as automaticity and attention by Synder and Posner (1975), as reported by Myers. Automaticity features high level semantic analysis. Attention features the active process of retrieving information and assimilating sensory events as well as the integration of the former into a set of mental representations. This interplay of experience, consciousness, and mental set is a source of content for a writer to draw upon when encountering a writing situation involving sensory data. Since Whole Language proponents as well as cognitivists advocate the placement of learning situations in frames of existing schema, (Miller, 1994); it would follow that a certain thematic set of sensory stimuli related to a specific learning task would enrich the response set of the subject.

Eisner (1976) has offered that "any stimuli event includes the cognitive act of drawing relationships between ideas and values acquired through prior experiences and the forms of meanings represented in current stimuli" (p. 143). Since this relationship has been empirically validated, the design of this study would appear to have a stable theoretical foundation. Students presented with stimuli will have an

added advantage when trying to draw on stored representations. This will translate into significantly improved measures of creative written expression as the students integrate presented stimuli with existing mental schema and draw upon such as source content.

Definitions

The following are terms that will be used throughout this thesis.

Creative writing: a classification of writing which involves the facilitation of the natural impulse to express feelings via the manipulation of words and images. The purpose of this type of writing is to describe and express sensory images through the medium of written text.

Auditory stimuli: a stimulus which is experienced through the auditory processing channels.

Visual stimuli: a stimulus which is experienced through the visual processing channels.

Auditory/visual stimulus in combination: a stimulus which is experienced with both the visual and auditory processing channels.

Process writing: an approach to writing divided into separate stages; pre-writing, drafting, revising, editing, and publishing.

Pre-writing: a stage of the process writing approach where an individual collects thoughts and calls upon relevant schema to brainstorm material to be used in the composition.

Rubric: a ranked scale used as an instrument to evaluate a students writing. Each rubric can be modified to reflect the objectives of the paper being evaluated.

Heterogeneous grouping: a grouping strategy that encourages students within a group to demonstrate many different ability levels.

Language ability: relevant scores of expressive language as scored on the expressive language section of the 1993 CAT 5.

Whole language: an ideology where instruction is centered around thematic units with emphasis placed primarily on written expression and reading skills.

Schema: an existing set of information about various concepts, events, and knowledge.

Metacognition: the active analysis and awareness of the an individuals own thought processes.

Assumptions

For the purpose of this study there are a few assumptions that should be made.

1. The subject pool of 5th graders used in this study is a normal representative population of other 5th graders in the United States.
2. Students of different classes are being taught by teachers utilizing the same materials and processes.

Therefore the students of different classes will react to a specific writing situation in a similar manner.

3. Students will all enter into this writing task with a high level of enthusiasm and work to the best of their ability.
4. Heterogeneous grouping will not affect results as all classes are balanced in the number of classified students.
5. Any experimental group that scores significantly higher than others will do so because of the experimental treatment that the group received.

Limitations

For the purpose of this study limitations must be mentioned.

1. Many variables will be uncontrolled as subjects come from 4 different classes which each have a different teacher.
2. Teacher attitudes towards writing can often differ, and any results could only be a function of a specific teacher's attitude, style, or enthusiasm.
3. All students have various preferred channels in sensory processing. Therefore some students may excel or struggle with specific sets of sensory stimuli.
4. Creative writing seems to be heavily grounded in sensory stimuli and imagery. Therefore any results that might be found may not be generalized to other taxonomic types of writing.

Summary

As stated earlier in this chapter, there is a growing need to examine our teaching techniques in order to improve our children's writing skills. Writing skills are rapidly assuming the center stage position in language classrooms; replacing such specific isolated skills such as grammar and diagraming.

This study will attempt to examine research related to cognition and sensory experience as related to the writing process. This study will develop specific methodology based upon the premise that sensory experience stimulates mental representations to be used as material for composition. The methodology used in this research design will serve as a resource for teachers to use in developing students' unique writing potential.

Chapter 2: Review of Literature

Scope of Review

Sensory experience, and its role in the composition process is a topic that brings together various fields of psychology. The fields of neuropsychology, cognitive psychology, and educational psychology are at the core of this issue. This review of literature will review the concept of representations (verbal and iconic) and the neuroanatomy behind them, as well as their role in the composition process. Once this is established, specific demonstrations of these relationships evidenced in discrete research involving educational issues will be analyzed, and their relevance will be validated.

Sensory Experience: Encoding and Access

The idea of audiovisual stimuli having an effect on writing rests on a simple premise; this being that there are specific encoded memories of events. When a subject is presented with stimuli which are related to these memories, the subject will be able to process iconic and verbal representations stored within the cortex. These images are then available for the writer to draw upon and thus bring richness into their texts.

In *Parallel Distributed Processing* (Morris, 1989), a model known as the Connectivist model of processing is developed. The Connectivist model proposes that there are

within the brain many small processing units. These units are connected and act as pathways for processing to occur in the brain. Stimuli experiences and events are capable of creating patterns when they are occur over a specific series of units repeatedly.. These patterns are known as representation (Morris, 1989). These representations are very active and they are capable of communicating within and among themselves without a central processor.

In his distributed model of memory, specific representations can be matched with specific words, images, concepts, and sensory experiences. As McClelland (1989) and Morris (1989) propose, a model is staged where sensory events can evoke and communicate with previous encoded mental representations, and then a wealth of data is available to the student. This model is one that sets the stage for explaining why sensory experience of a related nature can bring more creativity and detail out of students (Black, 1993).

Geoffrey E. Hinton (1989) also discusses this interrelatedness of sensory experience and memory. He proposes that these individual units of processing, form representations; which are just as McClelland mentions, merely a pattern of activation. Hinton goes on to say that the relationship between units is a function of the relationship of their represented concepts or experiences. He stresses the idea that the relationship between objects is critical to the organization of representations.

Whittlesea (1989) also postulates that the premise behind this replication study might be one of a sound nature. He remarks that the "the representations of past experiences are presented separately and interact only when recruited by a new stimulus-These concepts are distributed over traces of events, but traces remain separate" (p.186). This lends validity to the idea that there are separate traces or memories of events and experiences, and similar events can evoke the patterned activation, or representation. This should open the door to a plethora of data to be used in the composition process.

Granger and Lynch (1989) provide a tight net around the assumptions of this study. They propose that the it would be impossible for each incoming stimuli to be unconnected to others. Without relationships amongst events and experiences, learning would not be able to occur. Granger and Lynch state further that there is a heirarchical organization among these processing units. They feel that both the specific trace as well similarities among traces are separate processing activities. This is believed to occur in the layerII sensory cortex (Granger and Lynch, 1989). Some researchers such as Parisi and Burini (1988) suggest inherent dangers in such models which fail to document the regulation of these processing activities.

Representations and Schema

Pavio (1990) also has mirrored these findings in his 1990 study of mental representations. He makes use of a different

nomenclature with regard to the specific relationship among representations and processing units. He refers to this phenomenon as schema. He has found that a sensory event can activate a schema and then provide an instant framework with which to interpret and dissect the sensory event.

Pavio also has divided representations as well as stimuli into two distinct categories; verbal and nonverbal. The implications of this as related to this study lie in his idea of "relatedness of events". Pavio states that there is a constant interdigitation between the two representational systems. This provides grounding for the idea that various stimuli presentation combinations can and will evoke various sets of representations. This "structural connection" is the physiological foundation of this study.

This sets forth a sampling of how the science of neuropsychology and neuroanatomy have provided a pathway for this study. In summary, memories and sensory experiences are encoded within individual processing units. These processing units activate in patterns known as representations (McClelland, 1989 & Pavio, 1990). These representations are really the relationship and connectedness amongst events and experiences (Granger and Lynch, 1989). These relationships form a subject's schema and any sensory experience is capable of accessing many different but related schematic sets (Pavio, 1990). Therefore this theory proposes that sensory stimulation will provide the writer with direct access to representations

which will serve as a resource in composition.

Hemispheric Cooperation and Sensory Stimuli

Researchers have shown that sensory stimulation can increase communication between verbal and non verbal processing systems as well as heighten inter-hemispheric communication (Autrey, 1982 & Roberts, 1982). These researchers have shown that sensory stimulation, especially through occipital zones, can increase imagery and heighten free association responses. Autrey (1982) maintains that written composition is a complex task. Not only is writing a task that entails right brained creativity and holistic thought, but it requires as well the linear logical capacities of the left brain. Therefore, if visual stimuli increases imagery and inter-hemispheric cooperation (Autrey, 1982), a writer might be more successful in prosing and organizing at the same time.

Visual Stimuli in Language Experiences

Autrey (1982) feels strongly that the research documenting the effect of visual stimuli on writers has been overlooked. Autrey also cites that today's students are visually more attuned and by utilizing their honed skills, teachers can improve students communication skills; especially in the areas of writing.

Roberts (1982) feels that visual stimulation is so important to writing that the stages in process writing should

be changed to pre- Vision, Vision, and re- Vision. He draws upon neuroanatomical research and again reinforces the importance of hemispheric cooperation as he writes about the incomplete lateralization of the visual pathways. There seems to be a massive connection of visual information located at the corpus callosum. Evidence from aphasic patients has also shown that the neurologic basis for reading and writing involves the auditory comprehension system, as well as the units which provide associations between the auditory and visual processes (Roberts, 1982).

Auditory Stimuli in Language Experiences

With this proposed relationship between the auditory and visual systems in the language process, an examination of the auditory stimuli on language experiences is in order. As the previous section on visual stimuli portrayed, the presentation of audio stimuli does increase the response set of subjects when presented with the act of composition (Thompson, 1981). Katz (1989) also maintains the importance of auditory processing in the role of language processes. He examines the history of language development and proposes that auditory stimulation was the initial channel of choice for the development for language. Ancient scholars had no written texts and every thing was organized and carried on in verbal form. He relates this history to music in the way that music can activate representations and emotions.

Ball & Stafford (1986) also have expounded upon the importance of auditory stimuli in the composition process. In the Pine Bluff School District of Arkansas, Ball and Stafford developed a six week course in which sensory experience played a pivotal role in the composition process. Their hypotheses was that the increased use of sensory related experience and stimuli would increase students interest, enjoyment, and ultimately their performance on written composition tasks.

Music was a central sensory experience in their project involving fictional composition. Students who were presented with music were more interested in writing and produced better samples. They also were more apt to generalize items from musical language such as theme, emotion and pace; and then rewrite their compositions to mirror the same components within the language system.

Visual and Auditory Stimuli in Language Experiences

The role of sensory stimuli in language experiences, particularly writing, is clearly seen in studies which used a simultaneous combination of visual and auditory stimulation (Ball & Stafford, 1986 & Black, 1993). It seems that the effects of sensory stimulation on language are somewhat heirachially organized (Black, 1993). Written compositions improve in determined areas most when presented with a combination of stimuli. Visual stimuli alone have a small effect when presented alone and auditory stimuli have an even less significant effect in isolation (Black, 1993 & Thompson,

1981).

Imagery is a term used by educational psychologists to describe the language process when both visual and aural systems are highly integrated (Thompson, 1981 & Whittler, 1983). Thompson (1981) contends that imagery is the medium through which we "view" the representations within our neural system. Both nonverbal and verbal representations can take the form of imagery (Pavio, 1990). Greg (1989) suggests that images are functional in that they reinforce the patterned activations of the representations of which they are made. This insures that the individual can differentiate between encoded sensory events and maintain their homogeneity (Greg, 1989). There is also a highly individualistic aspect of the way people imagine (Granger and Lynch, 1989). Bayuk (1983), also discusses the fact that when developing language instruction strategies, one must take into account individual learning styles and preferred modes of sensory input.

Imagery in Composition

Thompson (1981) developed a study in which he intended to document the role of imagery in composition. He hypothesized that creative expression in writing will occur more often if the subject has access to previously encoded sensory stimuli during the process of writing; especially during the pre-writing stages. This replication study proposes to focus sensory stimuli during the prewriting stage as well.

Thompson worked with 13 year olds as he believed them to

be completely capable of imagery and abstractions; documented by Piaget's theory of development. He examined the effects of audio-pictorial and print-verbal stimuli on such educational issues as creative writing and divergent thinking abilities. Each condition was presented to one experimental group and a control group received no stimuli. After pre and post tests of written expression, Thompson found no significant results as to improved technical development of composition. However, she did find an increased measure of divergent and creative written responses. Thompson concluded that the sensory stimuli provided a bank of data to be used in the composition process. Her results also show that on measures of creativity, the audiovisual stimuli group did out perform other groups.

Richard Sinatra (1981) also documented the role of combined sensory experience in the process of composition. He hypothesized that if students were presented with a sensory experience of auditory and visual stimuli, they would be able to draw on the same concrete experience when asked to draw upon it in a related writing task. According to Sinatra, the theory behind this premise is that the visual and auditory stimuli would help the subjects become more proficient in regards to style and organization of writing. Stimuli must have a thematic organization for students to benefit from their presentation (Sinatra, 1981). Sinatra found that thematic presentation of stimuli had several effects on

learners. Subjects had a significantly more engaged sense of curiosity and were also significantly more motivated.

Review of Research to be Replicated

Janet Black designed and conducted a very comprehensive study which demonstrated the value of stimuli as an instructional supplement. Her research design questioned the effect of auditory stimuli, visual stimuli or the combination of the two in a specified writing task.

All the groups in Black's design were read a story. The experimental groups were presented with the conditions of the experiment. One group was presented with auditory stimuli in the form of music. Another was presented with audio stimuli in the form of a thematic slide show. Another group was presented with these conditions simultaneously. Finally, another group received no treatments, this being the control group. All treatments were administered during the pre-writing stage of a process writing task. Subjects were from a middle class suburb in California. 55 Tenth graders were used for this study and populations were all taught by the same teacher. Students were randomly assigned to 4 groups.

The results of this study indicated that auditory and visual stimuli, when presented together, increase subjects scores on measures of creativity on writing tasks. Black contends that this was due to an increased stimulation of thinking about background information during the prewriting stages. Black was unable to demonstrate significant effects

for other experimental conditions in isolation. Neither was she able to distinguish significant results between visual and auditory conditions in isolation. Black does suggest that the results of her study are worthy of further research on diverse groups. This study intends to attempt to replicate her findings that when students are presented with combination stimuli, they will demonstrate greater creativity in written expression than students that are not exposed to such conditions.

Chapter Three

Subjects

Subjects were obtained from Lower Township Elementary School District, specifically at the Sandman Consolidated Elementary School. Subjects were between the ages of 10-13 years old and were all in the 5-6th grades. This district is located in and around the area of Cape May, New Jersey and is composed of students of predominantly lower middle to upper middle class families. There are relatively few upper class families, as well as there being a small number of families living below the poverty line. A more descriptive factor analysis might be the factor that 46% of the families in the district qualify for free and reduced lunch. This places this district a little towards lower middle class on the average.

Sandman Consolidated was chosen as I, the experimenter, teach in this district. This enabled me to control as many variables as possible. All teachers and classes selected to participate were chosen according to three criteria. The first being that all participants were presently in the level 11 reading series published by Silver Burdette. Also, students were chosen on the basis that their teacher agreed to address a core group of curricula in regards to the creative elements of writing; within a given temporal framework precedent to the experiment. This was to insure instructional facilitation of basic writing concepts which are

a pre-requisite for good creative writing. These concepts were communicated to the participating teacher through a skill checklist found in appendix A. Teachers were also chosen on their enthusiasm and interest level in language arts.

The initial stages of this research were discussed with Marilyn Kobik, building principal. After the design was completed, Mrs Kobik was written a formal letter asking permission for the experimenter to insure that the participating teachers would cover the appropriate curriculum for students to be on equal footing, as well as permission for the study in general. This document is found in Appendix B.

Groups were assigned on a random basis. Subjects were assigned numbers and then placed into groups blindly by number. Each group had approximately 22 subjects. Students receiving basic skills or resource room were included as not to be exclusionary, however their scores were not recorded with the data. Students were assigned to four groups; control, auditory stimulation, visual stimulation, and audiovisual stimulation.

Independent Variable

The independent variable in this study is the form of sensory stimulation that the students will receive. This study proposes that the IV will evoke mental representations in the form of imagery which will provide the writer with detail. Each child will receive a presentation of either audio, visual, audiovisual, or no sensory stimulation. These will be

presented in an uniform manner and at very near the same time with each condition.

Dependent Variable

The dependent variable will be the score on the creative writing checklist added in Appendix C. This study proposes that the dependent variable will be a function of which condition the subject received. This is measured on a two part checklist which evaluates specific elements of creative writing in isolation, as well as evaluating the sample as a whole in regards creativity. The first part isolates elements of creativity, such as accessing encoded sensory representations, and creative mediums such as metaphor and similes. The section is evaluated by giving students a point for each utilization of creative elements. Then these frequencies are totaled. The second section looks holistically at the imagery conjured by the writing as well as providing room for creative and divergent writing styles to be rewarded in the scoring process. This section is rated with a Likert style scale. Finally, the scores from the two subscales are totaled and then a total measure of creativity is obtained.

Setting and Materials

This study will occur in one classroom on different days, but the time of day will be controlled. Slides were prepared for this design and they will be paired with a musical selection that is thematically related. A team of teachers

were consulted, and general agreement was obtained that the slide presentation and the music selection were of relevant nature to the selected reading selection. The musical selection was chosen after consultation with a music teacher.

Procedure

Students receiving independent variable manipulation will first enter the room and gather materials such as pencil and paper. When they become comfortable, they will be told that they are participating in a writing project initiated by a famous movie producer as a way to make writing fun. They will be read a selection from a book that is going to be a basis for a movie. They are informed that their task will be to creatively describe the setting in the recited selection. The purpose of this is said to be to inspire the producer to produce the movie. Then the subjects will be presented with the appropriate stimuli during the prewriting stage. Finally, all subjects will be asked to creatively write a story about what they visualized.

Independent Variable Controls

Each experimental condition will be presented with this experience in an uniform way via a standardized text prepared apriori. The only changes in the presentation will be the respective change in stimuli presentation. The control group will experience the same situation with the exception of the sensory experience. All sensory presentations will be the

same length and the audiovisual combination will occur simultaneously. Students will be allowed to work on prewriting during sensory stimulation. Prewriting will last 10 minutes, followed by 60 minutes for the writing to be completed.

Statistical Analysis

A 1x4 analysis of variance will be used. The dependent variable will be the score on the creativity index and the four conditions will be control, visual, audio, and audiovisual stimulation. Results will be found significant at the $p < .05$ level.

After determining if there was any significant difference in the treatment groups, a Scheffe' test will be used this will determine exactly where, if any, the difference lies. Results of the Scheffe' test will be found significant at the $p < .05$ level.

Hypothesis

This study intends to demonstrate the value of sensory stimulation in writing situations. The presentation of sensory stimulation should provide an activation of neuronal networking which will enable mental representations to become material for the writing process. The hypothesis asks if there is any effect on a measure of creativity of children's writing if they are presented with sensory stimuli during the prewriting stage.

I. H0: Students who receive sensory stimuli during the prewriting stage will not score significantly higher on a measure of creativity in written expression.

HA: Students who receive sensory stimuli during the prewriting stage will score significantly higher on a measure of creativity in written expression.

II. H0: There will be no significant difference between the audiovisual groups and the other experimental groups.

HA: Subjects in the audiovisual group will score significantly higher than any other experimental group.

Summary

Chapter three discusses the essential aspects of this study. Included are the population descriptions, a brief rationale, as well as hypotheses. Also covered in depth are the design parameters, procedures, and statistical analyses.

Chapter Four

Analysis

As discussed in Chapter Three, this study intends to determine if sensory stimulation during the prewriting stage has an effect on the creativity of written expression as measured on an index of creativity. Sensory stimulation will include a visual presentation, and auditory presentation, a control group which receives no presentation, or finally both visual and auditory presentation. The hypotheses of this study are that there will be a significant difference between those groups that receive sensory stimulation and the control group. As well, this study hypothesizes that the group that receives both visual and auditory stimulation simultaneously will score significantly higher than all the other experimental groups. Following the implementation of this design, four sets of scores were obtained. They are reported below in Table 4.1.

Table 4.1-Group Descriptive Statistics

	N	Mean	Median	SD	Variance
Control	18	29.5	27	8.47	71.80
Audio	18	40.28	40	14.90	221.98
Visual	17	39.47	40	7.94	63.01
Audio-Visual	15	45.07	42	9.07	82.37

To determine if the presentation of sensory stimuli significantly improved scores of written creativity, several

statistical analyses were used. To determine if there was a significant difference between experimental groups a One Way Analysis of Variance was used. When an experimental design produces two or more sample means this is the appropriate statistical design to be used (Gravetter & Wallnau, 1992). Table 4.2 contains the results of this analysis of variance. As evidenced in the table there is an obtained F of 6.49. This is significant at the .01 probability level where the critical level is 4.08. This exceeds the .05 level proposed in Chapter Three of this study. Based on this result, I may reject my first null hypothesis and accept my first research hypothesis which states that there will be a significant difference between the scores of these experimental groups.

Table 4.2 One Way ANOVA Summary

Source	SS	df	MS	F
Between	2175.3	3	725.1	6.49
Within	7155.3	64	111.8	-
Total	9329.7	67	-	-

F critical 4.08 $p < .01$

F obtained= 6.49 $p < .01$

As these results indicate, this study has now determined that there is a significant difference between the groups. Since there were four experimental conditions, a Scheffe' test was used to determine which conditions had significant differences.

A Scheffe' test is an f-ratio used to determine if there is a significant difference between any two groups (Gravetter & Wallnau, 1992). The Scheffe' test begins by examining the largest differences between the means, and determining if there is a significant difference. From there progressively smaller sample mean differences are examined until a nonsignificant difference is obtained. The red horizontal line demarcates the beginning of the critical region.

The largest mean difference was between the control group which received no sensory stimulation during prewriting, and the group which received both auditory and visual stimulation during the prewriting process. The mean for the control group was 29.5. The mean for the audiovisual group was 45.07. The difference between the two means was 15.57. A Scheffe' test was administered and the obtained ratio was 5.91. At .01 confidence level the critical region begins at 4.10. This allows the conclusion that since the obtained F-ratio is well within the critical region that there is a significant difference between the audiovisual and control groups. This is evidence enough to reject the second null hypothesis that stated that the audiovisual group would not score significantly higher than any other group in the study. We may therefore accept the second research hypothesis that states that the audiovisual group would score significantly higher than any other experimental group on a measure of creative written expression.

The next largest mean difference was between the group that received audio stimulation and the audiovisual group. The mean difference was 5.6. The obtained F-ratio was .753. This was well outside the critical region and therefore indicates that there was no significant difference between these groups. Due to the nature of the Scheffe' test, the assumption may be made without testing that there are no more significant differences between the groups since the remaining two mean differences are smaller in magnitude.

Summary

As a result of these analyses, several statements may now be made. The first null hypothesis may be rejected. This stated that there would be no significant difference between treatment groups. Since the ANOVA yielded a F value well within the critical region, there indeed exists a significant difference between treatment conditions. This supports the first research hypothesis which stated that there would be a significant difference between treatment groups.

The second null hypothesis may also be rejected. This stated that the audiovisual group would not score significantly different than the other groups. Since the obtained F-ratio was well within the critical region for the control and audiovisual groups, this study accepts the research hypothesis which predicted that the audiovisual group would significantly outperform the other groups. This supports the main premise of this study, as well as others

(Black, 1993), which maintained that the more encoded sensory experience is activated, the more material will be available to the writer.

Chapter Five

Conclusions

As discussed in the literature review found in Chapter Two, sensory stimuli has been found to be a valuable supplement to traditional classroom instruction in the language arts; particularly in the area of creative written expression. The present study was an extension of this literature and vindicated the results of others; namely Janet Blacks' 1993 study. In this study, she found as well that students presented with both audio and visual stimuli in the prewriting stage scored significantly higher than those subjects who did not.

This study presented subjects with one of four sensory stimuli experiences in the prewriting stages. One group was a control and received no stimuli. Another group received visual stimulation only. Another group received audio stimulation only. Another group received audio and visual stimulation simultaneously in the prewriting stage.

The results of this study allowed for the rejection of the first null hypothesis and the acceptance of the research hypothesis that there would be a difference between treatment conditions. This study also allowed for the rejection of the second null hypothesis and acceptance of the second research hypothesis which stated that the audiovisual group would score significantly higher than any other group. This finding is in line with the intent of the study as well as all literature,

research, and theory reviewed.

Discussion

While the results of this study warrant the acceptance of both research hypotheses, certain other conditions may have played into the results. First of all, the subjects came from four different classrooms. As mentioned in the limitations, to obtain large enough populations in each treatment condition, students had to be drawn from four classrooms. Although teaching content and technique was controlled by the experimenter, innate teacher techniques may have caused some experimental groups to receive unequal instruction.

As well, students were chosen by the reading level that they were presently in. This seems to be a fair grouping, but many teachers report that despite classes being on the same reading level, there may exist many different writing levels in the classrooms. Although there is a correlation between overall language skills and reading ability, creative writing skills in isolation may not be as closely correlated. Reliability of obtained raw scores may also be somewhat subject in this study. Due to the length of these essays and the detailed analyses of the checklists, scoring was done by only one examiner. The experimenter was unable to recruit any colleagues to do another scoring in the blind of each subject's performance. This can still be done at a later date without replicating the testing situation.

This study's premise that students who had stimulated

sensory systems during the prewriting stage would write better than those who did not was limited to creative writing. It would remain to be seen if the sensory stimulation would have a significant effect in other areas of writing.

The thematic nature of the sensory stimulation in this experiment may have had more effect to some students than others. Further statistical analyses would need to be computed to see if perhaps there was a correlation between sex and performance. This would be helpful in determining what sensory experiences would be effective with both sexes.

Implications for Future Research

Although there may be some procedural concerns, the premise of this study is well founded in research. Therefore it seems safe to assume that the results of this study are truly significant. The use of sensory stimulation to help subjects access encoded experiences in writing situations seems to be a promising avenue for language instructors.. As written expression continues to become more important in this era of communication, this use of sensory stimulation should be refined and explored further.

Not only should it be explored further, but it seems there is a justification for the transformation of this research into readily usable materials and procedures for educators today. By field testing and determining the dynamics of sensory experiences in writing tasks, we may be able to change the face of language instruction in the future.

Also a certain degree of attention should be focused on the application of this theory to other areas of writing such as narrative, expository, scientific, and persuasive writing. Other areas of written expression may be influenced by procedures such as that used in this study. Only through further research and experimentation will this be determined.

Subjects participating in this experiment uniformly reported that they enjoyed it more than more normative expediences in language. This seems to justify more research into this area as children always perform better on a task that they enjoy. The enjoyment and accomplishment of these subjects can be typified by several sample compositions from each group found in Appendix D. Most simply put, any methodology which produces children enjoying the writing process deserves unlimited research and development.

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APPENDIX A

Randy Yarwasky
210 E. 6th Ave.
N. Wildwood. NJ
November 10, 1994

Dear Mrs. Kobik:

As we have discussed, I am involved in my thesis project for my master's in School Psychology. I am formally petitioning your permission as building principal to conduct my study regarding sensory stimulation and the writing process. I will need to work with four classes of Level II readers. I will also need to communicate to participating teachers a core group of writing skills that must be addressed in order for children to all have equal footing on this task. Thank you for your time and patience in this matter. I will be sure to share my results with you upon completion.

Sincerely,

Randy Yarwasky

Appendix B

CREATIVE ELEMENTS CHECKLIST- PART 1

FREQUENCY

SUBTOTAL

	A	B	C
1	METAPHORS		
2	SIMILES		
3	ADJECTIVES		
4	ADVERBS		
5	IMAGERY		
6	IDIOMS		
7	ONOMATOPEIA		
8	EMOTIONS		
9	TACTILE SENSATIONS		
10	TASTE SENSATIONS		
11	IDIOMATIC TASTE		
12	AUDITORY SENSATIONS		
13	OLFACTORY SENSATIONS		

SUBTOTAL
PART 1

CREATIVE WRITING CHECKLIST - MOOD AND IMAGERY

PART-2 0=NOT AT ALL 1=VERY LITTLE 2=SOMEWHAT EFFECTIVE 3=VERY EFFECTIVE 4=EXCEPTIONAL WORK

	A	B	C	D	E	F	G
1	DOES THIS SAMPLE CATCH THE READERS ATTENTION	0	1	2	3	4	5
2	DOES THIS SAMPLE CREATE A MOOD RELATED TO THE READING SELECTION	0	1	2	3	4	5
3	IS THIS SAMPLE THEMATICALLY RELEVANT TO THE READING SELECTION	0	1	2	3	4	5
4	DOES THIS SAMPLE CONJURE UP A MENTAL IMAGE IN THE READER	0	1	2	3	4	5
5	IS THIS IMAGE THEMATICALLY RELEVANT TO THE READING SELECTION	0	1	2	3	4	5
6	IS THERE EVIDENCE OF PRESENTED STIMULI IN THE SAMPLE TEXT	0	1	2	3	4	5
7	IS THERE EVIDENCE OF BACKGROUND KNOWLEDGE INTEGRATED IN THE TEXT	0	1	2	3	4	5
8	CREATIVE MOOD AND IMAGERY SUBTOTAL-PART 2						
9	CREATIVE CHECKLIST SUBTOTAL-PART 1						
10	TOTAL MEASURE OF CREATIVITY						