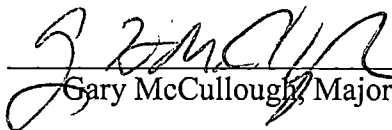


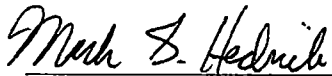
To the Graduate Council:

I am submitting herewith a thesis written by Lynna Supan Hood entitled "Will PQRS improve recall of narrative information in an individual subsequent to traumatic brain injury?" I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Speech Pathology.

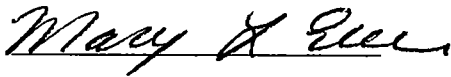


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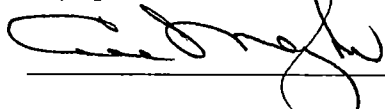


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Accepted for the Council:



Interim Vice Provost and
Dean of The Graduate School

WILL PQRSST IMPROVE RECALL OF NARRATIVE INFORMATION IN AN
INDIVIDUAL SUBSEQUENT TO TRAUMATIC BRAIN INJURY?

A Thesis

Presented for the

Master of Arts Degree

The University of Tennessee, Knoxville

Lynn Hood

May 2001

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ABSTRACT

The efficacy of cognitive remediation strategies for victims of traumatic brain injury (TBI) has sparked much controversy over the years. In the field of applied research, single-participant research designs are the best ways to answer the question of treatment efficacy. Previous case studies and single-participant, multiple baseline designs have suffered from various methodological flaws, which make their results suspect. In the current single-participant, multiple baseline investigation, three individuals received treatment for recall of narrative information, while two other condition were held at a baseline. Immediate, delayed, and long-term memory in both free recall and multiple choice recall tasks were evaluated over a period of approximately five months. The results of this study indicate improvement in all of the aforementioned areas. Due to the heterogeneity of the TBI population, each participant showed varying degrees of improvement, which coincided with the degrees of their injuries. The results of this study may prove to be very valuable for those individuals returning to the academic setting, as differentiation between free recall and multiple choice recall may be easily applied to the classroom and testing environments.

TABLE OF CONTENTS

CHAPTER ONE	1
OVERVIEW OF STUDY.....	1
INTRODUCTION.....	1
Traumatic Brain Injury.....	1
Definition.....	1
Prevalence and Etiology	1
Common Problems Resulting from Traumatic Brain Injury	2
Types of Memory Impairments Following TBI.....	2
PURPOSE.....	4
REVIEW OF THE LITERATURE	5
Treatment Efficacy of Cognitive Rehabilitation	5
Between-Group Designs	6
Pretreatment Baselines.....	6
Duration of Intervention	7
Training vs. Assessment Tasks	7
Participant Definitions	8
Generalization and Rehabilitation.....	8
General Memory Remediation Strategies	9
Memory Retraining Strategies for Paragraph Retention.....	11
Single-Participant Designs	12
Advantages.....	13
Disadvantages	14
Previous Studies with PQRST	14
Glasgow, Zeiss, Barrera, and Lewinsohn (1977).....	14
Benedict & Weschler (1992)	15
Summary of Literature Review.....	17
CHAPTER TWO	20
METHODS	20
PARTICIPANTS.....	20
Participant Selection.....	20
Description of Participants	20
Participant One.....	22
Participant Two	22
Participant Three	23
PROCEDURE	24
Wechsler Memory Scale – III	24
Assessing Word List Recall	25
Assessing Form Sequence Recall.....	25

Assessing Paragraph Recall	26
Baseline Sessions	26
Word List Recall	27
Form Sequence Recall.....	27
Paragraph Recall	27
Scoring	28
Treatment Sessions.....	29
ANALYSIS OF DATA	30
Visual Inspection.....	30
Agreement	32
CHAPTER THREE	34
RESULTS	34
AGREEMENT.....	34
VISUAL INSPECTION	36
Overall Results	36
Paragraph Memory Retraining for All Three Participants.....	36
Participant One.....	37
Immediate Recall	39
Delayed Recall	39
Long Term Recall	43
Participant Two	46
Immediate Recall	46
Delayed Recall	50
Long Term Recall	50
Participant Three	55
Immediate Recall	55
Delayed Recall	59
Long Term Recall	63
CHAPTER FOUR.....	66
DISCUSSION	66
REPLICABILITY OF RESULTS	66
LONG TERM MEMORY IMPROVEMENTS	67
IMMEDIATE AND DELAYED MEMORY IMPROVEMENTS	68
DEGREE OF INJURY	69
TBI VS. HEMORRHAGE	70
PARTICIPANT AGE.....	70
IMPLICATIONS FOR EDUCATION.....	71
UNEXPLAINED VARIANCE	71
Individual Differences.....	72
Practice Effects.....	72

UNEXPLAINED VARIANCE	71
Individual Differences.....	72
Practice Effects.....	72
Severity of Brain Damage.....	72
Extraneous, Uncontrolled Variables	73
CONCLUSIONS	73
FUTURE RESEARCH.....	74
REFERENCES.....	75
APPENDICES.....	81
APPENDIX A.....	82
BASELINE WORD LISTS, FORM SEQUENCES, PARAGRAPHS, ...	82
& SCORING PROTOCOL	82
Word Lists	82
Form Sequences	83
Paragraphs	84
APPENDIX B	96
TREATMENT WORD LISTS, FORM SEQUENCES, PARAGRAPHS, ...	96
& SCORING PROTOCOL	96
Word Lists	96
Form Sequences	100
Paragraphs	104
APPENDIX C	152
BASELINE SESSIONS	152
APPENDIX D.....	154
TREATMENT SESSIONS.....	154
APPENDIX E	156
FLOWCHART	156
VITA.....	157

LIST OF TABLES

TABLE	PAGE
1. Summary of PQRST Investigations.....	18
2. Demographic and Cognitive Test Data.....	21
3. Intrajudge Agreement.....	35
4. Interjudge Agreement.....	35
5. Percentages for Individual Judgements - Participant 1.....	38
6. Percentages for Individual Judgements - Participant 2.....	48
7. Percentages for Individual Judgements - Participant 3.....	57

LIST OF FIGURES

FIGURE	PAGE
1. Participant 1 - Immediate Free Recall.....	40
2. Participant 1 - Immediate Multiple Choice Recall.....	41
3. Participant 1 - Delayed Free Recall.....	42
4. Participant 1 - Delayed Multiple Choice Recall.....	44
5. Participant 1 - Long Term Free Recall.....	45
6. Participant 1 - Long Term Multiple Choice Recall.....	47
7. Participant 2 - Immediate Free Recall.....	49
8. Participant 2 - Immediate Multiple Choice Recall.....	51
9. Participant 2 - Delayed Free Recall.....	52
10. Participant 2 - Delayed Multiple Choice Recall.....	53
11. Participant 2 - Long Term Free Recall.....	54
12. Participant 2 - Long Term Multiple Choice Recall.....	56
13. Participant 3 - Immediate Free Recall.....	58
14. Participant 3 - Immediate Multiple Choice Recall.....	60
15. Participant 3 - Delayed Free Recall.....	61
16. Participant 3 - Delayed Multiple Choice Recall.....	62
17. Participant 3 - Long Term Free Recall.....	64
18. Participant 3 - Long Term Multiple Choice Recall.....	65

CHAPTER ONE
OVERVIEW OF STUDY
INTRODUCTION

Traumatic Brain Injury

Definition

Traumatic brain injury (TBI) is defined as an acquired injury to the brain resulting from an external physical or mechanical force. Two major types of traumatic brain injury that may occur include open and closed head injury. In an open head injury there is penetration of the skull by a foreign object. This type of injury typically leads to more focal damage to the brain. Open head injuries are commonly caused by bullets, rocks, shell fragments, knives, and blunt instruments (Meirowsky, 1984). In a closed head injury, the brain is damaged by a blow to the head. The most common example of this type of accident is a motor vehicle accident. The skull is not penetrated, but the brain is displaced within the cranial cavity. As a result, gray cortical matter is dragged along the brain's bony protuberances creating contusions and lacerations. Additionally, deep white matter axons may be damaged or even torn by a shearing action created by the blow to the head.

Prevalence and Etiology

The populations most at-risk for closed head injury (CHI) are adolescents and young adults. According to Sohlberg & Mateer (1989), CHI in adolescence and early adulthood

most commonly occurs between the ages of 18 and 25, and the most common cause is motor vehicle accident. According to the Tennessee Department of Health (1996), someone suffers a TBI once every 15 seconds, with approximately 70,000-90,000 of the survivors living with a disability.

Common Problems Resulting from Traumatic Brain Injury

Depending on the site and severity of the injury, problems associated with TBI may include headaches, impaired balance, tinnitus or other auditory symptoms, fatigue, tremor, visual impairments, and seizures (Raymond, Bennett, Hartlage, & Cullum, 1999). Communication disorders resulting from traumatic brain injury include impaired comprehension and use of language, dysarthria, and aphasic symptoms such as word-finding problems and disorganization of language. In addition, according to Ylvisaker and Urbanczyk (1990), deficits in receptive and expressive language skills may be characterized by difficulty organizing written language, attending, comprehending written and spoken language, identifying the main idea in narratives, as well as remembering and learning. Memory deficits are the most common cognitive impairment associated with closed head injury.

Types of Memory Impairments Following TBI

Memory may be broken down into three categories: sensory memory, short-term working memory, and long-term memory (Wilson & Moffat, 1992). Sensory memory is capable of storing information for immediate recall, and involves the use of sensory

systems, such as vision, taste, and touch. Short-term working memory is capable of temporarily holding information. This is often tested via recall of word lists and paragraphs. Short-term working memory is hypothesized to hold 7 ± 2 items of information (Sohlberg & Mateer, 1989). Long-term memory is responsible for storing and recalling information from minutes to years. It is the permanent memory store of knowledge. The capacity of this storage is not known, but it is thought to be unlimited (Ylvisaker & Szekeres, 1998).

While each individual will suffer specific memory deficits related to the nature and severity of their injury, some patterns emerge in the TBI population (Sohlberg & Mateer, 1989). Immediately following the injury, many patients suffer from posttraumatic amnesia and may not be able to maintain information from moment to moment. This transient memory disruption generally tends to improve with time. Permanent memory disruptions range from inability to store new information to severe, chronic amnesia. Permanent memory disruptions tend to be persistent and pervasive in nature.

Other impairments include anterograde and retrograde amnesia, as well as problems with declarative and procedural memory, semantic and episodic memory, visual and auditory memory, and verbal and nonverbal memory (Ylvisaker, Szekeres, & Haarbauer-Krupa, 1998).

PURPOSE

The purpose of the present study was to determine the efficacy of a memory retraining strategy for improving immediate, delayed, and long-term recall of narrative information following traumatic brain injury in three single-participant designs. Data was obtained from participants who have sustained a traumatic brain injury and have resulting memory deficits.

Initially described by Robinson (1970), PQRST is a verbal memory remediation strategy, which involves the use of mnemonics to aid in recall tasks. PQRST is an acronym that denotes the following steps:

P (Preview): Briefly skim the material to familiarize yourself with the general content

Q (Question): Ask yourself these key questions

1. Who are the main characters/What are the main subjects?
2. What are the main points?
3. What are the supporting details for those main points?

R (Read): Read actively with the goal of answering the questions.

S (State): Silently repeat/state the information that has been read.

T (Test): Test yourself on the material read.

REVIEW OF THE LITERATURE

Treatment Efficacy of Cognitive Rehabilitation

According to Sohlberg & Mateer (1989), cognitive rehabilitation refers to "the therapeutic process of increasing or improving an individual's capacity to process and use incoming information so as to allow increased functioning in everyday life... including methods to restore cognitive function and compensatory techniques." Cognitive rehabilitation involves utilizing therapy strategies to retrain problem areas caused by impairment to attention, visual processing, language, memory, reasoning, and executive functions. From the rehabilitative perspective, executive functions include self-awareness of strengths and limitations, ability to set reasonable goals and plan behaviors to achieve those goals, ability to initiate behavior, ability to monitor and evaluate performance, and the ability to revise plans and problem-solve in the event of difficulty or failure (Ylvisaker & Feeney, 1998).

In a comprehensive review of literature (Benedict, 1989) examining the efficacy of cognitive remediation strategies for TBI victims, it was noted that many studies suffered from a variety of methodological flaws including 1) too few between-group designs; 2) inadequate pretreatment baselines; 3) inadequate duration of intervention; 4) differences between training and assessment tasks; and 5) poorly defined type of TBI and time post-onset. Because of these flaws, the results these studies have produced are questionable.

Between-Group Designs

Between-group designs may be broken into two categories: experimental and descriptive. Experimental between-group designs expose different groups to different levels of the independent variable, and descriptive between-group designs compare the performance of different groups on a defined criterion (Schiavetti & Metz, 1997).

Between group designs provide comparisons of independent treatment effects, spontaneous recovery, and placebo factors among a number of groups. Gordon (1987) found this design to be the most effective tool to examine cognitive remediation. The most difficult problem with between-group research designs and cognitive remediation remains the ethical problem of assigning participants to situations of no-treatment. Furthermore, between-group research designs often conceal any significant changes made in an individual participant (Benedict, 1989). Another limitation of group designs (Wilson, 1987) is the inability to evaluate changes over time. Group designs typically only collect data on pre/posttest measures, which makes it difficult to identify patterns in treatment (Sohlberg & Mateer, 1989). For these reasons, Benedict (1989) recommends the use of experimental single-participant research designs.

Pretreatment Baselines

Lack of an adequate baseline creates an inability to establish a pretreatment trend. Williams (1993) found that in using single-participant designs, baselines play a major factor in the validity of the experiment. The author suggests establishing criterion levels for untrained items on a generalization probe (i.e. 90% accuracy over 3 sessions). Fussey

& Tyerman (1985) assessed patients pre- and post- treatment only one time to obtain baselines. Their results found no significant difference between baseline and post-training performance, but their results are suspect due to the inadequacy of pre- and post-treatment measures. McReynolds and Kearns (1983) suggest that a behavior should be measured until there is no change prior to treatment.

Duration of Intervention

Research suggests that patients suffering from a head injury will require more time than average to learn cognitive tasks. Given this fact, many studies have used too few treatment sessions with many having fewer than five (Benedict, 1989). Fussey and Tyerman (1985) attempted to evaluate one memory retraining program in patients who had suffered closed head injury. The authors met with participants individually for 12 sessions over one month, taking one pre/post measure for baseline information. Their results indicated no significant difference between baseline and post-training performance. The patients were able to describe the strategy in detail but not successfully employ it. The authors note that if the strategies could have been continued over a longer period, benefits may have been observed.

Training vs. Assessment Tasks

Methodological flaws arise when a cognitive remediation training task is found to be unrelated to the outcome that is being measured. Benedict (1989) found this problem

to be of significance in studies researching the effectiveness of videocomputer tasks and states that training tasks should target “specific information processing deficits.”

Participant Definitions

Many participant variables will affect the natural recovery process. When assessing treatment techniques, one must consider the site of lesion, severity of the injury, age at injury, time posttrauma, measure of improvement, and premorbid functioning. Benedict (1989) found severity of the injury (i.e., duration of loss of consciousness, duration of posttraumatic amnesia) and time posttrauma to be the most salient features with regards to cognitive remediation. These two factors were also found to be directly related to degree of impairment and responsiveness to treatment (Alexander, 1987; Wilson, 1987). They should, therefore, be included within participant descriptions for all research (Benedict, 1989).

Generalization and Rehabilitation

If clinicians are able to help TBI patients with memory impairments, generalization must be considered. Generalization is a crucial part of the rehabilitative process and should be incorporated into all treatment programs (Wilson, 1987). It should be considered across participants, across behaviors, and across settings. Generalization across participants indicates that successful treatment with one participant can be expected to be successful with others. Generalization across behaviors refers to those situations when strategies used to aid with one problem are used to assist with another.

Generalization across settings refers to the use of strategies taught in one setting in other settings. It is particularly important to note that when dealing with the TBI population, generalization across participants will be difficult to achieve since the impaired function, site, and severity of damage is individualized. Generalization for list learning has shown variable rates of success (Goldstein, McCue, Turner, Spanier, Malec, & Shelly, 1988). Typically, the use of multiple baselines across settings is the most effective method of measuring generalization (Connell, P.J. & Thompson, C.K., 1986).

General Memory Remediation Strategies

Generally speaking, memory remediation strategies may be classified into restorative and compensatory approaches (Sohlberg & Mateer, 1989). The goal of the restorative memory approach is to reestablish memory function through repeated practice. List-learning tasks and paragraph recall tasks are often included in this approach. Previous studies have found this approach to be unsuccessful in increasing scores on new tasks and poor generalization has been observed outside the clinic (Godfrey & Knight, 1985; Schacter, Rich & Stampp, 1985).

The compensatory approach teaches strategies to compensate for memory deficits. Two traditional memory compensation strategies include teaching participants to use external memory aids and internal memory aids (Sohlberg & Mateer, 1989). External memory aids may further be categorized into the following types: multicomponent organizational devices (i.e., memory notebooks), simple prospective memory devices (i.e., alarms), and environmental modifications (i.e., posted reminders, alphabetized

pantry). Since patients who have suffered a head injury generally have difficulty with new learning, teaching new external strategies is frequently ineffective. Internal memory aids use internal mnemonic strategies to compensate for memory deficits. These may include improving organizational skills, rehearsing important information, or training specific mnemonic devices (visual and verbal). Visual strategies, such as method of loci (MOL), require the patient to create a visual image of an item and associate it with a familiar setting (Robertson-Tchabo, Hausman, & Arenberg 1976). Verbal strategies, such as Robinson's (1970) PQRST (preview, question, read, state, and test) procedure, involve the use of mnemonics to remember strategies to aid in recall tasks. Using both of these techniques, patients have been able to show marked improvement in memory functioning (Benedict & Wechsler, 1992; Glasgow, Zeiss, Barrera, & Lewinsohn, 1977; Wilson, 1987).

Various other mnemonic strategies have been successfully used to improve memory deficits. While Glasgow, Zeiss, Barrera, and Lewinsohn (1977) reported no benefit from a visual imaging mnemonic (MOL), they reported consistent, positive findings using the PQRST verbal mnemonic, originally known as the SQ3R (survey, question, read, recite, and review) approach (Robinson, 1970). Wilson (1987) also investigated this strategy with eight head-injured patients and reported that all patients were able to acquire some new information utilizing this strategy. These findings, however, are limited due to inadequate pretreatment baselines.

In the search for the “best” memory remediation strategy, Fussey & Tyerman (1985) simultaneously practiced a visual imaging mnemonic strategy across four patients. Results indicated no significant differences in pre- and posttest measures.

Memory Retraining Strategies for Paragraph Retention

Strategies to aid with recall of narrative information and to facilitate academic performance have been used for years with the general public (Ladas, 1973; Robinson, 1970; Snowman & Cunningham, 1975). In 1977, Glasgow, Zeiss, Barrera, and Lewinsohn attempted to apply these strategies to treat memory impairments with the brain-damaged population. They treated a 22-year-old undergraduate student (Ms. J) for 24 sessions over the course of six months. After suffering a motor vehicle accident approximately three and a half years prior to treatment, the authors reported her presenting complaint to be difficulty remembering school-related information such as lectures and reading assignments. She was tested for immediate, delayed, and long-term recall of prose passages through administration of multiple-choice questions. Following the diagnosis of impaired long-term recall of verbal material, two treatment strategies were employed: rehearsal and PQIRST. Robinson (1970) first described the PQIRST strategy, as a combination of organizational and rehearsal strategies, to improve recall of academic information. Ms. J. was exposed to the passages auditorily and visually and instructed to practice the following sequence: P – preview and skim the material; Q – pose four questions related to the material; R – read actively answering the questions; S – state the information; and T – test for recall. When compared to the simple rehearsal strategy, the

patient exhibited consistently better performance utilizing the PQRSST strategy. A limitation of this study, however, is that presentation time for each stimulus was not held constant across conditions. Additionally, the authors point out that the PQRSST strategy took three times as long as the control method to employ. Therefore, it is uncertain whether the increased performance with this strategy was due to the extra time involved.

Benedict and Wechsler (1992) also attempted to evaluate immediate and delayed memory in patients with TBI using two approaches: the method of loci (MOL) and PQRSST. The two memory tasks developed for these approaches were auditory paragraph and word-list recall. All stimuli were standardized according to criteria set by the authors. In contrast to Glasgow et. al (1977), presentation time for each stimulus was held constant. In addition, instead of multiple choice questions, participants were instructed to write down all they could remember from the paragraph. The authors reported more improvement with the PQRSST approach than with MOL. However, results indicated that effectiveness of memory retraining strategies is directly correlated with the severity of injury. Thus, both strategies were more effective with mild to moderate participants than severe ones.

Single-Participant Designs

Single-participant research designs allow for repeated measures to be taken over time in an individual. The control for outside variables is demonstrated within that individual participant. That is, the baseline and treatment phases both include the effects of external variables, providing a research design that is appropriate for examining

individual rehabilitation outcomes (Sohlberg & Mateer, 1989). According to Barlow & Husen (1984), "the multiple baseline design may be the most practical single case design for cognitive remediation research because it permits the simultaneous assessment of several dependent measures and the examination of the independent effects of specifically targeted interventions." To preserve internal validity in these designs, it is important to establish an adequate baseline with a consistent trend in pre-treatment performance.

Advantages

McReynolds and Thompson (1986) listed several technical advantages to single-participant research designs. First, they allow for identification of functional relationships between the independent and dependent variables, allowing one to make the cause-effect statement that the independent variable actually caused the change in the dependent variable. Second, they include exploration of interparticipant variability, accepting that these participants may not be a homogeneous group. Third, these designs include exploration of intraparticipant variability. Through repeated measurements over time, one may look at the participant's variability across behaviors. Additionally, the authors found practical and relevant applications of single-participant designs. First, the relationship between the researcher and clinician allows for objective data to be measured using a quantitative scale composed by the researcher. Second, these designs can easily be replicated in the clinical setting.

Disadvantages

According to McReynolds and Thompson (1986), in order to control for extraneous variables, researchers must: 1) possess underlying knowledge of the research design, 2) create an appropriate design for the hypothesis, and 3) fulfill all basic requirements of an experimental study. Without this knowledge, researchers are at risk for reporting results from an inadequate design, thus providing misleading information.

Previous Studies with PQRST

Glasgow, Zeiss, Barrera, and Lewinsohn (1977)

In 1977, Glasgow, Zeiss, Barrera, and Lewinsohn investigated whether or not PQRST would help remediate the memory deficits in the brain-injured individuals. They attempted to answer this question in a case study involving Ms. J., a 22-year-old female who suffered a head injury secondary to a motor vehicle accident. She was seen by the authors for a total of 24 sessions over six months. The authors' assessed Ms. J.'s semantic memory functioning through a reading skills program, which required her to read brief passages (3-4 paragraphs) of up to two pages narrative prose. These selections were tested by free recall and multiple choice questions. They further assessed her intelligence via the Weschler Adult Intelligence Scale (WAIS). The authors held Ms. J. at baseline for eight sessions over a two week period. During these sessions, half of the selections were read to her, while she read the other half silently. The order of presentation of all variables was counterbalanced across sessions. Ms. J. performed consistently well on immediate recall (88%), but was only able to remember 8% of the main points for long

term recall. Since long term recall appeared to be the problem, that is where the authors focused their treatment.

The authors selected two intervention strategies (PQRST and rehearsal) and compared them to a control (no treatment) procedure. The rehearsal procedure required that Ms. J verbally state what she remembered from the material. The PQRST strategy was modified by combining the P (preview) and Q (questions) stages for auditory presentation of the material. Materials and scoring were similar to those used during the assessment. During each session, Ms. J. would read or hear three selections and was instructed to use one of the three aforementioned techniques (PQRST, rehearsal, no strategy). Recall for each selection was tested at one-half week and one week.

PQRST was found to be superior to rehearsal, which was found to be superior to the control condition. While the rehearsal took twice as long as the control to employ, PQRST took twice as long as the rehearsal strategy.

Benedict & Weschler (1992)

In 1992, Benedict & Weschler published a study evaluating the efficacy of long term memory retraining in two patients with TBI. The authors used two single-participant, multiple baseline research designs. Their participants (GR and BD) had both suffered brain injuries and were participating in an outpatient rehabilitation program. GR suffered two head injuries from a motor vehicle accident (MVA) and a fall. BD suffered one head injury from an MVA. BD was much more neurologically impaired than GR. To meet the requirements of their study, it was necessary that all participants 1) have a

memory impairment as evidence by the Weschler Memory Scale (WMS), 2) be able to participate in the study for approximately six months, and 3) have no prior exposure to PQRT.

The authors' goal in creating the assessment tasks was to evaluate immediate and delayed (30 minutes) recall for text and word lists over a period of time. Method of loci (MOL) was employed as the memory retraining strategy for word lists, and PQRT was employed as the memory retraining strategy for paragraphs. PQRT is an adapted version of the PQRTS strategy, which omits the S (state) phase during auditory presentation. The paragraph task included paragraphs altered to fit the WMS Logical Memory Subtest. The word lists task included twelve single-syllable common object nouns. Overall, fourteen paragraphs and fourteen word lists were used.

Participants met once weekly in group sessions. They began with auditory presentation of the paragraph task, which was followed by a three-second pause. Then, each participant was asked to write down all they could remember. Next, the word list was read aloud and again, following a three-second pause, each participant was asked to write down as many words as they could remember. Following a 25-30 minute discussion, each participant was then asked for delayed recall of the previously presented material. Memory retraining for paragraphs involved weekly meetings for group and individual practice. First each participant previewed (P: previewed) or skimmed the material. Second, questions (Q: question phase) were posed by the therapist (or patient, depending on the session number). Third, the paragraph was repeated (R: read/repeated) at a slower pace. Additionally, daily homework was also assigned. Word list training

required each participant to practice the MOL strategy (i.e., imagine stimulus words as unusual items in familiar places).

To determine if a significant degree of memory remediation was achieved, the authors looked at pre- and posttreatment scores using standardized tests. Raw scores were converted to standardized T scores and a multiple baseline designs across memory tasks were used to interpret participant data. Because the extent of serial dependency (the extent that one data point is related to the prior data point) did not reach statistical significance, the converted data for each participant was submitted to a one-way analysis of variance ANOVA.

GR's improvement in paragraph recall was found to be statistically significant when treatment was compared to no treatment. While significance was not found for delayed word list recall, there was improved performance, as evidenced by visual inspection of the data. BD had an exceedingly variable performance and evidenced little change in paragraph recall over time both statistically and through visual inspection. Similarly, no changes were evident in word list recall.

The previous studies involving PQRST, as well as the current investigation, are summarized in Table 1.

Summary of Literature Review

Despite methodological problems, research supports the hypothesis that performance on memory tasks may be improved with repeated practice. However, due to inconsistent generalization, not all remediation strategies are appropriate for all TBI patients. Previous

Table 1: Summary of PQRST investigations

	Hood (2001)	Glasgow et. al. (77)	Benedict & Weschler (92)
<i>Remediation approach used</i>	PQRST	PQRST & rehearsal	PQRST & MOL
<i>Assessment of the approach</i>	Free Recall & Multiple Choice	Free Recall & Multiple choice	Free recall
<i>Rx design</i>	Multiple baseline across participants	Case study	Multiple baseline across participants
<i>Length of pre-baseline</i>	6 sessions/3 weeks	8 session/2 weeks	6 weeks
<i>Method of presentation</i>	Visual	Auditory, Visual	Auditory
<i># of participants</i>	3 (TA, LP, & CM)	1 (Ms. J.)	2 (GR & BD)
<i>Severity of injury</i>	mild	mild	severe
<i>Duration of Tx</i>	TA, LP, & CM: 36 sessions/5 months 12 sessions – baseline 24 sessions - PQRST	Ms J.: 24 sessions/6 months 8 sessions – baseline 8 sessions – rehearsal 8 sessions – PQRST	GR: 27 sessions/42 weeks 5 weeks - baseline 14 weeks - MOL 23 weeks PQRST BD: 34 sessions/41 weeks 4 weeks - baseline 17 weeks - MOL 20 weeks - PQRST
<i>Types of memory tested</i>	Immediate, delayed, & long-term	Long-term	Long- term
<i>Stimulus presentation time</i>	Constant	Not Constant	Constant
<i># of tasks used</i>	3 (WL, FS, P)	1 (P)	2 (WL,P)
<i>Type of Session</i>	Individual	Individual	Group
<i>Statistical Analysis</i>	Visual Inspection & Time -Series Design	Comparison of pre- & posttreatment baselines	Visual Inspection & One-Way ANOVA
<i>Flaws</i>		➤ Generalization from a case study is difficult. ➤ Stimulus presentation time was not held constant.	➤ BD's injuries were too severe to us PQRST. ➤ No postbaseline phase

WL - Word list, FS - Form sequence, P - Paragraph

literature has suffered from methodological flaws, such as inadequate pretreatment baselines, which compromise their internal validity. Future research is needed to replicate results while meeting the criteria of an internally valid research design.

The following questions were investigated in this study:

1. Does PQRST improve immediate recall of narrative information in an individual subsequent to traumatic brain injury?
2. Does PQRST improve delayed recall (15-20 minutes) of narrative information in an individual subsequent to traumatic brain injury?
3. Does PQRST improve long-term recall of narrative information in an individual subsequent to traumatic brain injury?

CHAPTER TWO

METHODS

PARTICIPANTS

Participant Selection

Participants were selected based on the following criteria: 1) mild to moderate memory impairment following closed head injury as assessed by the Wechsler Memory Scale - III (WMS-III), 2) ability to participate in the memory retraining program for approximately five months, 3) twelve months posttrauma to control for spontaneous recovery, 4) future educational plans that would make improved narrative recall functional for the participants, and 5) no prior exposure to the PQRST strategy.

Description of Participants

Participants were recruited via newspaper editorial or professional referral. Five individuals agreed to participate. Two of the five individuals were not deemed appropriate candidates based on their performance during the pre-baseline sessions. One participant achieved such high scores that treatment would not have benefited her, while the other participant could not complete all the tasks within the one hour session. Three participants completed the treatment program. All participants were administered the WMS - III to assess memory functioning. Demographic and cognitive test data are presented in Table 2.

Table 2: Demographic and cognitive test data

Parameter	Participant 1 (TA)	Participant 2 (LP)	Participant 3 (CM)
Age	23	36	45
Sex	Female	Female	Female
Education	12 years	16 years	19 years
Vocation	Student	Cardiac Nurse	Graduate Student
Time posttrauma	71 months	73 months	84 months
Etiology	CHI	CVA	CHI
Cause of trauma	Hydrocephalus	Hemorrhage	Falling object
Duration of loss of consciousness	N/A	N/A	15 minutes
Duration of posttraumatic amnesia			
Immediate Memory			
Auditory	12	22	26
Visual	10	11	25
Delayed Memory			
Auditory	6	17	25
Visual	10	11	25
Auditory Recognition	3	10	12
General Memory	19	38	62
Working Memory	8	7	27

Participant One

TA, a 23-year-old female, suffered a closed head injury secondary to acute, non-communicating hydrocephalus on 9/1/94. She presented to the Emergency Room with markedly elevated intracranial pressure, which was promptly decompressed via ventriculostomy followed by ventriculoperitoneal shunt. A CT (computerized tomography) scan of the brain indicated acute hydrocephalus with dilation of all four ventricles. Due to shunt malfunction, TA suffered persistent hydrocephalus; and over the next five months was also diagnosed with a left parietal subacute, subdural hematoma secondary to drainage of the ventricular system, an astrocytoma in the cerebellum, obstructive hydrocephalus at the level of the fourth ventricle, and a 2cm thick parietal subdural hematoma. On 6/27/95, TA was diagnosed with a low-grade astrocytoma, shunt dependence, and ataxia. A suboccipital craniectomy was performed to partially resect the tumor. An MRI (magnetic resonance imaging) of the brain and brain stem on 9/11/95 indicated a cerebellar astrocytoma of the vermis and a shunt malfunction. Following the shunt revision she was again discharged home. As of 1/31/00, there was no suspicious hydrocephalus, no midline shift of the tumor, and no CT evidence of any suspicious acute intracranial abnormality. TA is currently active in her church and a volunteer with the Honor Guard. Her future educational plans include attending seminary.

Participant Two

LP is a 36-year-old female who suffered a right frontal-parietal hemorrhage secondary to an arteriovenous malformation (AVM) in July of 1994. As a result of the

hemorrhage, LP developed acute communicating hydrocephalus. No ventricular rupture was apparent. LP underwent a craniotomy on 7/7/94 to evacuate the hemorrhage, and an emergency ventriculostomy was performed on 7/8/94. She again developed acute communicating hydrocephalus, causing third nerve paralysis secondary to increased intracranial pressure. This was alleviated by insertion of a ventricular drain. CT of the brain then revealed a left, frontal, intracerebral hemorrhage on 8/4/94. A craniotomy was performed on 8/5/94 to remove a lesion in the left frontal area for biopsy. LP was ultimately diagnosed with metastatic choriocarcinoma, seizure disorder, and depression. She also suffers from tunnel vision, though she compensates very well. LP was premorbidly employed as a cardiac-rounding nurse. Her future plans include completing her continuing education to keep her nursing license current and to be a more independent single mother.

Participant Three

CM, a 45-year-old female, suffered a traumatic brain injury secondary to a blow to the head from a television set in May of 1993. Immediately following the injury, CM was unconscious for approximately 15 minutes. Upon presentation to the Emergency Room, she was evaluated and x-rays were performed. However, when the Emergency Room was contacted, they were unable to locate any medical records for CM on the date in question. CM's medical history is remarkable for the following: Chron's disease, chronic obstructive pulmonary disorders (COPD), and lifelong inner and outer ear/hearing problems. While not all medical records have been received, the participant

reports suffering an initial closed head injury to the frontal lobe when the television fell from the ceiling, and a second closed head injury to the occipital area when her head hit the floor. Although a hematoma was present in the right forehead area above the temple, there were no lacerations. The attending physician reported she had a concussion and cautioned her to watch for weird or unusual behavior. Approximately one week later, CM consulted a neurologist who admitted her to a local hospital. Again, these records have not yet been received. Subsequent to the injury, CM has suffered from lethargy, severe pain on the left side of her jaw, dizziness, headaches, temporomandibular joint (TMJ) problems, visual disturbances, organizational difficulties, initiation problems, difficulties finding and forming words, loss of direction/distance/time, and overall personality changes. She has also consulted a chiropractor, physical therapist, massage therapist, and psychologist to help with all of the above problems. Approximately three years after the accident, CM was diagnosed by a neuropsychologist as having suffered a mild traumatic brain injury. She has never received formal therapy for this injury. CM was premorbidly employed as a graduate student in pursuit of Master's degree, an actress, and musician. She is currently enrolled in a graduate program as a non-degree student. Her future educational plans include completing a doctoral degree in applied educational psychology.

PROCEDURE

Wechsler Memory Scale – III

Before treatment, all participants were individually administered the WMS-III (Wechsler Memory Scale –III) to assess memory function. The WMS-III is a battery of

learning, memory, and working memory measures. This test is normed on older adolescents and adults ages 16-89 years and provides information that allows the clinician to estimate an individual's level of memory functioning. In an educational setting, the WMS-III provides a useful measure to determine the degree to which a learning disability may be attributed to memory dysfunction. Furthermore, the results of this test may be beneficial when recommending additional aids or memory training for adolescents or adults with a learning disability.

In this experiment, the participants were tested for word list recall, form sequence recall, and paragraph retention. The order of these tasks were randomly assigned for immediate, delayed, and long-term recall each session. All word lists, form sequences, and paragraphs used may be found in Appendices A (Baseline Sessions) and B (Treatment Sessions).

Assessing Word List Recall

Words for the word list recall were taken from *3000 Instant Words*. These lists contained 12 single-syllable common object nouns. The repetition of syllables and easy associations were minimized (see Appendices A and B).

Assessing Form Sequence Recall

Forms for the form sequence recall were arranged by the examiner. These sequences contained five forms in varying order. Each sequence was only used once (see

Appendices A and B). The purpose of this assessment was to determine if treatment would affect non-verbal memory and to determine if spontaneous recovery was occurring.

Assessing Paragraph Recall

These paragraphs were taken from local and national periodicals, and altered to fit the WMS-III logical memory subtest format. That is, each paragraph consisted of 3 to 4 sentences, 25 main ideas, and 56 words (see Appendices A and B).

Baseline Sessions

An overview of the format for baseline sessions is located in Appendix C. Each participant attended an individual session twice weekly over a period of 3 weeks. Sessions took place in South Stadium Hall at the University of Tennessee. Each participant was seen individually and was seated directly across the table from the primary investigator. Each participant was provided with pens and unlined paper. Prior to administration of any task, each participant was instructed to perform as well as she could using any strategy she would normally use in her daily life. Each session involved visual presentation of the word list task, form sequence task, and the paragraph task. The order of tasks was randomized each session to offset temporal influences, which could occur from task to task.

Word List Recall

During visual presentation of the word list, each participant was given a list of words to read for one minute and asked to remember as many words as possible. Following a three-second pause, participants were asked to write down all the words they could remember in any order possible. Participants were informed that this was not a timed task. Next, they were asked to circle words from a word bank according to what they remembered having read. The word bank consisted of 24 single-syllable words, 12 of which each participant had already read and 12 new words (see Appendix A).

Form Sequence Recall

During the form sequence task, participants were given a sequence of various forms to review for one minute and asked to remember as many forms as possible in the correct sequence. Following a three-second pause, participants were asked to write down all the forms they could remember in the correct order. Participants were informed that this was not a timed task. Next, they were asked to choose the correct form sequence from a choice of four presented. Participants were asked to circle the sequence they believed to be correct (see Appendix A).

Paragraph Recall

During visual presentation of the paragraph task, the participants were given a paragraph to read silently for two minutes. A three-second pause was given following completion of the paragraph; then participants were asked to write down all they could

remember from the paragraph. Following this task, participants were asked to answer multiple-choice questions regarding the paragraph they read (see Appendix A).

All participants were then given a 15-20 minute break from the session to allow time for delayed recall of the information. Following the break, according to the randomized order of the tasks, all participants were asked, once again, to write down in outline form all they remembered from the paragraph followed by multiple choice questions. They were asked to write down all the words they could remember from the word list and were then instructed to circle words from a word bank according to what they remembered having read. And, they were asked to write down all the forms they could remember from the form sequence task in the correct order and choose the correct sequence from a field of four.

To further assess long-term recall, participants performed the same tasks, according to the randomized order, at the beginning of the following session. All tasks were randomized for assessment of immediate, delayed, and long-term memory within each session.

Scoring

The paragraph tasks were scored as percent of main ideas recalled, with participants receiving one point per main idea (25 points possible), and percent of multiple choice answered correctly. The word list recall tasks were scored as percent of words recalled in the written form and percent of words recalled when selected from a

group. Participants received one point per word with twelve points possible. The form sequence tasks were scored as percent of forms correctly recalled. Participants received one point per form with five points possible.

Treatment Sessions

An overview of the format of the treatment sessions is provided in Appendix D. All participants participated in individual sessions twice weekly over a period of 3 months (24 sessions). During sessions one through seven, all participants received instruction by the examiner in the PQRSST memory retraining strategy. During sessions eight through twenty-four, participants reviewed the PQRSST memory retraining strategy with the clinician. PQRSST was practiced with paragraphs using visual presentations of material. During the P (preview) stage, the examiner, or participant (depending on session number), outlined important information after briefly scanning the paragraph to learn the information. During the Q (question) phase, the examiner, or participant (depending on session number), posed questions regarding these outlined points. During the R (read) phase, participants actively read the paragraphs with the objective of answering the questions posed. During the S (state) phase, the participants reread the paragraph at a slower pace. Finally, during the T (test) phase, the participants were tested on the presented material.

The word list and form sequence tasks continued to be measured utilizing the same procedures, assessment strategies, and scoring guidelines used in the baseline sessions. No treatments were provided for these tasks. As in the baseline sessions, all

tasks (paragraph, word list, and form sequence) were randomly ordered for assessments of immediate, delayed, and long-term recall each session. The PQRSST memory retraining strategy was reviewed prior to administration of the paragraph task.

At the end of each session, participants were instructed not to practice the PQRSST strategy between sessions.

An overall flowchart for this investigation is provided in Appendix E.

ANALYSIS OF DATA

Visual Inspection

Visual inspection is one of the oldest forms of analyzing data. It is simply the graphic display of one or more sets of information, which allows a viewer to make judgments regarding any relationships present among them. According to Parsonson and Baer (1992) there are many “advantages to be gained” through visual inspection. First, the graphic display allows a viewer to look at a chart and quickly draw conclusions and hypotheses regarding the graphed information. Second, graphs are easy to make, requiring a computer or simply a piece of graph paper and a pencil. Third, the relationships present in graphed information are immediately available to students who may be at diverse levels of training. Fourth, graphs do not present the probability that changes in the patterns and distributions arose by chance. According to the authors, “graphs invite us to make that judgment ourselves.”

In single-participant designs, data are graphically displayed over baseline and intervention phases. These charts then serve to facilitate judgments about whether or not

the requirements of the design have been met (i.e., did the data show the pattern required to infer one condition caused the other). Visual inspection can be used in applied research because of the desired treatment effects. Due to the nature of the criteria for determining change, only those treatments that produce marked effects will lead all to agree that treatment produced a change. Weak results will not meet the criteria of visual inspection. The insensitivity of visual inspection for detecting weak effects has been viewed as an advantage rather than a disadvantage because this encourages one to look for powerful treatments or to develop weak treatments to the point that large effects are produced (Parsonson and Baer, 1992).

When visually inspecting data, one may observe the magnitude of changes across phases (means and level) and the rate of these changes (trend, latency of the change). When looking for changes in means, one should look for shifts in the average rate of performance (i.e., look to see if performance on the average has changed). When evaluating a change in level, one should look for a shift of performance from the end of one phase to the beginning of the next (i.e., look for changes in pre- vs. post- baseline). A change in level is independent of change in mean. That is, the changes do not necessarily go together. To rate these changes, consider trend and latency. A change in trend (slope) indicates the tendency of the data to systematically increase or decrease over time. A change in latency indicates the changes in the period between onset/termination of one condition (prebaseline, treatment, postbaseline) and changes in performance. The more closely in time the changes occur after the experimental condition has been altered, the more clear the intervention effect.

Visual inspection was used to decide whether a vertical change was demonstrated and whether that change could be attributed to the intervention. Each participant's data for immediate, delayed, and long term recall of paragraphs, word lists, and form sequences was graphically displayed. All visual inspection charts had a trend line displayed for each set of data. Each set of graphs was separated into free recall and multiple choice recall. Paired comparisons were then made for each chart. All visual inspection charts were randomly ordered for presentation to the judges, and the order of presentation of each participant's data was randomized across judges.

Five graduate students were recruited to serve as judges of visual inspection charts. During a group session, all judges received training from the principal investigator regarding the criteria for determining change by visual inspection. Additionally, each judge was given a sheet of paper with four graphs showing typical changes in means, level, trend, and latency of the change to use as a reference while judging. All visual inspection charts were presented on a computer using *Microsoft Powerpoint* to create slide shows for each participant's data. All judges participated in a sample slide show to familiarize themselves with presentation of the graphs as well as with the computers. Each judge was instructed to proceed to the next chart at her own pace.

Agreement

Intrajudge agreement was established by having all the judges' re-analyze 33 percent of the participants' visual inspection charts. None of the judges were informed they were viewing various charts more than once. The principle investigator randomly

chose six of 18 visual inspection charts to use for agreement measures. All 24 charts were then randomly assigned for each participant in a visual inspection slide show.

Additionally, slide shows for each participant were randomized across judges. This procedure was completed for each of the three participants.

Interjudge agreement was established by comparing 33% of the judgments made by all five judges. Ratings for 24 graphs, randomly selected, were compared across judges. Percent agreement was tabulated.

CHAPTER THREE

RESULTS

AGREEMENT

Results for intrajudge agreement for all participants are presented in Table 3.

Intrajudge agreement was determined by comparing each judge's first judgment with her second judgment of the same chart. This was completed for all three participants, and an average was taken to calculate an overall intrajudge agreement for each judge. Each judge viewed six charts per participant for a total of eighteen. The lowest intrajudge agreement for participant one was 92% (judge 3), and the highest intrajudgement agreement was 100% (judges 1, 2, 4, and 5). The lowest intrajudge agreement for participant two was 92% (judges 1 and 4), and the highest intrajudge agreement was 100% (judges 2, 3, and 5). Intrajudge agreement for participant three was 100% for all five judges. The overall percent agreement for all three participants was 97% for judges 1, 3, and 4, and 100% for judges 2 and 5.

Results for interjudge agreement for all participants are presented in Table 4.

Interjudge agreement was established by comparing each of the judge's judgments to each other (i.e., judge 1 vs. judge 2 vs. judge 3, etc). This was completed for all three participants, and an average was taken to calculate an overall intrajudge agreement for each judge. Again, each judge viewed six charts per participant for a total of eighteen. The lowest interjudge agreement was 83% for graphs from participants two and three.

Table 3: Intrajudge Agreement

	% Agreement Between 1 st & 2 nd Judgments			Overall Agreement
	Participant 1	Participant 2	Participant 3	
Judge 1	100 %	92 %	100 %	97%
Judge 2	100 %	100 %	100 %	100%
Judge 3	92 %	100 %	100 %	97 %
Judge 4	100 %	92 %	100 %	97 %
Judge 5	100 %	100 %	100 %	100 %

Table 4: Interjudge Agreement

	Participant 1	Participant 2	Participant 3	Overall Agreement
Judge's Agreement	85 %	83 %	83 %	84 %

The highest interjudgement agreement was 85% for graphs from participant one. The overall percent agreement for all three judges across all participants was 84%.

VISUAL INSPECTION

Overall Results

Paragraph Memory Retraining for All Three Participants

All three participants improved in some aspect of paragraph recall (immediate, delayed, long term) over the two baseline, no treatment conditions (word list, form sequence). While some improvements were observed in some of the participants during delayed and long term recall, the most improvements in all three participants was observed during immediate recall. One of the three participants who improved from the treatment appeared to perform better on free recall than multiple choice recall. Whereas, another participant appeared to perform better on multiple choice rather than free recall. The third participant improved equally in free recall and multiple choice recall. The two participants who improved most (participant one and participant three) suffered the most purely defined forms of head injury. Participant one suffered from acute, non-communicating hydrocephalus, and participant three suffered a blow to the head from a falling object. Participant two, on the other hand, suffered from an intracerebral hemorrhage.

The answer to the first research question, "Does PQRST improve immediate recall of narrative information in an individual subsequent to traumatic brain injury?", is yes for all three participants. All three participants improved in immediate recall of

paragraphs when compared with word lists and form sequences. Participants one and three improved in both free recall and multiple choice recall tasks; whereas, participant two only improved in multiple choice recall. Specific results are discussed below.

The answer to the second research question, "Does PQRS improve delayed recall (15-20 minutes) of narrative information in an individual subsequent to traumatic brain injury?", is yes for all three participants. Again, all three participants improved in delayed recall of paragraphs when compared with word lists and form sequences. Participants one and two improved in both free recall and multiple choice recall tasks; whereas, participant three only improved in free recall. Specific results are discussed below.

The answer to the third research question, "Does PQRS improve long term recall of narrative information in an individual subsequent to traumatic brain injury?", is yes for all three participants. However, participant one was the only participant to improve in both free and multiple choice recall tasks. Participant two only improved in multiple choice recall, and participant three only improved in free recall. Specific results are discussed below.

Participant One

Percentages for individual judgments of paired comparisons for participant one are provided in Table 5. Percentages are broken down into immediate, delayed, and long term memory, as well as free recall versus multiple choice recall tasks.

Table 5: Percentages for individual judgments - Participant 1

Immediate Recall	
Free Recall	Multiple Choice Recall
Paragraphs vs. Word Lists: Paragraphs - 100 % Word Lists - 0 % No change - 0 % Paragraphs vs. Form Sequences: Paragraphs - 60 % Form Sequences - 40 % No change - 0 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 100 % No change - 0 %	Paragraphs vs. Word Lists: Paragraphs - 100 % Word Lists - 0 % No change - 0 % Paragraphs vs. Form Sequences: Paragraphs - 20 % Form Sequences - 60 % No change - 20 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 80 % No change - 20 %
Delayed Recall	
Free Recall	Multiple Choice Recall
Paragraphs vs. Word Lists: Paragraphs - 80 % Word Lists - 0 % No change - 20 % Paragraphs vs. Form Sequences: Paragraphs - 0 % Form Sequences - 0 % No change - 100 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 80 % No change - 20 %	Paragraphs vs. Word Lists: Paragraphs - 100 % Word Lists - 0 % No change - 0 % Paragraphs vs. Form Sequences: Paragraphs - 100 % Form Sequences - 0 % No change - 0 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 100 % No change - 0 %
Long Term Recall	
Free Recall	Multiple Choice Recall
Paragraphs vs. Word Lists: Paragraphs - 100 % Word Lists - 0 % No change - 0 % Paragraphs vs. Form Sequences: Paragraphs - 20 % Form Sequences - 80 % No change - 0 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 80 % No change - 20 %	Paragraphs vs. Word Lists: Paragraphs - 100 % Word Lists - 0 % No change - 0 % Paragraphs vs. Form Sequences: Paragraphs - 100 % Form Sequences - 0 % No change - 0 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 80 % No change - 20 %

Immediate Recall

Free Recall

One hundred percent of the judges agreed that free recall for paragraphs improved over word lists, based on visual inspection of the data (see Figure 1). Sixty percent of the judges agreed that immediate, free recall for paragraphs improved over form sequences; and, 100% of the judges noted improvement in form sequences when compared with word lists.

Multiple Choice Recall

All of the judges agreed that immediate, multiple choice recall for paragraphs improved over word lists, based on visual inspection of the data (see Figure 2). Sixty percent of the judges, however, did not believe that paragraph recall improved over form sequence recall. When comparing word lists to form sequences, 80% of the judges agreed that multiple choice recall for form sequences improved to some extent. Twenty percent of judges observed no change in either task.

Delayed Recall

Free Recall

Eighty percent of the judges agreed that participant one improved free recall for paragraphs when compared to word lists, based on visual inspection of the data (see Figure 3). One hundred percent of the judges agreed that no changes were observed when

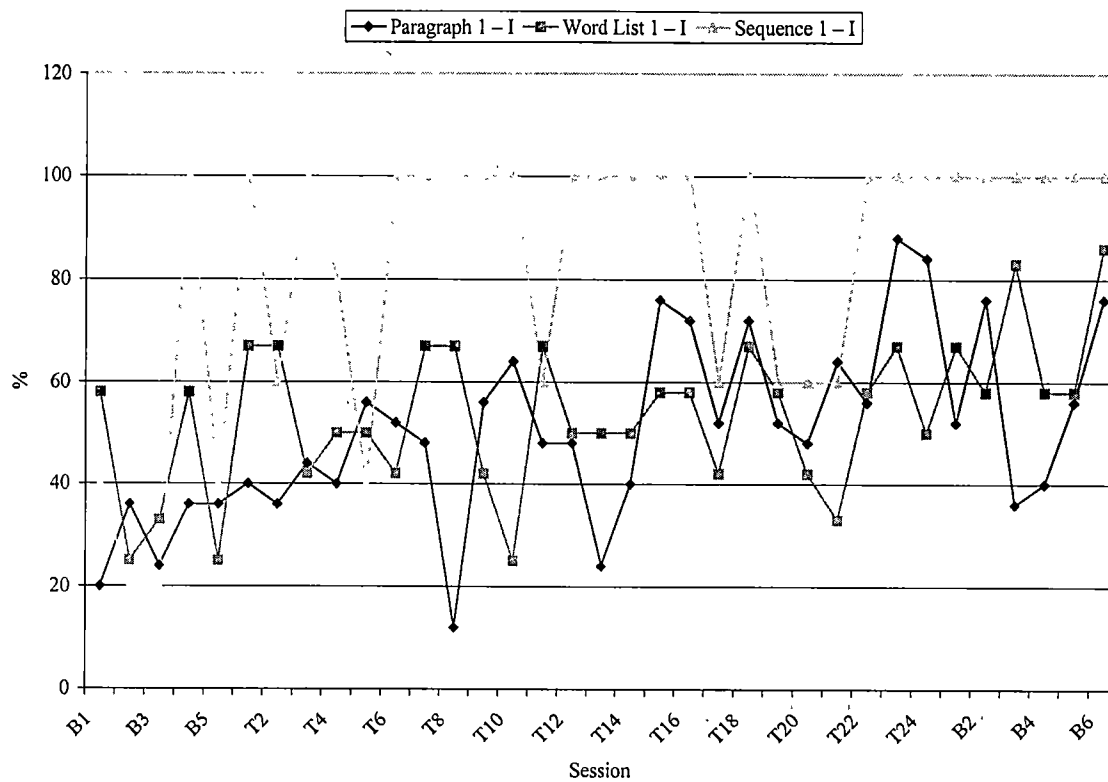


Figure 1: Participant 1 – Immediate Free Recall

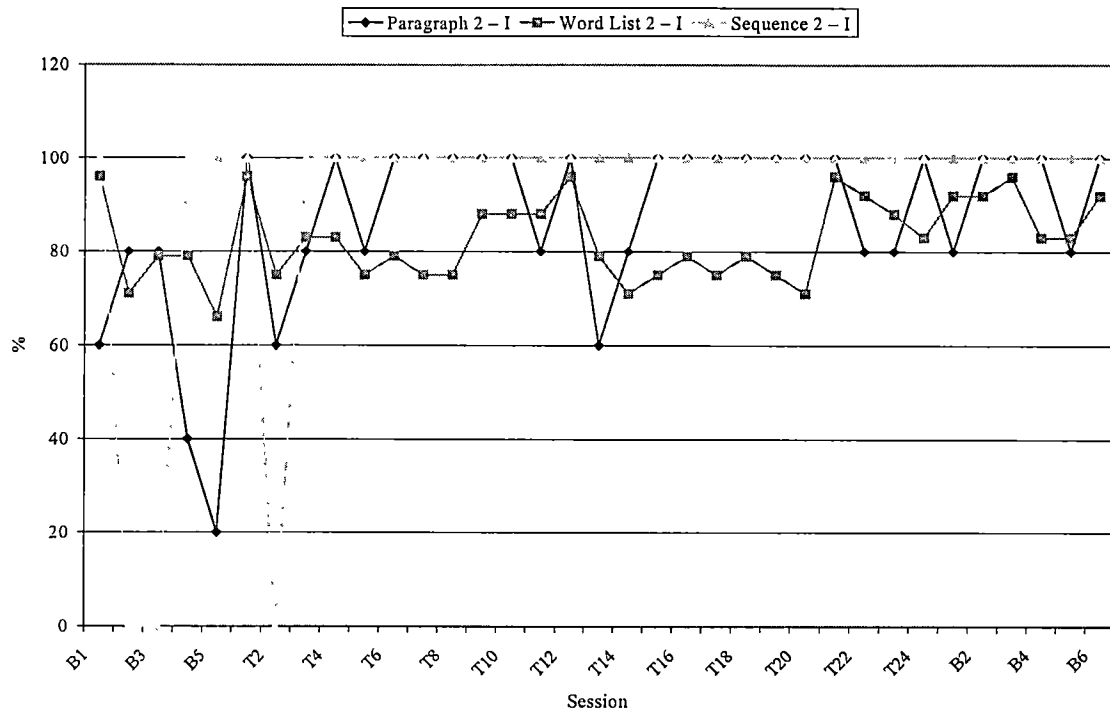


Figure 2: Participant 1 – Immediate Multiple Choice Recall

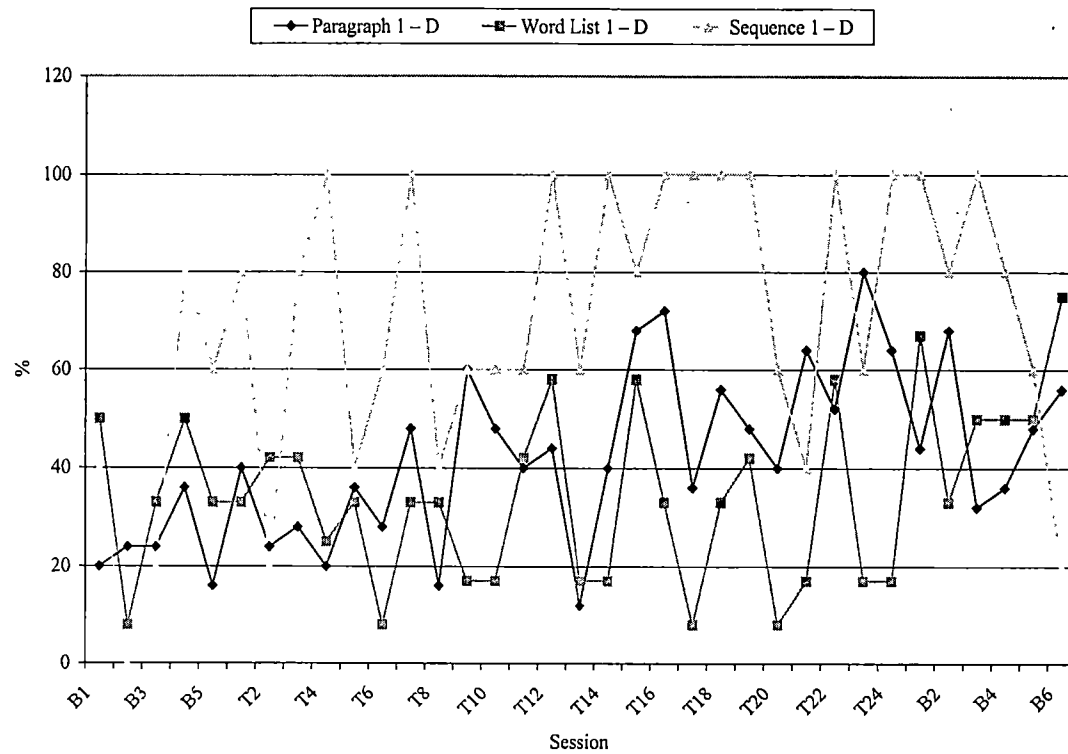


Figure 3: Participant 1 – Delayed Free Recall

comparing paragraphs with form sequences. When comparing word lists to form sequences, 80% of the judges agreed that free recall for form sequences improved, and 20% of the judges noted no change in word list recall.

Multiple Choice Recall

One hundred percent of the judges agreed that delayed, multiple choice recall for paragraphs improved when compared with word lists and form sequences, based on visual inspection of the data (see Figure 4). One hundred percent of the judges found that multiple choice recall for form sequences improved when compared with word lists.

Long Term Recall

Free Recall

One hundred percent of the judges agreed that long term, free recall for paragraphs improved over word lists, based on visual inspection of the data (see Figure 5). When comparing paragraphs with form sequences, however, 80% of the judges agreed that form sequence recall improved over paragraph recall. When word lists and forms sequences were compared, 80% percent of the judges agreed that free recall for form sequences improved over word lists, and 20% observed no change between the two tasks.

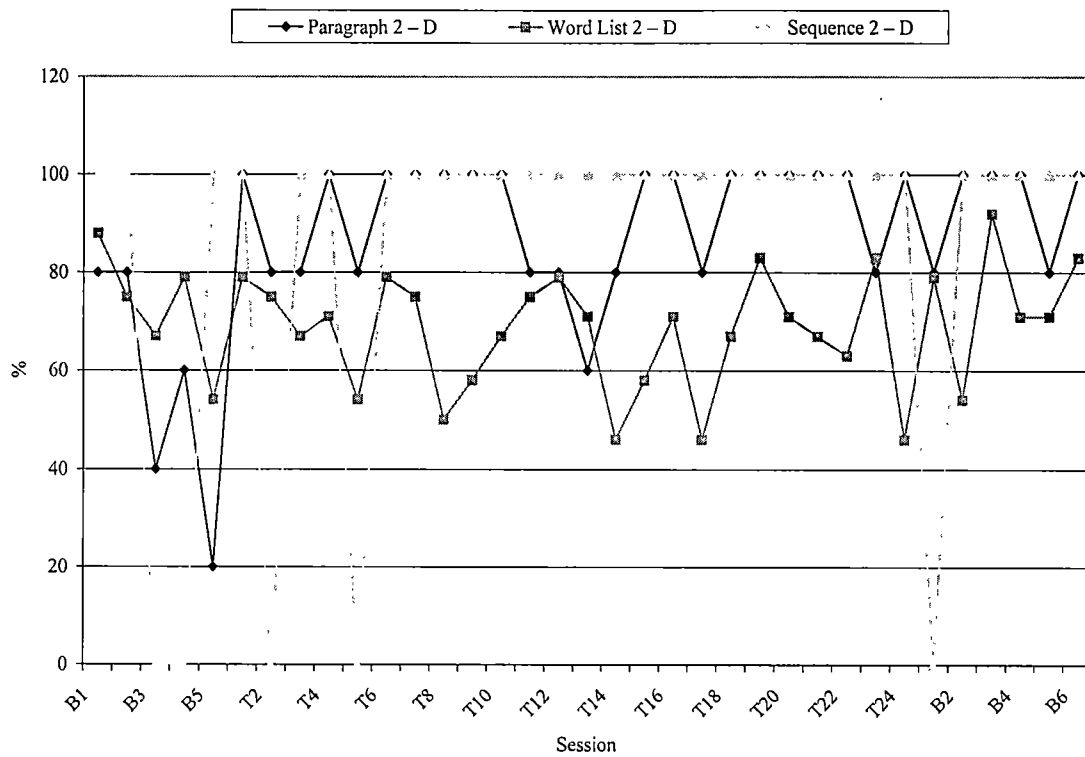


Figure 4: Participant 1 – Delayed Multiple Choice Recall

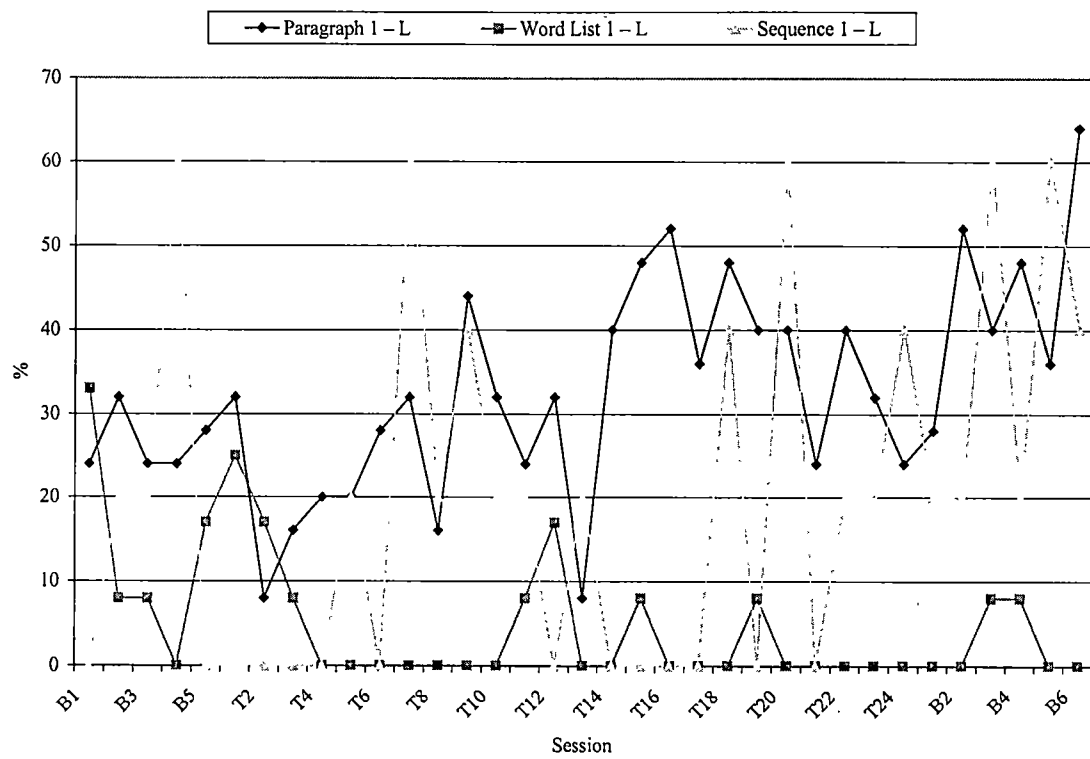


Figure 5: Participant 1 – Long Term Free Recall

Multiple Choice Recall

All of the judges agreed that multiple choice recall for paragraphs improved when compared with word lists and form sequences, based on visual inspection of the data (see Figure 6). Eighty percent of the judges agreed that form sequences improved when compared with word lists, while 20% observed no change.

Participant Two

Percentages for individual judgments of paired comparisons for participant two are provided in Table 6. Percentages are broken down into immediate, delayed, and long term memory, as well as free recall versus multiple choice recall tasks.

Immediate Recall

Free Recall

Eighty percent of the judges agreed that immediate, free recall of word lists improved when compared with paragraphs, based on visual inspection of the data (see Figure 7). No changes were observed for free recall of paragraphs as compared with form sequences and 60% of judges observed no change when comparing free recall of word lists to form sequences.

Multiple Choice Recall

Eighty percent of the judges agreed that immediate, multiple choice recall for paragraphs improved as compared with word lists and form sequences, based on visual

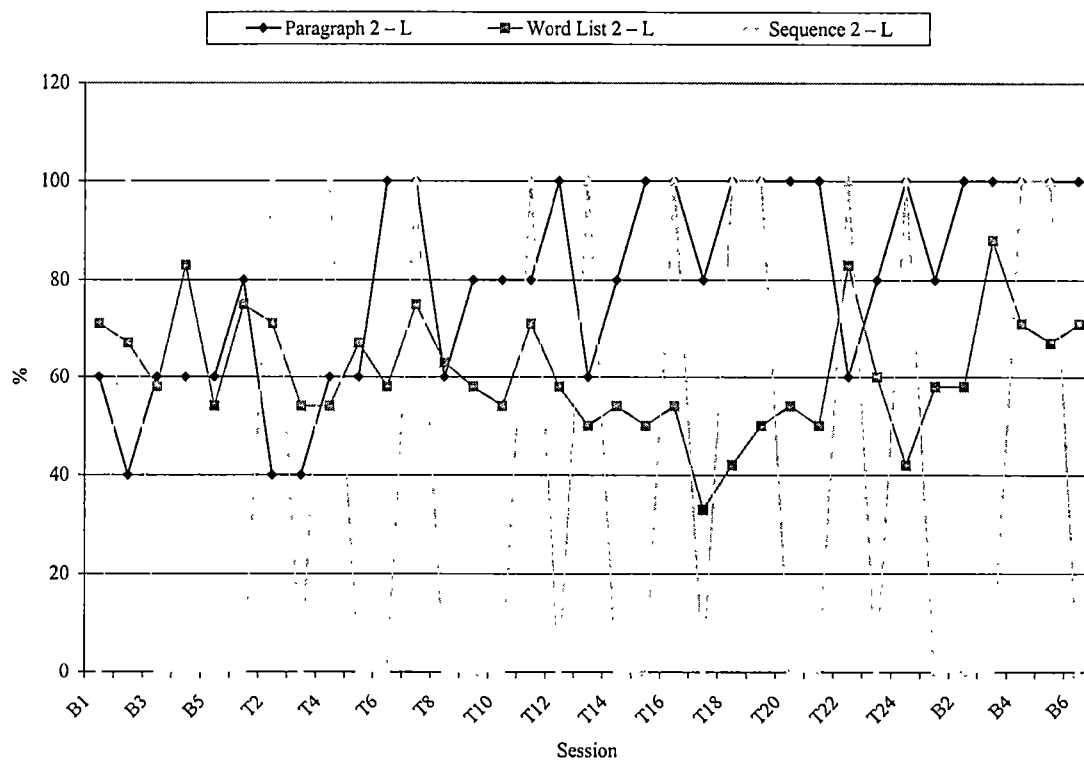


Figure 6: Participant 1 – Long Term Multiple Choice Recall

Table 6: Percentages for individual judgments - Participant 2

Immediate Recall	
Free Recall	Multiple Choice Recall
Paragraphs vs. Word Lists: Paragraphs - 0 % Word Lists - 80 % No change - 20% Paragraphs vs. Form Sequences: Paragraphs - 0 % Form Sequences - 0 % No change - 100 % Word Lists vs. Form Sequences: Word Lists - 40 % Form Sequences - 0 % No change - 60 %	Paragraphs vs. Word Lists: Paragraphs - 80 % Word Lists - 0 % No change - 20 % Paragraphs vs. Form Sequences: Paragraphs - 80 % Form Sequences - 0 % No change - 20 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 0 % No change - 100 %
Delayed Recall	
Free Recall	Multiple Choice Recall
Paragraphs vs. Word Lists: Paragraphs - 0 % Word Lists - 0 % No change - 100 % Paragraphs vs. Form Sequences: Paragraphs - 60 % Form Sequences - 0 % No change - 40 % Word Lists vs. Form Sequences: Word Lists - 60 % Form Sequences - 0 % ↑ No change - 40 %	Paragraphs vs. Word Lists: Paragraphs - 80 % Word Lists - 0 % No change - 20 % Paragraphs vs. Form Sequences: Paragraphs - 80 % Form Sequences - 0 % No change - 20 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 0 % No change - 100 %
Long Term Recall	
Free Recall	Multiple Choice Recall
Paragraphs vs. Word Lists: Paragraphs - 0 % Word Lists - 100 % No change - 0% Paragraphs vs. Form Sequences: Paragraphs - 0 % Form Sequences - 0 % No change - 100 % Word Lists vs. Form Sequences: Word Lists - 40 % Form Sequences - 0 % No change - 60 %	Paragraphs vs. Word Lists: Paragraphs - 100 % Word Lists - 0 % No change - 0 % Paragraphs vs. Form Sequences: Paragraphs - 80 % Form Sequences - 0 % No change - 20 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 0 % No change - 100 %

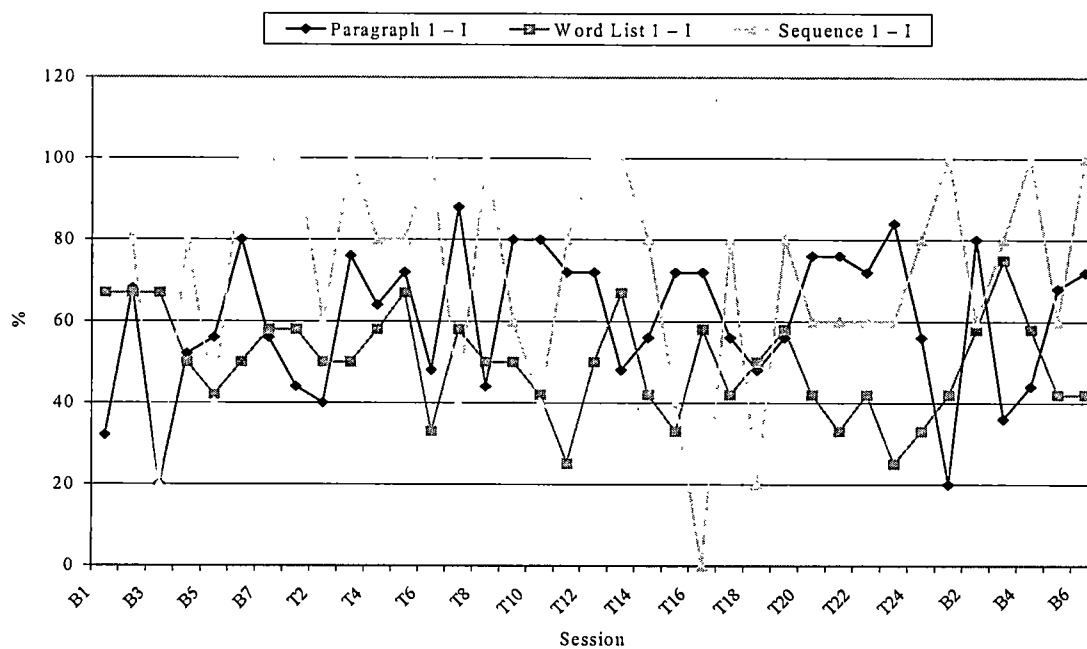


Figure 7: Participant 2 – Immediate Free Recall

inspection of the data (see Figure 8). One hundred percent of the judges observed no change in multiple choice recall of word lists as compared with form sequences.

Delayed Recall

Free Recall

No changes were observed for delayed, free recall of paragraphs as compared with word lists, based on visual inspection of the data (see Figure 9). Sixty percent of the judges observed improvement in free recall of paragraphs and word lists when compared with form sequences, and 40% observed no change in either task.

Multiple Choice Recall

Eighty percent of the judges agreed that delayed, multiple choice recall for paragraphs improved over word lists and form sequences, based on visual inspection of the data (see Figure 10). No changes were observed between the two baseline conditions, word lists and form sequences.

Long Term Recall

Free Recall

All of the judges agreed that long term, free recall for word lists improved when compared with paragraphs, based on visual inspection of the data (see Figure 11). No changes were observed for long term, free recall of paragraphs over form sequences (see Figure 11). While 60% of judges observed no changes when comparing word lists to

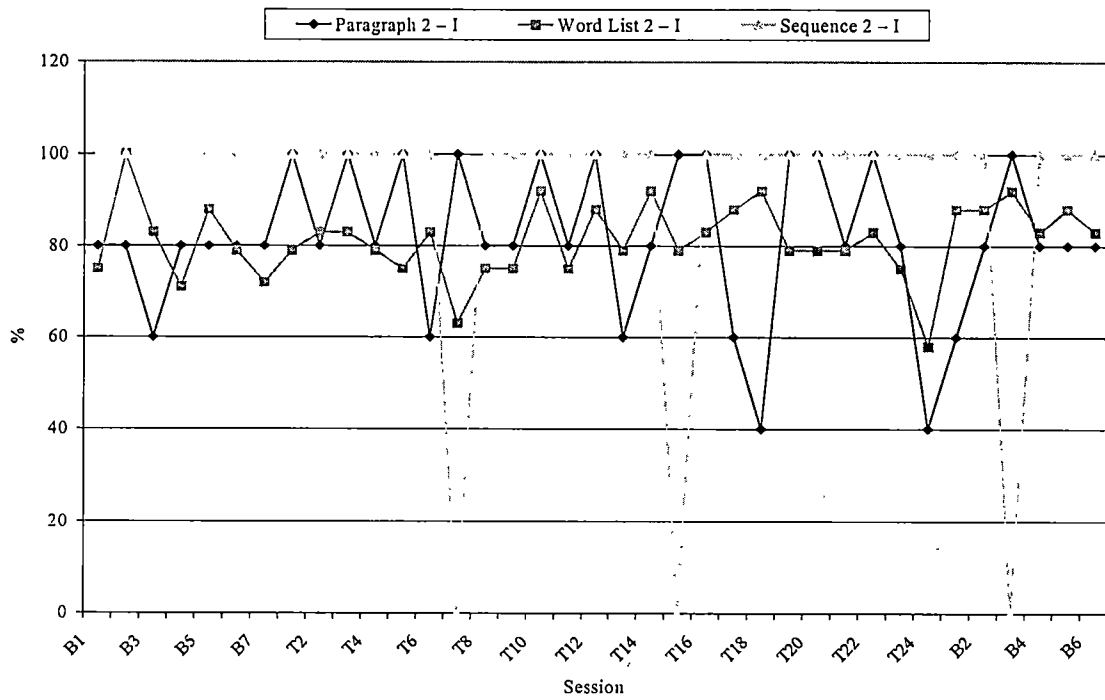


Figure 8: Participant 2 – Immediate Multiple Choice Recall

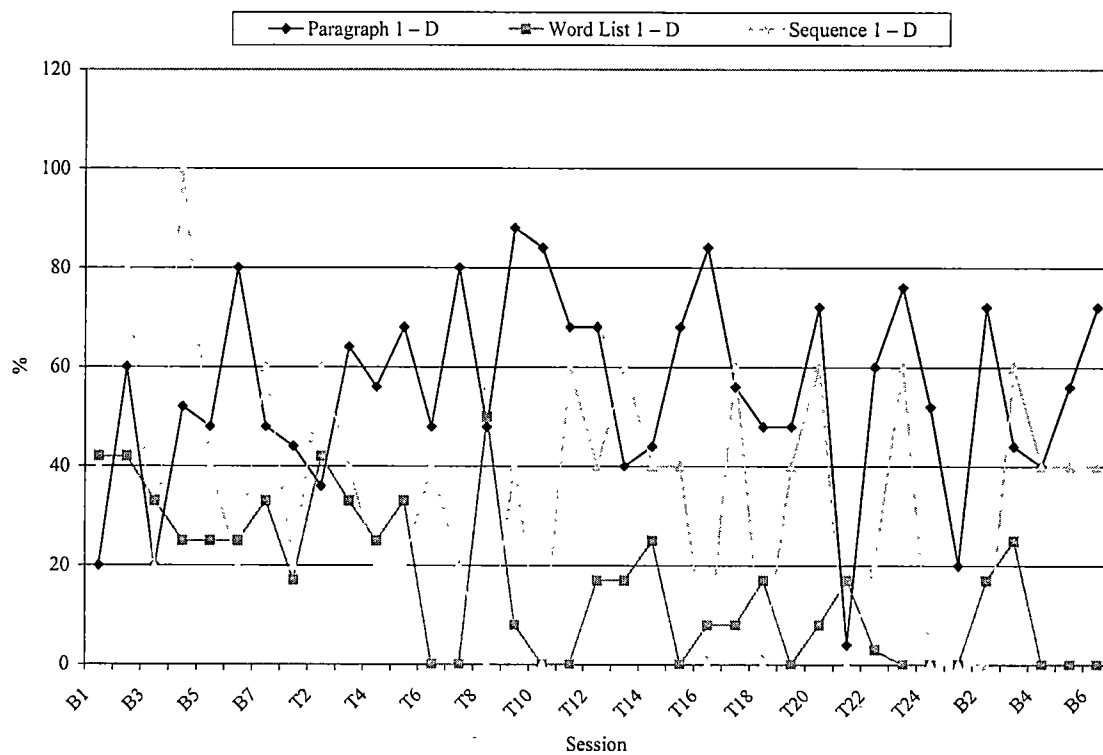


Figure 9: Participant 2 – Delayed Free Recall

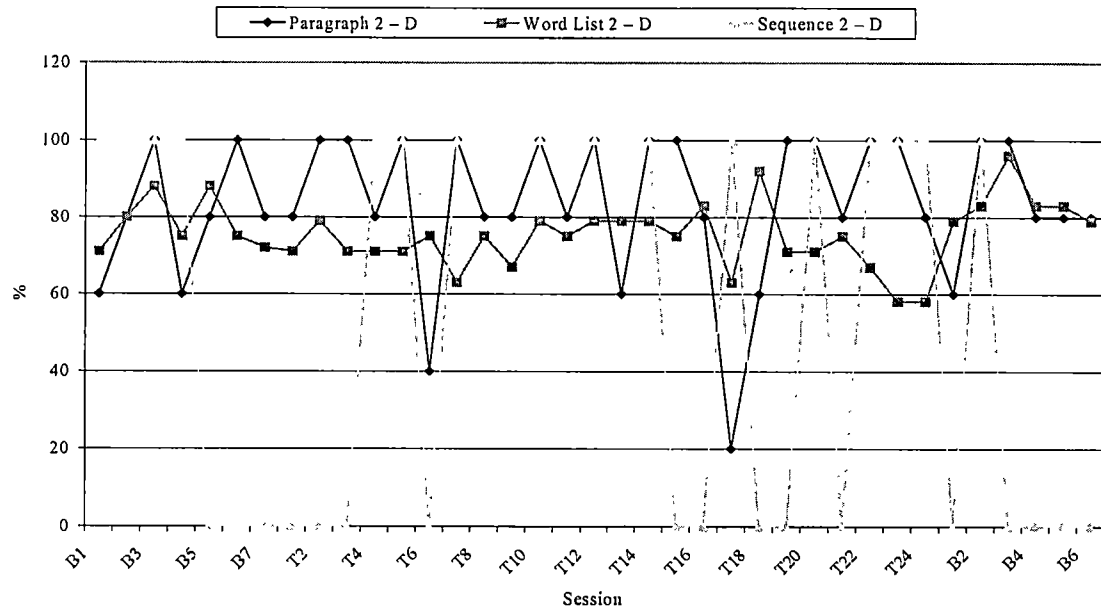


Figure 10: Participant 2 – Delayed Multiple Choice Recall

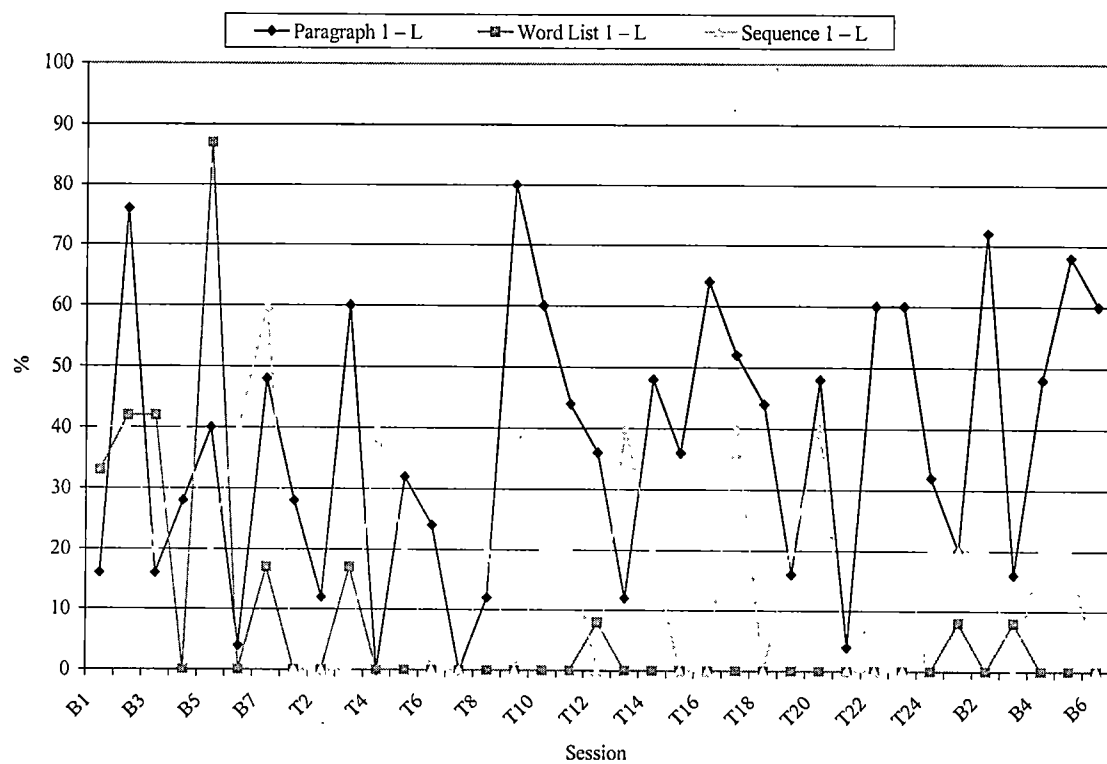


Figure 11: Participant 2 – Long Term Free Recall

form sequences, 40% agreed that word lists improved to some extent.

Multiple Choice Recall

One hundred percent of the judges agreed that long term, multiple choice recall for paragraphs improved over word lists, based on visual inspection of the data (see Figure 12). Eighty percent of judges agreed that long term, multiple choice recall for paragraphs improved over form sequences. No changes were observed for word lists as compared with form sequences.

Participant Three

Percentages for individual judgments of paired comparisons for participant three are provided in Table 7. Percentages are broken down into immediate, delayed, and long term memory, as well as free recall versus multiple choice recall tasks.

Immediate Recall

Free Recall

One hundred percent of the judges agreed that immediate, free recall for paragraphs improved over word lists and form sequences, based on visual inspection of the data (see Figure 13). Sixty percent of the judges agreed that no changes were observed for word lists as compared with form sequences.

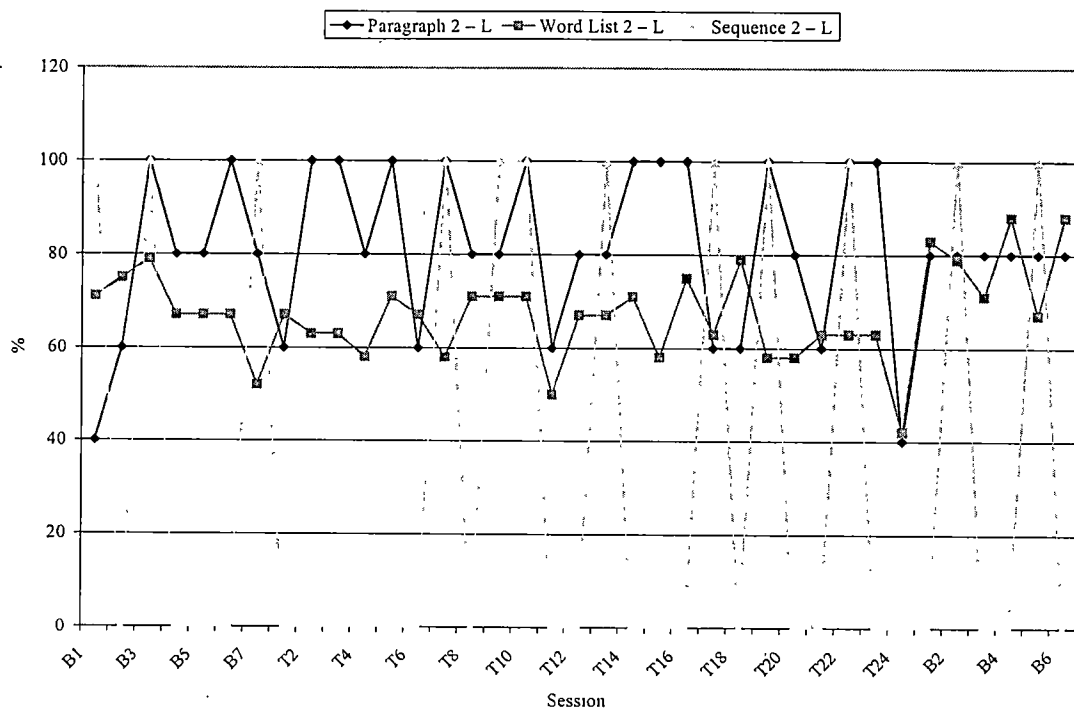


Figure 12: Participant 2 – Long Term Multiple Choice Recall

Table 7: Percentages for individual judgments - Participant 3

Immediate Recall	
Free Recall	Multiple Choice Recall
Paragraphs vs. Word Lists: Paragraphs - 100 % Word Lists - 0 % No change - 0 % Paragraphs vs. Form Sequences: Paragraphs - 100 % Form Sequences - 0 % No change - 0 % Word Lists vs. Form Sequences: Word Lists - 40 % Form Sequences - 0 % ↑ No change - 60 %	Paragraphs vs. Word Lists: Paragraphs - 0 % Word Lists - 0 % No change - 100 % Paragraphs vs. Form Sequences: Paragraphs - 80 % Form Sequences - 0 % No change - 20 % Word Lists vs. Form Sequences: Word Lists - 80 % Form Sequences - 0 % No change - 20 %
Delayed Recall	
Free Recall	Multiple Choice Recall
Paragraphs vs. Word Lists: Paragraphs - 100 % Word Lists - 0 % No change - 0 % Paragraphs vs. Form Sequences: Paragraphs - 100 % Form Sequences - 0 % No change - 0 % Word Lists vs. Form Sequences: Word Lists - 60 % Form Sequences - 0 % ↑ No change - 40 %	Paragraphs vs. Word Lists: Paragraphs - 0 % Word Lists - 80 % No change - 20 % Paragraphs vs. Form Sequences: Paragraphs - 0 % Form Sequences - 0 % No change - 100 % Word Lists vs. Form Sequences: Word Lists - 60 % Form Sequences - 0 % No change - 40 %
Long Term Recall	
Free Recall	Multiple Choice Recall
Paragraphs vs. Word Lists: Paragraphs - 100 % Word Lists - 0 % No change - 0 % Paragraphs vs. Form Sequences: Paragraphs - 100 % Form Sequences - 0 % No change - 0 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 20 % ↑ No change - 80 %	Paragraphs vs. Word Lists: Paragraphs - 0 % Word Lists - 60 % No change - 40 % Paragraphs vs. Form Sequences: Paragraphs - 0 % Form Sequences - 80 % No change - 20 % Word Lists vs. Form Sequences: Word Lists - 0 % Form Sequences - 60 % No change - 40 %

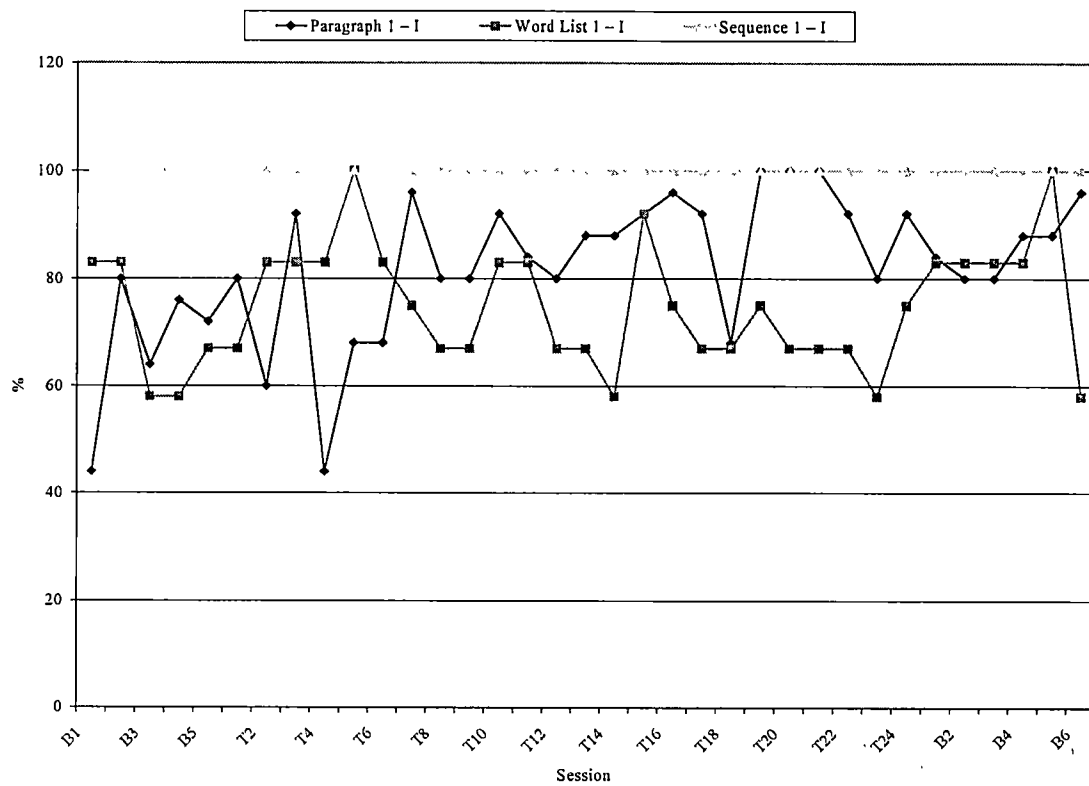


Figure 13: Participant 3 – Immediate Free Recall

Multiple Choice Recall

One hundred percent of the judges agreed that no improvement occurred for multiple choice recall of paragraphs as compared with word lists based on visual inspection of the data (see Figure 14). However, 80% of the judges observed improved recall in immediate, multiple choice recall of paragraphs and word lists as compared with form sequences.

Delayed Recall

Free Recall

One hundred percent of the judges agreed that delayed, free recall for paragraphs improved over word lists and form sequences, based on visual inspection of the data (see Figure 15). Sixty percent of the judges observed improvement in word lists as compared with form sequences, and 40% of judges observed no change.

Multiple Choice Recall

Eighty percent of the judges agreed that word lists improved when compared with paragraphs, based on visual inspection of the data (see Figure 16). No improvements were observed for delayed, multiple choice recall of paragraphs as compared with form sequences. Sixty percent of the judges observed improvement in word lists as compared with form sequences, and 40% of judges observed no change in either task.

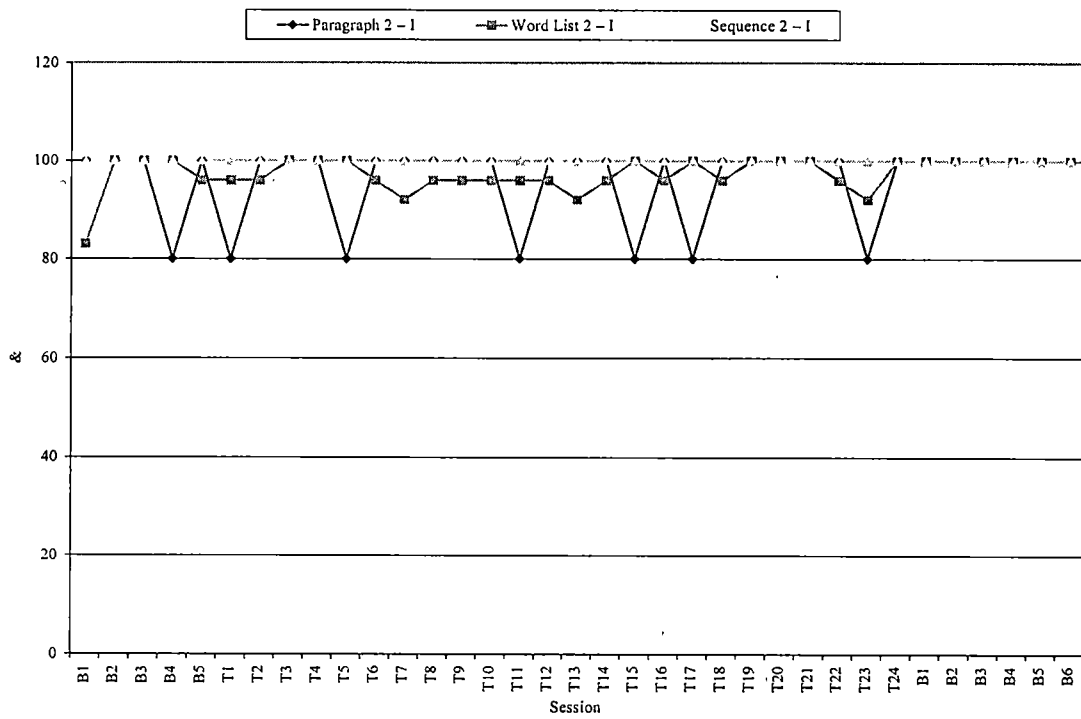


Figure 14: Participant 3 – Immediate Multiple Choice Recall

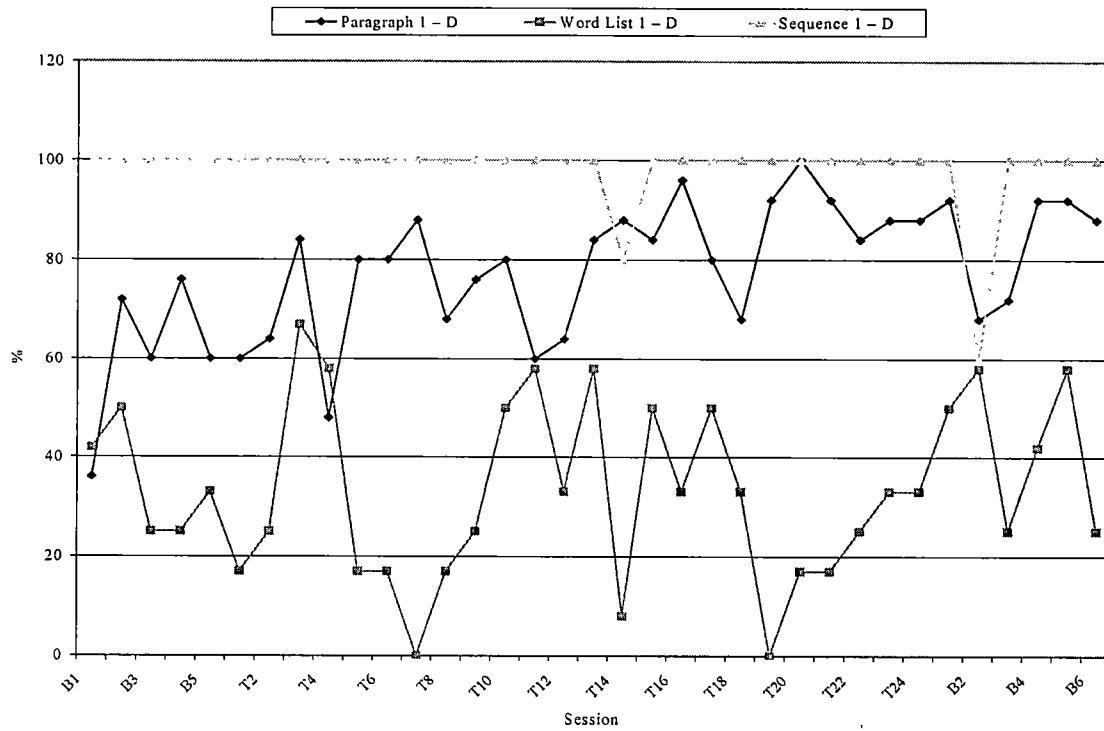


Figure 15: Participant 3 – Delayed Free Recall

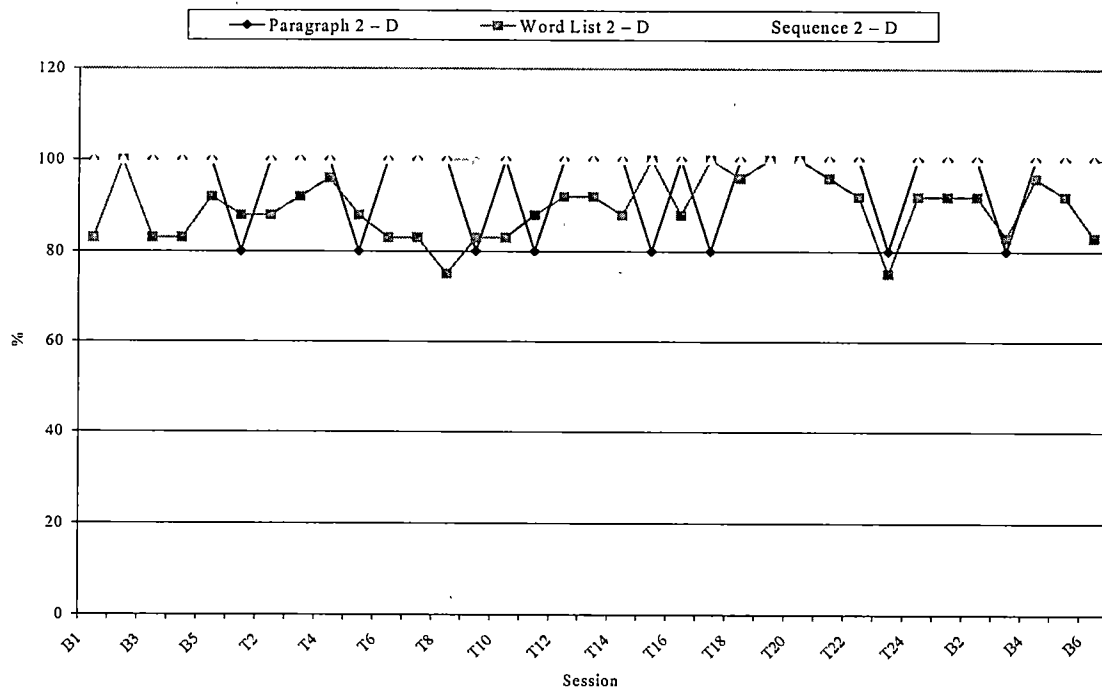


Figure 16: Participant 3 – Delayed Multiple Choice Recall

Long Term Recall

Free Recall

One hundred percent of the judges agreed that long term, free recall for paragraphs improved over word lists and form sequences based on visual inspection of the data (see figure 17). Eighty percent of the judges observed no improvement in word lists when compared with form sequences.

Multiple Choice Recall

Sixty percent of the judges agreed that long term, multiple choice, word list recall improved when compared with paragraphs, based on visual inspection of the data (see Figure 18). Eighty percent of the judges agreed that long term, multiple choice recall of form sequences improved over paragraphs, and 60% observed similar improvement over word lists.

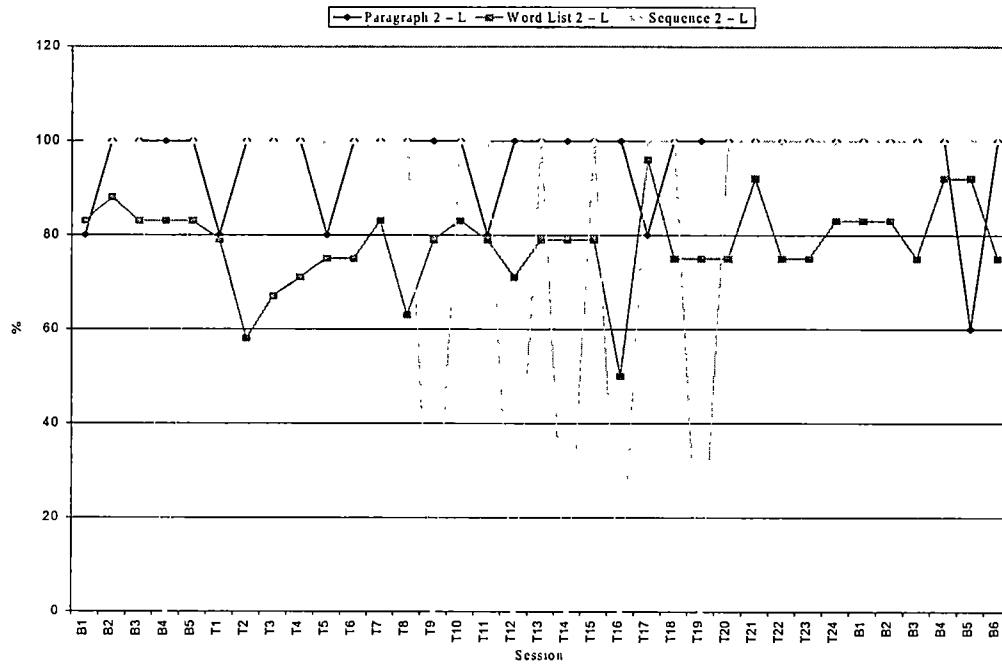


Figure 17: Participant 3 – Long Term Free Recall

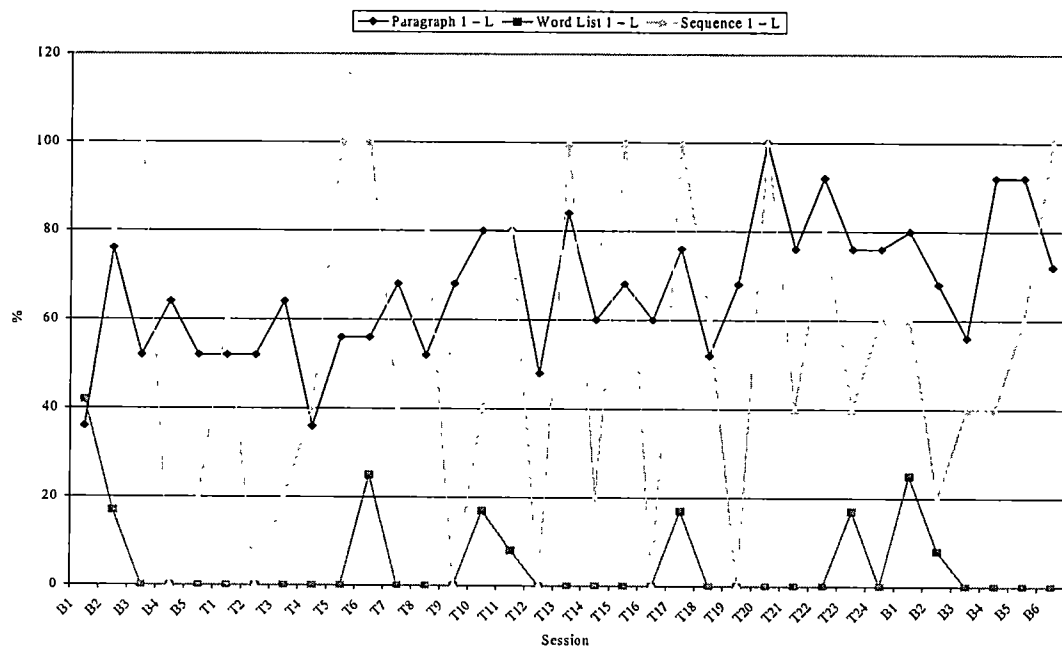


Figure 18: Participant 3 – Long Term Multiple Choice Recall

CHAPTER FOUR

DISCUSSION

The results of this study indicate the effectiveness of this memory remediation strategy (PQRST) for improving memory of narrative information in immediate, delayed, and long-term recall tasks with three participants.

REPLICABILITY OF RESULTS

It is unclear from previous research with PQRST what methodologies were used for visual inspection of the data and if inter- and intrajudge agreements were calculated. In this investigation, paired comparisons were used to determine if one task improved over the other. Inter- and intrajudge agreements were calculated to determine percent agreement among judges, and percent agreement from judgment to judgment. When judges compared one task to another on the visual inspection charts, it was crucial to have each judge state which task improved more. While improvements may have been evident in both tasks on some charts, one condition may have improved much more over the other condition. This is important since spontaneous recovery may create small improvements in one condition, but treatment may create much larger improvements in the other.

LONG TERM MEMORY IMPROVEMENTS

The results of this study were consistent with findings of other studies on PQRST. The improvements in long-term, free recall and long term, multiple choice recall were consistent with improvements observed by Benedict & Weschler (1992) and Glasgow et. al. (1977). One (GR) of the two participants used in the Benedict & Weschler (1992) study demonstrated improvements in long term, free recall of paragraphs subsequent to PQRT (an adapted version of PQRST) training. A one-way ANOVA indicated a significant difference in long term, free recall for paragraphs between the treatment (PQRT) and no treatment (baseline, word lists) phases for their participant. However, upon visual inspection of the data, a clear change in trend was not evident. In the case study reported by Glasgow et. al. (1977), Ms. J. demonstrated improvements in long term, free recall and long term, multiple choice recall of paragraphs. Similarly, in the current investigation, participant one improved in long term, free recall of paragraphs over untreated word lists and in long term, multiple choice recall of paragraphs in comparison to untreated word lists and form sequences. Participant two demonstrated improvements in long term, multiple choice recall of paragraphs in comparison to untreated word lists and form sequences. Participant three improved in long term, free recall of paragraphs in comparison to untreated word lists and form sequences.

Improvements in long term, free recall in the Glasgow et. al. (1992) study are suspect, since it is unclear whether or not the changes occurred as a result of PQRST or the increased time of stimulus presentation. It was reported that the PQRST method took three times as long to accomplish as the control, thereby allowing Ms. J. three times as

long to review the stimulus material. The current investigation served to remedy this flaw by holding all stimulus presentation times constant.

IMMEDIATE AND DELAYED MEMORY IMPROVEMENTS

What this study indicated that was not apparent from previous research, is that PQRST does improve immediate and delayed, as well as long term, recall of narrative information in individuals subsequent to TBI. All three participants evidenced improvements in immediate, delayed, and long term recall of paragraphs over word lists and form sequences. Participant one demonstrated improvements in the following areas: immediate, free recall of paragraphs over word lists and form sequences; immediate, multiple choice recall of paragraphs over word lists; delayed, free recall of paragraphs over word lists and form sequences; and delayed, multiple choice recall of paragraphs over word lists and form sequences. Participant two demonstrated improvements as follows: immediate, multiple choice recall of paragraphs over word lists and form sequences; delayed, free recall of paragraphs over form sequences; and delayed, multiple choice recall of paragraphs over word lists and form sequences. Finally, participant three demonstrated improvements in the following areas: immediate, free recall of paragraphs over word lists and form sequences; immediate, multiple choice recall of paragraphs over form sequences; and delayed, free recall of paragraphs over word lists and form sequences. Thus, the majority of judges agreed that all three participants improved immediate and delayed, as well as long term, recall of paragraphs treated with PQRST.

Some participants improved mostly in free recall tasks, while others improved more on multiple choice recall tasks.

DEGREE OF INJURY

Glasgow et. al. (1992) also reported that the effectiveness of a memory retraining strategy is dependent on the severity of the patient's injury. One of their participants (BD) did not display the same benefits of intervention as the other, despite similar training regimens. BD's injuries were much more severe, and involved more neurological impairment. In the current investigation, similar results can be observed with respect to the type and degree of neurologic damage. Participant three's injuries were more complicated than those of participant one. Additionally, participant three suffered from two head injuries. Given this information, it is not surprising that participant one demonstrated more improvement in the following areas tested: delayed, free recall; delayed, multiple choice recall; and long term, multiple choice recall.

Of the twelve possible variables (immediate, delayed, and long term for free and multiple choice recall) that could demonstrate improvement in paragraph retention as compared to word lists and form sequences, participant one improved in eight of 12 areas (67%); participant two improved in seven of the 12 areas (58%); and participant three improved in seven of the 12 areas (58%). Other reasons for less improvement in participants two and three are worthy of discussion. Still, all of these findings are consistent with Ryan and Ruff (1988), who reported that the more severe the impairment, the more difficult it will be to process and use memory retraining strategies.

TBI VS. HEMORRHAGE

PQRST has been proven an effective memory retraining strategy for individuals who have suffered head trauma (Benedict & Weschler, 1992; Glasgow et. al., 1977). All individuals from previous studies met the true definition of TBI (i.e., blow to the head from some external force). While participant one did not suffer from a blow to the head, she did present with hydrocephalus, which is a very common secondary injury sustained from head trauma. Additionally, brain tumors are more likely to fall into the category of head trauma requiring similar management and rehabilitation. Participant two, however, does not fit the true definition of traumatic brain injury. Participant two suffered a massive intracerebral hemorrhage secondary to AVM. While participant two displayed improvements in immediate, delayed, and long-term, multiple choice recall for paragraphs when compared to word lists and form sequences, and delayed, free recall for paragraphs when compared with form sequences, she did not improve to the same degree as the others. This suggests that individuals who have suffered from a brain hemorrhage may improve somewhat using PQRST, but may not be the ideal candidates for the treatment.

PARTICIPANT AGE

While the age differences between participants were negligible for Glasgow et. al., there was a large age discrepancy among participants in the current investigation. Participant three was 22 years older than participant one and nine years older than participant two. This may have an effect on overall rehabilitation potential, as our bodies

ability to protect and repair itself tends to decline with age. Jennet and Teasdale (1981) reported a "continuous and essentially linear relationship" between age and less favorable outcome subsequent to TBI over the life span. These authors suggest that the older the individual is, the more likely he/she will have longer hospital stays, increased long term disability, and increased mortality rates. Therefore, participant age may be an additional reason for less improvement in participant three when compared to participant one.

IMPLICATIONS FOR EDUCATION

This investigation revealed that certain individuals might perform better on a free recall task than a multiple choice task, or vice-versa. While participant two improved mostly in multiple choice recall, participant three evidenced the majority of her improvement in free recall. Participant one demonstrated equal improvements in both free recall and multiple choice recall. This information could be very valuable in outpatient rehabilitation settings, educational settings, and in home environments, as educators and therapists can determine which method (multiple choice or free recall) would be best for assessing each individual.

UNEXPLAINED VARIANCE

While this discussion has highlighted potential reasons for variance in results across participants, the discrepancy between improvements observed in each participant cannot be fully explained. The discrepancy could be due to a number of additional factors, including: 1) differences within each participant that make PQRST more or less

effective, 2) the lack of experimental procedures to control for practice outside of treatment, 3) the severity of brain damage suffered by each participant, and 4) effects related to uncontrolled variables outside of the experiment proper.

Individual Differences

All participants entered this study with differing diagnoses, which may have contributed to individual performance differences. Moreover, all participants entered this study at different levels of cognitive functioning, with varying degrees of immediate, delayed, and long-term recall of narrative information. Overall, participants one and three performed at a higher level than participant two. However, on specific tasks, participant two performed at a higher level than participants one and three. Although individual differences on performance are evident, these differences are difficult to explain definitively.

Practice Effects

It is very difficult to control for practice outside of treatment. Although all participants were advised not to practice this strategy outside of the clinic, no true measure of practice effects could be made.

Severity of Brain Damage

As mentioned previously, the severity of the injury each participant sustained can impact their degree of improvement. Typically, the more severe the injury is, the more

severe the deficit will be over time. One would also expect greater variability in the scores of the more severely injured patient. Levin et. al. (1990) reported that patients who have sustained severe TBI may have disturbances in memory, concentration, and speed of information processing which can create great variability during neuropsychiatric assessment.

Extraneous, Uncontrolled Variables

Circumstances that occur outside of treatment and are not controlled by the experiment can affect the results. These may be evidenced by unexplainable drops in performance, as was observed, for example, in participant's one's drastic decrease in long-term, free recall during treatment session 14. Any number of reasons are worthy of speculation, including amount of sleep, illness, hunger, or simply the variability in cognitive functioning associated with individuals subsequent to head injury (Lezak, 1987).

CONCLUSIONS

In conclusion, the results of this investigation indicate that PQRST is an effective memory remediation strategy for improving memory of narrative information in immediate, delayed, and long term recall tasks in some individuals, subsequent to head injury. Additionally, these results support previous research using PQRST and generate several novel findings, as well. These novel findings include improvements observed in immediate and delayed recall tasks and improvements observed in free recall as

compared with multiple choice recall tasks. While not all variance can be fully explained, the overall improvements viewed by all three participants suggest that PQRSST is an effective method for improving narrative recall in an individual subsequent to traumatic brain injury.

FUTURE RESEARCH

Future research should focus on replication of the results in this investigation using larger samples or between-group designs. Additionally, generalization may best be measured via multiple baselines across settings. Furthermore, efforts should be made to use participants of similar ages and socioeconomic backgrounds.

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APPENDICES

APPENDIX A

BASELINE WORD LISTS, FORM SEQUENCES, PARAGRAPHS, & SCORING PROTOCOL

Word Lists

List 1 Word Bank

1. They *game*
2. Right *tea*
3. Air *warm*
4. Life *dry*
5. Straw *hot*
6. Car *six*
7. Fact *built*
8. Rain *cause*
9. Bill *train*
10. Third *length*
11. Trip *kept*
12. Mice *gone*

List 2 Word Bank

1. Sum *stone*
2. Wide *root*
3. Glass *meet*
4. Case *solve*
5. Age *snow*
6. Bit *care*
7. Pay *floor*
8. Hat *phrase*
9. Blood *bed*
10. Chart *hope*
11. Tune *spring*
12. Coat *bright*

List 3 Word Bank

1. Bay *beat*
2. Week *seeds*
3. Odd *wire*
4. Link *please*
5. Rice *strange*
6. Jet *caught*
7. Pool *fell*
8. Toy *child*
9. Pot *break*
10. Fifth *flow*
11. Dare *crops*
12. Pen *tone*

List 4 Word Bank

1. Duke *cross*
2. Kite *scale*
3. Two *lot*
4. Oil *build*
5. Page *speed*
6. Off *count*
7. Small *poor*
8. Stand *fight*
9. Goat *dress*
10. Note *row*
11. Blue *least*
12. Check *net*

List 5 Word Bank

1. Bat *pounds*
2. Suit *luck*
3. Aunt *plains*
4. None *grass*
5. Pond *skin*
6. Dam *cloud*
7. Knife *task*
8. Crack *bad*
9. Frog *nerve*
10. Gift *east*
11. Tent *yard*
12. Horn *coast*

List 6 Word Bank

1. Fool *bones*
2. Brick *board*
3. Youth *guess*
4. Lamp *crowd*
5. Ghost *sense*
6. Coach *mouse*
7. Seam *wings*
8. Due *thick*
9. Clue *spot*
10. Dirt *bell*
11. Bang *loud*
12. Steep *boots*

Scoring for each list:

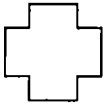
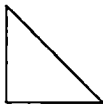
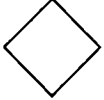
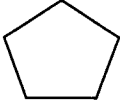
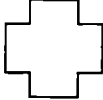
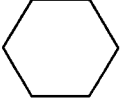
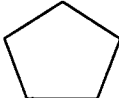
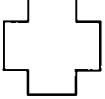
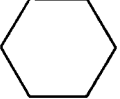
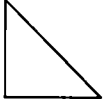
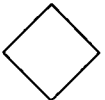
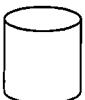
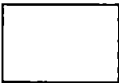
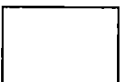
1. # Words Correctly Recalled: _____

% Words Correct: _____/12 x 100 = _____%

2. # Words Correctly Circled: _____

% Words Correct: _____/24 x 100 = _____%

Form Sequences

1.					
2.					
3.					
4.					
5.					
6.					

Scoring for each sequence:

Forms Correctly Recalled: _____

% Forms Correct: _____/5 x 100 = _____%

Paragraphs

1. Vincent Curio, Italian Mafia boss, was serving a sentence for murder at a prison in Turin. The bars of his cell were made of soft metal. He flossed after every meal, flossed through the bars of his cell, hopped the prison fence and remains free. So, one should floss to prevent both cavities and incarceration.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Vincent			Vincent or variant of the name
Curio			Curio is required
Italian			Italian is required
Mafia			Indication of Mafia
boss			Boss is required
			<i>Indication of a main character who is male</i>
was serving a sentence			Indication of serving a sentence
for murder			Murder is required
at a prison			Prison is required
in Turin.			Turin is required
			<i>Indication that the character was in prison</i>
The bars			Bars is required
of his cell			Indication of a cell
were made of soft metal.			Indication of soft metal
			<i>Indication of a prison cell</i>
He flossed			Flossed is required
after every meal			Indication of following every meal
			<i>Indication of flossing</i>
flossed			Flossed is required
through the bars			Bars is required
of his cell			Cell is required
hopped			Hopped is required
the prison fence			Indication of a prison fence
and remains free.			Indication of remaining free
			<i>Indication of method of escape</i>
So, one should floss			Indication that one should floss
to prevent			Indication of prevention
both			Both is required
cavities			Cavities is required
and incarceration.			Incarceration is required
			<i>Indication that cavities prevent flossing & incarceration</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) Vincent Curio was:
 - a. a prison guard
 - b. an Italian Mafia boss
 - c. a cook
 - d. a teacher
- 2) He was:
 - a. guarding murderers
 - b. serving a sentence for murder
 - c. serving meals to murderers
 - d. teaching sentences to dentists
- 3) The bars of the cell were made of:
 - a. dental floss
 - b. lead
 - c. hard metal
 - d. soft metal
- 4) He escaped from prison by:
 - a. digging a tunnel, and hopping a train
 - b. using dental floss to climb out of his cell, and repel down the wall
 - c. flossing through the bars, and jumping a fence
 - d. knocking down a wall, and running free
- 5) According to this story, flossing may help:
 - a. prevent cavities and incarceration
 - b. prevent cavities and poor hygiene
 - c. prevent incarceration and prison
 - d. prevent trips to the dentist

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a man in prison.

2. For Timmy Smith's eighth birthday, his mother, Carol invited all of his friends from City Elementary School to their home for a party. Carol hired Bobo the Clown to entertain the children by making balloon toys, performing magic tricks, and painting faces. Timmy received many presents and all of the children had a really great time.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
For Timmy			Timmy or variant of the name
Smith's			Smith is required
eighth			Eighth is required
birthday			Birthday is required
party			Indication of a party or celebration
			<i>Indication that the main character is male</i>
his mother			Mother is required
carol			Carol or variant of the name
invited all of his friends			Indication of an invitation of friends
from City Elementary School			City Elementary is required
to their home			Indication that the party is at their home
for a party.			Party is required
			<i>Indication that there is a party at their home</i>
Carol			Carol is required
hired			Indication of hire/employment
Bobo the Clown			Bobo the Clown is required
to entertain			Indication that he entertained
the children			Children is required
by making balloon toys			Balloon toys is required
performing magic tricks			Magic tricks is required
and painting faces			Painting faces is required
			<i>Indication that a clown was hired to entertain</i>
Timmy			Timmy is required
received			Indication of receipt
many presents			Presents is required
			<i>Indication that Timmy received presents</i>
and all			All is required
of the children			Children is required
had a really great time.			Indication of a great time
			<i>Indication that all the children had a great time</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) How old was Timmy going to be?
 - a. 6
 - b. 7
 - c. 8
 - d. 9

- 2) _____ is Timmy's mother's name.
 - a. Denise
 - b. Carol
 - c. Karen
 - d. Cynthia

- 3) Who entertained the children?
 - a. Mark the Magician
 - b. Timmy the Great
 - c. Carol
 - d. Bobo the Clown

- 4) Timmy attended school at:
 - a. City Elementary School
 - b. Home School
 - c. Hamilton Elementary School
 - d. City High School

- 5) Timmy:
 - a. Is an only child
 - b. Played many games
 - c. Had his party at school
 - d. Received many presents

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a boy's birthday party.

3. Sammy Sosa, who plays for the Chicago Cubs and Mark McGwire who plays for the St. Louis Cardinals are preparing for another season of baseball. These two players are the elite home run hitters in Major League Baseball. The current home run record of 70 is held by McGwire, and was set in the 1998 season.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Sammy			Sammy is required
Sosa			Sosa is required
Who plays			Indication of play
For the Chicago			Chicago is required
Cubs			Cubs is required
And Mark			Mark is required
McGwire			McGwire is required
Who plays			Indication of play
For the St. Luis			St. Louis is required
Cardinals			Cardinals is required
			<i>Indication of 2 male players</i>
Are preparing			Indication of preparation
For another season			Indication of another season
Of baseball			Baseball is required
			<i>Indication of preparation for baseball</i>
These two players			Indication of two players
Are the elite			Indication of elite status
Home run			Home run is required
hitters			Hitters is required
In Major League			Major League is required
Baseball			Baseball is required
			<i>Indication that players are the elite in their League</i>
The current			Indication of current
Home run			Home run is required
record			Record is required
Of 70			70 is required
Is held by			Indication of holding
McGwire			McGwire is required
			<i>Indication that McGwire holds the record</i>
And was set			Indication that a record was set
In the 1998 season			1998 is required
			<i>Indication of the year</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) Who plays for the Chicago Cubs?:
 - a. Mark McGwire
 - b. Sammy Sosa
 - c. John Jacobs
 - d. Mitch Mitchel

- 2) Who plays for the St. Louis Cardinals?:
 - a. Mark McGwire
 - b. Sammy Sosa
 - c. John Jacobs
 - d. Mitch Mitchel

- 3) These two players are the:
 - a. Elite pitchers in baseball
 - b. Elite outfielders in baseball
 - c. Elite hitters in baseball
 - d. Elite catchers in baseball

- 4) The current home run record is:
 - a. 41
 - b. 51
 - c. 61
 - d. 71

- 5) When was this record set?:
 - a. 1988
 - b. 1999
 - c. 1998
 - d. 1997

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about baseball.

4. Julia is a famous food critic who travels through Europe sampling new sauces and recipes. Her criticism is highly sought after, even though she has a reputation of being unreasonably hard to please. She once told a chef at a four-star restaurant, "Use more spices, cook the vegetables longer, and add more wine to the sauce."

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Julia			Julia or variant of the name
Is a famous			Indication of famous
Food			Food is required
Critic			Critic is required
Who travels through			Indication of traveling
Europe			Europe is required
			<i>Indication of a main character who is female</i>
Sampling			Indication of sampling
New			Indication of new
sauc es			Sauces is required
And recipes			Recipes is required
			<i>Indication of sampling items</i>
Her criticism			Indication of criticism
Is highly sought after			Indication of a sought after/wanting
			<i>Indication of a sought after opinion</i>
Even though			Indication of even
She has a reputation			Indication of reputation
Of being unreasonably			Unreasonable is required
Hard to please			Indication of hard to please
			<i>Indication of a hard to please reputation</i>
She once told a chef			Indication of telling a chef
At a four-star restaurant			Four-star is required
			Restaurant is required
			<i>Indication of a restaurant</i>
Use more			More is required
Spices			Spices is required
Cook the vegetables			Cook is required
Longer			Indication of longer
And add more wine			Indication of addition
To the sauce			Sauce is required
			<i>Indication of additions to the sauce</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) What was Julia's occupation?:
 - a. A chef
 - b. A restaurant owner
 - c. A food critic
 - d. A salesman

- 2) Where did she travel?
 - a. Australia
 - b. East India
 - c. The United States
 - d. Europe

- 3) According to the story, Julia's opinion is _____:
 - a. Highly sought after
 - b. Not respected
 - c. Both a and b
 - d. None of the above

- 4) Julia had a reputation for being _____:
 - a. Exotic
 - b. Reasonable
 - c. Unreasonably hard to please
 - d. Shy

- 5) At one restaurant, she told the chef to _____:
 - a. Use more spices
 - b. Cook the vegetables longer
 - c. Add more wine to the sauce
 - d. All of the above

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a food critic.

5. Watching a professional golfer hit a golf ball appears to be a very easy thing to replicate but in the real world, the perfect golf swing is one of the hardest movements in sports. It requires concentration, coordination, flexibility, and timing to strike the ball correctly. It is an unmistakable feeling when you strike it accurately.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Watching			Watching is required
A professional			Professional is required
Golfer			Golfer is required
Hit a golf ball			Indication of hitting a golf ball
Appears to be			Indication of appearance
A very			Very is required
easy thing			Indication of ease
To replicate			Replicate is required
			<i>Indication of a golfer</i>
But in the real world			Indication of the real world
The perfect			Perfect is required
Golf			Golf is required
Swing			Swing is required
Is one of the			Indication of one
hardest			Hardest is required
movements			Movements is required
In sports.			Indication of sports
			<i>Indication that a golf swing is hard</i>
It requires			Requires is required
concentration			Concentration is required
Coordination			Coordination is required
Flexibility			Flexibility is required
And timing			Timing is required
To strike			Indication of striking
the ball			Ball is required
Correctly.			Indication of correct
			<i>Indication of requirements to hit the ball</i>
It is an unmistakable			Indication of no mistake
Feeling			Feeling is required
When you strike it			Indication of striking
Accurately			Indication of accurately
			<i>Indication of feeling upon accurately striking the ball</i>

Main ideas: _____

% Main ideas correct: ____/25 x 100 = ____%

Multiple Choice Questions:

- 1) What type of ball is the professional hitting?:
 - a. A baseball
 - b. A soccer ball
 - c. A golf ball
 - d. A tennis ball
- 2) According to the story, which of the following is true?:
 - a. Watching a professional golfer hit a golf ball requires coordination.
 - b. Watching a professional golfer hit a tennis ball is awkward.
 - c. Watching a professional golfer hit a golf ball is easy to do.
 - d. Watching a professional tennis player hit a golf ball is awkward.
- 3) This motion is _____ to replicate:
 - a. easy
 - b. hard
 - c. quick
 - d. slow
- 4) Achieving the perfect swing involves:
 - a. skill, luck, and timing
 - b. concentration, coordination, flexibility, and timing
 - c. the perfect club, the right ball, and timing
 - d. concentration, timing, and luck
- 5) According to this story it is:
 - a. Unmistakable when you hit the ball accurately.
 - b. Unmistakable when you hit the ball incorrectly.
 - c. Easy to misinterpret an accurate hit for an inaccurate one.
 - d. Better to watch the professionals than imitate them.

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about golf.

6. On a cold Saturday morning at the local gym, 26-year-old Mario Gregorio, shivering in a loincloth, is making one last phone call to the 21st century studio before strapping on the heavy, wide-brimmed leather helmet. His face is completely covered, except for two small, round eyeholes. He is preparing for a gladiator style of sport fight.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
On a cold			Cold is required
Saturday			Saturday is required
Morning			Morning is required
At the local gym			Indication of a local gym
			<i>Indication of morning at a gym</i>
26-year-old			26 is required
Mario			Mario or variant of the name
Gregorio			Gregorio is required
Shivering			Indication of shivering
In a loin cloth			Loin cloth is required
			<i>Indication of a min character who is male</i>
Is making one last phone call			Indication of a last phone call
To the 21 st Century studio			21 Century is required
			Studio is required
			<i>Indication that phone call is made</i>
Before strapping on			Indication of strapping/binding
The heavy			Heavy is required
Wide-brimmed			Wide is required
Leather			Leather is required
helmet			Indication of a helmet
			<i>Indication that the helmet is heavy</i>
His face			Face is required
Is completely covered			Indication of covering
Except for 2			2 is required
Small, round			Indication of shape
eyeholes			Eyeholes is requires
			<i>Indication that his face is almost entirely covered</i>
He is preparing for			Indication of preparation
A Gladiator style of sport fight.			Gladiator is required
			Sport is required
			<i>Indication of gladiator fighting</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) In this story it was:
 - a. Sunday morning
 - b. Monday morning
 - c. Friday morning
 - d. Saturday morning

- 2) Mario was _____ years old.
 - a. 16
 - b. 26
 - c. 36
 - d. 46

- 3) Mario made a phone call to the:
 - a. 21st Century studio
 - b. 21st Century
 - c. last studio
 - d. 2nd Century

- 4) In this story, Mario strapped on a:
 - a. sword
 - b. shield
 - c. helmet
 - d. face mask

- 5) What is Mario doing?
 - a. Preparing for a gladiator-style fight
 - b. Preparing for medieval-style fight
 - c. Preparing for a school play
 - d. Preparing props for an actor

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about is gladiator style fight.

APPENDIX B

TREATMENT WORD LISTS, FORM SEQUENCES, PARAGRAPHS, & SCORING PROTOCOL

Word Lists

List 1 Word Bank

1. First *ore*
2. Work *saw*
3. Still *dime*
4. Big *few*
5. Add *both*
6. Talk *group*
7. Left *time*
8. Sun *back*
9. Fish *things*
10. State *fog*
11. Black *juice*
12. Verb *same*

List 2 Word Bank

1. Help *throat*
2. Light *world*
3. Dog *high*
4. Girl *near*
5. Far *food*
6. Red *own*
7. List *plants*
8. Tape *last*
9. Chief *school*
10. Four *trees*
11. Cook *miles*
12. Screen *thought*

List 3 Word Bank

1. Fire *boy*
2. Sit *show*
3. Yes *form*
4. Ball *large*
5. Job *leaf*
6. Son *kind*
7. Gold *hand*
8. Act *play*
9. Bank *change*
10. Foot *spell*
11. Eight *house*
12. Tube *point*

List 4 Word Bank

1. Ride *night*
2. Soft *white*
3. Wild *once*
4. Milk *book*
5. Key *hear*
6. Cool *miss*
7. Hit *lot*
8. Safe *young*
9. Pole *leave*
10. Rich *horse*
11. Lie *sink*
12. String *cliff*

List 5 Word Bank

1. Hair *door*
2. Low *whole*
3. Cents *draw*
4. Team *doll*
5. Sand *cold*
6. Thin *seal*
7. Fruit *plan*
8. Tail *south*
9. Wife *ground*
10. Gun *fall*
11. Dead *wood*
12. Seat *road*

List 6 Word Bank

1. Clean *ten*
2. Mine *fly*
3. Meat *weight*
4. Swim *strong*
5. Tin *stars*
6. Fig *front*
7. Dots *feel*
8. Load *rest*
9. Gray *stay*
10. Spoke *green*
11. Hunt *joke*
12. Cap *round*

List 7 Word Bank

1. Part *sight*
2. New *terms*
3. Swiss *sell*
4. Words *block*
5. Day *spread*
6. Raft *sharp*
7. Men *truck*
8. End *fair*
9. Set *chance*
10. Old *wrong*
11. Well *church*
12. Line *fresh*

List 8 Word Bank

1. Up *match*
2. Place *steel*
3. Long *March*
4. Now *sir*
5. Home *view*
6. Eyes *chair*
7. Earth *chord*
8. Side *dream*
9. Feet *band*
10. Sea *press*
11. Friends *range*
12. Top *send*

List 9 Word Bank

1. Out *stream*
2. Years *weight*
3. Down *France*
4. Grave *shop*
5. Land *nose*
6. Name *huge*
7. Song *rose*
8. Mark *Greek*
9. Next *deal*
10. hard *rope*
11. king *corn*
12. map *bath*

List 10 Word Bank

1. Sweat *guide*
2. Town *mass*
3. Wind *weigh*
4. Sing *share*
5. War *charge*
6. Half *drink*
7. Main *feed*
8. Week *teeth*
9. Cape *plate*
10. Sign *fear*
11. Race *speech*
12. Lost *bag*

List 11 Word Bank

1. North *skill*
2. Fast *path*
3. Rule *smooth*
4. Dry *grown*
5. Moon *proud*
6. Free *nest*
7. Soil *sort*
8. Tall *grain*
9. Cat *rays*
10. Sick *shot*
11. Touch *jazz*
12. Brown *strike*

List 12 Word Bank

1. Farm *lid*
2. Lens *whale*
3. Drive *shells*
4. Fine *sad*
5. Sail *graph*
6. Cost *throw*
7. Fit *strip*
8. Trade *chalk*
9. Death *pack*
10. Score *height*
11. Tools *style*
12. Track *meal*

List 13 Word Bank

- | | |
|----------|---------------|
| 1. One | <i>stage</i> |
| 2. Flute | <i>queen</i> |
| 3. Cash | <i>lion</i> |
| 4. Chin | <i>fourth</i> |
| 5. Blast | <i>brave</i> |
| 6. Body | <i>pitch</i> |
| 7. Room | <i>cave</i> |
| 8. Close | <i>smoke</i> |
| 9. Stop | <i>bus</i> |
| 10. Run | <i>paid</i> |
| 11. Eat | <i>roar</i> |
| 12. Keep | <i>cake</i> |

List 14 Word Bank

- | | |
|------------|---------------|
| 1. Ship | <i>tribes</i> |
| 2. Class | <i>clay</i> |
| 3. Step | <i>date</i> |
| 4. Birds | <i>veins</i> |
| 5. Rock | <i>nails</i> |
| 6. Best | <i>pan</i> |
| 7. Face | <i>vote</i> |
| 8. Low | <i>fur</i> |
| 9. Box | <i>roof</i> |
| 10. Fist | <i>tax</i> |
| 11. Street | <i>swing</i> |
| 12. True | <i>craft</i> |

List 15 Word Bank

- | | |
|-----------|---------------|
| 1. Watch | <i>dad</i> |
| 2. Course | <i>duck</i> |
| 3. Five | <i>curve</i> |
| 4. Voice | <i>frame</i> |
| 5. Short | <i>sweet</i> |
| 6. Field | <i>socks</i> |
| 7. Plane | <i>brook</i> |
| 8. Dance | <i>barn</i> |
| 9. Eggs | <i>rod</i> |
| 10. Love | <i>pipe</i> |
| 11. Full | <i>gate</i> |
| 12. Clear | <i>source</i> |

List 16 Word Bank

- | | |
|-----------|---------------|
| 1. Felt | <i>tired</i> |
| 2. Test | <i>snake</i> |
| 3. Square | <i>glands</i> |
| 4. Sat | <i>gear</i> |
| 5. Legs | <i>wise</i> |
| 6. Noun | <i>pigs</i> |
| 7. Boat | <i>drum</i> |
| 8. Prey | <i>twelve</i> |
| 9. Core | <i>guard</i> |
| 10. Cells | <i>bow</i> |
| 11. Mind | <i>waste</i> |
| 12. Drop | <i>trick</i> |

List 17 Word Bank

- | | |
|----------|---------------|
| 1. Wall | <i>mount</i> |
| 2. Ripe | <i>dust</i> |
| 3. Paint | <i>brain</i> |
| 4. Heart | <i>lunch</i> |
| 5. Deep | <i>tip</i> |
| 6. Force | <i>post</i> |
| 7. Size | <i>rough</i> |
| 8. Sled | <i>cave</i> |
| 9. Sky | <i>desk</i> |
| 10. Past | <i>wolves</i> |
| 11. Type | <i>pile</i> |
| 12. Lead | <i>sheep</i> |

List 18 Word Bank

- | | |
|-----------|---------------|
| 1. Lake | <i>storm</i> |
| 2. Tight | <i>ranch</i> |
| 3. Ears | <i>scene</i> |
| 4. Catch | <i>drawn</i> |
| 5. Gas | <i>wheat</i> |
| 6. Rug | <i>bike</i> |
| 7. Ran | <i>broad</i> |
| 8. French | <i>tongue</i> |
| 9. Hole | <i>pie</i> |
| 10. Bear | <i>sick</i> |
| 11. Shade | <i>worth</i> |
| 12. Fun | <i>deer</i> |

List 19 Word Bank

1. Flat *flag*
2. Park *stock*
3. Lump *mud*
4. Ring *Spain*
5. Born *slope*
6. Shoes *bake*
7. Win *stamp*
8. Paste *prince*
9. Cows *sports*
10. Saltherd
11. Sheet *spin*
12. Camp *pet*

List 20 Word Bank

1. Bar *coins*
2. Sword *fuel*
3. Shore *pad*
4. Spoon *kids*
5. Fate *beans*
6. Court *fort*
7. Log *calf*
8. Bread *claim*
9. Noise *bend*
10. Cloth *prize*
11. Folk *bear*
12. Wet *lock*

List 21 Word Bank

1. Cup *dig*
2. Lane *slide*
3. Nice *bees*
4. Coal *cream*
5. Trail *bull*
6. Hen *stems*
7. Ant *crew*
8. Head *knees*
9. Rate *fox*
10. Taste *globe*
11. Ax *pins*
12. Moth *lungs*

List 22 Word Bank

1. Art *lips*
2. Damp *bark*
3. Nine *port*
4. Hall *swift*
5. Price *belt*
6. Beach *tank*
7. Flew *stroke*
8. Stone *cage*
9. Trap *joy*
10. Club *deck*
11. Prime *flash*
12. Jar *grade*

List 23 Word Bank

1. Twice *flame*
2. Steam *mold*
3. Wine *tide*
4. Clock *pump*
5. Neck *sale*
6. Brush *shirt*
7. Flight *aid*
8. Judge *cheese*
9. Blank *wool*
10. Card *toes*
11. Fence *mood*
12. Bowl *burst*

List 24 Word Bank

1. Base *chain*
2. Wish *stitch*
3. Heat *flood*
4. Shape *blind*
5. Dark *doubt*
6. Pair *trunk*
7. West *chest*
8. Arms *grant*
9. Hill *bite*
10. Spark *hook*
11. Ice *male*
12. Sleep *tales*

Scoring for each list:

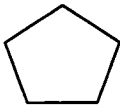
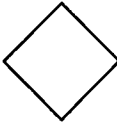
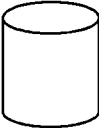
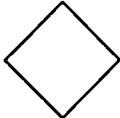
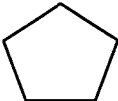
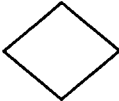
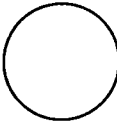
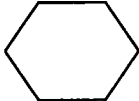
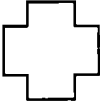
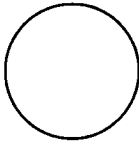
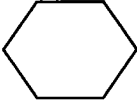
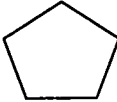
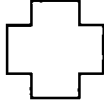
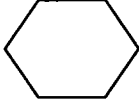
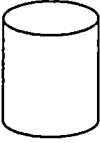
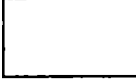
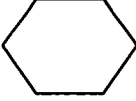
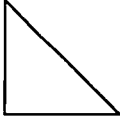
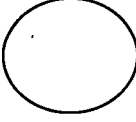
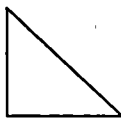
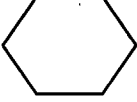
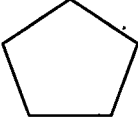
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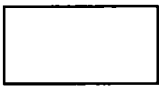
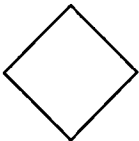
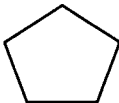
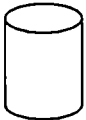
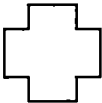
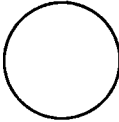
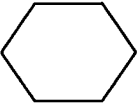
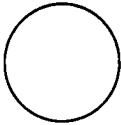
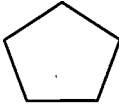
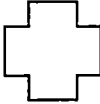
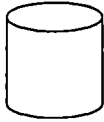
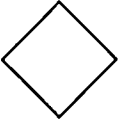
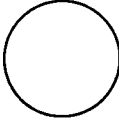
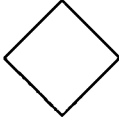
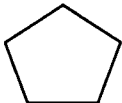
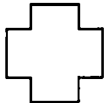
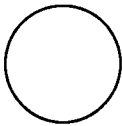
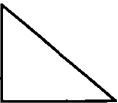
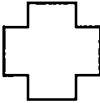
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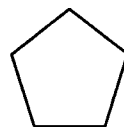
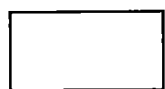
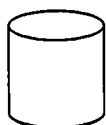
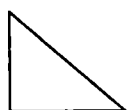
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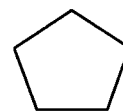
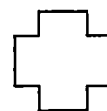
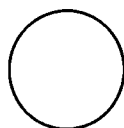
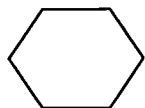
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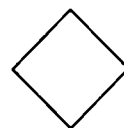
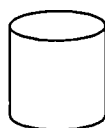
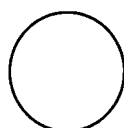
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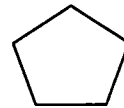
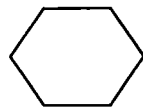
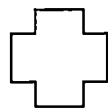
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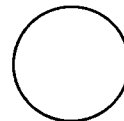
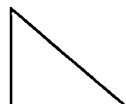
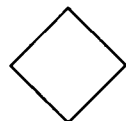
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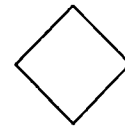
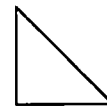
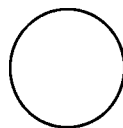
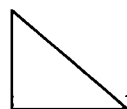
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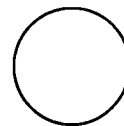
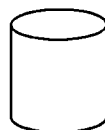
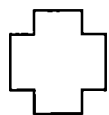
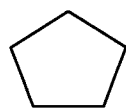
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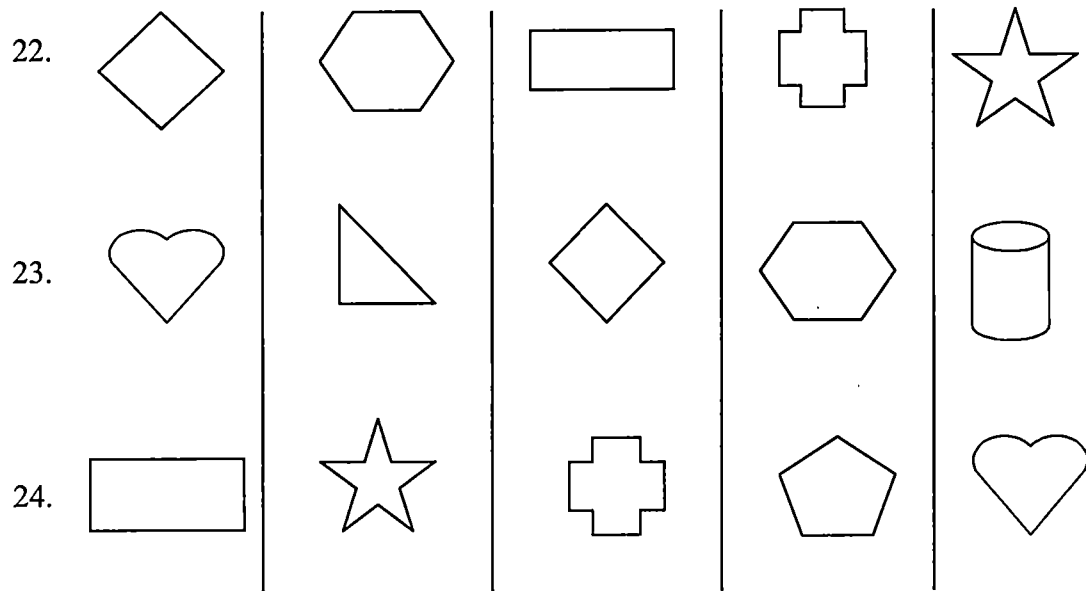


20.



21.





Scoring for each sequence:

Forms Correctly Recalled: _____

% Forms Correct: _____/5 x 100 = _____%

Paragraphs

1. With springtime quickly approaching, now is the time to start doing yard work to have a great looking yard this summer. You should rake up all the grass that has died during the winter to allow for new grass to grow. You should also fertilize the grass and begin to water for short periods of time.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
With Springtime			Springtime is required
Quickly			Quickly is required
Approaching			Indication of drawing near
			<i>Indication of Spring</i>
Now is the time			Now is required
To start doing			Indication to begin
Yard work			Yard work is required
			<i>Indication that work should begin</i>
To have a great looking yard			Indication of having/obtaining a nice yard
This summer			Summer is required
			<i>Indication of a nice yard</i>
You should			Indication of should
Rake up			Rake is required
All the grass			Grass is required
That has died			Died is required
During the			Indication of during
Winter			Winter is required
To allow			Indication of allowing
For new grass			Indication of new grass
To grow			Grow is required
			<i>Indication of step to help new grass grow</i>
You should			Indication of should
Fertilize			Fertilize is required
The grass			Gras is required
And begin			Indication of begin
To water			Water is required
For short			Indication of short
Periods of time			Indication of time
			<i>Indication of fertilizing and watering</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) Which season is approaching?
 - a. Fall
 - b. Spring
 - c. Summer
 - d. Winter

- 2) According to the story, during this time of year you should begin _____.
 - a. vegetable gardening
 - b. raking up dead leaves
 - c. painting the house
 - d. doing yard work

- 3) Why should you rake up dead grass?
 - a. To allow new grass to grow
 - b. So the yard will look neater
 - c. To make fertilizer
 - d. Because everyone else does

- 4) According to the story, how often should you water new grass?
 - a. every day
 - b. for long periods of time
 - c. for short periods of time
 - d. twice a day

- 5) According to the story, in addition to watering the grass, you should also:
 - a. apply fertilizer
 - b. cut it often
 - c. add worms
 - d. rake it daily

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about yard work.

2. Mark Stephens worked for the G & I Shirt Company for fifty years. At 15, he made extra money after school by cleaning desks and washing floors. After high school he worked as a secretary and arranged meetings. The company put him through college. Today, at 65, he is retiring from his position as chief executive officer.

	Score 0 or 1		
Mark			Mark or variant of the name
Stephens			Stephens is required
Worked			Indication of worked
For the G & I			G & I is required
Shirt			Shirt/blouse is required
Company			Indication of company
For 50 Years			50 is required
			<i>Indication of a main character who is male</i>
At 15			15 is required
He made extra money			Indication of extra money
After school			Indication of after school
By cleaning			Cleaning is required
Desks			Desks is required
And washing			Washing is required
Floors			Floors is required
			<i>Indication of working after school</i>
After high school			High school is required
He worked as a			Indication of worked
Secretary			Indication of secretary
And arranged			Indication of arranged
meetings			Meetings is required
			<i>Indication of working as a secretary</i>
The company			Indication of company
Put him through college			College is required
			<i>Indication of attending college</i>
Today			Today is required
At 65			65 is required
He is retiring from his position			Indication of retiring
As chief executive officer			Chief executive officer/CEO is required
			<i>Indication of retiring</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Please choose the best answer:

- 1) What was the main character's name?
 - a. Vincent Curio
 - b. Mark Stephens
 - c. Steve Markman
 - d. Timmy Smith
- 2) How many years did he work for the company?
 - a. 10
 - b. 15
 - c. 50
 - d. 65
- 3) What duties did he perform after school?
 - a. Cleaning desks
 - b. Washing floors
 - c. Both a & b
 - d. None of the above
- 4) How old is the main character today?
 - a. 15
 - b. 50
 - c. 60
 - d. 65
- 5) What position is he retiring from?
 - a. Janitor
 - b. Secretary
 - c. Chief executive officer
 - d. Cook

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a man who is retiring

3. Joe and Mary Farmer have a TV show about gardening and housekeeping. Last night, they demonstrated how to get ready for spring planting. Mary fertilized the soil and planted seeds for the flowers. Joe cut the bushes and gathered seed pods together with a rake. They both sprayed for insects and watered the lawn with the sprinklers.

	Score 0 or 1		
Joe and			Joe or variant of the name
Mary			Mary or variant of the name
Farmer			Farmer is required
Have a TV show			Indication of a TV show
About gardening			Gardening is required
And housekeeping			Indication of housekeeping
			<i>Indication of two main characters, male and female</i>
Last night			Last night is required
They demonstrated			Indication of demonstrated
How to get ready			Indication of getting ready
For spring			Spring is required
Planting			Indication of planting
			<i>Indication of getting ready for spring</i>
Mary			Mary or variant of the name
Fertilized			Fertilized is required
The soil			Indication of soil
And planted seeds			Seeds is required
For the flowers			Indication of flowers
			<i>Indication of planting</i>
Joe			Joe or variant of the name
Cut the bushes			Cut/trimmed is required
and gathered seeds pods together			Indication of seeds
With a rake			Rake is required
			<i>Indication of raking</i>
The both			Both is required
Sprayed for insects			Indication of insects
And watered			Watered is required
The lawn			Indication of lawn
With the sprinklers			Sprinklers is required
			<i>Indication of watering the lawn</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Please choose the best answer:

- 1) Who are Joe and Mary Farmer?
 - a. Insect specialists
 - b. Gourmets
 - c. Workaholics
 - d. TV personalities
- 2) When did the television show air?
 - a. Last night
 - b. Two nights ago
 - c. A week ago
 - d. None of the above
- 3) What did Mary do?
 - a. Fertilized the soil
 - b. Planted seeds for the flowers
 - c. Both a and b
 - d. None of the above
- 4) What did Joe do?
 - a. Cut the bushes
 - b. Gathered leaves with a rake
 - c. Both a and b
 - d. None of the above
- 5) According to the story, their television show demonstrated how to _____.
 - a. Get ready for summer planting
 - b. Get ready for fall planting
 - c. Get ready for the winter season
 - d. Get ready for spring planting

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a couple hosting a TV show.

4. If anyone can make a mountain out of a molehill, it is the Internal Revenue Service. The tax agency managed to bill a small business for \$286.50 in fines and penalties for an alleged tax underpayment of only one-cent. First notice of the underpayment came three weeks ago, followed by a second notice demanding the \$286.50.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
If anyone			Indication of anyone
Can make			Indication of make
A mountain			Mountain is required
Out of a molehill			Molehill is required
It is the Internal Revenue Service			IRS is required
			<i>Indication of the IRS</i>
The tax agency			Tax agency is required
Managed to bill			Indication of billing
A small			Indication of small
Business			Business is required
For \$286.50			\$286.5 is required
In fines			Indication of fines
And penalties			Indication of penalties
			<i>Indication of billing a business</i>
For an alleged			Indication of alleged
Tax			Tax is required
Underpayment			Underpayment is required
Of only one			One is required
Cent			Cent is required
			<i>Indication of underpayment</i>
First			First is required
Notice			Notice is required
Of the underpayment			Underpayment is required
Came 3 weeks ago			3 weeks is required
			<i>Indication of a first notice</i>
Followed by			Indication of followed
A second notice			Second is required
Demanding			Indication of demanding
The \$286.50			\$286.50 is required
			<i>Indication of a second notice</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) This story is about _____.
 - a. a bankrupt business
 - b. IRS billing
 - c. The United States Postal Service
 - d. Both a and c

- 2) The agency in this story billed a small business for _____.
 - a. an alleged tax underpayment
 - b. embezzling funds
 - c. laundering money
 - d. none of the above

- 3) What was the amount of this bill?
 - a. \$28.60
 - b. \$286.50
 - c. \$2865.00
 - d. one cent

- 4) This bill was _____.
 - a. sent twice
 - b. correct
 - c. incorrect
 - d. both a and c

- 5) When was the first time the small business received notice of the bill?
 - a. 1 week ago
 - b. 2 weeks ago
 - c. 3 weeks ago
 - d. 4 weeks ago

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about IRS billing.

5. The failure of most public schools to teach underprivileged children is a national tragedy.

According to the federal government, 58 percent of low-income fourth graders cannot read, and 61 percent of low-income eighth graders cannot do basic math. Of the 20 million low-income children in K-12 schools, 12 million aren't even learning the most elementary skills.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
The failure			Indication of failure
Of most public			Public is required
Schools			Schools is required
To teach underprivileged			Indication of underprivileged
Children			Children is required
Is a national			National is required
Tragedy			Indication of tragedy
			<i>Indication of underprivileged children in school</i>
According to the federal government			Indication of government
58%			58 percent is required
Of low-income			Indication of low-income
Fourth graders			Fourth is required
Cannot			Indication of negative
Read			Read is required
			<i>Indication that 4th graders can't read</i>
And 61%			61 percent is required
Of low-income			Indication of low-income
Eighth graders			Eighth is required
Cannot do			Indication of negative
Basic math			Math is required
			<i>Indication that 8th graders can't do math</i>
Of the 20 million			20 million is required
Low-income			Indication of low-income
Children			Children is required
In k-12 schools			k-12 is required
			<i>Indication of 20 million children in schools</i>
12 million			12million is required
Aren't even learning			Indication of not learning
The most elementary skills			Elementary skills is required
			<i>Indication that some aren't learning basic skills</i>

Main ideas: _____

% Main ideas correct: _____ / 25 x 100 = _____ %

Multiple Choice Questions:

- 1) Most public schools ____:
 - a. excel when teaching underprivileged children
 - b. fail when teaching underprivileged children
 - c. refuse to teach underprivileged children
 - d. cannot teach underprivileged children
- 2) What percent of low-income fourth graders cannot read?
 - a. 58%%
 - b. 85%
 - c. 61%
 - d. 16%
- 3) What percent of low-income eighth graders cannot do basic math?
 - a. 58%
 - b. 85%
 - c. 61%
 - d. 16%
- 4) How many children are in grades k-12?
 - a. 20 million
 - b. 12 million
 - c. 2 million
 - d. 21 million
- 5) Of these children, ____ are not learning elementary skills.
 - a. 20 million
 - b. 12 million
 - c. 2 million
 - d. 21 million

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about public schools and underprivileged children

6. Fire officials are predicting a long fire season this year and are asking residents to take steps to keep wildfires from starting. They are asking that homeowners take precautionary steps such as clearing away debris and mowing grass to decrease the chances that a fire will spread easily. Open fires and cigarette smoking are being controlled.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Fire			Fire is required
Officials			Officials is required
Are predicting			Indication of predicting
A long			Indication of long
Fire season			Fire season is required
This year			Indication of this year
			<i>Indication of fire</i>
And are asking			Indication of asking
Residents			Residents is required
To take steps			Indication of taking steps
To keep wildfires			Wildfires is required
From starting			Indication of starting
			<i>Indication to prevent wildfires</i>
They are asking			Indication of asking
That homeowner			Homeowner is required
Take precautionary			Precautionary is required
Steps			Indication of steps
Such as clearing away debris			Indication of clearing away
And mowing grass			Indication of mowing grass
			<i>Indication of homeowner involvement</i>
To decrease the chances			Indication of decreased chances
That a fire			Fire is required
Will spread			Indication of spreading
Easily			Easily is required
			<i>Indication of fire spreading</i>
Open fires			Open is required
And cigarette			Cigarette is required
smoking			Smoking is required
Are being controlled			Indication of control
			<i>Indication of fire control</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) _____ are predicting a _____ fire season this year.
 - a. Fire officials, long
 - b. Fire officials, short
 - c. Police officials, long
 - d. Forest rangers, short
- 2) These officials are asking for assistance from _____.
 - a. campers
 - b. fire safety officials
 - c. homeowners
 - d. none of the above
- 3) _____ and clearing away debris will decrease the chances of a fire spreading.
 - a. Watering the lawn
 - b. Mowing the lawn
 - c. Both a and b
 - d. None of the above
- 4) These officials are controlling _____ and _____.
 - a. open fires, cigarette smoking
 - b. wildfires, bonfires
 - c. open fires, fireworks
 - d. fireworks, cigarette smoking
- 5) This story is about _____.
 - a. the end of the fire season
 - b. preparing for the fire season
 - c. the peak of the fire season
 - d. wildfires

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about getting ready for the fire season.

7. Jesse Barnum, a student at Community College, thought he was invincible, so he never worried about how much health insurance he had. He was hurt badly while he was lifting weights with the football team. After surgery, Barnum thought that his insurance, through his mother, would cover the costs. They wouldn't and now he owes \$8000.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Jesse			Jesse or variant of the name
Barnum			Barnum is required
A student			Student is required
At Community college			Community is required College is required
			<i>Indication of main character who is male</i>
Thought that he was invincible			Invincible is required
So he never worried about			Indication of not worrying
how much			Indication of quantity
Health insurance			Health insurance is required
He had			Indication of having
			<i>Indication of health insurance</i>
He was hurt			Indication of hurt
Badly			Badly is required
While he was lifting			Indication of lifting
Weights			Weights is required
With the football			Football is required
Team			Team is required
			<i>Indication of an injury</i>
After surgery			Surgery is required
Barnum			Barnum is required
Thought that his insurance			Indication of insurance
Through his mother			Mother is required
Would cover the costs			Indication of coverage of costs
			<i>Indication that insurance would cover costs</i>
They wouldn't			Indication of negative
And now he owes			Indication of owes
\$8000.			\$8000 is required
			<i>Indication of owing money</i>

Main ideas: _____

% Main ideas correct: ____/25 x 100 = ____%

Multiple Choice Questions:

- 1) Who is the main character in this story?
 - a. Vincent Curio
 - b. Jim Bales
 - c. Jesse Barnum
 - d. Jim Barnum

- 2) What is his occupation?
 - a. circus clown
 - b. physician
 - c. insurance agent
 - d. none of the above

- 3) How did he hurt himself?
 - a. lifting weights
 - b. playing football
 - c. during surgery
 - d. both a and b

- 4) Whose insurance covered his health costs?
 - a. his
 - b. his mother's
 - c. the costs were not covered
 - d. both his and his mother's insurance

- 5) How much does he owe the insurance company?
 - a. \$800
 - b. \$8000
 - c. \$80
 - d. nothing

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a student without insurance.

8. This year, eight-year-old children from all over the county signed up for Little League Baseball. Families of loyal fans attended the games and cheered each child on. During one game, an athlete struck out three times and made five errors on the field. With a big smile on his face, he announced, "Baseball is not my sport."

	Score 0 or 1		
This year			This year is required
Eight-year-old			8 is required
Children			Indication of children
From all over the county			Indication of county-wide
Signed up for			Indication of signing
Little League			Little League is required
Baseball			Baseball is required
			<i>Indication of baseball</i>
Families			Families is required
Of loyal			Indication of loyal
Fans			Fans is requires
			<i>Indication of fans</i>
Attended the games			Indication of attendance
And cheered			Indication of cheered
Each child on			Child/player is required
			<i>Indication of cheering</i>
During one game			Indication of one game
An athlete			Athlete/player is required
Struck out			Indication of struck out
3 times			3 is required
And made 5			5 is required
Errors			Indication of errors/mistakes
On the field			Field is required
			<i>Indication of errors made during a game</i>
With a big smile			Indication of a big smile
On his face			Face is required
He announced			Indication of announcement
Baseball			Baseball is required
Is not my sport			Indication of negative
			<i>Indication of a smiling child</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) What sport were the children playing?
 - a. Little League Baseball
 - b. Little League Football
 - c. Little League Soccer
 - d. None of the above

- 2) How old were the children playing this sport?
 - a. 5
 - b. 6
 - c. 7
 - d. 8

- 3) According to the story, who usually attends these games?
 - a. Families from all over the county
 - b. Families of loyal fans
 - c. Both a and b
 - d. None of the above

- 4) What happened to an athlete in the field during one game?
 - a. He struck out 3 times
 - b. He made 4 errors
 - c. He made 5 errors
 - d. Both a and c

- 5) After this happened, what was the boy's reaction?
 - a. He was crying.
 - b. He threw down his bat and left the field.
 - c. He had a big smile on his face.
 - d. He just laughed.

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about Little League Baseball.

9. According to the newsletter Retirement Watch, drug prescriptions filled over the Internet, can save 10 percent or more from the price at your local pharmacy. The newsletter surveyed pharmaceutical Web sites and found that while not all offer good discounts, comparison shoppers should do well. But be aware, there is not a pharmacist available for consultation.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
According to the newsletter			Indication of newsletter
Retirement			Retirement is required
watch			Watch is required
			<i>Indication of a newsletter</i>
Drug			Drug is required
Prescriptions			Prescriptions is required
Filled over the Internet			Indication of Internet
Can save			Indication of savings
10%			10% is required
Or more			Indication of more
From the price at			Indication of price
your local			Local is required
pharmacy			Pharmacy is required
			<i>Indication of savings over the Internet</i>
The newsletter			Indication of a newsletter
Surveyed			Surveyed or variant of the word
Pharmaceutical			Pharmaceutical is required
Web sites			Web sites is required
			<i>Indication of a survey</i>
And found that while not all offer			Indication of negative
Good discounts			Indication of good discounts
Comparison shoppers			Shoppers is required
Should do well			Indication of doing well
			<i>Indication that you can do well</i>
But be aware			Indication of being aware
There is not			Indication of negative
A pharmacist			Pharmacist is required
Available for consultation			Consultation is required
			<i>Indication of no consultation</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) What was the name of the newsletter?
 - a. AARP
 - b. Retirement Watch
 - c. Retirees Watch Out
 - d. Watch for Retirement
- 2) This newsletter suggests that you can save _____ percent on prescriptions from _____.
 - a. 10, the Internet
 - b. 20, the Internet
 - c. 10, your local pharmacy
 - d. 20 your local pharmacy
- 3) Whom did the newsletter survey?
 - a. 10 local pharmacies
 - b. discount pharmacies
 - c. pharmaceutical web sites
 - d. none of the above
- 4) According to this story, all those surveyed offered _____.
 - a. consultation
 - b. good discounts
 - c. free delivery
 - d. both a and c
- 5) As a word of caution, a _____ is not always available if needed.
 - a. pharmacist
 - b. prescription
 - c. both a and b
 - d. none of the above

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about filling drug prescriptions on the Internet.

10. Barry Bonds and the San Francisco Giants finally made themselves at home in their new ballpark. Bonds led off the eighth inning with his ninth home run of the season and the Giants beat the Montreal Expos 2-1 on Saturday afternoon for their first win in seven games at the new ball park, Pacific Bell Park.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Barry			Barry or variant of the name
Bonds			<i>Bonds is required</i>
And the San Francisco			San Francisco is required
Giants			Giants is required
			<i>Indication of a main character who is male</i>
Finally made themselves at home			Indication of being at home
In their new			Indication of new
ballpark			Ballpark is required
			<i>Indication of a new ball park</i>
Bonds			Bonds is required
Led off the 8 th			Indication of 8 th
Inning			Inning is required
With his 9 th			Indication of 9 th
Home-run			Home-run is required
Of the season			Season is required
			<i>Indication of a home-run in a season</i>
And the Giants			Giants is required
Beat			Indication of beat
The Montreal			Montreal is required
Expos			Expos is required
2-1			Indication of 2-1
On Saturday			Saturday is required
afternoon			Afternoon is required
			<i>Indication that a team won on Saturday</i>
For their 1 st win			Indication of 1 st win
In 7 games			7 is required
At the new ball park			Indication of new ball park
Pacific Bell			Pacific Bell is required
Park			Park is required
			<i>Indication of a win in their ball park</i>

Main ideas: _____

% Main ideas correct: _____ / 25 x 100 = _____ %

Multiple Choice Questions:

- 1) Barry Bonds plays for the _____.
 - a. San Francisco Giants
 - b. Montreal Expos
 - c. San Francisco Expos
 - d. Montreal Giants
- 2) This baseball game was played _____.
 - a. at home
 - b. away
 - c. at their new ballpark
 - d. both a and c
- 3) When was this game played?
 - a. Friday evening
 - b. Saturday morning
 - c. Saturday afternoon
 - d. Friday afternoon
- 4) The _____ won the game.
 - e. San Francisco Giants
 - f. Montreal Expos
 - g. San Francisco Expos
 - a. Montreal Giants
- 5) What is the name of the ballpark?
 - a. Western Bell Park
 - b. Atlantic Bell Park
 - c. Pacific Bell Park
 - d. Eastern Bell Park

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a baseball's team's new ball park.

11. Every Wednesday evening, the suburbs of Hillsboro holds a popular bingo game at the new East End Mall. The event is well attended. The Smith family attends regularly. John, who calls out numbers, is on the police force. His brother, George, fights fires. Their younger sister, Sue, drives an ambulance. Sometimes she brings Mary, her next-door neighbor.

	Score 0 or 1		
Every Wednesday			Wednesday is required
Evening			Indication of evening
The suburbs			Suburbs/Hills is required
Of Hillsboro			Hillsboro is required
Holds a popular bingo game			Indication of a bingo game
At the new			Indication of new
East End mall			East End Mall is required
			<i>Indication of a bingo game</i>
The event			Indication of event
Is very well attended			Indication of good attendance
The Smith			Smith is required
Family			Family is required
Attends regularly			Indication of regular attendance
			<i>Indication of a family's attendance</i>
John			John or variant of the name
who calls out numbers			Indication of calling out numbers
Is on the police force			Indication of being on the police force
His brother			Brother is required
George			George or variant of the name
Fights fires			Indication of fighting fires
			<i>Indication of 2 male characters</i>
Their younger			Indication of younger
Sister			Sister is required
Sue			Sue or variant of the name
Drives an ambulance			Indication of driving an ambulance
			<i>Indication of a female character</i>
Sometimes she brings			Indication of sometimes
Mary			Mary or variant of the name
Her next-door neighbor			Neighbor is required
			<i>Indication of neighbor</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) What night is the bingo game held?
 - a. Monday
 - b. Wednesday
 - c. Friday
 - d. None of the above

- 2) The bingo game is held at _____.
 - a. East End Mall
 - b. West End Mall
 - c. North End Mall
 - d. South End Mall

- 3) What is the name of the family who attends regularly?
 - a. Jones
 - b. Rich
 - c. Mills
 - d. Smith

- 4) Which member of the family fights fires?
 - a. John
 - b. George
 - c. Sue
 - d. Mary

- 5) Which member of the family drives an ambulance?
 - a. John
 - b. George
 - c. Sue
 - d. Mary

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a family who attends a bingo game.

12. State and federal agencies are investigating claims by Asian workers of job discrimination at Lawrence Livermore National Laboratory. The Equal Employment Opportunity Commission initiated a federal probe into the claims, stated San Francisco attorney Brad Yamauchi. He represents nine Asian workers who have filed complaints of bias with the state Department of Fair Employment and Housing.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
State			State is required
And federal			Federal is required
Agencies			Agencies is required
Are investigating			Indication of investigation
Claims			Claims is required
			<i>Indication of an investigation of claims</i>
By Asian workers			Asian is required
Of job discrimination			Indication of discrimination
At Lawrence Livermore			Lawrence Livermore is required
National Laboratory			National Laboratory is required
			<i>Indication of job discrimination</i>
The Equal Employment Opportunity Commission			EEOC is required
Initiated a			Indication of initiation
federal probe			Indication of a federal probe
Into the claims			Claims is required
Stated San Francisco			San Francisco is required
Attorney			Attorney is required
Brad			Brad or variant of the name
Yamauchi			Yamauchi is required
			<i>Indication of a male involved</i>
He represents			Indication of represents
Nine			9 is required
Asian workers			Asian is required
			<i>Indication of 9 workers</i>
Who have filed			Indication of filed
Complaints of bias			Indication of complaints of bias
With the state			State is required
Department of Fair Employment			Fair employment is required
And Housing			Housing is required
			<i>Indication of complaints</i>

Main ideas: _____

% Main ideas correct: _____ / 25 x 100 = _____ %

Multiple Choice Questions:

- 1) State and federal agencies are investigating claims by ____
 - a. the EEOC
 - b. Asian workers
 - c. housing workers
 - d. none of the above

- 2) The Equal Employment Opportunity Commission (EEOC) ____ a ____ probe into the claims.
 - a. terminated, federal
 - b. terminated, state
 - c. initiated, federal
 - d. initiated , state

- 3) Who was the attorney for the plaintiffs?
 - a. Brad Yamauchi
 - b. Chris Chu
 - c. Sam Komatsu
 - d. Brian Yomasito

- 4) How many people filed complaints?
 - a. 3
 - b. 5
 - c. 7
 - d. 9

- 5) With whom did they file their complaints?
 - a. the state Department of Fair Employment and Housing
 - b. the federal Department of fair Employment and Housing
 - c. the EEOC
 - d. both a and b

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about job discrimination.

13. Today Russia will inaugurate the stern, careful Vladimir Putin as its second democratically elected president, handing him a mandate to restore national pride and economic health after decades of decline. Boris Yeltsin, who dismantled the Soviet Union and brought Putin to the Kremlin before resigning in December of 1999, will hand the chain of command over.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Today			Today is required
Russia			Russia is required
Will inaugurate			Indication of inauguration
The stern			Stern is required
Careful			Careful is required
Vladimir			Vladimir or variant of the name
Putin			Putin is required
			<i>Indication of main character who is male</i>
As its second			Second is required
Democratically elected			Indication of democratic
President			President is required
			<i>Indication of president</i>
Handing him a mandate			Indication of a mandate
To restore			Restore is required
National pride			Indication of pride
And economic health			Indication of economic
After decades of decline			Indication of decline
			<i>Indication of restoration</i>
Boris			Boris or variant of the name
Yeltsin			Yeltsin is required
Who dismantled			Dismantled is required
The Soviet Union			Soviet Union is required
And brought Putin			Putin is required
To the Kremlin			Kremlin is required
			<i>Indication of male character in the Soviet Union</i>
Before resigning			Indication of resigning
In December			December is required
Of 1999			1999 is required
Will hand over the chain of command			Indication of handing over command
			<i>Indication of year</i>

Main ideas: _____

% Main ideas correct: ____/25 x 100 = ____%

Multiple Choice Questions:

- 1) The main character in this story is:
 - a. Vladimir Putin
 - b. Boris Yeltsin
 - c. Vincent Curio
 - d. Vladimir Yeltsin

- 2) This main character is Russia's _____ democratically elected president.
 - a. 1st
 - b. 2nd
 - c. 3rd
 - d. 4th

- 3) The president now has the ability to restore national _____ and _____.
 - a. health, welfare
 - b. pride, health
 - c. pride, the economy
 - d. none of the above

- 4) _____ was the man who dismantled the Soviet Union.
 - a. Vincent Curio
 - b. Vladimir Putin
 - c. Boris Yeltsin
 - d. Vladimir Yeltsin

- 5) What year did this man resign?
 - a. 1999
 - b. 1989
 - c. 1998
 - d. 1988

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a Russian president.

14. Rental return vehicles, or “program cars”, as they are commonly called, from Advantage Rent-A-Car, will be sold this weekend directly to the public during an inventory liquidation event. Due to exclusive buyback agreements between the new car factories and rental car companies, dealers usually buy up all these vehicles. All vehicles have a 7-year, 100,000-mile warranty.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Rental			Renal is required
Return			Return is required
Vehicles			Indication of vehicles
Or program cars			Program is required
As they are commonly called			Indication of common name
From the Advantage Rent-A-Car			Advantage Rent-A-Car is required
Will be sold			Sold or variant of the word
This weekend			Weekend is required
			<i>Indication of cars being sold</i>
Directly			Directly is required
To the public			Indication of public
During an inventory			Inventory is required
Liquidation event			Liquidation is required
			<i>Indication of public liquidation</i>
Due to exclusive			Exclusive is required
Buyback agreements			Indication of buyback
Between the new car			Indication of new car
Factories			Factories is required
And rental car			Indication of rental car
Companies			Companies is required
			<i>Indication of agreements between companies/factories</i>
Dealers			Dealers is required
Usually buy up			Indication of buying
All the vehicles			Indication of vehicles
			<i>Indication that dealers purchase vehicles</i>
All vehicles			Indication of vehicles
Have a 7-year			7 is required
100,000 mile			100,000 is required
Warranty			Warranty is required
			<i>Indication of a warranty</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) _____ commonly calls rental return vehicles "program cars."
 - a. Avis Rent-A-Car
 - b. Enterprise rent-A-Car
 - c. Advantage Rent-A-Car
 - d. Hertz Rent-A-Car

- 2) According to the story, these cars will be sold _____.
 - a. in 7 months
 - b. next week
 - c. this year
 - d. this weekend

- 3) Who usually buys these vehicles?
 - a. car dealers
 - b. other rental companies
 - c. national corporations
 - d. families

- 4) What is the typical warranty on these cars?
 - a. 10 years and 70,000 miles
 - b. 7 years and 100,000 miles
 - c. 3 years and 50,000 miles
 - d. 5 years and 30,000 miles

- 5) This story is about:
 - a. the sale of rental vehicles
 - b. renting cars
 - c. how to choose the best rental company
 - d. where to purchase a rental car

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about the sale of rental vehicles.

15. The Governing Council of East Mountain High School decided to accept up to 120 students when the new school opens this fall. The school originally planned to accept a maximum of 100 ninth-grade students for its first year. After examining attrition rates at local schools, the council decided it would accept more students the first year.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
The Governing Council			Governing council is required
Of East			East is required
Mountain			Mountain is required
High School			High school is required
			<i>Indication of a high school</i>
Decided to accept			Indication of acceptance
Up to 120			120 is required
students			Students is required
When the new school			Indication of a new school
Opens			Indication of open
This fall			Fall is required
			<i>Indication of acceptance of students</i>
The school			School is required
Originally			Indication of originally
Planned to accept			Indication of acceptance
A maximum			Maximum is required
Of 100			100 is required
9 th grade students			9 th is required
For its first			Indication of first
year			Year is required
			<i>Indication of a maximum acceptance number</i>
After examining			Indication of examining
Attrition rates			Attrition is required
At local schools			Schools is required
			<i>Indication of examining attrition rates</i>
The council			Council is required
Decided it would accept			Indication of acceptance
More students			Students is required
The first year			First is required
			<i>Indication of accepting more students</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) What is the name of the High School in this story?
 - a. West Mountain High School
 - b. East Mountain High School
 - c. North Mountain High School
 - d. South Mountain High School

- 2) This school _____.
 - a. has been open since the fall
 - b. has been open since the spring
 - c. will open in the fall
 - d. will open in the spring

- 3) How many students did they decide to accept?
 - a. 120
 - b. 210
 - c. 200
 - d. 100

- 4) After examining attrition rates, the school council decided to accept _____ students than they had intended.
 - a. fewer
 - b. more
 - c. the same number
 - d. no more

- 5) This story is about:
 - a. rejection of students in an old school
 - b. acceptance of students in an old school
 - c. rejection of students in a new school
 - d. acceptance of students in a new school

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about the acceptance of students in a new school.

16. Skywalker Sound, division of Lucas Digital and part of Lucasfilm, is a combination of separate but related entities. One side of the building houses the extensive film and sound editing and mixing facilities. This is where various components that go into finished motion pictures are put together. The other side is dedicated to the scoring stage.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Skywalker			Skywalker is required
Sound			Sound is required
Division of			Indication of a division
Lucas			Lucas is required
Digital			Digital is required
And part of			Indication of part/piece
Lucasfilm			Lucasfilm is required
			<i>Indication of a film company</i>
Is a combination			Indication of a combination
Of separate			Separate is required
But related entities			Indication that both entities are related
			<i>Indication of a combination</i>
One side			Indication of one
Of the building			Building is required
Houses the extensive			Indication of extensive
Film			Film is required
And sound			Sound is required
Editing			Editing is required
And mixing facilities			Mixing is required
			<i>Indication of film and editing facilities</i>
This is where various components			Indication of multiple components
That go into finished			Finished or variant of the word
Motion			Motion is required
Pictures			Pictures is required
Are put together			Indication of compilation
			<i>Indication finished motion pictures</i>
The other side			Indication of the opposite side
Is dedicated			Indication of dedication
To the scoring stage			Scoring stage is required
			<i>Indication of another side</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) _____ is a division of Lucas Digital.
 - a. Skywalker Sound
 - b. Lucasfilm
 - c. Dolby Digital
 - d. Dreamcast

- 2) Skywalker Sound is a conglomerate of:
 - a. separate but related entities
 - b. two identical entities
 - c. unrelated and separate entities
 - d. none of the above

- 3) Skywalker Sound is:
 - a. 2 buildings
 - b. 1 building with 2 separate sides
 - c. a movie house and a sports arena complex
 - d. both a and b

- 4) The facilities at Skywalker Sound house:
 - a. film facilities
 - b. sports facilities
 - c. computer facilities
 - d. security facilities

- 5) According to this story, Skywalker Sound is involved in:
 - a. producing Broadway musicals
 - b. producing sporting events
 - c. producing movies
 - d. none of the above

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a sound company.

17. Thomas Chandler will think before he drinks next time. The 19-year-old Australian lifeguard finished a tough shift and hit the break room, where he grabbed a soda from the refrigerator. Upon his first sip, he immediately felt his throat start to swell and his respiratory system begin fail. The bottle read: Do not drink- Jellyfish tentacles.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Thomas			Thomas or variant of the name
Chandler			Chandler is required
Will think			Indication of thinking
Before he drinks			Indication of before drinking
Next time			Indication of the future
			<i>Indication of a main character who is male</i>
The 19 year-old			19 is required
Australian			Australian is required
Lifeguard			Lifeguard is required
Finished a tough shift			Indication of a tough shift
And hit the break room			Indication of the break room
			<i>Indication of foreign lifeguard</i>
Where he grabbed			Indication of grabbed
A soda			Soda or variant of the word
From the refrigerator			Refrigerator is required
			<i>Indication of grabbing a soda</i>
Upon his first sip			First is required
He immediately felt			Indication of immediate
His throat			Throat is required
Start to swell			Swell is required
And his respiratory			Respiratory is required
System			System is required
Begin to fail			Indication of failure
			<i>Indication of physiologic reaction</i>
The bottle			Bottle is required
Read			Indication of read
do not drink			Indication of do not drink
jellyfish			Jellyfish is required
tentacles			Tentacles is required
			<i>Indication of tentacles in the bottle</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) What is the main character's name?
 - a. Vincent Curio
 - b. Thomas Chandler
 - c. Vincent Chandler
 - d. Thomas Curio
- 2) What is his occupation?
 - a. Lifeguard
 - b. Concession worker
 - c. Refrigerator repairman
 - d. Emergency medical technician (EMT)
- 3) He _____ a tough shift.
 - a. was about to begin
 - b. was in the middle of
 - c. had just finished
 - d. had quit
- 4) What happened when he took a drink?
 - a. He passed out and hit the floor
 - b. His throat began swelling and his respiratory system failed
 - c. He dropped his drink and called 911
 - d. None of the above
- 5) What was in the bottle?
 - a. Poison
 - b. Squid
 - c. Jellyfish tentacles
 - d. Both b and c

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: This story is about a male lifeguard.

18. According to the Society for Human Resource Management in Washington, college credentials on resumes are checked 61 percent of the time. In these days of electronic resumes, it is crucial to have sterling credentials, since companies perform keyword searches of terms like Harvard and MBA. With these keywords, computers put you on top of the list.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
According to the society			Society is required
For human			Human is required
Resource			Resource is required
Management			Management is required
In Washington			Washington is required
			<i>Indication of a society</i>
College			College is required
Credentials			Credentials is required
On resumes			Resumes is required
Are checked			Indication of checking
61% of the time			61% is required
			<i>Indication that credentials are checked</i>
In these days			Indication of current days
Of electronic			Electronic is required
resumes			Resumes is required
It is crucial			Indication of crucial
To have sterling			Sterling is required
credentials			Credentials is required
			<i>Indication of electronic resumes</i>
Since companies			Companies is required
Perform keyword searches			Indication of keyword searches
Of terms			Terms is required
Like Harvard			Harvard is required
And MBA			MBA is required
			<i>Indication of terms searched</i>
With these keywords			Keywords is required
Computers			Computers is required
Put you on top			Indication of top
Of the list			List is required
			<i>Indication that keywords put you on top</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) How often are college credentials on resumes checked?
 - a. 16% of the time
 - b. 61% of the time
 - c. 10% of the time
 - d. 60% of the time
- 2) Where did this percentage come from?
 - a. A survey in Washington, D.C.
 - b. Random mailings
 - c. The Society for Academic Honesty
 - d. The Society for Human Resource Management
- 3) What is the most popular type of resume these days?
 - a. Electronic
 - b. Video
 - c. Interactive
 - d. Both a and c
- 4) What is the most crucial aspect of the resume?
 - a. that it is personalized
 - b. previous employment history
 - c. sterling credentials
 - d. none of the above
- 5) Many companies perform keyword searches of terms such as ____ and _____.
 - a. Princeton, MBA
 - b. Harvard, Princeton
 - c. Harvard, honors
 - d. Harvard, MBA

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about college credentials on electronic resumes.

19. This year venture capitalists began believing that the Internet remains the place to invest. These capitalists invested a record \$22.7 billion in 1,557 U.S. companies during the first quarter this year, according to a report from the National Venture Capital Association. The trade group reported seventy-five percent of those investments, \$17.1 billion, went to Internet companies.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
This year			Indication of this year
Venture			Venture is required
Capitalists			Capitalists is required
Began believing			Indication of belief
That the Internet			Internet is required
Remains the place			Indication of remaining
To invest			Invest is required
			<i>Indication of investing on the Internet</i>
These capitalists			Capitalists is required
Invested a record			Indication of a record
\$22.7 billion			22.7 is required
In 1,557			1557 is required
US companies			Indication of US companies
			<i>Indication of record earnings in the US</i>
During the first			Indication of first
Quarter			Quarter s required
This year			Indication of this year
			<i>Indication of first quarter</i>
According to a report			Indication of a report
From the National			National is required
Venture Capital			Venture Capital is required
Association			Association is required
			<i>Indication of a report from an association</i>
The trade group reported			Indication on a report
75%			75% is required
Of those investments			Indication of investments
17.1 billion			17.1 is required
Went to Internet			Internet is required
Companies			Indication of companies
			<i>Indication of portion of invests going to Internet companies</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) According to venture capitalists, _____ the place to invest.
 - a. technologies are
 - b. the Internet is
 - c. pharmaceuticals are
 - d. telecommunications are
- 2) These capitalists made a record investment of _____ billion dollars.
 - a. 22.7
 - b. 1.57
 - c. 75
 - d. 17.1
- 3) The investments were made during _____.
 - a. the 1st year
 - b. the 1st four years
 - c. the 1st quarter of this year
 - d. the 1st quarter four years ago
- 4) What percent if these investments went to Internet companies?
 - a. 25
 - b. 50
 - c. 75
 - d. 95
- 5) A report form the _____ Association reported these investments.
 - a. National & Federal Capital
 - b. National Venture Capital
 - c. Internet Capital
 - d. Ventura Capital

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about investing in Internet companies.

20. Last August, 18-year-old Peter Natale geared up to go to college, as did hundreds of thousands of other students before him. He applied for an American Express credit card so that he would not have to phone his Dad every time he needed cash. The response from the credit card company- Sorry, you don't measure up.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Last			Indication of last
August			August is required
Peter			Peter or variant of the name
Natale			Natale is required
Got ready			Indication of getting ready
To go to college			College is required
			<i>Indication of main character who is male</i>
As did hundreds			Indication of hundreds
Of thousands			Indication of thousands
Of other students			Students is required
Before him			Before is required
			<i>Indication of others before him</i>
He applied			Indication of application
For an American Express			American Express is required
Credit card			Credit card is required
			<i>Indication of application for a credit card</i>
So that he would not			Indication of negative
Have to phone			Phone or variant of the word
His dad			Dad is required
Every time			Indication of every time
He needed			Indication of needed
cash			Cash is required
			<i>Indication of needing money</i>
The response			Response is required
From the credit card			Credit card is required
Company			Company is required
Sorry -			Sorry is required
You don't			Indication of negative
Measure up			Measure up is required
			<i>Indication of rejection from the company</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) What was the main character's name?
 - a. Peter
 - b. Richard
 - c. Greg
 - d. Paul

- 2) Where was he preparing to go?
 - a. on vacation
 - b. to his father's house
 - c. to college
 - d. none of the above

- 3) Which credit card did he apply for?
 - a. Visa
 - b. American Express
 - c. Mastercard
 - d. Discover

- 4) Why did he apply for a credit card?
 - a. So he would have cash
 - b. Because everyone else did
 - c. To pay his phone bill
 - d. Both a and d

- 5) According to this story:
 - a. he got the card
 - b. he got the card, but his dad took it away
 - c. he did not get the card
 - d. he got the card, but cut it up

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a young man applying for a credit card.

21. A forest fire creates its own weather. Air heated by the fire rises rapidly, sucking in more air from all sides, generating a miniature windstorm. Scientists studying the phenomenon have found that the heat and energy can be so intense that fires can create their own tornadoes, spinning off whirlwinds of fire at the blaze's perimeter.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
A forest fire			Forest fire is required
Creates			Indication of creates
Its own weather			Weather is required
			<i>Indication of a fire</i>
Air			Air is required
Heated by the fire			Indication of heating
Rises			Rises is required
Rapidly			Rapidly is required
Sucking in more air			Indication of sucking
From both sides			Both is required
Generating			Indication of generating
A miniature			Indication of miniature
Windstorm			Windstorm is required
			<i>Indication creating a miniature windstorm</i>
Scientists			Scientists is required
Studying the phenomenon			Phenomenon is required
Have found that			Indication of findings
The heat			Heat is required
And energy			Energy is required
Can be so intense			Indication of intense
			<i>Indication of strong heat and energy</i>
That fires			Fires is required
Can create			Indication of creating
their own tornadoes			Tornadoes is required
			<i>Indication of tornadoes</i>
Spinning off			Indication of spinning off
Whirlwinds of fire			Whirlwinds is required
At the blaze's			Blaze is required
perimeter			Perimeter is required
			<i>Indication of whirlwinds at the perimeter</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) According to the story, forest fires can:
 - a. spread rapidly
 - b. prevent rain storms
 - c. create their own weather
 - d. occur most often in the springtime
- 2) Forest fires are capable of creating:
 - a. miniature windstorms
 - b. miniature rainstorms
 - c. enormous windstorms
 - d. enormous rainstorms
- 3) _____ and _____ can create tornadoes.
 - a. Wind, rain
 - b. Hot air, wine
 - c. Gravity, force
 - d. Heat, energy
- 4) These tornadoes are likely to occur:
 - a. at the blaze's perimeter
 - b. at the blaze's core
 - c. both a and b
 - d. none of the above
- 5) _____ study the phenomenon of the forest fire.
 - a. Forest rangers
 - b. Scientists
 - c. Fire fighters
 - d. Meteorologists

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about forest fires.

22. A civilian researcher working for the Army on a vaccine against a rare disease contracted the illness after being exposed to the bacteria. The microbiologist, identified as a man in his 30s, was diagnosed with glanders, a bacterial infection found in horses. A general with the Army Medical Research Institute of Infectious Diseases reported the accident.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
A civilian			Civilian is required
Researcher			Researcher is required
Working			Indication of working
For the army			Army is required
			<i>Indication of a main character in the army</i>
On a vaccine			Vaccine is required
Against a rare			Indication of rare
Disease			Disease is required
Contracted the illness			Indication of contracting the illness
After being exposed			Exposed or variant of the word
To the bacteria			Bacteria is required
			<i>Indication of a vaccine for bacteria</i>
The microbiologist			Microbiologist is required
Identified as a man			Man is required
In his 30's			30's is required
			<i>Indication of a male character</i>
Was diagnosed			Indication of diagnosed
With glanders			Glanders is required
A bacterial			Bacterial is required
infection			Infection is required
Found in horses			Horses is required
			<i>Indication of having an infection</i>
A general			Indication of general
With the army			Army is required
Medical			Medical is required
Research			Research is required
Institute			Institute is required
Of Infectious Disease			Infectious disease is required
Reported the accident			Indication of an accident
			<i>Indication that the accident was reported</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

1) Where did the main character work?

- a. The Navy
- b. The Army
- c. The Air Force
- d. The marines

2) What was his job?

- a. Microbiologist
- b. Geneticist
- c. Macrobilologist
- d. Botanist

3) The man was working on _____.

- a. genetically engineering a disease
- b. a variety of illnesses
- c. a vaccine for a disease
- d. all of the above

4) Where can you find glanders?

- a. in hoses near gardens
- b. in horses
- c. in bacteria
- d. in Navy research

5) Who reported the accident?

- a. a microbiologist
- b. a private in the Army
- c. a civilian
- d. a General in the Army

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a researcher working on a vaccine.

23. Twenty-five year-old Jun Sato has a very unique job. He walks the streets of Tokyo and allows anyone in an angry mood to hit him in the face or the stomach for 1,000 yen (\$10). He does wear a protective suit while doing the job. He enjoys the conversations he has after they have hit him.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Twenty-five-year-old			25 is required
Jun			Jun or variant of the name
Sato			Sato is required
Has a very unique			Indication of unique
job			Indication of job
			<i>Indication of a main character who is male</i>
He walks			Indication of walking
The streets			Streets is required
Of Tokyo			Tokyo is required
			<i>Indication of walking streets</i>
And allows anyone			Indication of allowing
In an angry			Angry is required
mood			Mood is required
To hit him			Indication of hit
In the face			Face is required
Or the stomach			Stomach is required
For 1000			1000 is required
Yin			Yin is required
\$10			\$10 is required
			<i>Indication of being hit for money</i>
He does wear			Indication of wearing
A protective			Protective is required
Suit			Suit is required
While doing the job			Indication of while doing the job
			<i>Indication wearing protection while working</i>
He enjoys			Indication of enjoying
The conversations he has			Indication of conversations
After			After is required
They have hit him			Hit is required
			<i>Indication of talking after being hit</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

1) What is the main character's name?

- a. John Sims
- b. Brian Sands
- c. Jun Sato
- d. Juno

2) How old is the main character?

- a. 20
- b. 25
- c. 30
- d. 35

3) Where does he live?

- a. Australia
- b. Vietnam
- c. The United States
- d. Tokyo

4) What is his occupation?

- a. being hit for money
- b. hitting people for money
- c. protecting people from being hit
- d. paying people to hit strangers

5) How much does he earn?

- a. \$10
- b. 1000 yen
- c. both a and b
- d. none of the above

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about a man who walks the streets to get hit.

24. Mike Rizzo owns and operates a pizza parlor in a popular location next to the University. The restaurant serves calzones, lasagna, pasta and many other Italian dishes but the one that makes the restaurant so popular is the deep-dish Sicilian pizza. For \$15.00, you can get a large pizza and a pitcher of beer for two.

Paragraph 1	Score 0 or 1		Scoring Criteria
	Story Unit	Thematic Unit	
Mike			Mike or variant of the name
Rizzo			Rizzo is required
Owens			owns is required
And operates			Operates is required
A pizza			Pizza is required
Parlor			Parlor is required
			<i>Indication of a main character who is male</i>
In a popular location			Indication of popular
Next to			Indication of next to
The University			University is required
			<i>Indication of a good location</i>
The restaurant serves			Indication of serves
Calzones			Calzones is required
Lasagna			Lasagna is required
Pasta			Pasta is required
And many other Italian dishes			Italian dishes is required
			<i>Indication of serving a variety of dishes</i>
But the one			Indication of 1
That makes the restaurant			Indication of making the restaurant
So popular			Indication of popular
Is the deep-dish			Deep-dish is required
Sicilian			Sicilian is required
pizza			Pizza is required
			<i>Indication of 1 popular dish in particular</i>
For \$15			\$15 is required
You can get a large			Indication of large
Pizza			Pizza is required
And a pitcher of beer			Pitcher of beer is required
For 2			2 is required
			<i>Indication of 2 items for 1 price</i>

Main ideas: _____

% Main ideas correct: _____/25 x 100 = _____%

Multiple Choice Questions:

- 1) What is the main character's name?
 - a. Mike Rizzo
 - b. John Rizzo
 - c. Mike Richards
 - d. Rich Rizzo

- 2) What sort of business does he own?
 - a. a gourmet restaurant
 - b. an Italian supermarket
 - c. a pizza parlor
 - d. a brewery

- 3) What dish is makes this business famous?
 - a. the beer
 - b. the calzones
 - c. the lasagna
 - d. none of the above

- 4) You can order a large pizza and pitcher of beer for _____.
 - a. \$25
 - b. \$10
 - c. \$15
 - d. \$20

- 5) This business is in a popular location, _____.
 - a. in the middle of downtown
 - b. next to the University
 - c. in Little Italy
 - d. on the river

Multiple-Choice Correct: _____

% Multiple-Choice Correct: _____/5 x 100 = _____ %

Prompt: The story is about am Italian restaurant.

APPENDIX C

BASELINE SESSIONS

1. Participants are instructed to use any memory strategy they would normally employ.

The order of the following tasks will be randomly assigned for immediate recall each session.

2. Examiner presents word list to all participants.
3. Participants write down, then circle all the words remembered to test immediate recall of verbal information.
4. Examiner presents the paragraph to all participants.
5. Participants outline the paragraph and answer multiple choice questions to test immediate recall of verbal information.
6. Examiner presents form sequence to all participants.
7. Participants write down all the forms remembered in the correct order to test immediate recall of non-verbal information.
8. Participants choose the sequence they think is correct from a choice of four.
9. Participants receive a 15-20 minute break between tasks.

The order of the following tasks will again be randomly assigned for delayed recall each session.

10. Participants outline the paragraph and answer multiple choice questions to test delayed recall of verbal information.
11. Participants write down, then circle all the words remembered to test delayed recall of verbal information.
12. Participants write down all forms remembered in the correct order, then choose the correct sequence to test delayed recall of non-verbal information.

The order of the following tasks will again be randomly assigned for long-term recall each session.

13. Participants will perform the same tasks at the beginning of the following session to assess long-term recall of the paragraph, word list, and form sequence. All tasks will be randomly ordered.

APPENDIX D

TREATMENT SESSIONS

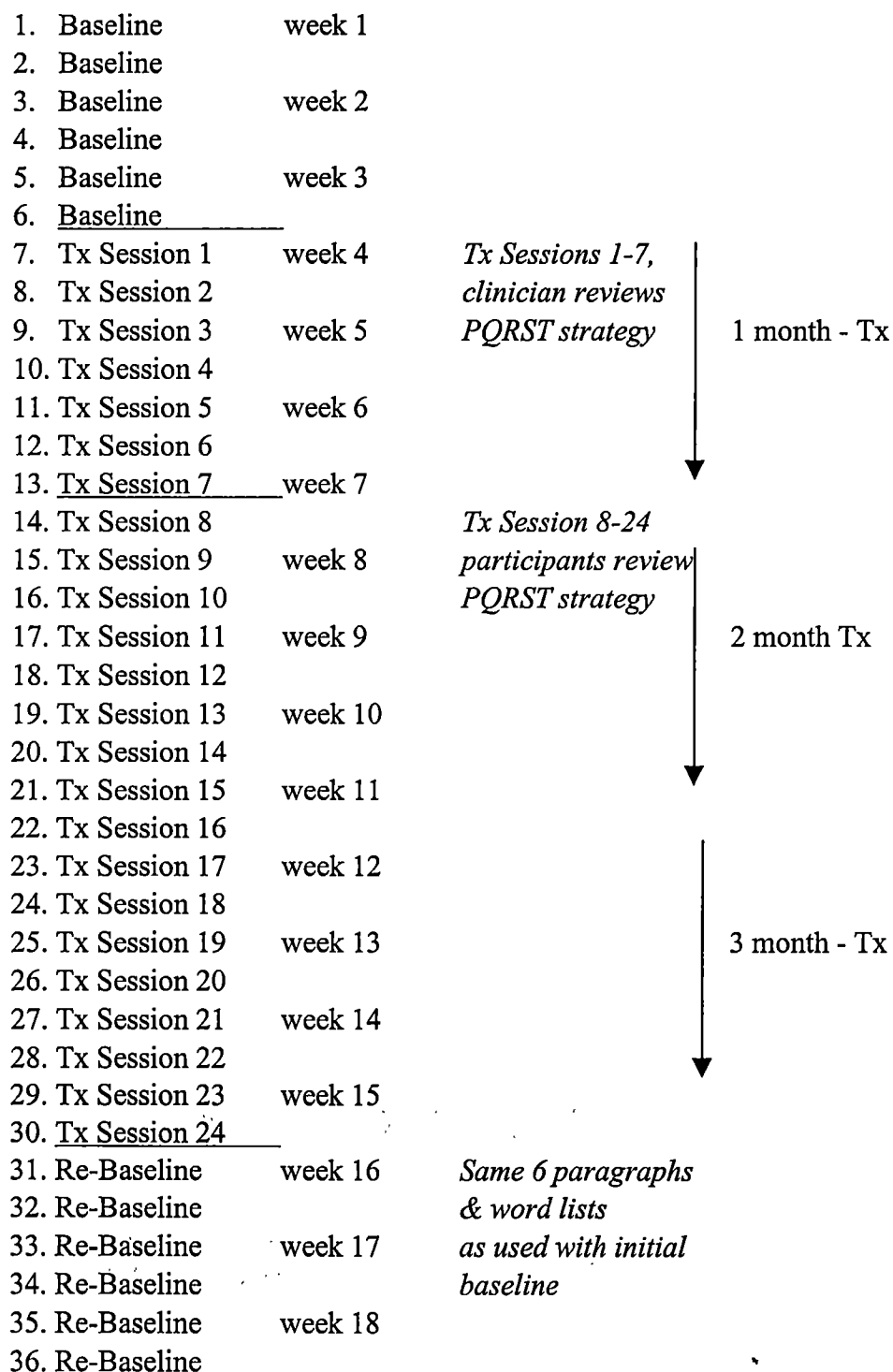
As in the baseline sessions, the paragraphs, word lists, and form sequences will be randomly assigned for testing of immediate, delayed, and long-term recall each session. The PQIRST memory retraining strategy will be reviewed prior to administration of the paragraph task.

1. Examiner (for treatment sessions 1-7) and the participants (for sessions 8-24) review the PQIRST memory retraining strategy.
 - For treatment session 1-7, examiner will demonstrate and use the strategy with practice paragraphs while explaining each step.
 - For treatment sessions 8-24, participants will review each step of the strategy with the examiner.
2. Examiner presents paragraph to all participants.
3. Participants outline the paragraph and answer multiple choice questions to test immediate recall of verbal information.
4. Examiner presents the word list to all participants.
5. Participants write down, then circle all the words remembered to test immediate recall of verbal information.
6. Examiner presents form sequence to all participants.
7. Participants write down all the forms remembered in the correct order to test immediate recall of non-verbal information.
8. Participants choose the sequence they think is correct from a choice of four.

9. Participants receive a 15-20 minute break between tasks.
10. Participants outline the paragraph and answer multiple choice questions to test delayed recall of verbal information.
11. Participants are instructed not to practice the PQIRST memory retraining strategy between sessions.
12. Participants write down, then circle all the words remembered to test delayed recall of verbal information.
13. Participants write down all forms remembered in the correct order, then choose the correct sequence to test delayed recall of non-verbal information.
14. Participants will perform the same task at the beginning of the following session to assess long-term recall for the paragraphs, word lists, and form sequences. All tasks will be randomly ordered.

APPENDIX E

FLOWCHART



VITA

Lynn Hood, originally from Chattanooga, Tennessee, graduated from the University of Tennessee at Chattanooga in August 1996 with a Bachelor of Arts in Biology and a minor in Chemistry. Presently, Lynn is working towards a masters degree in Speech Pathology from the University of Tennessee, Knoxville. Her main interests lie in the areas of adult language disorders and dysphagia. She has completed practicum experience at the university clinic, a birth to three language program, and a hospital. Following the completion of her degree, she will pursue a fellowship position in the areas of adult neurogenic disorders. She also plans to pursue a doctoral degree in the Speech Pathology.