Sampling inner experience in the learning disabled population

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Sampling inner experience in the learning disabled population

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SAMPLING INNER EXPERIENCE IN
THE LEARNING DISABLED
POPULATION

by

Barbara L. Schamanek

A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Arts

in

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Abstract

The inner experience of four learning disabled individuals and three undiagnosed individuals, ages 24 to 40 years, was investigated using the method of descriptive inner experience sampling (Hurlburt, 1990). This method requires that the subject "freeze" moments of inner experience when signaled by a randomly programmed beeping device, and write down the thoughts, feelings, images and/or other inner experiences occurring at that precise moment. Within 24 hours, the subject met with the experimenter and discussed in detail each sampled moment. The experimenter then prepared descriptions of each sampled moment, which were examined for salient characteristics which emerged from these descriptions. It was found that learning disabled individuals experience considerably less Inner Speech than most normal individuals, supporting the findings of other research that did not employ the thought sampling method. The learning disabled subjects also experienced Images, Feelings, and Unsymbolized Thinking more frequently than normal subjects. Three undiagnosed subjects were also examined in this manner. These subjects do not form a control group but are presented to add to the pool of subjects that have been sampled using this method.
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Introduction

One assumption in the field of learning disabilities is that the disabilities are caused by deficiencies in basic psychological processes not measurable by standard intelligence tests. Another assumption is that these cognitive limitations occur as the result of variations in the neurological substrates. These two basic assumptions have guided the field of learning disabilities from the earliest beginnings (Torgesen, 1986).

Poplin (1988) proposed four models of learning disabilities: (1) the medical model of the 1950s; (2) the psychological process model of the 1960s; (3) the behavioral model of the 1970s; and (4) the cognitive/learning strategies model of the 1980s.

None of these models, however, have examined the inner experiences of the learning disabled population. The present research involves the inner experiences of four learning disabled and three undiagnosed individuals.

The inner experiences of the subjects were examined using the thought sampling procedure discussed in the chapter on method. The subsequent chapter demonstrates that the method can be considered reliable.

The four learning disabled subjects were discussed fully in individual chapters. The findings were discussed in Chapter 12. The final three chapters cover the inner
experiences of three undiagnosed subjects.

The first section of this project begins with an overview of thought sampling, followed by three chapters exploring some of the literature covering each of the three basic models of learning disabilities. Since it is of value to this project, a chapter on the role of subvocalization in learning disabilities is included.

Torgesen (1986) noted three main paradigms: (1) the Neuropsychological; (2) the Information Processing; and (3) the Applied Behavior Analysis models. Each of the paradigms makes a contribution to the study of learning disabilities.

Poplin (1988) noted that although the models can be applied singularly in practice, it is rare that one theory prevails. For instance, Swanson and Cochran (1991) state that there has been a growing realization in recent years that the performance of subjects with information processing deficits, such as the learning disabled population, represents a vital source of information about memory performance. Theories that emanate from the cognitive as well as the neuropsychological frameworks have been brought to bear on the impaired pattern of memory performance of the learning disabled. The memory deficiencies of that population have been documented in both the cognitive and neuropsychological literature. We turn now to discuss thought sampling, the main models of learning disabilities, including a description of the population and a brief historical overview, and subvocalization.
Overview of Thought Sampling

The term introspection was derived etymologically from the Latin words spincere (to look) and intra (within). The earliest account of introspection was Augustine's De Trinitate. Lyons (1986) stated that Augustine suggested something that became the orthodox view from about the end of the Middle Ages to the turn of this century and the basis for the allegedly scientific technique of introspection. Augustine claimed that we can discover the nature of mind by a process of bracketing out the external world. In this way we can better perceive internal mental events and then engage in some process of inner perception or inner observation.

Brentano, a direct heir to the empiricist tradition, proclaimed that the proper objects of psychology were mental phenomena and the chief method lay in "inner perception" or Wahrnehmung, which he distinguished from "inner observation" or Beobachtung. He believed that we could not directly focus on or observe our inner mental life. He concluded that to do so would draw our attention away from the existence of the first-order mental life of thoughts, volitions, and feelings. What one could do, however, would be to observe mental phenomenon indirectly, out of the corner of our "mental eye," while going about our everyday
activities. Mental events, by their very nature, force themselves on us rather than us actively forcing them. This would be the only way of finding out about them (Lyons, 1986).

In 1874, Brentano's book and the first edition of Wundt's handbook appeared (Boring, 1950). The two books represented attempts to formulate the "new" psychology. Brentano's psychology was empirical and Wundt's was experimental. According to Boring (1950), Brentano believed that the stressing of experimentation led to an overemphasis upon method and a blindness for the main issue. In Brentano's viewpoint he resembled William James and, to some degree, the philosophers who sought to interpret experience.

Boring (1950) stated that a fundamental test of a system of psychology is the manner in which the author distinguishes psychology from physics. Brentano defined psychical phenomena by their possession of "immanent objectivity" that they were said to have when they refer to a content. In other words, they are directed upon an object or have that object "inexisting intentionally" within them. It is the psychical phenomena that are thought of as acts. "When one sees a color, the color itself is not mental. It is the seeing, the act, that is mental" (p. 360).

Brentano stated that the acts of ideating (i.e., sensing, imagining), judging (i.e., acknowledging, perceiving, rejecting, recalling), and the psychic phenomena of loving and hating (like feeling, resolving, wishing,
desiring, intending) were thus divided into three fundamental classes (Boring, 1950).

According to Boring (1950), the dilemma for systematic psychology at that time lay between Brentano and Wundt, or between act and content.

Wilhelm Wundt agreed with Brentano's distinction between inner perception and inner observation and endorsed his preference for the former. He believed, however, that inner perception was of no value for a scientific psychology because it must be unsystematic since the first-order mental phenomenon (the feelings, thinking, and volitions) take the pace (Lyons, 1986). The subject must wait until the phenomenon comes to his attention without concentrating or focusing or forcing the pace in any way since this will turn the process into inner observation and, in so doing, remove the possibility of successfully observing the phenomenon.

Wundt believed that one could mold inner perception into a scientific method. To do so would necessitate ordering and controlling the external conditions. By so doing the process of inner perception could be possible. It could come to resemble in all important respects external, ordinary perception while avoiding becoming useless, overblown inner observations. Hence, experimental psychology was born (Lyons, 1986). Other individuals were also becoming interested in inner experience.

James wrote the following in his classic work, The Principles of Psychology:
Introspective observation is what we have to rely on first and foremost and always. The word introspection need hardly be defined - it means, of course, the looking into our own minds and reporting what we there discover. Everyone agrees that we there discover states of consciousness. So far as I know, the existence of such states has never been doubted by any critic, however skeptical in other respects he may have been. That we have cognitions of some sort is the inconcussum in a world most of whose other facts have at some time tottered in the breath of philosophic doubt. All people unhesitatingly believe that they feel themselves thinking, and that they distinguish the mental state as an inward activity or passion, from all the objects with which it may cognitively deal. I regard this belief as the most fundamental of all the postulates of psychology, and shall discard all curious inquiries about its certainty as too metaphysical for the scope of this book (James, 1890/1981, p. 185).

John Mill, replying to a statement to the effect that we can have no introspective cognition of our minds made by Auguste Comte (as cited in James, 1890/1981) said the following:

It might have occurred to M. Comte that a fact may be studied through the medium of memory, not at the very moment of our perceiving it, but the moment after: and this is really the mode in which our best knowledge of our intellectual acts is generally acquired (James, 1981, p.188).

Therefore, James, in agreement with Mill's response, stated that we have knowledge of what passes in our minds, and our more superior way of knowing our conscious states is by directly observing them suspended in memory, in other
words, by retrospecting them (Lyons, 1986).

It appears that Galton was a good introspectionist. He surmised that a man's report of what goes on in his own mind is as valid as a geographer's report about a new country. By observing his mind while walking the streets of London, he came to his initial conclusions concerning the variety of its associative processes. He noted that ideas fluctuate until one of them dominates. He stated that this was without any conscious act of the will. He also noted the great extent that the unconscious processes occur in "the antechamber of consciousness" (Boring, 1950, p. 484).

According to Boring (1950) Galton's greatest contribution to introspective psychology was his study of imagery and individual differences in imagery. He, along with Fechner and Charcot, was one of the three originators of ideational types. His questionnaire of determining types and measuring the vividness of imagery for the various senses is well known.

Titchener, in America, represented "pure" introspective psychology. His fundamental theory was that there are possible three points of view: (1) a physical point of view; (2) a psychological point of view; and (3) perhaps other points of view such as that of biology or common sense. Psychology depends upon its own point of view (Boring, 1950).

Titchener allowed that thinking, volition, and emotion could and should be the proper object of introspective
study. As opposed to Wundt, Titchener devised a long list of rules and built the scientific conditions into the attitude of the introspector rather than into the laboratory conditions (Lyons, 1986). (For a more complete historical review of introspection see Monson, 1989.)

In spite of the enthusiasm demonstrated by early introspectionists, the interest in introspection faded, and little introspective research was done until the 1960's (Monson, 1989).

Hurlburt & Melancon (1987b) stated that over the past 20 years research into personal experience of thought has used a variety of techniques. Klinger (1978) outlined the five classes of procedures in use for obtaining systematic reports of inner experience. They are as follows: (1) Questionnaires filled out by participants retrospectively; (2) Thinking Out Loud reports in which participants may be asked to report the stream of their thoughts as they occur; (3) Descriptive Thought-Sampling, where participants are asked to engage in their everyday tasks, are interrupted and asked to describe their inner experiences; (4) Thought Sampling Using Ratings, where subjects are asked to respond to items by rating their inner experiences on a previously agreed upon scale; (5) Event Recording, where subjects are asked to report particular types of events each time they occur during a particular period of time. In this example they use a simple reporting device that can be atomized.
Descriptive Experience Sampling

Descriptive experience sampling, utilized as a means of determining how an individual thinks, interrupts individuals at random intervals to seek out their self-reports concerning what inner experiences were occurring for them at that moment (Hurlburt, 1980; 1990). This method has been used on a number of people experiencing various mental disorders as well as numerous people with no known disorders.

In Hurlburt's (1990) book on the subject various normal individuals ranging in educational attainment from high school to the MD were sampled. The inner experiences of six normal and four schizophrenic subjects were reviewed.

Hurlburt (1990) developed the thought sampling technique described in this report. He and several colleagues worked with various individuals and have discovered some interesting findings.

Hurlburt (1990) made some general observations concerning schizophrenia. A more clear understanding can be gleaned from the carefully collected data on the inner experiences of these individuals. Hurlburt noted that when schizophrenics are not decompensating they may have extremely clear emotional experiences. He stated that their "inner emotional experience is not blunted" (p. 254). It appears that the external appearance of blunting may reflect a hiding of a clear inner emotional experience rather than a lack of it. It also appears that schizophrenics experience
more frequent and more concrete inner visual experiences. In particular, Images were frequently "goofed up" as in the Images experienced by a 23-year-old schizophrenic subject (Hurlburt & Melancon, 1987a). This subject saw a glass of iced tea suspended at an angle above a table while the table remained straight. She also experienced an Image of the garbage bag in her room that she had seen as full while it was actually empty, and an Imaged Ping-Pong player who was playing left handed rather than the actual right-handed and wearing a different colored shirt than in actuality.

Over the years that Hurlburt and his associates have employed the thought sampling method, several various types of subjects have been examined. Sampling of inner experience has included anxious individuals (Hebert, 1991), bulimics (Doucette, in preparation) adolescents (Monson, 1989) and depressed people (Hurlburt, in press).

Saltman (1983) sampled her own personal inner experiences over a period of nine days, collecting 296 samples. She wrote a pre-sampling retrospective general account of her inner experience as described in Hurlburt's (1990) description of the thought sampling methodology as employed in this case. Comparing the "pre-sampling, retrospective, general account" (PRGA) that she had prepared to the actual results acquired from the sampling procedure proved interesting. It appears that she was aware of several aspects of her thinking, but she was unaware of several other aspects that were brought to awareness through
the descriptive thought sampling procedure.

Of particular interest to the subject matter in this paper is Monson's (1989) adolescent learning disabled subject whom she called Jacob. At the time of sampling this subject was a 12-year-old who had been diagnosed as learning disabled by his school district. He was attending special math, English, and reading classes in the seventh grade. Monson's (1989) report was based on 32 samples of his inner experience. Jacob experienced several types of inner experiences including Images, Unsymbolized Experience, Inner Hearing, Just Doing, and Feelings. Monson noted that Jacob experienced Inner Speech only once. She observed that Jacob did not think in words. Monson went on to say that Jacob does not practice verbalizing in inner experience and that this fact may result in Jacob being penalized by the educational system.

The inner experiences of learning disabled individuals has received very little attention. Some research (Swanson, 1983) has been done with learning disabled individuals in the area of subvocalization (Inner Speech). Also, the difficulty learning disabled individuals have with Inner Speech has been discussed (Brutten, Richardson, & Mangel, 1973).
Chapter 2

The Physiological Model of Learning Disabilities

The learning disabled population consists of a group of individuals who, when tested, have average or above average intelligence and normal vision and hearing. In spite of these facts, these individuals have deficits in some specific domain of intellectual functioning such as writing, reading or spelling (Kolligan & Sternberg 1987). Learning disabled individuals are usually emotionally stable and come from an environment that offers motivational stimulation, yet they fail to learn from the usual teaching methods (H. B. Levy, 1973).

Cruikshank (1981) states that learning disabled individuals frequently demonstrate an inadequate ability to recognize fine differences between auditory, visual, and tactual stimuli. Deficits frequently lie in the areas of memory where they often demonstrate an inadequate ability to retain discriminatory sounds and forms in short-term as well as long-term memory. Many of these individuals demonstrate a poor ability to sequence, and many of them have an inadequate ability dealing with time and space orientation as well as obtaining closure (for example, they may make a U rather than an O when attempting to create an O shape).

Furthermore, learning disabled individuals may display an inadequate capacity for integrating sensory information.
They have difficulty combining tasks that are both visual and auditory but seem able to handle separate visual and auditory tasks. Frequently, these individuals have problems judging the amount of energy required to initiate and accomplish a given motor task. They can appear to be driven to respond to stimuli to a degree than can appear hyperactive (Cruickshank, 1981).

Learning disabilities are divided into three clusters: dyslexia (difficulty with reading), dyscalculia (difficulty with arithmetic), and dysgraphia (difficulty with writing). Literature in these three areas has grown increasingly over the years and now encompasses an enormous body of research (Torgesen, 1986).

History

In 1861, Broca studied the language disturbance found in adults that resulted from central nervous system damage. The specific disturbances that resulted from that damage were compared to the speech and reading disabilities in children demonstrating the symptoms of what was termed minimal cerebral dysfunction. Today, these children are known as learning disabled.

In 1896, Morgan, an English ophthalmologist, and in 1897, Kerr, a physician, reported cases of reading disability in intelligent children (cited in Farnham-Diggory, 1978). Morgan described a fourteen-year-old boy who may have been born with word-blindness. Consequently, through this discovery, the
notion of developmental dyslexia came about. He believed that word memory was not a compound of letter memory, but that it was entirely different and localized in a different area of the brain. In this case there were persons who could read words intact but who could not spell them out letter by letter. He writes of one of his patients, "Where he failed to write p, r, or n...he wrote quite readily pot, Robert, nail and so on" (Farnham-Diggory, 1978, p.22). Although Morgan and Kerr were the first to note these occurrences, it was Hinshelwood who went on to study the subject further.

Broca's findings led to the work of Hinshelwood (cited in Farnham-Diggory, 1978) and others in the area of disturbances in receptive and expressive aspects of language or "word-blindness" (an impairment of lexigraphic perception that does not include the loss of visual perceptions) and "word-deafness" (normal hearing coupled with difficulty recognizing the spoken word), as well as motor aphasia (a total or partial loss of the power to understand or use words) and agraphia, (a form of aphasia which presents itself in the total or partial loss of the ability to write).

Hinshelwood's paper was concerned with an affliction that produced a sudden loss of the ability to read. His theory stipulated that the brain must have a separate area that governs visual memory in general, visual letter memory, and visual word memory. He set out to demonstrate his
theory with people who had suffered damage to their brains in which a loss of the ability to read had been produced. Using knowledge obtained from the work of the French physician Dejerine, Hinshelwood surmised that the angular gyrus region of the left hemisphere was a critical site. Although he was wrong about why the angular gyrus was critical, he was correct in identifying the angular gyrus as an important region. The site, rather than being a visual word storehouse, is an association area where triple connections can be made among the kinesthetic, auditory, and visual areas of the brain (Farnham-Diggory, 1978).

These discoveries led to the later work of Orton, an American neurologist. The work of Morgan, Kerr, and Hinshelwood dealt with the structural aspects of the disorder, i.e., specific brain sites, while Orton's work was involved with the functional aspects, i.e., how information gets from one part of the brain to another (Farnham-Diggory, 1978).

Essentially, Orton (1925) believed that dyslexia was based on the notion of hemispheric imbalance. He speculated that one side of the brain is not processing information as it would in a normal person. Orton observed mirror writing in some of the individuals he had studied. That is, their handwriting could be placed in front of a mirror and read as though it were written normally. With mirror writing, Orton believed that he had uncovered a significant clue in understanding dyslexia. He believed that the written
productions of those experiencing strephosymbolia (the Greek roots are strepho and symbolon meaning twisted sign) were similar to a print-out of stored information in the brain. He believed that if the words "not" and "saw" were stored in the left hemisphere of the brain, those words would be stored as "ton" and "was" in the right hemisphere (Springer and Deutsch, 1989). Mirror writing, Orton speculated, demonstrated that information must be stored in more than one orientation in the brain.

Orton believed that learning to read and write was an issue involving learning which hemisphere to pay attention to. Normally, the child learned to pay attention to the left hemisphere. At times, however, the child paid attention to the right hemisphere and therefore developed abnormally (Farnham-Diggory, 1978).

Orton (1925) noted three types of cortical cells that he believed were involved in specific brain functions. The "visual perceptive" areas of the brain were the first receivers of sensory information which Orton referred to as the "arrival platform." The next level, the "visual recognitive" area, consisted of brain cells that produced a limited type of visual association in which connections could be made with other information from motor as well as sensory areas. Although objects could be recognized at this level, only at the next level, the "visual associative" level, could the meaning of an object be surmised.

In Orton's estimation, either hemisphere could
effectively perform perceptive activities as well as recognize activities, but associative activities were the domain of the left hemisphere alone. These speculations were neurologically straightforward. Injury at the first and second levels caused an effect only if the damage occurred in both hemispheres. In the case of injury to the "visual associative" level, only damage to the left hemisphere produced word blindness. Damage to that area in the right hemisphere caused no impairment in functioning (Farnham-Diggory, 1978).

The notion of cerebral specification stipulates that the left hemisphere controls the right side of the body and the right hemisphere controls the left side of the body. Subsequently, the use of dominant motor areas, such as eyes, hands and feet is frequently considered evidence of the dominant hemisphere. For instance, left handedness suggests right hemisphere dominance. Many people, however, do not have specific dominance in eyes, hands and feet. This is referred to as mixed dominance (Huston, 1987).

Several years after he started studying the issues involving strephosymbolia, Orton (1937) suggested that the problem of strephosymbolia was one of mixed or crossed dominance. Orton stated that an insufficiency of left cerebral dominance can be noted by the "mixed" handedness, footedness, and eyedness in strephosymolic children (Hiscock and Kinsbourne, 1987). This view of dyslexia still exists today (Huston, 1987).
Arithmetic disability has not been studied as extensively as the other learning disabilities. Farnham-Diggory (1978), however, states that studies have shown that defects in logic, defects in planning involving a failure to perform a preliminary analysis of the problem, perseveration of inappropriate procedures, and inability to perform simple calculations may contribute to the disabilities.

Defects in logic are revealed by a person's lack of ability to understand phrases such as "the brother's father." The elements in this statement have a spatial aspect and to understand them, one must keep the elements in mind simultaneously while comparing them in some dimension.

Studies of brain injured adults have revealed that the arithmetic disability experienced by the subjects being examined were associated with damage to the right frontal region of the brain. This is the region that Luria described as affecting spatial logic (Farnham-Diggory, 1978).

Current Research

Orton's speculation on hemispheric imbalance as it relates to the learning disabled population has been investigated extensively in the field. Witelson (1977) invented a method that she named a dichhaptic task for testing the dominant hemisphere of handled objects. The subject is blindfolded and two different objects are placed in his hands. It is then determined which object the
subject identifies most often and most accurately. Depending upon the favored hand, it is suggested that one hemisphere or the other predominates.

Testing learning disabled and normal children with a dichhaptic stimulation task, and using dichotic listening tasks as well, which is a popular method used to study hemispheric differences, Witelson suggested that learning disabled individuals, specifically dyslexics, experience their left hemispherre similarly to their right hemispheres. Since it has been demonstrated that children who had difficulty when learning to read English were able to learn to read Chinese logographs, which rely on holistic right brain processing (Rozin, Poritsky, & Sotsky 1971), Witelson's theory may be relevant in understanding learning disabilities.

Witelson (1977) hypothesized that normal girls, like dyslexic boys, have bilateral representation of spatial functions but exhibit no reading difficulty. Dyslexic boys may also have deficits in the left hemisphere as well. It has been found that learning disabilities are far more prevalent in males than in females. Studies by Bentzen conducted in 1963 and by Miller, Margolin, and Yolles conducted in 1957 report that males outnumber females experiencing learning disabilities approximately 2:1. Cone, Wilson, Bradley, and Reese, in their 1985 study, found that males outnumber females by 3:1, and in their 1980 study Norman and Zigmond found the difference to be 4:1. In 1967
Coleman and Sandhu conducted research that found the males outnumbered the females with learning disabilities by 6:1 (cited in Smith, 1991). This may be relevant to understanding the sex difference issue.

Hiscock and Kinsbourne (1987) argued that laterality, which they consider a behavioral phenomenon, does not provide information about the physiological characteristics of the brain. Although the logic of deviant brain development resulting from various disordered hemispheric specializations is straightforward, Hiscock and Kinsbourne stated that there is little reason to believe that there is in any way a relationship between hemispheric specialization and behavioral skills. They believed that hemispheric models assume independence of processing of the hemispheres, quantitative or qualitative differences between processing information, and a tendency of one hemisphere to inhibit the other hemisphere.

Hiscock and Kinsbourne (1978) used a dual-task procedure as a measure of speech lateralization in 151 normal right-handed children. The task involved the children in unimanual finger tapping with and without current speech. It was hypothesized that if speech is, indeed, left lateralized, talking should disrupt tapping of the right hand more than it disrupts tapping of the left hand. About 70% of the children did demonstrate the predicted effect. This is the same figure that approximates the typical incidence of right-ear advantage in dichotic
listening studies. It differed, however, with other studies measuring speech lateralization where the results were as high as 95%-99% for the incidence of left lateralization in right-handers. Since powerful and direct methods of assessing language lateralization such as the sodium Amytal technique and studies of aphasia following unilateral brain damage suggest such high incidences, the authors suggested that the dual-task and dichotic listening methods may produce a measurement error.

In the preceding study, however, as well as in the study conducted by Obrzut and Hynd (1981), results have found that lateralization appears to be as marked in younger children as it is in older children, thus refuting Lenneberg's (1967) claim that language lateralization does not reach completion until around the time sexual maturity is reached.

Not all theories about neurological causes of learning disabilities are viewed as directly focused on the central nervous system (Adelman and Taylor, 1986). Obrzut and Boliek (1986) state that essentially learning disabled individuals experience a delay of left hemispheric specialization that may produce a delay in their ability to perform age related cognitive tasks.

In their work, Obrzut & Hynd (1981), have found that it is possible that language is lateralized in normal and learning disabled children, but that the learning disabled children may experience less efficiency of the language
processor as a result of maturational lag. Maturational lag is based on the theory that persons whose neurological development is disrupted will lag behind their peers.

Until recently, no anatomical asymmetries were found in regard to functional differences in the two hemispheres even though functional asymmetry of the two cerebral hemispheres in humans has been accepted for over a century (Witelson & Pallie, 1973).

Geschwind and Levitsky (1968) found an asymmetry that could be seen without use of a microscope in the posterior region of the superior surface of the temporal lobe. This area is part of Wernicke's area and is known to be involved with language function. Until Geschwind and Levitsky made their measurements of the superior surfaces of the right as well as the left temporal lobes of 100 adult human brains, indicating that the temporal plane, an index of the auditory association cortex, was one third longer on the left, there had been little knowledge of the structures involved in the functional differences of the hemispheres (Chi, Dooling, and Gilles, 1977).

Witelson and Pallie (1973) examined the brains of 16 adults and 14 infants. In both the adult and neonatal group, the planum temporale (temporal lobe) was statistically significantly larger on the left-sided area in both groups. It was suggested that this asymmetry is present before any environmental effects such as unimanual preference and language learning take place. It was also
noted that the neonatal asymmetry suggests that the infant is born with a pre-programmed ability to process speech sounds.

Chi, Dooling, and Gilles (1977) conducted a study that examined the brains of human fetuses of various gestational ages to determine the topography and the tempo of the anatomical asymmetries of the transverse temporal gyri and temporal plane. Their study confirmed left-right asymmetry of the number of transverse temporal gyri that can be detected as early as 31 weeks of gestation. This study suggests that the human brain has an anatomical substrate that may underlie functions for the development of language function as well as for the development of lateralized speech. It is interesting to note that in slightly over half of the brains examined, the auditory association area is more extensive on the left than on the right side. Thus, it is suggested that the larger left temporal plane may provide more surface area for receiving as well as processing visual, somatosensory, and motor inputs to be integrated with the left lobe auditory association area.

The autopsy study of a 20-year-old male with an extensive, well documented history of developmental dyslexia revealed some pertinent findings regarding the physiology of the condition (Galaburda & Eidelberg, 1982; Galaburda & Kemper, 1978). No abnormalities in the brain could be seen with the naked eye, and under microscopic examination there was no evidence of either gliosis or neuronal loss. As
would be expected in the case of developmental dyslexia, abnormalities were confined to the left cerebral hemisphere. The most striking damage was in the area of micropolygyria, where adjacent molecular layers of the abnormal gyri were often fused. The micropolygyria were located in parts of Heschl's gyrus as well as the planum temporal. Many other abnormalities were found as well. The posterior thalamus contained two striking deviations in cytoarchitecture. The medial geniculate nucleus contained large cells distributed homogeneously throughout the nucleus where normally these cells are located dorsomedially and anteriorly. Abnormal myelin bonds were also noted.

It was suggested that the hereditable nature of dyslexia may reflect a genetic defect in the cellular programming of neural migration occurring at a time when the left-hemisphere cortex is more vulnerable to insult than the right-hemisphere cortex (Galaburda and Eidelberg, 1982).

Other Findings

There are several naturally-occurring conditions that manifest as one of their symptoms a specific learning disability. Lewandowsky (1985) states that children with various genetic and neurologic syndromes have been either neglected or misunderstood by the individuals working in the field of learning disabilities. It is especially important that teachers, researchers, and clinicians recognize this small subgroup.

Turner's syndrome, a chromosomal abnormality with a
karyotype 45, XO presents itself with several well documented physical anomalies including underdeveloped sex organs, webbed neck, and short stature. These individuals may also demonstrate motor, cognitive and perceptual deficits that affect their visual-motor, visual-spatial, and mathematical abilities. Even though their language skills are intact, they are unable to solve a maze accurately, do a complex puzzle, or draw a design (Lewandowsky, 1985).

Children born prematurely who have sustained an intracranial hemorrhage frequently demonstrate learning disabilities. Lewandowsky (1985) followed through 15 such children, who can now be identified with ultrasound and CT imaging techniques, and found that 13 of them manifested one or more of the following problems: developmental language delay, perceptual deficits, cognitive limitations, mild-to-moderate motor problems, attention disorder and soft neurological signs.

Children whose connecting fibers between the hemispheres are incompletely developed also frequently experience learning disabilities. This disorder can be found during an autopsy but improved scanning techniques can enable the problem to be found immediately after birth.

Finally, many children acquire learning disabilities as a result of head injury. The brain injury is frequently sustained in car accidents, falls, abuse, and sports injuries. Learning disabilities can also result in the event of brain tumors.
Chapter 3

The Information Processing Perspective of Learning Disabilities

Much of the current information on learning disabilities has come about because of the influence of the computer-based models of learning and memory. These models propose that learning and memory are composed of a number of stages operating with various underlying processes at each of the stages (Bauer, 1982).

Cognitive or information processing psychology examines how sensory input is transformed, reduced, elaborated, stored, retrieved, and used. To understand how each of these processes plays a part in information flow, three general components must be clarified. They are as follows: (1) the structural component that is compared to computer hardware. Within this structure, information can be processed through three stages: sensory storage, short-term memory, and long-term memory; (2) the strategy component, analogous to the software of a computer and describing the operation occurring at the various stages; and (3) the executive process, used to monitor and oversee the learners' strategies. Operations at each stage change information for entry into the next stage. This succession of stages often is presented in flow chart form since this model consists of a series of stages and components (Swanson, 1987).
Meaning is obtained through an interconnected network of concepts called a semantic network. This network consists of each individual's separate listing of ideas composing their notion of a particular word or concept. After the features of the word have been picked up, buffered, and synthesized, the word triggers a response in semantic memory and the process of conceptualization takes place (Farnham-Diggory, 1978).

Swanson (1985) suggests that the information processing approaches used by learning disabled children do not appear to exhaust or perhaps even to tap the intellectual level of these individuals. It appears that the learning disabled populations failure with scholastic as well as with social interactions has been demonstrated by their inability to shift from one strategy to another, to process information with one strategy and then select another, to abandon inappropriate strategies, and to consider several processing approaches in rapid succession.

While earlier studies have been directed at learning disabilities in general, there is a growing trend toward research on the applied learning tasks (Farnham-Diggory & Nelson, 1984). Various cognitive models have been used to examine reading, writing, spelling, and arithmetic. Research utilizing the information processing perspective is being undertaken in these areas as well as in the areas of memory storage and retrieval (Swanson, 1987). The following are summaries of studies in the areas of reading,
writing/spelling, and arithmetic disability.

Reading Disability

Research involving the processes involved in word recognition is imperative when an attempt is made to understand the cognitive processes involved in reading by the learning disabled population.

Samuels, (La Berge & Samuels, 1974; Samuels, 1987) noted that there are four key elements to be found in studying a person's reading abilities. The first element, attention, may be considered to be the effort or energy required to perform cognitive tasks. In order to read, the words must be decoded and meaning has to be fabricated. These tasks require attention. It appears that poor readers consume so much attention decoding the material that there is little left to decode the meaning.

The second stage of reading entails visual memory. This stage is responsible for the reader's ability to take print from the page and chose an appropriately-sized print unit for word recognition. For example, the experienced reader will select entire words while the novice will select letters as the units of word recognition.

The third element is phonological memory, which represents the sound units. The sound units vary in size from phonemes to morphemes. Learning how to read entails learning how to map the sound unit onto the appropriate visual unit.

The fourth, and final, element is semantic memory,
where various kinds of declarative and procedural knowledge are stored and where lexical information dealing with words and word meaning is stored. Research into word recognition, as well as the key elements in reading, is necessary to understand the processes involved in reading and by implication the processes that break down for the learning disabled.

Elbert (1987) investigated the process of word recognition in a group of learning disabled youngsters. Word recognition is thought to involve the initial stages of perception and memory encoding whereas comprehension is thought to involve linguistic and semantic memory networks. Sternberg's recognition memory paradigm (cited in Elbert, 1987) was used. This paradigm allows for the separation of processing time into encoding and memory search stages and is, therefore, particularly well suited for studying the learning disabled population. It was found that learning disabled children are generally poorer in performing memory operations but are not different from good readers in the speed that they encode words into internal representation.

A simplified prototype of the cognitive model of reading disability would involve the reader's attending to the first visual portion of the word. Furthermore, the reader then would retrieve an auditory associate from long-term memory, holding on to that association while attending to the next visual part of the word until he had completed reading the entire word. At that point, the
auditory particles would be integrated and activated sequentially with adjustments made in articulation. For example, when reading the word particular, par, ti, cu, lar, reading would include a learned instruction to emphasize the ti (Chomsky & Halle, 1968).

Research conducted by Farnham-Diggory and Gregg (1975) on good and poor readers would lead us to expect that the learning disabled population has a difficult time matching patterns phonemically and may be unable to analyze syllables into phonemes. This specific inability to analyze syllables into phonemes has been suggested (Savin, 1972) by the inability of poor readers to learn pig Latin as well as experience difficulty with rhyme. Thus, this population may have a problem with visual chunking and auditory chunk-matching. Short-term memory capacity may present a problem for the learning disabled person since the reader must hold onto visual information as he switches to auditory equivalents. The reader then holds onto the auditory information while locating the next visual chunk of information.

Farnham-Diggory and Gregg (1975) also suggested that memory scanning must occur both in the early process of keeping track as well as during the final stage of word integration. Without this function, the reader would be unable to keep track of his place during reading.

Farnham-Diggory and Gregg (1975) also investigated whether children with reading difficulties process the basic
concept of letter patterns apart from knowledge of spelling patterns. They looked at absolute capacity as well as modality switching in memory span data. They found that the transfer of control from visual to auditory short-term memory and from auditory to visual short-term memory seemed to revive the memory capacity for good readers but did not eliminate the fatigue in poor readers.

Spring and Capps (1974) investigated reading in learning disabled readers (dyslexics). Their study tested a model attributing the impaired recall of dyslexic children to slow speech-motor encoding. They found that dyslexics were slower than normal children on naming-speed tests. Based on Atkinson and Shiffrin's (1968) two-storage memory model, when an item is presented for reading it is encoded to a speech-motor response and stored, for a brief period, in short-term memory. If the items in short-term memory are rehearsed, they may be transferred to long-term memory. If the items are presented rapidly, however, the probability of recall is reduced.

Writing and Spelling Disability

The reading disabled individual's problems in that area are reflected by deficits in writing as well (Critchley, & Chritchley, 1978). In adolescent dyslexics, the errors evident in written work can greatly exceed the errors in reading.

Writing is a motor as well as a linguistic act, and it is difficult for the individual to learn how to form letters
and orient them on the page. Letter confusions (between b and d or m and n, for example) letter reversals, and fusions of adjacent letters are common in young children who are attempting to acquire the coordination for fluent writing at the same time (Ellis, 1984).

There are very few cognitive models of writing. It appears, however, that a writing model would be similar to a model of speech production (Fodor, Bever, & Garrett, 1974). There would exist a high level executive scheme directing the entire writing operation. At the next lower level will be what in writing is referred to as a genre scheme. A genre scheme consists of the knowledge available for directing a specific type of writing. Beneath the genre scheme exists the content processor that draws semantic material from memory and organizes it according to instructions received from the genre scheme. The gist then goes to the language processor that puts it into content. Therefore, writing consists of the gradual elaboration and refinement of relevant schemes at different processing levels. If there are problems with processing information, it will be reflected in the inability to write.

To the learning disabled individual, writing is usually a painfully slow process. So slow, in fact, that learning disabled college students frequently cannot take notes during lectures, nor can they complete examinations during time allotted. Not only is the student a slow writer, but the individual also may experience difficulty with spelling.
In fact, there is consistent evidence that the inability to spell accurately and rapidly may be one of the most common identifying characteristics of the learning disabled population (Gerber, 1984).

Although the total empirical as well as clinical literature on various aspects of spelling is quite large, there have been few attempts to select what information processing requirements may underlie spelling performance. Some exploration (Gerber & Hall, 1987) has gone into small "protomodels" of spelling. Under the current protomodels of spelling, flexible access to, and use of, short-term, limited capacity memory is implied. How relationship between modes of access to stored spelling information and stimulus coding is crucial when examining the learning disabled student's error making and slow rates of acquisition.

The most popular current theme in regard to spelling and the learning disabled population presumes a two-channel processing model (Gerber & Hall, 1987). Spelling knowledge is thought to signal pronunciation and syntactic-semantic identity and function. Stored knowledge about spelling is assumed to be representative of either word specific knowledge such as morphemic information about irregular words and homophones or knowledge about grapheme-phoneme correspondence rules or the relationship between pronunciation and graphemic patterns.

Spellers are assumed to select either a lexical or a
nonlexical processing system to generate or recognize words. Each of these systems includes modes for directing attention to the relevant stimuli, searching and retrieving information from memory, and assembling or cuing response programs. Spelling error is predicted as a function of the breakdown in the processing system or channel responsible for selecting and encoding stimuli as well as inadequacies in the content or organization of stored spelling knowledge.

Failure of the lexical mode entails a breakdown in the processing system responsible for selecting and encoding stimuli for examination or decision. Failure of the nonlexical mode relates to inadequacies in the content or organization of stored spelling knowledge (Seymour & Porpodos, 1980).

Farnham-Diggory and Nelson (1984) examined the lexical and nonlexical processing systems and determined how the systems might operate. They noted that when examining some written words there were obvious increases in pause latency before a burst of writing while other written words, usually consisting of more difficult words, did not appear to show an increase in pause latency. It appeared that words that were more difficult to the speller resulted in what they termed a LOOK-UP program where a rapid output of a stored sequence of graphemes were produced. The easier words were subject to what they termed the SEGMENTATION program that is characterized by coding of the phonemic string into segments small enough to be held in short-term memory where they can
be recoded for output.

If Farnham-Diggory and Nelson's (1984) assumptions are correct, the learning disabled population, due to immature development of information processing skills, should have access to stimulus words in a lexical processing channel (LOOK-UP). This should occur for both easy and difficult words.

Learning disabled spellers may become accurate spellers in a slow, plodding way (Gerber & Hall, 1987). Apparently, however, they do not develop spontaneously sufficient speed in basic processes so that the more elemental process components can be reorganized and stored as complex program of processing instructions.

Arithmetic Disability

Many studies have investigated reading and spelling disorders, but few have investigated arithmetic disorders. Batchelor, Gray, and Dean, (1990) suggested that a possible reason for this apparent absence of interest may be that there exists a tacit assumption that difficulties with arithmetic may indicate a more permeating language disorder.

Witelson (1977) and others (Orton, 1937; Dalby & Gibson, 1981) have found that dyslexia is predominantly a brain hemispheric phenomenon. It appears that the dyslexic processes information in the left hemisphere similarly to the way that information is processed in the right hemisphere. Arithmetic disability, on the other hand, appears to be a left hemispheric problem (Farnham-Diggory,
1978). It appears that there is a complex neuropsychological factor underlying arithmetic performance (Batchelor, Gray, & Dean, 1990). Whatever the underlying cause of arithmetic disability, it presents a serious problem to the afflicted individual.

Dinnel, Glover, and Ronning (1984) attempted to explain how solving math problems is aided by pencil and paper. According to their provisional model of mathematical problem solving, the working memory's activities are seen as being supported by the problem task environment and long-term memory. The task environment component provides an organized, continual visual stimulus. The visual stimulus is seen to function as an external memory for the stimulus while it is also seen to function as an externalized representation of the problem.

The long-term memory component of their information processing model contains math facts ($2 + 2 = 4$) and math processes (subtraction, addition, etc.). The long-term memory component is seen as the location for arithmetic facts, vocabulary, problems, heuristics, and algorithms. This information may be employed in the working memory or accessed, held briefly in the working memory, then placed into the external memory storage in the problem task environment.

Working memory is the most active component of the model. Mathematical problem solving in working memory contains three major processes: (1) Representation of the
problem (e.g., reading and interpreting the problem); (2) retrieving the information that is relevant to the problem from long-term memory; and (3) reporting the problem (e.g., writing, verifying, and editing).

Pellegrino and Goldman (1987) presented an information processing analysis of knowledge and performance in three areas of the elementary mathematical curriculum. They found that adults have two basic types of mathematical knowledge. The first consists of declarative knowledge that is an interrelated network containing the basic addition facts. Essentially, declarative knowledge consists of things that are true or false. Strength of stored information varies and time to activate a piece of information varies accordingly. The second type of knowledge consists of methods that can be used to derive answers for problems that lack presorted answers. This is known as procedural knowledge.

The emphasis that Pellegrino and Goldman (1987) placed on analyzing mathematical knowledge is in diagnostic analysis of the knowledge underlying the less than expert performances exhibited by disabled children. Answers to research questions raised by their study should assist in providing a basis for understanding and may contribute to the remediation of some of the problems experienced by learning disabled children in the area of arithmetic.
Chapter 4

The Behavioral Model of Learning Disabilities

The behavioral model purports that the environmental history of the child is important in shaping his behavior, including any inappropriate learning. According to Koorland (1986) when the behavioral model is operationalized the following four steps are employed: (1) the behavior is pinpointed and targeted for change; (2) the behavior is measured directly; (3) a change in the events antecedent to the behavior and/or consequent to the behavior is instituted; and (4) evaluation is made. If the goals are not attained attempts are made again. The methodological foundations of the behavioral model are derived from B. F. Skinner's principles of operant conditioning (1938). One of the assumptions underlying the behavioral model is that a small set of principles may be used to explain all behavior, whether it be simple or complex in nature, and regardless of specific organismic variables (Torgesen, 1986).

Many supporters of the behavioral model have adopted the view that initial causes usually cannot be assessed and, if they could, they would be of little consequence. Appropriate remediation procedures based on helping the learning disabled individuals acquire learning skills and strategies that should have been previously acquired are more appropriate and useful (Adelman and Taylor, 1986).
Proponents of the behavioral model of learning disabilities believe that educators should teach directly the academic and social behaviors necessary to succeed in school (Poplin, 1988).

Lovitt (1975a, 1975b) wrote several articles concerned with the classroom implementation of the behavioral model. Teachers were instructed to task-analyze the skills necessary for success and to modify the students' behavior by applying principles of reinforcement. The use of reinforcement was common. Several types of reinforcement were used: praise, money, food, etc. Sometimes token systems were established. Criterion-referenced tests were created to attempt to determine which academic behaviors a student lacked. Programmed materials were devised to assist students, particularly in reading, math, and language (Poplin, 1988). Englemann and Bruner's Distar materials and programs for teaching reading, language, and math skills were used as tools to implement an intervention (cited in Adelman & Taylor, 1983).

The behavioral approach toward teaching is oriented toward the processes by which human behavior is shaped and reinforced. The focus is on changing the behavior of the child, specifically basic academic and social skills. The emphasis is on breaking learning tasks down into a series of small, sequenced behaviors (Adelman and Taylor, 1986).

There are six basic models of teaching that fall under the behavioral approach. They are as follows: (1)
assertiveness training; (2) self-control through operant methods; (3) training model; (4) stress reduction; (5) contingency management; and (6) desensitization. These different approaches are matched to the various students and represent an assortment of alternative approaches so that the teachers can help the children obtain a variety of goals (Joyce and Weil, 1980).

Instruction is frequently directed toward some of the secondary problems that learning disabled children experience. The learning disabled child needs help in understanding himself and gaining insight into his problems. Sometimes there is a problem with self-esteem since self-esteem and self-concept are frequently formed from the feedback received from other people (Blanton, 1984).

Some learning disabled children disrupt their classes. Some laugh at inappropriate times, trip, push, pick on others, throw objects, or hit (Blanton, 1984). These behaviors must be targeted and worked on.

There is a subset of the learning disabled population who are the opposite of the disruptive children. These children are socially withdrawn and experience difficulty expressing themselves. Problems arise when attempting to form meaningful relationships with others (Blanton, 1984; H. B. Levy, 1973).

Process testing has been discontinued as a criterion for diagnosis. This procedure was replaced by the significant discrepancy clause. A significant discrepancy
between academic achievement and potential must be found in order to diagnose a child as learning disabled (Poplin, 1983).

Since these children must be carefully observed and tested in order to determine the exact problem, several assessment tools have been devised.

Assessment of the learning disabled population has been attempted with the use of many psychometric tests. Some of the more popular procedures will be discussed in the following section.

Assessment of the Learning Disabled Population

Cruickshank (1981) stated that much of the confusion regarding learning disabilities in children comes from the failure to differentiate between learning disabilities and educational problems that are primarily related to environmental causes.

Problems exist also in noting the differences between children whose functioning level is low overall and children who are low in only a few areas. It is now known that there are three distinct, yet overlapping, areas in the field of special education. As Hallahan and Kauffman (1976) pointed out, these areas are known as learning disabled (LD), emotional disturbance (ED), and educable mental retarded (EMR). Discernment among the three areas can be difficult. Testing for learning disabilities entails several areas. Intelligence is usually tested with the Wechsler Intelligence Scales (WPPSI, WISC-R, WAIS) and the
Stanford-Binet Intelligence Test. Testing achievement in reading, math, mechanics of English, and spelling is usually accomplished with the Metropolitan Achievement Test, California Achievement Test, Wide Range Achievement Test, and the Woodcock-Johnson Psycho-Educational Battery. The Bender Visual-Motor Gestalt Test, Developmental Test of Visual Perception, Lincoln-Oseretsky Motor Development Scale, and the Graham-Kendall Memory for Designs are some of the tests used to test the Perceptual Motor area. Testing for Language is frequently done with the Illinois Test of Psycholinguistic Abilities, Test of Written Language, Peabody Picture Vocabulary Test, Wepman Auditory Discrimination Test, and the Goldman-Fristoe Test of Articulation. Testing for social and emotional functioning is accomplished with the Vineland Adaptive Behavior Scales, Sentence Completion, Children's or Thematic Apperception Test, and the Rorschach (Adelman and Taylor, 1986).

Assessment of learning disabled children has not only focused on academic achievement but also on special abilities such as auditory and visual discrimination, receptive and expressive oral language, perceptual-motor performance and reading (Hallahan and Kauffman, 1976).

A major goal of assessment of the learning disabled population is to devise procedures that assess functions in the auditory and visual receptive modalities. The Luria-Nebraska Neuropsychological Battery for Children and the Reitan-Indiana Neuropsychological Test Battery for
Children provide relevant information for the evaluation of learning disabled children (Obrzut and Hynd, 1983). Soft neurological tests (involuntary motor reflexes) have been used along with the lists of characteristics of brain damaged adults in the past to determine the presence of minimal brain dysfunction. Eventually the electroencephalogram was included to determine the presence of learning disabilities (Poplin, 1988). Other neuropsychological research methods include Brain Electrical Activity Mapping (BEAM), Regional Cerebral Blood Flow, Magnetic Resonance Imaging (MRI), and Ultrasonography (Smith, 1991).

New technology such as computerized tomography CT and position emission tomography PET scans provide opportunities to examine the brain. Also advances in understanding of the microscopic structure of the brain has allowed professionals to reexamine how the brain stores, perceives, and makes use of information (Obrzut and Hynd, 1983). Important information regarding the learning disabled population can be discovered from the tests used in their evaluation.

In the Petrauskas and Rourke study (1979) three reliable subtypes of reading-disabled children were found. The largest subtype of reading-disabled children had an approximate ratio of three males to one female. This group of subjects exhibited the largest discrepancy between WISC verbal IQ and performance IQ (favoring performance IQ). Additionally, their scaled scores on the WRAT reading and
spelling subtests were poorer than their arithmetic subtest score. A second subtype exhibited less of a discrepancy on the WISC verbal-performance scales. This group of children produced a pattern known as the ACID pattern on the WISC. The ACID profile consists of low scores on the Arithmetic, Coding, Information and Digit Span subtests. Their scores were uniformly poor on the WRAT reading, spelling, and arithmetic subtests. Their auditory-verbal and language-related problems were less severe than the problems of Subtype 1. Subtype 3 had average visual-spatial abilities, no clear deficiency in verbal comprehension, some problems in psychomotor skills, some problems on tasks involving the generalization of verbal information and verbal coding. These children demonstrated difficulty with the right hand as compared to the left hand on both the Tactual Performance Test and the Finger-Recognition Test. This group had difficulty in conceptual flexibility, especially when it involved linguistic coding. This group also demonstrated the ACID pattern on the WISC (Rourke and Strang, 1983).
Chapter 5

The Role of Subvocalization
in Learning Disabilities

Subvocalization in reading has been of interest to psychologists and educators for years. The phenomenon has been called silent speech, inner speech, phonemic recoding, speech recoding, and acoustic recoding (Klieman, 1975).

In 1908 Huey (cited in Swanson, 1983) stated the following:

There can be little doubt that the main meaning comes to consciousness only with the beginning of the sentence utterance, and the reader does not feel he has the complete sense until he has spoken it. He is almost sure to deliberately say the passage over to himself if it is difficult and persons who do not read very much must usually use an actual whisper, even in easy reading, if the meaning is to be obtained. (p.147)

Huey (1908) also stated that subvocalization seems to help hold the word in consciousness until enough other words are given to combine with it in a sentence. He stated that it is of service to the reader or listener that at each moment a great amount of what is being read should hang suspended in the primary memory of the inner speech. Huey went on to say that without something of this effect there would be no comprehension of speech at all (cited in Baddeley, Eldridge, and Lewis, 1981). Many studies have been used to understand more fully the effect that
subvocalization has on reading for meaning. The function of subvocal speech in reading, however, continues to remain a puzzle (Slowiaczek and Clifton, 1980).

Baddeley, Eldridge, and Lewis (1981) state that there are three main paradigms used to study the role of phonological coding in reading. The first deals with electromyographic monitoring of the muscles involved in vocalization in an attempt to study the role that articulation plays in reading. This approach is open to the problem that muscle tone may increase as task difficulty increases, creating problems with interpretation.

The second approach to phonological coding in reading is to instruct the subject in the use of a task to detect non-words within a sequence of normal English words. Evidence can be produced of the type of coding involved by changing the nature of the non-words (Braddeley et al, 1981).

The third approach to the role of phonological coding in reading uses a technique in which the subject is required to repeat an irrelevant item subvocally while reading. This has been referred to as articulatory suppression. The subject's comprehension is then tested. When this technique is used, articulatory suppression does cause performance decrements, especially when the material is being read, as opposed to being heard (Braddeley et al, 1981).

Using the third approach, Slowiaczek and Clifton (1980) found that subvocalisation is of value in reading for
specific types of meaning. They had their subjects count or say "colacolacola..." aloud. The effect of blocking inner speech was specific to tests that required integration of concepts within or across sentences as compared with tests that required memory of individual word concepts only. They found that combining concepts and integrating ideas does require subvocalisation.

Slowiaczek and Clifton (1980) offered two hypotheses as to how subvocalization helps in sentence comprehension. The "memory" hypothesis claims that subvocalization translates a visual input into a phonological code, and that code lasts longer than a visual code would last in working memory. Klieman (cited in B. Levy, 1977) stated that this hypothesis claims that lexical access of the words occurs without speech recoding, but the recoding subsequently occurs in working or short-term memory so that single items may be kept active long enough for semantic integration to occur.

Since the "memory" hypothesis relies on the assumption that phonological information can be maintained in memory for a longer period than visual information and that more elaborate sentence processing requires more time and a memory code that lasts longer, Slowiaczek and Clifton (1980) offered their own hypothesis. They stated that their "prosodic structure" hypothesis does not rely on those assumptions. Rather it suggests that subvocalization reorganizes the visual input into a representation that allows ready access to the information needed for processing
a sentence. The authors state that spoken language has an abundance of information other than the sounds that make up each individual word. Studies by Cutler and others (cited in Slowiaczek and Clifton, 1980) have shown that listeners use this other information to comprehend sentences.

B. Levy (1978) summarized evidence suggesting that speech recoding is necessary for lexical access. With the assumption that short-term memory was a phonemic store, five types of supporting evidence were cited: (1) Sperling's finding that tachistoscopically presented letters were, for the most part, forgotten 250-500 msec following presentation. This finding suggested that visual representations fade rapidly in memory; (2) Conrad's finding that errors in short-term recall were similar to those found in listening, even for visually presented lists. This finding suggested that visual events were phonemically encoded in short-term memory; (3) Murdock's finding that the final items were retained more effectively if they were presented auditorily rather than visually; (4) Murray's finding that there is a high correlation between recallability and loudness of the vocalization; and (5) B. Levy's finding that visual recall was decidedly reduced when speech recoding was suppressed, and auditory recall was unaffected (cited in B. Levy, 1978).

Although there has been little investigation into the role of subvocalization in the learning disabled population, it seems that these individuals have a problem in this area.
Brutten, Richardson, and Mangel (1973) state the following about learning disabled children:

Some children have great difficulty with "inner speech," the use of words in thought and in concept development. This problem is called central aphasia or, if severe, global aphasia. When the child is unable to think in words, concepts are limited, thought patterns are disorganized, and ability for abstract reasoning is restricted. (p. 40)

Swanson (1983) investigated the role of subvocalization in the learning disabled population. Two groups, nondisabled readers and learning disabled readers, were compared, under conditions of suppressed and non suppressed subvocalization, on silent reading and listening comprehension of noun lexical, verb lexical, semantic and inferential sentences.

Swanson (1983) found that disabled readers find reading comprehension more difficult when they must combine concepts and integrate ideas. Both groups, however, are comparable in reading comprehension of noun lexical changes when allowed to subvocalize. Subvocalization seems necessary for comprehension of individual words in both groups. The author found, however, that while subvocalization is vitally important for non learning disabled readers' comprehension of combined concepts, it is not as important for the learning disabled group. In both groups, comprehension was found to be more difficult for an inferential than a lexical change question. Regardless of the group, the subjects had less difficulty comprehending noun lexical and semantic
test sentences than the same type of sentences presented in silent reading. Learning disabled readers' comprehension of noun lexical changes was superior to the other types of sentences presented in the study. Non disabled readers' comprehension of noun lexical changes was better than the other sentence types only when they did not suppress subvocalization.

Swanson (1983) stated that his study sought to address the role of subvocalization for noting differences in learning disabled and non learning disabled readers' reading comprehension. He considered three interpretations for the findings.

First, Swanson (1983) stated that the counting task may be seen as dividing available attention. Disabled individuals' attentional resources may be too limited to handle both counting and reading at the same time. Evidence, however, argues against such a simple explanation (Swanson, 1983).

Second, the direct pathway hypothesis was considered in the above study. The findings seem to support the notion that as comprehension requires more meaning-related responses, subvocalization is not as necessary. When both groups of readers' semantic memory skills are taxed, they took a direct route, bypassing subvocalization to determine a passage's meaning. Swanson (1983) found, however, that since the disabled group's comprehension of semantic changes was inferior to the non learning disabled group, regardless
of the subvocalization conditions, the mediational effect of subvocalization may not simply be a matter of availability and utility for readers at different levels.

Third, the working memory hypothesis may account for dislexic's comprehension performance. This hypothesis stated that subvocalisation translates visual information into a verbal code. This verbal code lasts longer in working memory than does a visual code. In Swanson's (1983) study both disabled and non-disabled readers reading comprehension of lexical change was interfered with when subvocal suppression was used. Both Kleiman (1975) and B. Levy (1978) demonstrated that engaging in activities that tie up speech production disrupts some types of sentence comprehension. According to B. Levy (1978) these disruptive activities interfered with phonological codes and short-term memory. Swanson (1983) stated that his study extended the working memory hypothesis by suggesting that subvocalization is used in mediation if the subject possesses the prerequisite semantic knowledge to infer passage meaning.

Swanson (1983) interpreted the results found in his study to be an extended working-memory hypothesis. His findings supported the theory that learning disabled readers' deficient semantic knowledge hinders their utilization of subvocalisation strategies. The working memory hypotheses suggests that words can be accessed meaningfully without subvocalization. Subvocalization occurs, however, in working or short-term
memory in order to keep information active enough to enable semantic comprehension (Baddelley, et al, 1981).

Kleiman (1975) found that blocking the subjects' subvocalization interfered with their ability to comprehend the meaningfulness of sentences read. He suggested that adequate judgment of a sentence requires that subject hold the sentence in memory. Therefore, it seems likely that preventing subvocalization impairs memory for a sentence. This finding is in agreement with findings showing that learning disabled readers' experience problems with working memory. Therefore, it may be argued that dyslexics poor comprehension and memory on a number of tasks is related to subvocalization (Swanson, 1983).

Investigators have used serial memory tasks for studying basic skills or abilities in processing and coding serially presented information. An essential requirement of serial memory tasks is that subjects retain information concerning the order of the stimuli that are presented. The rationale of most of these studies deals with the requirements of the reading tasks to process and retain information which is presented serially. Standing and Curtis (1989) state that the immediate memory span (ie, number of stimulus items that a subject can report perfectly in sequence after a single presentation) is a measure of exceptional consistency.

Mackworth (1972) has pointed out the central role of memory for sequential probabilities of both letters and
words in aiding word recognition and sentence comprehension. Accordingly, Mackworth states that memory for inter-item relationships (which are sequential in nature) is essential to the development of reading skill because it contributes to the individual's ability to process visual information in increasingly larger chunks.

A strong association between memory span and subvocalization rate has been demonstrated (Baddeley, Thomson, & Buchanan, 1975; Hoosian, 1982). Standing and Curtis' (1989) study examined whether the subvocalization rate effect could be obtained with verbal material showing patterning. They also examined whether the subvocalization rate is superior as a span predictor to other measures of cognitive processing speed.

To test the hypothesis that higher subvocalization rates occur concurrently with increased spans, Standing and Curtis (1989) examined the span for verbal materials of three levels of sequential approximation to English prose, plus nonsense syllables. They found that stimulus materials that possess more organization produce a higher span and a faster rate of subvocalization. The researcher's second experiment followed up the first experiment to obtain four alternative indices of rehearsal speed and to identify the best predictive variable from silent subvocalization rate, whispered subvocalization rate, silent reading rate and voiced reading rate. Standing & Curtis (1989) suggested that memory span is best predicted by age and mean
subvocalization time. Age, however, proved to be the best single predictor of span.

Most research in the area of learning disabilities has been with children. Most studies of learning disabled adults have examined the differences between them and learning disabled children (Runyun, 1991). Wechsler (1981) found that learning disabled adults did poorly on the Digit Span, Arithmetic, and Coding subtests of the Wechsler Adult Intelligence Scale-Revised (WAIS-R). Although dyslexic children may perform well on several of the subtests included in the Wechsler Intelligence Scale for Children, their scores have consistently been found to be deficient for the Digit Span Subtest (Klasen, 1972).

Torgesen and Houck (1980) conducted eight experiments to determine which of several theoretically relevant variables (attention, motivation, mnemonic strategies, subprocessing skills) could account for some learning disabled children's poor performance on tests like the Digit Span subtest of the WISC-R. Atkinson and Shiffrin's (1968) model was used to provide a framework for the authors' discussion of the result of the eight experiments. Torgesen and Houck (1980) stated that Atkinson and Shiffrin (1968) make a distinction between processes that aid memory but are not usually under conscious control (structural) and behavior, processes, or strategies that can be selected and used by an individual to adapt to the requirements of specific tasks (control processes). Subjects were from a
learning disabled group that had been identified as having problems with sequencing or short term auditory memory deficits (LD-S), learning disabled children who performed in the average range on the Digit Span subtest (LD-N), and children with normal academic achievement who performed in the average range of that subtest (N). They found that part of the disparity in recall between the LD-S group and the other two groups may have been the result of differences in processing activities that were under the conscious control of the individuals in the N and LD-N groups. It appeared that the LD-S may not have used certain active control processes to the same degree as the individuals in the other two groups. Evidence from these experiments also suggested that control processes such as cumulative rehearsal and chunking could not have been responsible for performance differences among the groups. The authors (Torgesen & Houck, 1980) stated that although the precise nature of the processing deficits present in the LD-S group is not clear, their research suggested an important role for structural limitations, as opposed to control processing problems, in accounting for the poor performance on the Digit Span subtest.
Method

Subjects
Subjects were 4 learning disabled and 3 undiagnosed men and woman (average age was 31 years). Carl, Mary, Dan, and Jay were learning disabled students attending the Reading Center and Clinic at the University of Nevada, Las Vegas. Permission to sample with learning disabled students from that facility was obtained from the director of that center. The age of the learning disabled subjects ranged from 24 to 40 years, with the average age for that group being 32 years. Two other learning disabled subjects agreed to take part in this project. One of the students dropped out before sampling began when he decided that he did not have sufficient time to take part in the sampling procedure. The other learning disabled subject to drop out of the research was present for one interview and decided that he did not want to participate, again because of the considerable amount of time that would be needed. The undiagnosed subjects were UNLV students interested in the thought sampling procedure. Elsa was a psychology graduate student and graduate assistant working at the Reading Center and Clinic, and Antonio was an undergraduate student who was employed part-time at that facility. Ken was a graduate student in psychology who intended to use the thought sampling procedure on another population of subjects. The
age range of the undiagnosed group was 25 to 35 years with the average age being 27 years. One undiagnosed subject, also working as a graduate assistant at the Reading Center who agreed to take part in the research, dropped out after one session. As with the other individuals who were unable to participate, the time involved in the project presented a problem. Approval for using human subjects in this research project was received from the University of Nevada, Las Vegas Human Subjects Committee.

**Apparatus**

Each subject was provided with a random-interval generating device (beeper) about the size of a package of cigarettes. The device beeped a tone (400-Hz) at random intervals (Hurlburt, 1980). The beep was heard through a small radio earphone attached to it.

The subjects were each given small calendar notebooks (2 1/2 X 4 3/4) with which to write down their inner experiences when they were signaled by the beeper.

**Procedure**

The author used, for the most part, the method of descriptive thought sampling discussed fully in Hurlburt's (1990) book describing the inner experiences of normal and schizophrenic subjects. All subjects were interviewed jointly by the author and Dr. Russell Hurlburt for most of the sessions. Some sessions were conducted by the author alone and other sessions consisted of the author, Dr. Hurlburt and one or two other interviewers. Carl's sessions
were joint sessions that took place during a thought sampling class involving the author, Dr. Hurlburt and two additional graduate students who were involved in the sampling procedure with other populations. All categories of inner experience emerged as a result of these sessions. The emergence of categories resulted from an interplay between the subject and author.

1. Each subject was given a beeper and instructed to wear the beeper with the earphone until they had recorded anywhere from 6 to 10 samples of their inner experience. At each beep they were asked to write down their inner experiences. Some of the subjects used the small notebooks that were provided for them to write on. If they wished the students were instructed to write on larger paper since some of the learning disabled students expressed difficulty writing in a small area. All the subjects were instructed to omit sampled moments that he or she did not wish to share with the experimenters. Within a reasonable period (usually about 24 hours) the subjects were asked to meet with the experimenters to discuss fully each recorded sample of their inner experience. This meeting usually took about an hour.

2. Each subject was interviewed by the author and/or Dr. Russell Hurlburt as well as the two graduate students who were also working with Dr. Hurlburt in this area of research. As the subjects discussed their experiences and were questioned regarding the accounts, the author took notes on their responses. At a later date, the author
organized all of each subject's responses and placed them in categories (Inner Speech, Unsymbolized Thinking, Images, etc.). Characteristics were written, revised in consultation with Dr. Hurlburt and rewritten until each description was felt to convey the experience as accurately as possible.

3. As a final precaution, copies of each chapter were given to the subjects to examine and comment upon. Two of the subjects, however, could not be located. If the subjects disagreed with any part of the chapter, they were instructed to consult with the author so that appropriate changes could be made.
Chapter 7

Interrater Reliability

The method used in this study has sometimes been criticized concerning the possibility that the descriptions may not always reflect the sampled moments. There are two ways that an inaccurate description of a moment may arise: First, the subject may not be an accurate reporter of his own experienced moment; and furthermore, the researcher may not accurately describe what the subject has stated. In regard to the first problem, it is not possible to fully understand the accuracy of an individual's inner experiences, but Hurlburt (1990) provided examples of certain samples where the reliability of a subject could be checked, and he found that in general the subjects' reports were accurate.

Concerning the second source of error, the researcher's failure to accurately describe moments, there is a way to examine the probability of error. Two interviewers can be present during the interview and they can each separately rate the sampled moments of one subject.

In regard to this research, two interviewers individually rated one of the subject's (Carl's) categories of inner experiences. The researcher (also the first interviewer) determined the categories of thinking while the subject was being interviewed as well as after sampling had
been completed and gave the second interviewer a list of the nine categories. Rating was accomplished by scoring each category from 0 to 5, with 5 being the most extreme example of that type of inner experience. Both of the interviewers were involved in a 15 week thought sampling training class conducted by Hurlburt. The subject was sampled and interviewed for this course during a period of approximately 4 weeks.

Ratings of each of the interviewers were correlated. The interrater reliability coefficient for each of the 9 separate categories of inner experience for this subject was calculated across the subject's 31 samples. The results are seen in Table 1.

In general, these interrater reliability coefficients are sufficiently high to give confidence in our method of describing moments.

Note, however, that these ratings are of each individual item. The overall accuracy of judgments about the relative presence of the particular characteristics (averaged across all the items) would be much higher.
Table I

Interrater reliability coefficients for 9 characteristics of Carl's Inner Experience

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Sensitivity</td>
<td>.57</td>
</tr>
<tr>
<td>Images</td>
<td>.93</td>
</tr>
<tr>
<td>Concentrating/Blocking</td>
<td>.37</td>
</tr>
<tr>
<td>Feeling</td>
<td>.71</td>
</tr>
<tr>
<td>Blackness</td>
<td>.79</td>
</tr>
<tr>
<td>Noticing Characteristics</td>
<td>.75</td>
</tr>
<tr>
<td>Almost Inner Speech</td>
<td>.58</td>
</tr>
<tr>
<td>Purposefully Altering Feelings</td>
<td>.85</td>
</tr>
<tr>
<td>Multiple Experience</td>
<td>.39</td>
</tr>
</tbody>
</table>
The Learning Disabled Subjects

The following four chapters contain the descriptions of four learning disabled adults. All subjects were volunteers from the University of Nevada, Las Vegas Reading Center and Clinic. All the subjects had been tested and diagnosed as learning disabled before taking part in this research. The subjects expressed a desire to learn more about their inner experiences as well as to contribute to the study of the learning disabled population. All the subjects gained personal insight into their inner experiences as a result of this study.
Carl (not his real name) was 40 years old at the time these samples of his inner experience were obtained. He was attending classes at the University of Nevada, Las Vegas where he was in his senior year. Carl was an extremely intelligent subject with his IQ having been measured at 139 on the Weschler Intelligence Scale for Adults (in the Very Superior range). His learning disability was primarily in the area of written expression (dysgraphia).

Carl was interested in sampling his inner experiences and was cooperative and eager to be interviewed. He sampled from April 20, 1989, to May 19, 1989, and we discussed 31 samples. Subsequent analysis differentiated nine distinct characteristics of inner experience: (a) Feelings (61%), emotional sensations located in various parts of his body; (b) Concentrating/Blocking Out (30%), a blanking out of everything in his mind. This could be a slow process where conscious input was gradually blocked out or a rapid process of putting things out of his mind; (c) Images (23%), pictures seen directly in front of his visual field. These Images were seen as fully formed or in the process of being formed. Some of Carl's Images were of people or places that he had just seen in reality; (d) Multiple Experiences (19%); concentrating on two activities at one time; (e) Time
Sensitivity (16%), a fine-tuned awareness of time. Time seemed to be compressed or slowed down for him during these brief moments; (f) Blackness (16%), a cognitive shutting down of all mental activities or when he is taking a rest break and is not thinking about anything; (g) Noticing Characteristics (13%), which occurs when he is doing something while being focused on discrete aspects of what it is that he is doing rather than the overall task, (h) Purposeful Altering of Feelings (10%), conscious attempts to produce some change in his feelings; and (i) Almost Inner Speech (10%), a sense of speaking in inner experience but with no actual words being said.

Feeling

Feeling was the most frequently experienced characteristic of Carl's samples, occurring in varying degrees in 19 (61%) out of the 31 samples. Carl experienced Feelings as physical sensations in various parts of his body as well as in an empathetic way, which consisted of Carl's feeling what someone else was feeling (as perceived by Carl).

For example, a physical sensation was experienced by Carl in Sample #6 as a warm Feeling located inside his brain while he was in the process of forming mental Images. He was Imaging himself in helpful situations in response to reading the words "interpersonal relationships" (as discussed above in the Images section). These partially-formed Images were of himself and the various
other people, his wife included, whom he was helping. The Feelings that Carl was experiencing were Feelings of extreme interest in the subject of interpersonal relationships as well as a Feeling of kindness.

Feelings for Carl were sometimes experienced empathetically, such as in Sample #9 when he was watching his professor during lecture and concentrating on the professor's mouth, which was forming the word "there" in the middle of a sentence. Carl stated that he experienced a mental sensation at the moment but, other than that, the beeper "blew away" everything else that was going on other than the awareness of the word "there" and a sensation of knowing what the professor was Feeling. Carl was so closely attending to the professor's mouth that the rest of the professor's face had become a blur (also an example of Concentrating/Blocking Out). The sensation of knowing what the professor was Feeling was experienced by Carl as a weak emotion in the middle of his gut.

Another example of empathetic feeling was Sample #8, where Carl was seeing a girl blowing a bubble with bubble gum (described above in the section called Images). Carl stated that he was experiencing an embarrassed Feeling that was a physical sensation that he described as being "a cold, soft, small wet thing having no locus in my body." This embarrassment was not Carl's own, but was Felt "for" the girl as she was being "caught" blowing the bubble.

At times Carl experienced the disappearance of Feeling,
a lack of something that had been there. For example, in Sample #7, Carl was in class and had been looking at the words "Unconditional Positive Regard, Genuiness, and Empathy" written on the blackboard. While looking at these words, Carl had been experiencing a warm, good Feeling, felt in all areas of his body. At the moment of the beep, he was in the process of finishing looking at the words, and he noticed that the Feeling was going away. The good Feeling was being replaced by an empty Feeling that he described as if it were a "gas tank would feel on empty - like a lack of something being there."

Most of the time Carl experienced his Feelings as being generally present in his body, but with no particular location. At Sample #16, however, Carl experienced a very detailed physical manifestation of a Feeling. While Carl was talking to a friend about moving, he experienced a happy, anticipatory, and light-hearted Feeling as though everything were really good. The anticipatory Feeling was described by Carl as Feeling as though it were physically located inside the top part of his chest just under the collar bone. He described the physical location of the Feeling in detail as a small area that was about 1/4 of an inch in diameter and had no thickness.

As the most frequently occurring event in Carl's samples, Feeling was evident in over half of the cases. Sometimes a physical sensation could be pinpointed by Carl and at other times just a general description of the
experience.

Concentrating/Blocking Out

In 9 (30%) out of the 31 sampled moments Carl experienced himself "as turning everything off" so that he could "take a rest break," a process we are calling Concentrating/Blocking Out. For example in Sample #2 (also described in Time Sensitivity), while sitting in class, Carl was blocking his visual abilities so that everything in his visual field was perceived as unclear or blurry and his hearing so that when the beeper signaled him, the sound made by the beeper was barely perceptible to him. When Carl became aware of the beeper he mentally "turned the sound up," and it whooped up to its normal level.

Similarly to Sample #2 above, Sample #4 (also described in the Images section) was a white blanking of an Image of a man Carl had just seen while he was backing out of his parking space. Carl stated that a small white dot formed in the center of the Image of the man and slowly grew until it had almost completely filled his visual field. Only one percent of this Image retained the remnants of the Image at the edges of his visual field.

Concentrating/Blocking Out could be used effectively by Carl as demonstrated in Sample #19. At the moment of the beep, Carl was lifting a heavy box. His eyes were focused on the top of the brown cardboard box that he was lifting and he was concentrating on the feelings in his back muscles so that he would not strain his back. Carl stated that he
was "leaving his mind open," actively filtering out all thoughts and sensations so that he could focus on the feelings in the muscles in his back during the lifting, so that if he thought that he was going to hurt his back, he would be able to put the box down and avoid injury. Carl stated that the only cognitive activity going on at the time was the concentration on his back. When the beep signaled Carl, it too was perceived to be almost completely filtered out of awareness, starting almost imperceptibly then getting louder, but he "put it out of his mind" until he had safely set the box down. Putting the beep out of his mind was a perceptual process for Carl that consisted of "turning the beep down" to about 20 decibels while he continued to concentrate on lifting. Then Carl allowed the sound to return to its normal level of about 78 decibels when he completed his task.

Carl was frequently able perceptually to turn down and adjust the sound of the beeper when it was necessary for him to do so (as noted above in Sample #19). He was also able to take "rest breaks" because of his ability to block out incoming stimuli.

Images

Images occurred in 7 (23%) out of Carl's 31 samples. Carl's Images were inner pictures that he had experienced in front of his visual field. Some of Carl's Images were realistic, as in Sample #18. Carl was talking to one of his professors about an overhead projector and some ideas that
he had recently developed. While he was talking about the projector, Carl experienced an Image of a projector screen with a realistic yellow Kodak logo on the lower right hand corner.

Carl experienced an Image superimposed on reality in Sample #17 (this sample is also discussed below in Purposeful Altering of Feelings and Multiple Experiences). While riding in an elevator that was painted a yellow-green color that he especially disliked, Carl was attempting to change his dislike for the color to one of liking, and was also looking up at the number "2" which designated the floor that the elevator was on at the time. The number was located above the elevator door. At the moment that he was signaled by the beeper, Carl was experiencing an Image of the number "2" superimposed on top of the actual number "2" that he was looking at. Looking at the number and experiencing an Image of the number were two distinctly different, simultaneous processes for Carl. Looking at the number was an outward process and experiencing the Image was an outward and inward process.

Some of Carl's Images were experienced as several Images in various degrees of formation, as in Sample #6. While reading the words "Interpersonal relationships" from a photocopy of a page of a textbook, Carl was experiencing extreme interest. At that time, Carl was forming a visual inner experience which consisted of five separate Images in various stages of development, from barely there (about 1%
formed) to over halfway (about 60%) completed. The first two separate Images were of himself and his wife standing and talking, the third was of him with another person in which he was the therapist, and the last two were of people that he was helping. The Images were located out in front of his visual field as though he were watching them. In the first two Images he was talking to his wife. These two Images were about 60% formed. In other words, Carl could see himself standing and talking to his wife in two of the Images, but the details were not yet formed. The next Image of himself helping someone was 10% formed. He was aware of what the Image would be of, but it was, as yet, only 10% completed. The last two were only 1% formed. Even though the Images were in the process of being formed, Carl knew what they were going to be but not yet what they looked like. He was aware that the last two Images were of people that he had helped.

Sometimes Carl experienced Images of people that he had just seen, as was the case when he was walking past the UNLV library and saw a girl standing in front of the entrance blowing a bubble-gum bubble (Sample #8). Like the previously described Sample (#6), this visual experience contained two Images seen at once. After seeing the girl, Carl continued walking toward the student union with his head down looking at the sidewalk as he went. Carl experienced a life-size Image of the girl that included the surrounding UNLV campus from the library to the student
union. The Image was in realistic color and accurate brightness, with the green grass, green trees and blue sky being visible. The Image was of the girl standing on the sidewalk outside the library blowing a bubble gum bubble that was so large it came up to her eyes. The girl had an amused, embarrassed look on her face as a result of having recognized that Carl had seen her blow the bubble. Layered over that Image was a close-up Image of the girl's head with the amused, embarrassed expression on her face. The facial features that were relevant in creating the expression, such as the eyebrows, eyes, and mouth, were seen clearly but the other features, including the girl's hair, were obscure. Since the full-body Image featured the girl on the left of that particular Image and the disembodied head was positioned on the right side of its Image, both Images were easily seen at once as though looking at a screen. The two Images together appeared to be one Image surrounded by an edge like a photograph. Carl could also see the actual gray sidewalk that he was looking down at while walking, as if seen through both Images.

Sample #4 was another example of Carl experiencing an Image of a person that he had just seen. Carl was driving out of the parking lot while wearing the beeper with its white earphone in his ear. The Image was of a man he had just seen standing by his car and getting ready to get the aluminum cans out of the garbage can. The man was looking at Carl, and seemed to be wondering, "I wonder why someone
that young (meaning Carl) would be wearing a hearing aid (actually the beeper)?" This Image was in color but lacked detail. Carl stated that he was experiencing a blank white screen, much like a large TV screen, which overlaid the Image of the man, (an example of Concentrating/Blocking Out). Although 99% of the Image had been obliterated by the white screen, 1% of the Image that Carl had been experiencing moments before remained, now seen as black and white remnants of the Image around the edges of the blank white screen.

In Sample #26, while he was looking at a MacTool business card, Carl was thinking about his friend Tim who worked for MacTool. Carl was experiencing a colored Image of himself and his friend standing inside his friend's large tool van. In the Image experience, Carl was standing by the driver's seat in the front of the van and looking toward the back at Tim. The Image was experienced as though Carl were looking at Tim from within the van and he was also aware of himself being present in the van. The skin tone and hair color were distinct, but the man's features were not. The clothing was not distinct although Carl could see that the pants were black and shirt that Tim was wearing was white. The detail of the tools hanging in the van was not clear but the tools in the Image were arranged much more neatly than they were in real life. Carl stated that this Image was the last of four images, and that the other three had been experienced immediately before the beep signaled him. The
other three Images were: Carl outside and walking up to the truck; Carl inside in a full body view; and Tim from the shoulders up.

Images thus occurred in many ways for Carl. Sometimes they were simple such as in Samples #17 and #18 (the number 2 and the Kodak logo as discussed above) and other times complicated such as in Sample #4 where Carl imagined what a person he had just seen was thinking while he was visually experiencing that person. At times Carl experienced several Images simultaneously. Sometimes the Images were not only completely formed but were in the process of being formed as noted above in Sample #6. Completion of the Images was anywhere from 60% down to 1%.

Multiple Experiences

Carl had Multiple Experiences in 6 (19%) out of 31 samples. Sometimes the experience was one of Carl actually doing two tasks at quickly-alternating times such as in Sample #1 when Carl was concentrating his attention on listening to the professor explain a paragraph while attending one of his regular classes. While paying attention to the professor talking, Carl was also reading a sentence in the class text book. Carl defined this process as "time sharing." He stated that attending to both tasks was a process of alternating reading and listening in a quick back and forth manner. Carl stated that his attention was first concentrated on listening and then on reading, blocking out everything else so that he could concentrate
his attention and, consequently, accomplish both tasks. Carl stated that although reading and listening were not actually done at once (both tasks were attended to alternately), he still had a sense of doing both of them at once.

At other times Multiple Experiences were perceived as two distinct processes occurring at one time. In Sample #17 (described above as an example of Images and Purposeful Altering of Feeling), Carl was riding in the psychology department elevator. At the moment of the beep, he was experiencing the yellow-green color of the elevator and attempting to alter his negative feelings for this color. At the same time, he was also looking at the number 2 on the floor indicator above the elevator door and he was seeing an "Image" of the number 2 superimposed on top of the actual number. Carl was confident that he was both seeing the number and Imaging it at the same time. Both processes were visual but were experienced differently. The seeing was experienced outwardly, a looking upward into the elevator. The Imaging was experienced as an inward process (one occurring in Carl's mind) and an outward process (one occurring in reality). Carl stated that at the beep, he was experiencing a light headed feeling while watching the Image of the number and working on changing his feelings about the color.

Another multiple-experience sample was Sample #27. At the moment of this beep, Carl was watching a TV program that
showed a series of beach scenes, where the waves were crashing upon the California coast. While watching this scene, Carl was remembering living in California and going to the beach. This remembering the California beaches consisted of a series of Images of San Diego that were located in the back of his head. These Images had been popping up rapidly, spreading, metaphorically speaking, like the water when a pebble has been thrown into it, and disappearing, one after another in a succession that lasted for half an hour (an example of Time Sensitivity). Carl was also experiencing a Feeling that he described as a "longing heartache" while experiencing this moment. The sensation of watching the Images and listening to the sounds of the waves crashing upon the rocks on TV while also recalling memories of his own experiences at the California beaches enabled Carl to experience the smell of the salt air.

Thus, frequently Carl had several things going on in inner experience at once. He was able to read and attend to a class lecture as though doing both tasks at separate times, an event that he called "time sharing." He frequently experienced several activities at once, for instance in Sample #17 when he experienced an Image while looking at the number 2 and actively attempted to alter his feelings about the color of the elevator (Purposeful Altering of Feelings) at the same time.

Time Sensitivity

Carl experienced Time Sensitivity in 5 (16%) out of the
31 beeps obtained. For example, while eating a sandwich containing lettuce (Sample #3), Carl was sensing his teeth crunching through the individual leaves of lettuce, as well as hearing the sound of the lettuce crunch as he bit into it. This listening/sensing of the lettuce crunching was perceived by Carl as though he could feel and hear the individual, discrete sequence of sensations and sounds as his teeth crunched through the individual leaves of lettuce. He was aware of the individual crunches and the individual time durations between crunches; aware of their patterns: crunch (long delay), crunch (short delay), crunch, crunch, crunch (medium delay), crunch. . .etc. This entire sequence lasted less than 1/4 second (the time of a normal bite through a sandwich), and yet Carl was attending to the sequence and similarities and differences of perhaps 10 discrete lettuce leaves as his teeth severed them. Carl's concentration was not only on the physical sensation that he was experiencing while biting into the lettuce, but also on the sounds of the crunches, which he experienced as being extremely loud. The crunch of the lettuce and the sound of his teeth biting into the lettuce were experienced in synchrony. At the same moment that Carl was experiencing the sound and sensation of the lettuce, he was thinking about taking his daughter to the doctor's office.

In Sample #14, Carl was playing with his pen on the table top while attending a class. He was holding the pen between his thumb and first two fingers while oscillating
the pen, which he balanced on the retainer clip, back and forth over the desk top. While Carl was moving the pen back and forth, he could feel the pattern of friction as the pen slid over the desk's surface. This sensing of the pattern produced a differentiation of the discrete irregularities in the movement of the pen; quick, slow, smooth, slow, quick, quick. . .etc., apparently as the pen clip encountered minor irregularities in the table top Formica surface. This pattern of irregularities was experienced as happening in a cycle, and while the pattern was not exactly the same with each cycle of the pen's moving back and forth, the sequence of patterns was extremely similar. Carl was oscillating the pen perhaps 6 times per second, and noting the pattern of perhaps 6 irregularities within each cycle, and also noting the discrepancies of patterns between cycles. Thus it seemed that Carl was breaking each second down into at least 36 parts and noting irregularities of those parts. Carl stated that he was also experiencing a pleasant feeling associated with paying attention to the inertia that he could feel at the end of each cycle as the pen continued to pull forward, almost imperceptibly, after he started the pen going in the opposite direction.

In Sample #22 Carl was sitting in his car and warming up the engine. He was watching the manifold pressure gauge and paying attention to the pattern of "pops" created by the dual exhaust pipes of his car. Paying attention to the patterns created by the "pops" was a separate, simultaneous
process for each of the two exhaust pipes. The left pipe was not as "ragged" or uneven as the right pipe, and Carl stated that listening to these sounds was not so much a hearing of the noises in the exhaust pipes as a paying attention to the patterned sequence of exhaust noises as they happened in 10-second blocks of time. As time progressed, Carl continued to update each new 10-second block. Carl described the experience of listening and evaluating the "pops" as being a repeating analysis of each section of sound so that he could evaluate the condition of his car engine.

From the five samples of Time Sensitivity that were collected, Carl experienced time in several ways. One of the ways in which he experienced time was to notice discrete patterns in otherwise ordinary activities. For example, the above-mentioned biting through the lettuce in a sandwich was a detailed inner experience in which he was able to attend to the sequence, similarities and differences of as many as 10 lettuce leaves as his teeth bit into them. Moving a pen over the surface of a table became a detailed inner experience for Carl. While oscillating the pen at about 6 times per second, Carl was noting the pattern of irregularities within each cycle and the discrepancies of patterns between cycles. While listening to the engine of a car warm, Carl was able to exert control over the sound level of the beeper to such a degree that he was able to pay attention to the sound of the beeper increasing slowly.
Blackness

In 5 (16%) out of the 31 samples Carl experienced what we have called Blackness. This type of experience occurred for Carl when too many things were going on at one time, when he experienced "overload" and "shut down" his mind, and also an experience was of a Blackness where Carl could not recall anything going on at the moment other than the Blackness and its accompanying feelings and sensations.

In Sample #24, Carl was awakened from a dark sleep that he called his "sugar coma." Carl stated that was seeing a Blackness which appeared before his eyes. Carl stated that it was like looking into a black cave. This was not merely a lack of seeing anything but was instead a positive experience of seeing blackness.

Again, in Sample #31, Carl was signaled at the moment that he was yawning with his eyes closed. He was seeing Blackness and there was no sound and no movement, only a tingling that occurred in the trunk of his body and in his head. The beep allowed Carl to capture what he termed "the awareness" of the pervasive nature of the Blackness that he was seeing at that moment in time. Carl was also experiencing a pulling of the muscles in the jaw area of his face as he yawned. The pulling was located in the center of the jaw and went outward. Carl noticed a searching Feeling at this moment, which was tied into the discomfort that he was experiencing because of the realization of the Blackness and seeming loss of control that he Felt.
In Sample #2, while attending a class, Carl had cognitively "turned everything down" to take a rest break; he was enjoying the quiet and experiencing an inner feeling of peace when he was signaled by the beeper. Carl had turned down his inner volume to such a degree that he could just barely hear the sound of an argument that was taking place between two students in the classroom. This turning down was not experienced as simply a lack of paying attention to the argument, but rather as an adjustment of the volume in his inner experience so that he could just barely hear the student's voices: their tone of voice was audible but the words were not. This turning down of the volume applied to the beep also: he could just barely hear it when it first signaled him. Carl experienced the sound of the beep becoming louder in a continuous, exponentially-increasing "who-o-oop!" of volume, gradually increasing at first and then ever more rapidly (in reality, the beeper's sound is sudden and remains constant) over a period that Carl considered to be 1/10 of a second.

Noticing Characteristics

Carl experienced Noticing Characteristics in 4 (13%) of the 31 thought samples obtained. For Carl, Noticing Characteristics was somewhat like taking a rest break. During these times Carl was paying little attention to his surroundings. He did notice some of his surroundings, however, and especially noticed the colors of the objects that he was looking at.
In Sample #20, while walking down one of the isles of the bookstore, Carl noticed the blue and purple sweatshirts laid out on the display table in front of him. He noticed the UNLV logo on the sweatshirts. He was not only seeing the colors of the sweatshirts, but also the brown of the table that could be seen around the edges of the colored cloth. Other than these visual experiences, however, Carl was not aware of anything else at this moment. He stated that he was "mindlessly walking" and that his mind was not engaged.

In Sample #21, Carl was still in the UNLV bookstore looking at the cover of a book called "Spanish Made Simple." While looking down at the Spanish book, Carl could see a large stack of red English books and another stack of turquoise books. Even though Carl could see the three stacks of books together, the seeing was experienced as emptiness. Carl was looking for interesting books to look at and nothing was holding his interest. Carl experienced an empty feeling located in his head at this moment.

At times Carl was just wandering and doing nothing in particular. This was experienced by Carl as similar to taking a rest break but with more physical activity going on.

Purposeful Altering of Feelings

In 3 (10%) out of the 31 samples of Carl's inner experiences he attempted Purposefully to alter what he was feeling.
For example, in Sample #17 Carl was riding in an elevator. He was actually working at changing his feeling of intense dislike for the color of the elevator walls (which was a strong yellow-green) to a feeling of liking for that color (discussed above in the section on Images). He was attempting to change a "dark" feeling into a "white" feeling. Carl could not describe exactly how this attempt at altering his feelings was being done, but he was confident that he was in fact actively trying to do it. This attempt to change his feelings about the color had been going on for the last three years every time he had ridden in the elevator. The Purposeful Altering of Feelings, however, had been partially successful; he no longer experienced the strong repugnance for the color, but instead was currently experiencing only a mild dislike.

Another example of Purposefully Altering of Feelings was Sample #23 where Carl was trying to create a specific Feeling which would be appropriate to his current reading. He was looking at the written words "Hero/Villain/Victim" while he was reading a Jungian psychology book for one of his classes. Carl stated that the experience was one of searching and waiting for the Feeling appropriate to Jungian psychology to come along. During this searching process, Carl experienced an "open Feeling" that had no particular bodily location, but which began within him and went outward. Carl had been attempting, so far unsuccessfully, to experience the Feelings associated with Jungian
psychology for the entire semester.

Thus, Carl was beeped during the several moments where he was actively trying to change the way that he felt about something. These were intentional, ongoing processes for Carl sometimes taking several years and sometimes being partially successfully accomplished.

Almost Inner Speech

In 3 (10%) of the sampled moments Carl experienced a phenomenon that was similar to what we have elsewhere called Inner Speech, but which lacked some of the characteristics of true Inner Speech. Carl experienced this in different ways. Sometimes he felt as though he had articulated the words and other times as though he were listening to someone else say them and as an "all-at-once" experience.

For example, in Sample #6, Carl was reading the words "Interpersonal Relationships" to himself (this sample was described above in the Images section). Carl had a sense of articulating the words, but lacked the perception of having created and heard the words. Thus, the words themselves were not perceived by Carl as having been spoken to himself as he would have experienced had he been reading them out loud.

Again, in Sample #28, Carl was looking over his right shoulder while backing his truck out of his driveway. At the moment of the beep, Carl noticed the smell of burnt oil. This smell triggered some rapidly-occurring verbal phrases. Two of the sentences were, "If that's my car, I better get
if fixed," and "If that's someone else's car, they better get it fixed or they'll lose their motor." Carl knew that the words originated in his mind and the words were heard to be spoken in his voice, although lacking his normal resonance. The words were as though spoken by a what Carl described as a "dismembered voice" or an "emergency person" heard as though located outside Carl's body. These words are experienced as though a third person were saying them even though Carl was aware of controlling the voice. This experience was passive. It was a hearing that was tied in with the feeling of urgency that Carl experienced when he smelled the oil.

In Sample #30, Carl was standing behind a dresser at a store that he was doing volunteer work at and tucking in his shirt while wondering about the words "Loma Linda". He had just moments before seen a man walk by who had those words printed on the front of his shirt. The wondering consisted of the words "Loma Linda" being spoken in Carl's voice as though he were talking to himself except that the words were experienced all at once rather than in sequence. The experience wasn't auditory, but was more a comprehension of the words being spoken in Carl's own voice.

Almost Inner Speech was the closest that Carl came to experiencing true Inner Speech. He experienced the feeling of creating the words at times and at other times his experience was as though another person had said the words to him. He also sometimes experienced these words as
occurring all at once even though it seemed he was speaking them.

Summary

In summary, Feeling for Carl was the most frequent occurring experience taking place in 19 (61%) of the 31 samples.

Carl was able to block out many of his environmental stimuli to such an extreme degree that he was able to fully concentrate on many tasks as was demonstrated in the Concentrating/Blocking Out samples occurring in 9 (30%) of the samples.

Carl experienced 7 (23%) Image samples. Some Images were directly tied into his feelings, most notably those that he experienced empathy.

Carl was able to experience several things at once as was evident in his Multiple Experience samples that occurred in 6 (19%) of the 31 samples of his inner experience.

In Time Sensitivity, which was present in 5 (16%) of the samples, Carl had a very finely-tuned sensing of time. This awareness involves sensitivity to time that covers as little as a fraction of a second to a slowed down conception of time where a rapidly occurring event is perceived as being gradual.

Blackness, occurring in 5 (16%) of the samples, took place when so many things were going on that Carl would shut down.

Noticing Characteristics, found in 4 (13%) of the
samples, took place for Carl when he was just wandering around not necessarily thinking about anything in general and taking a break.

Purposeful Altering of Feelings was experienced by Carl in 3 (10%) of the sampled moments. It was an attempt to change or produce a feeling about something.

Almost Inner Speech was a form of inner speech for Carl that was close to, but not actually the same as, inner speech occurred in 3 (10%) of the samples.
Mary: A Learning Disabled University Freshman

Mary (not her real name), a learning disabled student at the University of Nevada, Las Vegas, was twenty-seven years old at the time of sampling which began on November 15, 1989, and continued until December 15, 1989. Mary was selected because she was a female and assessed with a learning disability in reading and writing. Mary was an outgoing individual who was attending Freshman level classes, working full time at a Las Vegas casino, and was in the process of buying a triplex apartment during the sampling period. During that time, twenty-two samples of Mary's inner experience were obtained.

The sampling process produced eight distinct categories of thinking. Feeling was experienced by Mary in 14 (64%) out of the 22 samples making this type of experience the most common. Mary experienced Feelings that were in her head, in her body, or in both of those areas as well as Feelings that she could not place physically. Mary experienced Images in 10 (45%) out of the 22 samples. Images were experienced in several distinct ways. She experienced an overpowering Image which was a unique and vivid type of experience for Mary. This type of thinking took place when Mary experienced a bright, overpowering light that literally disabled her momentarily. Moving
Images were experienced in four of the 10 Image samples. This type of experience was as though Mary were watching a movie in 3-D and sometimes in slow motion. Three of the 10 Images were multiple Images. These Images appeared as a collage of Images overlapping one another to produce one complete Image or two distinct Images side by side. In yet another sampled moment, Mary's Image was of words appearing in typed black letters and floating in Mary's inner experience. Unsymbolized Thinking, which was an all-at-once type of thinking experience, was present in 8 (36%) of the 22 sampled moments. Inner Hearing was experienced in 3 (14%) out of 22 samples. Sometimes during the Inner Hearing samples Mary heard her voice, affected by an extremely deep gravelly quality produced by past vocal cord surgery, as being smooth, without the raspy quality. The category Brain Location, in which Mary experienced different things happening on the left and right sides of her brain, was experienced twice (9%). In this instance, Mary could determine the exact location inside her head that she felt that she was experiencing her thoughts and images. Words Present, when Mary had an all-at-once type of thinking experience that was worded, occurred on two occasions (9%). Inner Speech, which was experienced as though Mary were actually talking but without moving her mouth was experienced once (4.5%). Multiple Experiences, moments in which many separate experiences were captured, was experienced in 1 (4.5%) of Mary's samples.
Feeling

Mary experienced Feelings more frequently (14/22) than any other category of inner experience (64%). In many cases, the Feelings were decisively negative and created alarm for Mary.

For instance in Sample #1, Mary was Imaging a boy trapped in a grain elevator and attempting to dig his way out. The Feelings that Mary experienced were those Feelings that the boy was experiencing such as, entrapment, isolation, fear and panic. Mary could not recall noting if the Feelings were located in any particular areas of her body. Experiencing the Image of the trapped boy and its accompanying Feelings was very much like watching a movie for Mary. The Image was lifelike, in color and contained movement.

At times, Mary's Feelings were accompanied by bodily sensations. In Sample #4, Mary was in class listening to the professor reading an article about communism. The professor was reading about how the people in Berlin were afraid to talk. While attentively listening, Mary experienced an insight (also discussed in the section on Unsymbolized Thinking) about how much she appreciated the freedom of speech. She experienced a sense of awe and a thought that went something like, "She is right. I never thought of it that way." Accompanying this thought was a Feeling of pity that was experienced in her heart and covered a large surface area of her chest.
Mary experienced a positive Feeling of inner laughter when she was thinking about her niece coming to Las Vegas to visit (Sample #6). While Mary experienced an Image of her niece, she also had a good Feeling that she stated was like laughing inside and remembering what she was like when she was her niece's age. Mary had an Image of her niece lying on a lawn chair on the sand (also discussed in the section on Images) and rubbing oil on herself, sipping water, and adjusting her sunglasses. Mary also stated that her niece was Feeling angry because she could not get a sun tan. This experience was all part of a moving Image experience which for Mary was very much like watching a movie.

In Sample #15, Mary experienced again the Feeling of inner laughter. While she was brushing her hair, she was experiencing an Image of a snowman painted on her red colored nails. In this Image Mary could see herself wearing her work uniform of maroon and gray and trying to shake the snowman off her nails. Mary recognized the general location of the Feeling of inner laughter to be in her body and head.

Mary experienced many instances of Feeling that were difficult for her to locate bodily. Several times, Mary noted Feelings of awe or wonder somewhat like a realization experience (Samples #4, 9, 17, and 19). She also had negative Feelings that produced sensations of fear or anger as well as happy feelings that were like laughing inside. In two samples (#2 and 8) Mary had a feeling of power. In Sample #2, when stepping on an ant, located in both the body
and head and in Sample #8, when she was thinking about a magazine and whether she could use it in her newly purchased triplex. This time, the location was in her head only.

Images

Mary had Images in 10 (45%) out of the 22 samples. Her Images were experienced in several different ways. Frequently she experienced multiple Images and moving Images. She also experienced isolated types of Images. The content of Mary's Images was experienced to be in motion in 5 out of the 10 Image experiences. Mary described these experiences as being similar to watching a movie since they were three dimensional and in color. At times, however, the motion was slow. In Sample #9, for instance, while Mary was reading a story about a Grizzly Bear attacking a bull she began to doze off and, at that moment, experienced an Image. The Image was in color and detailed. It consisted of a bull in the center of a pen, with a bear coming in from the side of the pen near a fence. The color of the animals was accurate and the grass was green. The Image was seen in 3-D as though Mary were far away, like looking at a 3-D movie. The depth was a little closer than a 3-D movie and consequently, the experience, for Mary, was like a combination of a 3-D movie and a real life seeing. The bull was flipping the bear and Mary stated that she could clearly see the bear as it flipped through the air. The bear being flipped in the air was seen as if in slow motion.

Although moving Images were often experienced by Mary
as frightening (as described above in Sample #1), she did experience several humorous samples. In Sample #6, Mary was thinking about her niece coming to Las Vegas for a visit. She was experiencing a three-dimensional, color, moving Image of her niece lying on a lawn chair sunning herself. Mary could not recall the exact thought content, but she was thinking something which if put into words might be something like, "The Sun Goddess is coming out and I can guess just what she will be doing" (explained more fully in the section called Unsymbolized Thinking). Her niece was sitting in a green lounge chair wearing a bright pink swimming suit. The sand was yellow. A pitcher of ice water, baby oil, and sun screen were on the ground beside the chair. Mary stated that her niece was rubbing the oil on her body, adjusting her sunglasses, and drinking some water. Again this Image was in 3-D. This time, however, the Image was seen with edges and looked as though Mary were seeing it out in front of her visual field as though it were a real movie.

In 5 out of the 10 samples of Images, Mary experienced multiple Images. Multiple Images, for Mary, consisted of several Images in one, usually represented as a collage. For instance, Sample #10, while containing other types of thinking, typifies Mary's multiple Image experience. While experiencing a thought that put into words would be "Gen is coming out on Saturday," Mary was also thinking about how she could get a pass for the Judd's show that was coming to
Caesar's Palace. The thought about Gen was without words and pictures, and although Mary was aware of the thought, the majority of her attention was on the task at hand, doing an English assignment. Mary stated that experiencing the thinking about Gen was like a thought that kept lingering in her mind. Thinking about getting the pass for the Judd's show consisted of visualizing an Image consisting of the show pass, the stage, the Judds, and the accounting department business card. This multiple Image was accomplished by seeing each separate Image on one larger Image collage. Mary could determine that there was no precise colored border but a hazy area on the edge of each Image that separated one from the other. The accounting card section of the Image was on the top of the entire Image and consisted of the word "accounting" on the top of the business card in fuzzy but visible print, with the name "Betty" known to be on the bottom of the card. The word "accounting" was clearly seen by Mary. The name Betty was not seen in the way the word accounting was seen but rather just "known" to be there by Mary since she has seen this card on many occasions. The Image of Naomi and Wynonna Judd was positioned beneath the accounting Image. Both the mother and daughter were seen on the stage in the showroom of Caesar's Palace. The two women were clearly pictured, but the surrounding areas were not. Those background areas appeared to be dimly lit. Also included in this Image collage was an Image of the tickets. The tickets were bold
and bright and clear. The words written on them, however, could not be seen. While experiencing this multiple Image, Mary was also aware of an unrelated single Image that had been there since Thanksgiving (also discussed in the section on Multiple Experiences). This Image consisted of a pile of cardboard boxes on her living room carpet. (The boxes had been placed there in reality and Mary was attempting to reduce the size of the boxes over a period of time.) The Image was in the back of Mary's head and Mary stated that it seemed to be there the entire time that she was experiencing Sample #10 and perhaps for some time before.

Sometimes Mary's Images were of two separate Images side by side such as in Sample #11. While reading a passage about wild horses, Mary was thinking about what activities her niece might enjoy while she was in Las Vegas for a visit. She was thinking that her niece would possibly like to go horseback riding and she was wondering if her niece knows how to handle a horse. At this moment, Mary was experiencing two Images. One of the Images that Mary had was of a horse and rider at a ranch in the mountains. The Image was fuzzy and unclear. It consisted of a person (not necessarily Gen) riding a horse. The other Image was of Gen standing beside a horse. These Images were like two snapshots placed side by side and seen in Mary's inner experience. They seemed to be faded, however, and blended together in the middle almost as though they were merging into one picture.
In one of the less often experienced types of Images, (Sample #13) Mary experienced an Image of the words GET BOOKS and MAIL in bold, black letters, and the word PSYCHOLOGY, also in black letters but not seen clearly. This Image was seen as free floating. In other words she was not aware of there being any background associated with the Image. It seemed to be floating in Mary's inner experience.

In another isolated example, Mary experienced a unique type of Image that can be defined as an overpowering Image. At the moment of Sample #16, Mary was walking through a mall looking for a gift for a friend. As she was walking, she saw a booth with the sign "Touch of Glass" on it. At this moment, she experienced an Image of a bright shining light. The light was like a bright light shining on a piece of crystal with an effect like a prism. She could see an Image of a crystal goblet for a very brief period of time (about 1/2 of a second). The light seemed to come up from behind the crystal and the crystal faded as the light became overwhelmingly bright. This experience lasted for about 30 seconds with the bright light finally fading.

In summary, Mary experienced Images in several ways. Sometimes her Images were overpowering. Sometimes they were multiple and other times they were moving. At times, they consisted of almost unnoticed Images in the back of her head and seemed to have been there for some time.
Unsymbolized Thinking

Many (36%) of Mary's thoughts were expressed in Unsymbolized Thinking (8 out of 22 samples). In this experience, a specific thought was understood to be happening but no words or Images were present.

At the moment of Sample #19, Mary was opening up a bag of sponges to use to clean the bathroom. She had reached her hand into the bag and felt that the sponges were moist. At this moment she had a thought of never having felt new sponges to be moist. This thinking was all-at-once but without an awareness of specific words.

At times the words were known by Mary, as in Sample #4, but she was unsure of the exact words. In this case, Mary was thinking about how much she appreciated the freedom of speech while the professor was discussing the people of Berlin's fear to speak about certain issues. She knew that she was thinking something like "She's right. I never thought of it that way" but she was not certain that those were the exact words or rather the general thought that she was experiencing.

Inner Hearing

Mary experienced Inner Hearing in 3 (14%) of the samples. For Mary, Inner Hearing was experienced as hearing words spoken in her own voice. Her voice was heard with either a raspy or a smooth quality.

In Sample #14 Mary experienced hearing both her natural (raspy) voice and a smooth voice. At the moment of the
beep, Mary was writing checks for payment of her bills and she was also listening to music on the television station. She was experiencing two thoughts, one concerning the water bill and the other about Terrence Trent D'Arby, a singer whose music she was listening to. Thinking about the water bill consisted of a wondering of what the water bill would be like by the time summer arrived. She heard the words, "I don't like the water bill." These words were heard in her own voice with the same inflection, rate of speed and tone that she normally used but without the gravelly quality that was normally present in her voice. Mary stated the hearing of her own voice was as if someone else was saying the words but she was aware that it was her own voice. This thought was experienced on the left side of her brain (an example of Brain Location). At the same time, she also heard the words, "I like Terrence Trent D'Arby" stated in her own voice, with the gravelly quality. This thought was heard coming from the right side of her brain. She stated that both thoughts were heard as though they were being amplified inside her brain.

In Sample #18, while Mary was getting one of her apartments ready to rent, she was thinking about charging "pet rent." She stated that she was thinking of charging $5.00 extra per month and possibly charging an extra $10.00 per month for people with animals. She was debating if people would want to stay or leave if the price went up too high. This experience of debating the pet rent was an audio
experience for Mary. She heard two voices. One voice said, "You should charge $10.00 because animals cause a lot of damage," and another voice said, "You should charge $5.00 cause people won't want to rent." The voice advocating the $10.00 charge was heard as a strong, authoritative voice that did not possess the normal gravelly quality of Mary's natural voice. The voice debating the $5.00 price sounded weaker and possessed the gravelly quality. Mary stated that she had a sense of listening to the voices and not of speaking the words. The voices were heard in the center of her head.

Inner Hearing was experienced by Mary as hearing words spoken in her own voice. Her voice was heard with either its own raspy or a smooth quality.

Brain Location

In this type of thinking Mary experienced words on both the right and the left sides of her brain. This phenomenon was experienced twice (9%).

For example, in Sample #13, Mary was glancing at a note she had written to herself. The note read, "Find out what books I need for next semester." At this moment, she had an "I Love Lucy" rerun playing on her TV set, to which she was partially attending. In addition, she was also thinking that she would get her books while she was on campus for the thought sampling research later in the afternoon. Glancing at the notebook entailed skimming what she had written. Mary noted that the skimming process was happening on the
left side of her brain. Mary stated that this skimming process was one of thinking of several things at once such as coming to UNLV, getting her mail, looking at books, and finishing work on the experiment. She was thinking in Unsymbolized Thought which if worded would go something like, "I'll be at the university today." She stated that this thought traveled in a straight line from the back, right side of her head forward. Implied in the thought was a knowledge of a list of things to do such as getting the mail, looking at books, and finishing the work on the project. There were no words involved in any of the thinking. Mary was experiencing a visualization of some printed words. GET THE BOOKS, MAIL, and PSYCHOLOGY were seen in typed black letters. The word PSYCHOLOGY was not clear. Mary stated that they were free floating inside her head and there was no background. The thoughts on the right side of Mary's brain consisted of immediate things for her to do and the thoughts on the left side as the less immediate things to do.

Sample #14 occurred while Mary was writing checks for payment of her bills (also an example of Inner Hearing). She was listening to Terrence Trent D'Arby on the music station on her television set and thinking about the water bill. The thinking about the water bill seen to be in the left side of her brain and the thinking about the singer was on the right side of her brain. The right-side thinking was experienced as an amplified sound and seemed to fill Mary's
head.

In summary, this type of thinking for Mary was experienced in words on both the right and the left sides of her brain.

Words Present

In two (9%) of the samples of Mary's inner experience she experienced a type of thinking we have called Words Present. In these samples Mary experienced a thought that was in words yet had an all-at-once quality.

For example, in Sample #2, Mary saw a mechanics magazine lying on the counter in a public bathroom, and thought, "Could I use that magazine in my new home?" Secondarily (in reference to mechanics), she also thought, "Maybe I should hire someone. I'm not tax deductible, someone else is." This thinking was experienced in an all-at-once knowing of what words she had said. At this same moment, Mary stated that she could also experience a Feeling of power that was located in her head.

For Mary, Words Present was experienced as a thought that was in words yet was an all-at-once experience.

Inner Speech

Mary experienced Inner Speech once (4.55%) during the sampling procedure. Inner Speech was evident when Mary could recall the exact words that she was thinking and explain how this thinking occurred to her.

In Sample #22, Mary was taking a bite of a bad tasting TV dinner. She experienced the following words: "Oh, my
God, this is horrible. I'm not eating another bite!" Mary noted that at this moment her mind was mentally alert because of the bad taste that she experienced. She stated that she was just "one notch" removed from saying what she had said out loud.

Although Mary appeared to come close to Inner Speech in several of the Unsymbolized Thinking samples, it was unclear (except in this one case) whether what she had experienced was Inner Speech or not. She could not recall the exact wording of her thoughts (other than in Sample #22) and was unable to fully describe other samples as being an Inner Speech experience.

In summary, Inner Speech was an experience of Mary almost speaking the words that were occurring in her inner experience.

Multiple Experiences

Multiple Experiences was a complicated type of experience in which Mary experienced several distinct types of thinking in one beeped moment. This was experienced once (4.5%).

In the single example of this type of thinking, Sample #10, Mary was working on correcting the grammar in an English essay, experiencing frustration, visualizing the worded line that she was attempting to correct in the essay, thinking about her niece coming for a visit, experiencing a multiple Image (see the section on Images), and experiencing a separate Image at the same moment. At the moment of the
beep, Mary was trying to form a sentence while working on an English essay. She needed to correct the grammar in the essay and position the words in a sentence concerning people's displays of hostility. Mary was experiencing frustration at this moment because she kept going over the same problem with her writing and had not been able to solve the problem. She was trying to word the sentence differently but kept ending the sentence that she was attempting to correct in the same way. She was thinking of the worded line and visualization of this worded line may have been seen in her mind, although Mary cannot be certain. Mary was also thinking a thought that, it put into words, might be something like "Gen is coming out on Saturday." This thought was in the back of her mind in the sense that while she was thinking about the sentence formation, the thought was like an intrusion. It was without words and pictures, and although Mary was aware of the thought, the majority of her attention was on the task at hand forming the sentence. Mary stated that the thinking about Gen was like a thought that kept lingering in her mind. Mary was also experiencing a Multiple Image of the Judds, the pass to their show, the stage they would perform on at Ceasar's Palace, and the accounting department business card (see section on Images). While all of this was going on, Mary stated that she was also aware of an Image that seemed to be located in the back of her head. The Image, which Mary stated seemed to have been there since Thanksgiving, was
located inside the right side of her head. The Image consisted of a pile of boxes sitting on her living room carpet. Mary stated that the Image changed over time and went small to larger in area. The boxes seen in the Image were as the boxes had originally looked when Mary had moved into her apartment. When Mary was describing the Image, however, the number of boxes located in her apartment had diminished, but the boxes visualized in her Image was still the same size as they originally had been.

Summary

In summary, Mary had several examples of Feeling. Feeling was experienced in 14 (64%) out of the 22 samples and was the most common of Mary's inner experiences. Mary experienced Feelings that were in her head, in her body, or in both of those areas as well as Feelings that she could not recognize as having a physical location.

Images were experienced in 10 (45%) of the samples. She experienced an overpowering Image, an Image of written words, several moving Images and several multiple Images.

Unsymbolized Thinking was experienced as an all-at-once type of thinking experience and occurred in 8 (36%) out of the 22 samples.

Inner Hearing took place in 3 (14%) of the samples and was experienced when Mary heard her own voice as though someone else were speaking. Her voice was heard with its natural raspy sound and with the absence of the deep, raspy quality.
Brain Location, occurring in 2 (9%) of the samples, was a phenomenon in which Mary could determine the side of her brain that the thinking seemed to be happening on.

Words Present was a type of thinking experience where Mary thoughts were experienced in an all-at-once manner but with her knowledge of the Words Present. This phenomenon took place in 2 (9%) of the samples.

Inner Speech was present on 1 occasion (4.5%). In this case Mary was almost speaking the words out loud.

Mary also had multiple Experiences in 1 (4.5%) out of the 22 samples of her inner experience. In this moment Mary experienced several different types of inner experiences.
Dan: A Learning Disabled University Senior

Dan (not his real name) was twenty-four years old at the time of sampling and was a full-time student majoring in Hotel Management. His learning disability was in the area of reading and writing. He shared an apartment with a roommate and was employed by the local casino as a bartender. Dan sampled from April 18, 1990, to July 26, 1990, during which 30 samples of his inner experience were obtained. Dan was a willing and cooperative subject. Because of a full work schedule coupled with a full-time credit load at school, however, there were times that it was difficult for him to sample. Therefore, sampling Dan's inner experience covered a period of about 14 weeks.

Dan experienced seven clearly distinguishable types of inner experiences. Most frequent were Feelings which were experienced in 22 (73%) out of the 30 samples. Images were experienced 12 times (40%), and Unsymbolized Thinking occurred 10 (33%) times. Brainstorming was experienced during 9 (30%) out of the 30 samples. Less frequently experienced samples of thinking were Thinking/Feeling experienced in 3 (10%) out of 30 samples. Inner Speech was also experienced in 3 (10%) of the samples, and Just Doing in 2 (7%).
Feeling

Dan experienced Feeling in 22 (73%) of the 30 samples of his inner experience. Many times his Feelings were located in the heart area. Dan stated that these "heartfelt" Feelings were sometimes painful for him such as in Sample #2 when he was talking to his roommate about having paid a bill and his roommate was saying that Dan did not pay the bill. Dan Felt anger and frustration at this moment. He stated that he felt frustrated because he wanted to do something about his roommate accusing him, but he could not do anything about it. The Feeling that Dan was experiencing seemed to be located inside his chest area. Dan stated that the anger caused his entire body to become tense, and that he was aware of having extra energy because of the adrenalin that his body was producing at that moment. Dan said that he attempted verbally to explain to his roommate that he had paid the bills and that the experience of talking to his roommate was like not thinking about the words or being aware of the words that he was speaking. Dan was aware of the anger and the Feeling and the energy created by that anger were a powerful experience for Dan.

In Sample #15, Dan again experienced a Feeling in the heart area while he was wondering in Unsymbolized Thinking about why two of one type of fish had died while the other seven fish of that type had lived. Dan was looking at his fish tank while he was Brainstorming (discussed in detail in the section on Brainstorming) and trying to understand what
may have happened to the two fish to cause them to die. At this moment, he experienced a Feeling that he described was as a sadness in the heart area. This Feeling seemed to be located inside Dan's heart and covered the entire area of the heart. Dan stated that the Feeling was like an emptiness and a Feeling of loss in his heart.

In Sample #7 Dan was talking to his friend Doug on the telephone. Doug was talking to Dan about work and how he hated to go in to work on that day. Dan was Feeling empathy and compassion while he was listening to his friend. There were no physical sensations accompanying this Feeling. It was an experience of knowing what his friend was talking about and Feeling what the friend was Feeling about not wanting to go in to work at that time. At this moment, Dan was also experiencing an Image of the restaurant that his friend worked at. This Image seemed to be like a remembering to Dan. It was as though Dan had recalled a memory of the last time that he had been at the restaurant. He was seeing that picture in his inner experience at the time that he was talking to his friend and empathizing about the friend's not wanting to go to work. The Image was from the perspective of walking into the restaurant. It was in color and Dan could clearly see the tables and the people seated at them.

In another sample (#12), Dan was experiencing a tired Feeling over his entire body. He stated that there was a bad Feeling inside his heart that was part of his not
wanting to go to work. Along with this Feeling, Dan was also experiencing an Image of the large casino bar where he works as a bartender. He could see the side view of the bar as he had seen it when he had previously walked into the bar. There was one man pictured in Dan's Image. Dan knew that this was Ray, the bartender, who was dressed in his black and white uniform and counting money as he prepared to complete his shift. Dan stated that although he could see the bar and everything there, there was no detail in the Image.

In summary, Dan experienced many Feelings in his heart area. He also experienced Feelings of empathy and compassion as well as Feelings that were located in his body.

Images

Dan experienced Images in 12 (40%) of the 30 obtained samples of his thinking. Frequently Dan experienced Images while he was Brainstorming (discussed in the section on Brainstorming).

At times, however, Dan experienced Images while doing other things such as in Sample #30 while he was reading a book. In this sample, Dan was reading and as he read he added the items that were discussed in the book to an Image of the scene that he was creating in his mind. Creating the Image was parallel to Dan's reading the written words. Dan felt that creating the Image was accomplished without expending much effort. Rather, he Felt very relaxed and the
pictures just seemed to appear as he read the words. The Image that Dan was creating began with a green valley, and as he read he added a shack along the landscape. Dan stated that the Image was realistic in color and light intensity and had no borders. The Image had depth to it and it was as if he could see as though he were looking straight ahead.

In Sample #20, Dan was feeling stressed while he was frantically looking for his keys. He was in a hurry to find them so that he would not be late for work. Dan was experiencing an Image at this moment. The Image consisted of a picture of the table that Dan thought that he had placed the keys on. In the Image, however, the table top was empty. Dan could see the table top as though looking down from above. He could see the brown color of the empty table top and the edges of it. The feeling of stress that Dan was experiencing had a physical location. The feeling was felt intensely in the back of Dan's neck and less intensely throughout his entire body.

In Sample #29 the experience of Imaging, for Dan, was like a reenactment of his visit with a girlfriend from a few days before the sampled moment. While Dan was sitting and relaxing on his couch, he experienced an Image of his girlfriend's face. Dan's Image of his girlfriend looked exactly the same as he had seen her look when he had last seen her, a few days before. She was seen smiling at him. The Image was in accurate color and seen with no background. Rather, her face was clearly seen by itself. Dan was
experiencing a good Feeling in his heart area at this moment. He stated that the experience of seeing her face in his inner Image was as though he were actually seeing her in person. The accompanying pleasant Feelings, however, were intense.

In summary, Dan experienced Images in many different ways. He created Images to go along with material he was reading, and he attempted to find some lost keys when he Imaged a table that they may have been on. In another instance, Dan experienced an Image that was a recreation of his girlfriend as he had last seen her.

Unsymbolized Thinking

Ten (33%) of Dan's sampled moments consisted of Unsymbolized Thinking, which is a form of thinking accomplished in an all-at-once manner. In each of Dan's experiences of Unsymbolized Thinking at least one other process was occurring in his inner experience.

In Sample #8, while Dan was sitting down to eat lunch, he was looking at the chicken on his plate and thinking in Unsymbolized Thinking, not in words, "It looks good." He stated that the experience was not of forming the words but rather of knowing that the sentence was in his awareness. Coupled with this awareness was a thought that he had been in that situation before and had that thought before. He was also experiencing a Feeling of happiness. Dan stated that it was a pleasant Feeling that was experienced by him as a relief of the tension that he had been experiencing
from being tired and hungry. Dan was aware of the Feeling being one of contentment.

In Sample #22 Unsymbolized Thinking was accompanied by an Image as well as Feelings. At this sampled moment, Dan was thinking in Unsymbolized Thinking about whether he had passed the finance test. The Unsymbolized Thinking was a wondering if Dan had passed the test. This inner experience occurred without words or pictures. At this sampled moment an Image was also occurring in Dan's inner experience. The Image was of the test. Dan could see a piece of white paper with black writing on it. Dan could not read what was written on the paper but he was aware that it was the test questions. The Image had edges and Dan perceived the test from an upward angle as though he were looking down on it from above. At this moment, Dan was experiencing a good Feeling in his entire body. He stated that the Feeling was one of relief located specifically in the heart and the shoulders as well as a general Feeling of relief over his entire body.

In other samples, Unsymbolized Thinking was accompanied by several other experiences. In Sample #15 Dan was thinking about what could have caused two of the fish to die in his aquarium (also discussed in the section on Brainstorming). He was looking at the fish tank and experiencing a Feeling of sadness in his heart area. His thoughts, in Unsymbolized Thinking, consisted of separate thoughts that were perceived as being in a row. The
thoughts were of the different types of illness that could kill a fish, along with thoughts about the aquarium such as, "Is the air pump clean?" Dan stated that it was as though he were saying the words to himself but that the thinking was done rapidly. As he was thinking his eyes were moving from the part of the fish tank that he was thinking about to the next part that he would be thinking about. For example, when he was thinking about the air pump he was looking at the air pump. With each thought, Dan moved on to another part of the aquarium. He did not determine whether that part of the aquarium was a problem, but continued on with his Brainstorming activity. As Dan went from one possibility to the next, he still had an awareness of each of the thoughts and each of the separate possibilities of what could have gone wrong to cause the problem.

Unsymbolized Thinking, for Dan, was always in the company of another inner experienced. Sometimes Unsymbolized Thinking was with Feelings, Brainstorm, and/or an Image.

Brainstorming

Dan experienced Brainstorming in 9 (30%) out of the 30 samples of his thinking. This type of Unsymbolized Thinking was called Brainstorming. While Brainstorming was accomplished by Unsymbolized Thinking, it was a more complex phenomenon, and can be considered a sub-category of Unsymbolized Thinking. Since the phenomenon of Brainstorming occurred frequently for Dan, it warranted a
In Sample #15 (described above in the section on Feeling) Dan was thinking in Unsymbolized Thinking why two of one type of fish in his tank died. Dan was looking at his fish tank while he was Brainstorming. Brainstorming was an active process in which Dan was mentally going through the different types of sicknesses that could kill a fish as well as trying to understand what may have happened to the two fish other than a disease to cause them to die. While he was looking at the fish tank, he was also experiencing a Feeling of sadness located specifically in his heart area.

Dan's thoughts consisted of separate thoughts that occurred in Unsymbolized Thinking and seemed to occur in a row. The thoughts were not only of the various illnesses that could kill fish, but also thoughts about the aquarium such as, "Is the air pump clean?" While the Unsymbolized Thinking was taking place, Dan's eyes were moving over the fish tank. While Dan was thinking about the air pump he was looking at the air pump. As he went over the parts of the aquarium, he did not determine whether that part of the aquarium was a problem. The process of going through the possible problems with the tank consisted of Dan rapidly scanning the fish tank and having a thought occur at each separate part of the tank. He went from one area of the tank to the next thinking about what could have gone wrong. As Dan's gaze was sweeping across the tank, the Brainstorming was going on. Dan stated that Brainstorming
was like a process of elimination for him. At the same time each separate possibility as to what may have caused the death of the fish was eliminated. There was also an ongoing awareness of all the other possibilities that remained present in Dan's inner experience.

Although this entire process was rapid, the thoughts appeared to be organized and to occur one after another. The Unsymbolized Thinking aspect of the Brainstorming was accomplished in an all-at-once manner, which is typical of Unsymbolized Thinking. Dan had a Feeling he described as a sadness in his heart area at the same time. He stated that this feeling was centered directly in the heart. Dan could describe the Feeling as one of loss and emptiness.

Sometimes Dan experienced an Image as part of the Brainstorming experience. In Sample #9 Dan was cleaning his room and thinking about the bills that needed to be paid. Dan stated that he was "doing some heavy thinking" in Unsymbolized Thinking of what bill to pay first and how he would benefit from paying that bill first. As he thought of the bills, an Image of each bill seemed to come up in his mind only to be replaced by the Image of the next bill. At the moment of the beep, Dan could see the phone bill. He stated that it was a white color but the details were not clear. He was thinking of the number of the bill and that number was in his mind but was not pictured. The Unsymbolized Thinking of the bills was a rapid process of the many bills combined with an overall thought that the
bills needed to be paid in a definite order. This order of payment was predominant in Dan's thinking. He was also feeling stress that was experienced as a heavy feeling of pressure inside his head.

Again, in Sample #28, Dan was Brainstorming about the bills. This time, however, Dan was thinking about preparing a budget for his household. Also, in contrast to Sample #9, this inner experience occurred without Images. At the exact moment of the beep, Dan was thinking, in Unsymbolized Thinking, of the word rent. He stated that this word "just came" or "popped" into his mind and that he did not actively create the word. The words for each of the separate bills that Dan was thinking about "popped" into his mind, and although there was the thought of only one bill present in Dan's inner experience at a time, the notion or awareness of all the bills was present at once. It was like a knowledge of all the bills with the thought, in Unsymbolized Thinking, of each bill appearing separately without any effort on Dan's part. Dan stated that he felt relaxed in his entire body at this time.

Sometimes Brainstorming was attempted, but did not result in as complete of an experience as the other examples. Sample #10 is an example of an attempt by Dan to produce a Brainstorming experience. In this sample, Dan was attempting to think of someone to sell his stock to. At this moment he was trying to create an Image of whom he could sell the stock to. He stated that his mind was like
an empty white space and that he was attempting to fill up
the space with someone who might purchase the stock. Dan
was thinking in Unsymbolized Thinking at this moment was
Brainstorming. Dan had no one to picture, however, because
he had no way of knowing how to get an address to sell the
stock. Attempting to fill in the white space was creating a
Feeling of light pressure that was experienced all over the
inside of Dan's head. He also experienced a Feeling of not
knowing what direction to go in or where to start to fill in
the blank in his mind.

Brainstorming was always accomplished with Unsymbolized
Thinking for Dan. At time, however, it was in the company
of other inner experiences such as Feeling,
Thinking/Feeling, and Images.

Thinking/Feeling

For Dan, there were 3 (10%) sampled moments when he was
both thinking and Feeling at the once. This was not a
separate Feeling experience nor an Inner Speech or
Unsymbolized Thinking experience. Rather, it was a
combination of the two inner processes, thinking and
Feeling, which created a new entity that we are calling
Thinking/Feeling. In each sample, Thinking/Feeling was
combined with an Image.

In Sample #17 Dan was thinking about not wanting to go
to work because of the various "headgames" that go on at the
casino where he worked. The thinking was not an
Unsymbolized Thinking experience but Dan stated that it
seemed to be a Feeling in his heart area of knowing about the games that these people play coupled with a Feeling of not wanting to go to work that was almost like thinking about those things. The experience began as a Feeling in the heart area then it became more of a thought process in his head accompanied by Images of the people who play the "headgames." The Images were like a succession of those specific people's faces, one after another. First Jim, then Linda, Dick, and finally Wanda (an example of Brainstorming). The Images of the faces of the various people that he worked with were in color and consisted of each person seen coupled with an awareness at their work stations. Dan was not able to further explain how he experienced the knowledge that they were at their work stations. As is typical of Brainstorming, Dan was going through the Images of each individual in a rapid succession one after the other. The pictures were clear and people could be seen from various angles at a speed of about 1/2 second per picture. There were no edges on the pictures. Dan stated that the experience was unpleasant. The Images were coupled with a negative Feeling and an awareness that he needed to act differently with each person in order to play the "headgames" and continue to work at the casino.

Sometimes Thinking/Feeling was coupled with Inner Speech as in Sample #16. Dan was beginning to feel sick and said in Inner Speech, "What's going to happen?" The experience of Inner Speech seemed to begin in Dan's heart
area. Dan stated that the words seemed to start in his heart area and then to move up into his head where the Inner Speech was formed. Dan felt that the words were formed by him, but when the words were in his heart area it was as though a little man were inside his chest creating the words. These words were coupled with the Feeling of being sick and not knowing what was going to happen.

Sometimes Thinking/Feeling was an ambiguous inner experience for Dan. At the moment of Sample #4, Dan was thinking about his best friend and what he should understand in the friendship. The thinking experience was combined with a Feeling of what the friendship was all about which produced the Thinking/Feeling experience. Dan could not explain the process further except to say that this experience was different from Feeling. Aside from the Thinking/Feeling experience, Dan was also experiencing a Feeling of confusion that was experienced as a bodily sensation inside his heart. Dan stated that this heartfelt Feeling was one of helplessness and that it seemed to be painful. At the same moment Dan was experiencing an Image of his friend as he had last seen him looking. The friend had on a tee shirt and shorts. He was standing up and looked just as he did when Dan last saw him. His face had no expression and the color was natural. Dan stated that it was like going back in time to the last time that he saw his friend. This Image seemed to be located inside Dan's head.

In summary, Thinking/Feeling occurred for Dan in only a
few instances. Sometimes this phenomenon occurred with an Image and at other times with Brainstorming.

Inner Speech

Dan experienced Inner Speech in 3 (10%) out of the 30 samples. Sometimes the experience was of Dan simply saying a sentence to himself.

In sample #5, Dan was watching a soap opera on television. At this moment, he was thinking about how stupid and far-fetched the story was. He said, "This is stupid" in Inner Speech. The words were said in his own voice, with its own inflection, tone, and rate of speed.

Again, in Sample #11, while eating lunch, Dan said in Inner Speech, "Well, school's almost over." The words were formed inside Dan's head and heard in his own voice, etc. This thinking was not associated with any Images and Dan was Feeling relaxed and happy at the thought that school was almost out and that he would soon be finished.

In Sample #16 the experience of Inner Speech seemed to begin in Dan's heart area. At this moment Dan was beginning to feel sick, and said "What's going to happen?" in Inner Speech. Dan stated that the words that he formed in Inner Speech seemed to start in his heart and move up into his head. Dan stated that he believed that the words were formed by him. When the words were in his heart area, however, he Felt that it was as though a little man were inside his chest creating the words from there.

Inner Speech was not a common event in Dan's inner
experience. This type of experience took place when Dan created words in his own voice, with his own rate of speech, etc., which were experienced just short of talking out loud. In one sample Inner Speech was alone. In the other two samples Inner Speech was with an Image or with an Image and Feelings.

**Just Doing**

Just Doing took place 2 (7%) times for Dan. It was a moment when Dan was not aware of any inner experience but was Just Doing something.

In Sample #3 Dan was in a rush while he was getting ready for work. He was attempting to gather up the things that he need for work. Although Dan thought that he may have been hoping that there wasn't any traffic on the roads at the time, he was not certain of having that thought.

In Sample #26 Dan was busy cleaning the kitchen and clearing the counter top. He was focusing his attention on getting the job done and was experiencing no other inner experiences or sensations. He was Just Doing at this moment.

**Summary**

In Summary, 22 (73%) of Dan's 30 sampled experiences contained Feeling. He had several examples of heartfelt Feelings where his Feelings seemed to originate in his heart area. He also had some Feelings that were physical sensations.

Images were experienced by Dan in 12 (40%) out of the
30 experiences. Sometimes Dan experienced Images with other inner experiences. At times, he had Images of people he was speaking to on the telephone or that he was thinking about.

Dan experienced Unsymbolized Thinking in 33% of the samples (10/30). For Dan, this experience was one of experiencing words in an all-at-once manner.

Brainstorming was a unique category for Dan. He experienced 9 (30%) out of his 30 samples while Brainstorming. For Dan, the experience of Brainstorming was one of mentally thinking, in a rapid manner, through many possibilities of a solution to a problem. Sometimes the Brainstorming was accompanied by Images and other experiences.

Thinking/Feeling was rare for Dan, occurring in only 3 (10%) of the 30 samples. In this moment, however, Dan was experiencing something different that Feeling that was a combination of thinking and Feeling.

Inner Speech was experienced in only 3 (10%) out of the 30 samples. With this type of thinking, Dan was certain that he had produced the words that he created in his own voice, own inflection, and rate of speed.

Just Doing was another rarely experienced type of moment that took place in 2 (7%) of the 30 samples. In this case, Dan was busy doing something and could not clearly define what else was going on or he was so absorbed in his task that he was certain that no other inner experiences were going on.
Chapter 11

Jay: A Learning Disabled College Student

Jay (not his real name) was a 40-year-old university senior at the time these samples of his thinking were obtained. He was a black man who had been employed as a police detective and was currently studying political science. Jay was agreeable and interested in understanding his thought processes. He was taking medication for depression, high blood pressure and other ailments at the time of sampling. Jay's learning disability was in the area of reading and written language. He also experienced problems with auditory processing and word retrieval.

Jay experienced seven clear patterns of inner experience during the sampling period from June 17, 1990, to August 6, 1990. During this time 40 samples of his inner experience were obtained. Feeling and Unsymbolized Thinking, occurring 20 times each (50%), were Jay's most common inner experience. Sometimes Jay experienced Feeling as a mental phenomenon and other times as being purely physical in nature and tied to his numerous health problems. Unsymbolized Thinking was an all-at-once type of thinking that in which Jay was aware of what he was thinking; that this type of thinking was "just there" and did not appear to be created by Jay. Inner Speech occurred for Jay a total of 12 out of the 40 samples (30%) and was experienced as an
inner speaking in Jay's own voice, with his own natural inflection and rate of speed. Images occurred 9 (23%) times and were experienced in many varieties from active, moving Images to inner pictures of his own handwriting. In Just Doing, experience 4 times (10%), Jay was engaged in some activity at the moment of the beep and had no inner experience that he was aware of. Inner Hearing was experienced 3 times (8%). In these instances, Jay could clearly hear voices that were inside his head. Sometimes the voice was his and other times the voice was of another person. Partially Worded Thinking, which was a type of thinking that was somewhere between Inner Speech and Unsymbolized Thinking occurred only once (2.5%).

Feeling

Feeling for Jay occurred in 20 (50%) of the 40 obtained samples and was the most frequent recorded type of inner experience for Jay. Sometimes Jay's Feelings were experienced along with other inner experiences such as Inner Speech and Images. Jay's Feelings were experienced with Unsymbolized Thinking in 12 out of the 20 samples.

For example, in Sample #1, Jay had been wondering if any of his children were going to call him for Father's Day. At the same time, he was also wondering if he had been a good enough father for the children to feel deeply enough about him to call. Also present was an awareness of his being epileptic and having a disability. The wondering was experienced for Jay as an all-at-once type of thinking that
was done without Images and without words. The Feeling that
Jay was experiencing at the moment was a bodily sensation of
his heart pumping rapidly. Jay was also experiencing a
Feeling inside the entire area of his head. He stated that
this Feeling inside his head was of pressure in the head
area. Somehow the Feeling of pressure inside his head was
tied into the thought about his having epilepsy and being
disabled. Jay also experienced a sadness, depression and
anxiety connected with his thoughts about the children.
These Feelings were somehow connected to an awareness that
perhaps the children were not aware that his disability had
created money problems for him. Jay stated that there was
also a thought concerning his ex-wife. He was wondering if
she would wish him a happy Father's day. All of these
thoughts were experienced at once along with the bodily
Feeling of Jay's heart pumping faster and faster.

Sometimes Jay experienced Images of people along with
Inner Speech and Feelings such as in Sample #27. In this
sample Jay was thinking about Professor Moore and Professor
Wright. He was upset with them and said in Inner Speech "I
don't know why they won't sign them. I'm getting impatient
with them after all the work I've done". Jay was
experiencing an Image of Dr. Wright walking into the room
where the meeting was held with his brief case in his hand.
This Image was a rerun of what happened when Jay went to see
Dr. Moore concerning his paper. Jay stated that the Image
seemed to be "sort of visual" and "sort of not visual" in
the sense that much of the Image was unclear and appeared to be ghostlike and hazy to him. Jay could see himself sitting next to Dr. Moore on a couch. Dr. Moore appeared to be ghostlike and was not clearly seen. Jay stated that he was seen as a grayish blur. Jay could see the part of the Image that included himself and the couch clearly although there was no color present. Jay was Feeling upset and this Feeling was associated with a bodily sensation of his heart pumping rapidly. This experience was coupled with a knowledge that his blood pressure was up based on his experience with high blood pressure and stress.

As in Sample #32, Jay experienced Feelings along with several other types of thinking and this became a confusing experience for him. He was considering about calling his doctor, in Unsymbolized Thinking, to ask him if he could drink a beer (he had recently been hospitalized for kidney problems) and wanted to first check with his doctor before taking his cousin out for a drink. The experience was not as though he were creating the words but rather like the words were "just there." Incidentally, Jay stated that, although he was thinking about calling the doctor at this beeped moment, he had already gone out and drank a beer with his cousin hours before. Jay also had said to himself out loud "Should I call the doctor?" At this beeped moment he was also thinking about Dr. Moore (a professor) while working on the assignment that Dr. Moore had given to him. The thinking about Dr. Moore was like a Feeling of
apprehension about doing the assignment that he was working on at the time. This Feeling/thought of apprehension seemed to be in the back of Jay's head. It felt like a heavy little weight located in a small area in the back and on the inside of his head. Jay stated that it was like a swelling and felt as though that part of his head had increased in size. Whether Jay's confusion about drinking the beer previously was a result of the medication that Jay was taking or a result of his natural thinking cannot be determined.

Feeling occurred more frequently than any other inner experience for Jay. Jay's Feelings were sometimes experienced with Images, Inner Speech, and Unsymbolized Thinking.

Unsymbolized Thinking

Jay experienced Unsymbolized Thinking in 20 (50%) out of the 40 samples. At times, Unsymbolized Thinking occurred simultaneously with Inner Speech and a clear distinction was made between the two types of thinking.

For example, in Sample #16, Jay was watching a gay rights program on television. He was saying in Inner Speech, "What do they want us to do!?!?" This sentence was heard in his own voice with the rate of speech, pitch, and inflection which would be typical of such an exclamation said aloud. Jay stated that he felt as though nothing else was inside his head except the awareness of the words. Jay stated that implicit in this exclamation was the following
thought: "If they're still having sex with each other, we should give them Bibles, not condoms." This thought was present in the all-at-once, non verbal type of thinking that we have been calling Unsymbolized Thinking. Jay stated that he just knew that that part of the thought was there. At this moment, Jay was also experiencing a swelling sensation inside his head and along the left side of his forehead. He stated that the sensation of swelling was like a numbness that started over the right eye and went across his forehead and then down the left side of his forehead. The sensation was perceived by Jay to be just on the inside of his skull and was annoying to him.

In Sample #2 Jay had just finished taking his medication and had started to lie down when he was signaled by the beeper. He had just taken his medication, which had made him feel drowsy. He said to himself in Inner Speech, "It's still early enough for my kids to call." This statement was experienced in his own voice, own inflection and at his own rate of speed. Jay was also experiencing a knowledge that there was loud music coming from a neighbor's apartment in the background and he had an Unsymbolized Thought that he wished the neighbors would turn the music down. This was an all-at-once non-verbal thinking experience. He also had a thought in Inner Speech about Dr. Moore. Jay stated that the thought had been "on his mind" for about a week. The thought was "I wish Professor Moore would return my financial aid sheet. He's had it over a
week." This thought was coupled with a disturbed Feeling that Jay could not further describe. At this moment, Jay was also experiencing a Feeling of relief in his chest area and had become aware that his head had stopped throbbing (it had been throbbing and his heart had been rapidly pumping before taking the medication).

Sample #39 was an example of multiple Unsymbolized Thoughts. In this case, however, several other types of thinking were occurring. At this beeper moment, Jay was experiencing numerous simultaneous thoughts including the four that he remembered well enough to report during his interview period. A dominant thought was about the library and his next independent study on AIDS. He was also thinking about the possibility that AIDS started in Africa as a manufactured virus and how he had recently read something about the manufacturing of the AIDS virus by the United States government. This thought was influenced by the implied wrongness of manufacturing the virus and the wrongness and horror of the act was almost a backdrop of thought that accompanied Jay's thinking about AIDS. Jay stated that along with these thoughts was a wondering of where he had seen the article about the manufactured virus. This thinking was not in words but was a "rush of thoughts" going on inside Jay's head. Another thought was of his cousin Lynn who was coming to visit Jay from another city. This thought was a wondering if Jay would be able to pick Lynn up and "just stayed there" in Jay's awareness for an
undetermined period. At the same time, Jay was thinking about picking up his girlfriend, Joy, at the dentist's office. Jay stated that this thinking about picking up Joy didn't require too much effort but that the memory of picking Joy up just stays in his awareness as though a piece of his mind is keeping track so that he won't forget about doing it. He was also thinking about coming to the university because of problems that he was having with financial aid and he needed to talk to one of his advisers in that office about the problems. Along with this rush of thoughts, Jay was experiencing an Image. The Image consisted of the word AIDS in black, block letters on a white background and the name Lynn in Jay's handwriting in black ink on a white background. Jay initially stated that the words were seen as two distinct Images, one on top of the other. Later, he stated that they appeared to be side by side as though on the same image and still later, Jay stated that the words alternated back and forth in his image. Jay was uncertain which event or if perhaps all the events were going on. He was certain, however, of how the words AIDS and the name Lynn appeared. Jay stated that he was experiencing a Feeling of anxiety in his body at this moment. He described this Feeling as a tingling sensation in his head as well as a Feeling of his head swelling.

At times, Unsymbolized Thinking occurred alone in Jay's inner experience (4/40). At other times Unsymbolized Thinking occurred with other phenomenon most frequently (12
out of the 20 samples) with Feeling.

Inner Speech

Inner Speech occurred for Jay in 12 (30%) out of his 40 samples. When Inner Speech was experienced, Jay felt positive that the words that he had experienced were in his own voice, with its own inflection and rate of speech, which is typical of Inner Speech as experienced by other individuals.

For example, in Sample #8 Jay had taken his medication and could feel the medication working. He Felt good, relaxed, and free of pain. At the exact moment of the beep, Jay said to himself "Gee, I feel good this morning. I wonder if I'll feel this way all day?" Jay was confident that this thinking was in Inner Speech. He was also wondering in Unsymbolized Thinking if he would get a pain somewhere or if he could make it through the day without pain.

Sometimes the Inner Speech was accompanied by an Inner Hearing such as in Sample #11. In this sample Jay was thinking about taking his daughter to the Excalibur Casino. He thought, in Inner Speech, "I'm going to take my daughter to the Excalibur and check out this madness." Not only did Jay experience the production of these words, he also had a sensation of hearing the words clearly spoken inside his head. The hearing of the words seemed to take place on the left side of Jay's head and cover that entire side of his head. The thought seemed to move around inside his head.
An Image also accompanied this experience. The Image was of the words printed in large black letters across a page that was seen inside his head. The words were in one line across the page and Jay felt as though he were reading the words.

In summary, Inner Speech was experienced by Jay as a phenomenon of creating words in his inner experience almost as though he were actually speaking them out loud.

Images

Images were experienced by Jay in 9 (23%) out of his 40 samples. They were experienced in a variety of ways.

Sometimes Jay experienced an Image of pages of a book that he had been reading as in Sample #9. In this sample Jay was reading the Bible and repeating the words to himself. These words were "Drinking the wine of the Holy Spirit. Lord I give you my body, I give you my soul." Jay was saying the words to himself and contemplating their meaning. Jay stated that he was in deep thought and he was thinking in Unsymbolized Thinking, "What does this mean?" although no words were present. Jay said that he was "capturing" the Bible words that had the most meaning to him. These words were Spirit, Soul, and Body. Jay felt that those particular words had a greater significance to him than the other words that he had read. At this moment, Jay was also experiencing an Image of the Bible opened to the page that he was reading from. This Image was of the opened Bible as it had appeared while Jay had been reading it. Both pages were opened and the black ink on white paper
was displayed. He could picture the words exactly as they appeared to him while he was reading the Bible. The words that had the greatest significance (Spirit, Soul, Body) were seen clearly by him. Jay was confident that this Image was located in his head.

In a similar experience, Sample #11, Jay was saying to himself, in Inner Speech, "I'm going to take my daughter to the Excalibur and check out this madness" (also discussed in Inner Speech and Inner Hearing). He was also thinking about the traffic being congested since the newly opened Excalibur had become a busy casino. This thinking about the traffic was in Unsymbolized Thinking. Jay was also experiencing an Image at this moment. The Image consisted of the words that he was saying in Inner Speech displayed in black printed letters. These words seemed to be inside but to the left side of his head, and they seemed to move around. Jay stated that the words were seen quickly and in a row. It was as though he were reading the words while he was thinking them.

In Sample #39 (also discussed in Unsymbolized Thinking) Jay was again experiencing an Image of words. This time, however, the Image consists of words written in his handwriting as well as printed words. In this sample Jay was thinking in Unsymbolized Thinking about AIDS and whether it was intentionally started in Africa by the United States government. He was also thinking in Unsymbolized Thinking about his cousin coming for a visit, that he had to pick up
his girlfriend at the dentist's office, and that he had to
get to the university because they had messed up his
financial aid. Coupled with the thought about AIDS was an
attempt to remember where he had seen an article about the
AIDS virus being a manufactured virus. This attempting to
remember was an experience of Unsymbolized Thinking and
consisted of a thought which if expressed in words might be
"where have I seen this before?" These thoughts were all
present at once and experienced rapidly but the thought
about AIDS was in the forefront. Jay was also experiencing
an Image of the article that he was attempting to remember.
He could see the black printed words of the article on white
paper but the only word that he could read was the word AIDS
clearly printed in big black print at the top of the
article. Jay was also experiencing another Image that
alternated back and forth with the Image about the AIDS
article. In this Image his cousin's name, Lynn, was seen in
Jay's handwriting. Seeing both the article with the word
AIDS clearly printed on it and the name Lynn in his
handwriting was as though Jay were looking at a blackboard
with these Images taking turns appearing on on it.

In Sample #35 Jay experienced an Image while reading
about a woman who was getting a stay of execution for
killing her three children. Jay had been reading about one
of the woman's children hanging himself on a roll of barbed
wire. He was experiencing an Image of a roll of barbed wire
along with a thought in Unsymbolized Thinking that the child
could not have killed himself on the barbed wire by hanging himself. Jay's Image of the barbed wire consisted of seeing the roll hanging on a wall as he was reading the description of the barbed wire. He stated that the Unsymbolized Thinking and the Image of the roll of barbed wire were tied into his actually working the case; trying to figure out (as he did when he actually worked cases) what may have happened in this instance and if the woman were actually innocent.

Some of Jay's Images were experienced in a dreamlike state while he was just awakening from a nightmare. After awakening he had put on the beeper and at the moment of the beep was experiencing a moving Image. During this time, Jay sat on the side of the bed and wrote down his inner experience it occurred. From Sample #21 through Sample #24 Jay continued to write and experience this moving Image that was ongoing throughout. In Sample #21 Jay had just awakened from a nightmare about a family that he had known. In this Image Jay stated that he was being shot at, threatened, and left by himself. He Felt as though he were in Roswell, Arizona and as though he were actually experiencing the activity that was going on in his inner experience. At each beeped moment, Jay was still writing from the previous moment and continued onto the next moment as though this were one long, sampled experience. Jay stated that he felt as though he were doing several things at once while his inner experience seemed to keep him immobilized. He was watching himself as he was part of the Image, he was writing
about himself as he sat on the side of the bed experiencing
the Image, and he was actually experiencing himself take
part in his vivid and active inner experience. Jay stated
that he felt as though he were frozen and not able to move
from his position at the edge of the bed. The experience of
Jay sitting on the side of the bed and writing his inner
experience covered a period of approximately three hours
during which time the beeper signaled him four times.

Images were experienced by Jay in different ways.
Sometimes the Image was seen as pages of a book that he had
been reading, other times of words he was thinking about.
Jay experienced a vivid moving Image that lasted through
several beeped moments.

Just Doing

Jay experienced 4 (10%) sampled moments when he was
Just Doing something (10%). At these moments he was not
aware of anything in his inner experience but was
concentrating on his task at hand.

An example of Just Doing was when, in Sample #19, Jay
was lying on his bed and listening to the Jack French
Program on the radio. Jay did not believe that there was
anything on his mind at this moment except listening to Jack
French saying the words, "and praising the Lord." Listening
to the words seemed to dominate his consciousness and was
all that Jay noted. In Sample #29 Jay was again listening
to a Christian radio program and could not identify any
other experiences going on at the moment of the beep. In
this experience, Jay was listening to a woman discussing the topic of demons. At this time, Jay's listening was as though he were actively monitoring her words since he had studied the subject and he was listening carefully to what she was saying. This was all-consuming to Jay.

In Sample #37, Jay was talking to his girlfriend and saying, "If Dr. Moore doesn't give me any feedback on this I don't know what I'm going to do." He was saying this out loud and experienced no other thoughts or feelings accompanied with this experience.

Sometimes Jay was busy Just Doing something. At these moments he could recall no other experience occurring.

Inner Hearing

Inner Hearing took place in 3 (8%) of the 40 sampled experiences. This hearing was in Jay's own voice such as Sample #11 (as described in the section on Inner Speech) or in another person's voice as in Sample #26 when Jay could hear the voice of one of his professors.

At the moment of Sample #26, Jay was talking to his 8 year old daughter and they were discussing what they wanted to have for dinner. His daughter was saying that she wanted pizza and he was saying that he wanted watermelon. At this moment he was also thinking about Dr. Moore and the paper that he had written for him. Jay could hear Dr. Moore saying "This is just not right, this is no good." Dr. Moore's voice, as Jay heard it in his inner experience, was exactly like Dr. Moore sounded to Jay in reality. Jay
detected a sound of racial prejudice in the professor's voice. Jay stated there there seemed to be nothing positive in the professor's voice. Jay felt anxious and could feel that his heart was pumping unusually fast. He also experienced the sensation that his head was swelling. At this moment, Jay stated that three people were talking at once: his daughter, himself, and Dr. Moore.

Sometimes Jay experienced both forming the words as well as hearing them as in Sample #13. At the moment of the beep Jay stated that his mind was rambling. He was saying in Inner Speech, "I might have messed up my liver yesterday. Why did my girlfriend let me drink that liquor yesterday?"
The experience was one of creating the words in his own voice, own inflection, rate of speed, but also an experience of Inner Hearing since Jay could also hear the words spoken. Jay stated that he was also experiencing a tingling sensation in his head and shoulder area and down the side of his neck at this moment.

Inner Hearing took place when Jay could hear words in his inner experience. Sometimes the words were heard in his own voice and sometimes in other people's voices.

Partially Worded Thinking

In one sample (4%) Jay was not sure if his inner experience had been Unsymbolized Thinking or Inner Speech or some type of thinking in between the two.

In Sample #18, Jay experienced we are calling Partially Worded Thinking. While listening to a Paul McCartney tune
on the radio, Jay was thinking that it does not make sense for people who work for the government not to have had sociology or psychology classes. He was also thinking that the people who don't know psychology or sociology are messing up other people's lives. The thinking about sociology and psychology was almost, but not quite, in words, but he could not explain this experience completely. There was something about this thought that seemed to be almost in words but that it was not a definite experience like Inner Speech. Jay was also working on his paper for Dr. Moore which was on the topic of incest. Jay was writing about father/daughter incest and was writing the sentence "Fathers that sexually abuse their daughters usually are hooked on alcohol, drugs or have a mental illness". He stated that there were many other things going on in his inner experience but that he was unable to recall them at the moment of the beep.

Partially Worded Thinking occurred for Jay when he experienced a type of thinking experience that fell in between Inner Speech and Unsymbolized Thinking.

Summary

In summary, there were seven types of inner experiences for Jay. Fully one half (50%) of Jay's experiences were Feeling experiences. He had Feelings that were mental and he also had frequent bodily sensations especially in relation to his health problems.

Unsymbolized Thinking occurred for Jay as frequently as
Feeling, in 20 (50%) of the samples. Jay experienced an all-at-once type of thinking in this experience where he was aware of what he was thinking but did not experience this thinking in words.

Inner Speech was an example of Jay actually forming the words in his mind and almost, but not quite, saying them out loud. Out of the 40 obtained samples, Jay experienced Inner Speech 12 (30%) times making this type of thinking rather common for Jay.

Images occurred for Jay in 9 (23%) of his sampled experiences. Many of the Images were still but in a series of Images they were seen as an ongoing moving Image where several beeped moments were perceived by Jay to be like one huge, ongoing Image.

Just Doing took place for Jay in 4 (10%) samples when he was Just Doing something and could not note if any other experience was happening or not.

Inner Hearing took place for Jay in 3 (8%) samples when he perceived his own voice as being heard in his inner awareness and also when he could hear another individual's voice.

Partially Worded Thinking occurred only once (4%).
In this research all the subject's categories of inner experience emerged as a result of the interview sessions. For instance, no subjects were asked if they were experiencing Inner Speech, or Images, etc. Rather, the subjects were asked to describe what the sampled moment of their inner experience was like for them. From these descriptions, the categories emerged.

The number of samples of inner experiences varied with subjects. Some of the subjects sampled for longer periods of time and more samples were collected. The varying number of samples was a result of the researchers' discontinuing the procedure at various times with each subject. Sampling with each subject was discontinued when the categories seemed to be clearly defined. This occurred when enough samples had been collected to be confident that the samples were representative of the subject's inner experience.

Table II is a summary of the learning disabled subjects' percentage of characteristics. The learning disabled subjects will be discussed primarily for the purposes of this study.
Table II

Frequency of Characteristics for Learning Disabled Subjects

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mary</th>
<th>Jay</th>
<th>Carl</th>
<th>Dan</th>
<th>Jacob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Samples</td>
<td>22</td>
<td>40</td>
<td>31</td>
<td>30</td>
<td>32</td>
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<tr>
<td>Images</td>
<td>45*</td>
<td>23</td>
<td>23</td>
<td>40</td>
<td>25</td>
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<td>Unsymbolized</td>
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<td></td>
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<td></td>
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<tr>
<td>Thinking</td>
<td>36</td>
<td>50</td>
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<td>63</td>
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<td>0</td>
<td>10</td>
<td>3</td>
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<td>50</td>
<td>61</td>
<td>73</td>
<td>59</td>
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<td>0</td>
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<td>8</td>
<td>0</td>
<td>0</td>
<td>3</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
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<td>10</td>
<td>0</td>
<td>0</td>
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<td>30</td>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
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<tr>
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<td>0</td>
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<tr>
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</tbody>
</table>

*This and all remaining entries are percentages. Characteristics overlap, thus at times percentages do not add to 100.*
There were four learning disabled subjects in this study, one female and three males ranging in age from 24 to 40 years old. When we discuss the characteristics of learning disabled subjects, we will also include the 12 year old learning disabled subject that Monson (1989) sampled. The following paragraph is a brief review of each of the five learning disabled subjects examined in this chapter.

Carl (Chapter 8) age 40, was an undergraduate student who was learning disabled in the area of writing. Mary (Chapter 9) age 27, was a freshman whose learning disability was in the areas of reading and writing. Dan (Chapter 10) age 24, was a senior majoring in Hotel Management whose learning disability was in reading and writing. Jay (Chapter 11) age 40, was a senior at the university whose disability was in the areas of reading and written language. He also experienced problems with auditory processing and word retrieval. It should be noted that forty samples were required before Jay's inner experience could be clearly defined. This was more than the other subjects required and could be due to the medication that he was taking for his various physical disorders. Jacob (Chapter 9; Monson, 1989) age 12, was attending both regular classes and special classes for learning disabled students in the seventh grade.

All five of these individuals had been diagnosed as learning disabled. The four adult subjects who were sampled in this report were tested and diagnosed at the University of Nevada, Las Vegas. They were attending the Reading
Center and Clinic at that university. Jacob had been diagnosed as learning disabled by his school district.

Characteristics of the Inner Experience of Learning Disabled Subjects

We will discuss below the characteristics of the learning disabled subjects which seem to distinguish them from the other groups who have been sampled in this way. Hurlburt, in his 1990, in press, and other unpublished studies has sampled approximately 40 various individuals, including normal, schizophrenic, depressed, and anxious people, (R. T. Hurlburt, personal communication, November 8, 1991) and it is against this group that these learning disabled subjects will be contrasted. Hurlburt's group represents a diverse, small group of individuals who cannot be said to be representative of the population at large. The comparisons we will make below are tentative attempts to characterize the similarities that our learning disabled subjects showed in order to prepare the way for future study of the learning disabled population.

The learning disabled population is a large, diverse group of individuals. No attempt was made in this research to sample any separate population or subpopulation of learning disability.

Feelings

We have defined Feelings as the momentary awareness of emotional experience. This experience is sometimes accompanied by physical sensations. Normal subjects tend to
experience Feelings as differentiated phenomena that contain a physical sensation, usually in the chest (Hebert, 1991). The experience of Feeling is moderately infrequent in normal subjects, occurring on perhaps 10 to 15 percent of samples (R. T. Hurlburt, personal communication, November, 8, 1991).

All the learning disabled subjects experienced Feeling extremely frequently. Table II shows that Feelings were experienced on from 50 percent to 73 percent of learning disabled subjects' samples.

The learning disabled subjects experienced Feelings in many ways. Sometimes the Feelings were experienced as physical sensations and other times they had no physical locus. Empathetic Feeling was an occurrence that some of these subjects experienced. For example, Carl Felt embarrassment for a girl that he saw blowing bubbles, and Dan Felt compassion and empathy for a friend who was unhappy about going to work. Mary experienced the Feelings of a boy she was Imaging. Sometimes the subjects experienced Feelings in the heart area. For Dan, heartfelt Feelings were common. Feelings for the learning disabled subjects were sometimes experienced as negative and other times as positive events.

Images

All the learning disabled subjects experienced Images. The frequency of their occurrence, as Table II shows, ranged from 23 percent to 45 percent. Those frequencies are considerably higher than most of the normal subject's
considerably higher than most of the normal subject's frequencies.

For the learning disabled population, Images represented a diverse and vivid type of inner experience. The Images were often experienced in accurate color. Some of the Images were experienced not only moving but to be in slow motion. Some of the subject's Images were still and very much like photos of an event that they had taken part in. Several of the subjects experienced Images while they were reading. One subject experienced Images in various degrees of formation. This subject also experienced an Image superimposed upon an object in reality. Many of the subjects experienced Images of people that they were thinking about. Three of the learning disabled subjects experienced two or more Images at once. Two of the five learning disabled subjects reported Images of words that the subject was thinking, a very infrequent phenomenon in normal subjects. In both of these cases the words were seen in inner experience in big, bold, black letters. In one of the subject's inner experience the Image was of a sentence that he was saying in Inner Speech. This experience was located to the left and inside his head and the words seemed to move around. The other subject to experience words in an Image experienced the words free floating inside of her head. One of these subjects also experienced an Image of a name written in his own handwriting.

Jacob and Carl experienced some similarities with their
Images. Jacob experienced seeing a black Image that was very much like Carl's category called Blackness. In Jacob's experience he had been lying on the sofa daydreaming. His mind seemed like a television set that he could turn on and off and at the moment of the beep he had it turned off. This was not an absence of seeing but was an experience of actively seeing black. Carl's category called Blackness was a time that he was experiencing the "seeing" of blackness in his inner awareness.

Both of them thought of their Images as being on a television screen. In Carl's case, the experience was one of seeing a white television screen. Carl experienced moments when his Images were in varying degrees of formation, and Jacob experienced an Image that faded. Jacob stated that the Image lost its color, became black and white, then became a blur and was gone. Both Carl and Jacob experienced a type of olfactory experience during an Image. Carl stated that he could smell the salt air during his Image of the California beach, and Jacob noted that he experienced the smells of dead men everywhere during an Image about trench warfare. It was noted by Monson (1989) that Jacob did not experience the smells in a sensory way.

The visual experiences of the normal subjects ranged in frequency from about 6 percent to 42 percent. Their Images were usually in color and at times, the Images contained some movement. Often they were an accurate reconstruction of a previously seen event. Some of the normal subjects saw
themselves from an external perspective. With the normal sample inner visual experiences were sometimes without inner Images. Hurlburt described what he termed Imageless Seeing in these instances. They were occasions when inner visualization took place without Images.

Imageless Seeing did not occur for the learning disabled group. The experiences of a black Image that Jacob had, however, was an actively seeing of the color black. Carl's Blackness experience was also an active seeing of the color black.

Like the normal subjects, the learning disabled subject's Images were frequently accompanied by strong emotional experiences. Some of the emotions were negative and some were positive.

Unsymbolized Thinking

Unsymbolized Thinking is the experience of thinking the meaning of a thought but without the presence of words, Images, or other symbols. There is considerable variability in the frequency of Unsymbolized Thinking in normal subjects, with most experiencing very little Unsymbolized Thinking. This was not true of the learning disabled subjects examined in this study and the learning disabled subject examined in Monson's (1989) study (therein called Unsymbolized Experience). Unsymbolized Thinking was a frequently occurring experienced for four of the learning disabled subjects. Of the four subjects who experienced Unsymbolized Thinking, the percentage of experience ranged
Hurlburt found a high incidence of Unsymbolized Thinking in the depressed subjects sampled in his study. Sometimes, the frequency of Unsymbolized Thinking experiences was as high as 90 percent. Hebert (1991) stated that this result may be because depressed subjects seem to have no words that are experienced in their thinking. Therefore, they experienced the meaning and content of thoughts without the use of words. This may also be the case with some learning disabled individuals.

The anxious subjects in Hebert's (1991) study also experienced a higher than normal incidence of Unsymbolized Thinking. For both the anxious and depressed individuals, however, there was a very low or zero frequency of Images. The learning disabled sample is the only group sampled so far that had a high incidence of both Images and Unsymbolized Thinking.

Inner Speech

Inner Speech is the experience of speaking words in inner experience. The words are generally expected to be in the subject's own voice, with natural inflection and tone. The learning disabled subjects experienced a very low frequency of Inner Speech by comparison with normal subjects, with percentages ranging from 0 to 30 percent. The learning disabled subjects had no difficulty describing the event of Inner Speech when it occurred. In agreement with Monson (1989), it appears that the learning disabled
subjects generally do not think in words.

Various Types of Experiences

The learning disabled population represents a heterogeneous group of individuals. The individuals involved in this study all experience varying types and degrees of disability. Also, while their I.Q.'s must be within the average range to qualify as learning disabled, some of the subjects were very intelligent.

Several of the learning disabled subjects experienced moments that were unique to them individually. For instance Dan experienced Brain storming and Thinking/Feeling, Mary experienced Brain Location, and Jay experienced Partially Worded Thinking.

Carl experienced moments, however, that were extremely different from the other four learning disabled subjects discussed here. He experienced several categories that were not experienced by the other subjects. They were Almost Inner Speech, Noticing Characteristics, Time Sensitivity, Concentrating/Blocking, and Purposefully Altering Feelings. He also did not think in either Inner Speech or Unsymbolized Thinking.

Results Compared with Other Findings

Very little research has been conducted about the inner experience of learning disabled individuals. The present study found that most of our learning disabled subjects experienced little or no Inner Speech. These results are in agreement with previous research that suggested that
learning disabled people experience difficulty using subvocalization strategies (Swanson, 1983). Since a strong association between memory span and subvocalization has been demonstrated (Baddeley, Thomson, & Buchanan, 1975; Hoosian, 1982), it is possible that learning disabled subject's deficient memory spans may present problems with experiencing Inner Speech. Since it was also found that two of the learning disabled subjects in this study experienced Images of words in their inner experience it could be the case that Imaging of words is a device that would enable these individuals to more readily hold a word (or an entire sentence, as was the case with one of the subjects) in memory. Perhaps their ability to experience Images in inner experience is enhanced by their lack of ability to produce Inner Speech. The increased incidence of Unsymbolized Thinking may also be a necessary and useful strategy utilized by this group of individuals. Any comments at this time, however, are purely tentative. Further research sampling the inner experience of learning disabled people will have to be conducted to support these hypotheses.
The Undiagnosed Subjects

The following three chapters consist of the inner experiences of three undiagnosed adults. All the subjects were volunteers who were interested in discovering more about their own inner experiences and in the research involving the thought sampling procedure. The percentages of the characteristics of the undiagnosed subjects are found in Table III below.

Table III

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Antonio</th>
<th>Ken</th>
<th>Elsa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Samples</td>
<td>29</td>
<td>32</td>
<td>29</td>
</tr>
<tr>
<td>Images</td>
<td>52 *</td>
<td>47</td>
<td>28</td>
</tr>
<tr>
<td>Unsymbolized Thinking</td>
<td>45</td>
<td>40</td>
<td>42</td>
</tr>
<tr>
<td>Just Doing</td>
<td>17</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Inner Speech</td>
<td>10</td>
<td>3</td>
<td>42</td>
</tr>
<tr>
<td>Feeling</td>
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<td>66</td>
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</tr>
<tr>
<td>Searching</td>
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<td>7</td>
</tr>
<tr>
<td>Words Present</td>
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<td>31</td>
<td>17</td>
</tr>
<tr>
<td>Soul Experience</td>
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<td>28</td>
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<td>Inner Hearing</td>
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<tr>
<td>Out of Body Experience</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

*This and all remaining entries are percentages. Characteristics overlap, thus at times percentages do not add to 100.

These subjects were sampled to add to the data base of individual inner experience. They were not intended to be
used as a control group for the learning disabled group. This group of individuals is not a representative sample of a normal control group as was the case in Hurlburt's control group discussed above. The following are brief descriptions of the undiagnosed subjects.

Elsa (Chapter 13) age 35, was a psychology graduate student. She was employed by the Reading Center and Clinic as a Graduate Assistant. Antonio (Chapter 14) age 25, was an undergraduate student who was working as an office employee in the Reading Center. Ken (Chapter 15) age 28, was a psychology graduate student who intended to do further research using the thought sampling method.

Elsa experienced a high frequency of Unsymbolized Thinking and Inner Speech (42% each). She also experienced a type of thinking called Words Present (17%). It appears that Elsa spent a considerable amount of her sampled moments thinking. She experienced some moments of Just Doing and a fairly high percentage of Images. A unique category of inner experience for Elsa was Searching.

Antonio experienced more than half of his experiences in Images. He also experienced Just Doing, Inner Speech, and Feeling. Antonio did not experience any categories of inner experience that had not been present in other individual's inner experiences.

Ken experienced Images frequently, in 52 percent of his samples. He also experienced Unsymbolized Thinking frequently. The highest frequency of inner experience for
him, however, was Feeling that he experienced in 66 percent of his samples. Words Present was experienced by Ken in 31 percent of his samples. During the sampled moments, he did think in words, but not with the experience of having created the words in his own voice as would be the experience of Inner Speech. Inner Speech comprised 3 percent of his samples. Ken experienced Inner Hearing, as well as two categories that were unique to him, Out of Body Experience and Soul Experience. Some of his inner experiences may have been related to a recent traumatic event (the death of a friend).
Chapter 13

Elsa: A First Semester Graduate Student

At the time of sampling Elsa (not her real name) was a 35-year-old graduate student at UNLV majoring in psychology. Elsa's undergraduate degree was in psychology with a minor in philosophy. She was selected to be a subject because she had no learning disabilities. Elsa sampled from October 10, 1989, to November 1, 1989, during which time 29 samples of her inner experience were obtained.

During the period of sampling seven salient characteristics of inner experience appeared for Elsa. Her most common type of inner experience was Unsymbolized Thinking, which occurred in 12 (42%) out of the 29 samples. Images occurred in 8 (28%) out of the 29 samples, as did Inner Speech. Words Present occurred in 5 (17%) of the samples. Just Doing was present in 4 (14%) out of the 29 samples. Elsa also experienced Feeling in 4 (14%) out of the 29 samples. Less frequently experienced, in 2 (7%) out of 29 samples, was a phenomenon we will call Searching.

Unsymbolized Thinking

Elsa experienced Unsymbolized Thinking in 12 (42%) out of the 29 sampled moments. This type of inner experience was a thinking experience without words, Images, or any other symbols being present to awareness. Of the 12 Unsymbolized Thinking experiences, 3 were accompanied by no
other inner experiences that Elsa could report.

For Instance, at the moment of Sample #23 Elsa was looking through her drawer trying to decide what socks to wear that day. She had seen a purple and white shirt the moment before and had thought about wearing the shirt. At the moment that she was signaled by the beeper she was thinking, in Unsymbolized Thinking, that she couldn't wear that shirt because she didn't have any purple socks. Elsa stated that she could recall no other inner experiences at that time.

Sometimes Unsymbolized Thinking was experienced simultaneously with Images. At the moment of Sample #16 Elsa was listening to a girl talking in very rapid speech. The girl's rapid speech had triggered in Elsa an Unsymbolized Thought that her daughter possibly eats too much sugar. The thought entailed an unsymbolized remembering about what and how much her daughter usually eats for breakfast, lunch and dinner. Along with these Unsymbolized Thoughts, Elsa was experiencing an Image of her daughter near the refrigerator. The Image was not clear, had no color, and no edges. Elsa could not recall any details of the Image, such as the clothing that her daughter was wearing. The experience for Elsa was as though she were looking out at the Image but she was aware that the Image was located inside her head. The Image seemed to be tied into Elsa's attempt to remember what her daughter eats.

Another example of Unsymbolized Thinking occurred at
Sample #10. In this sample, Elsa was starting a letter to her cousin, writing the words "Dear Penny and Roy." At the beeped moment she was Unsymbolized Thinking that she had never met Roy and had no face to put with the name. At the moment of the beep, she had an Image of Penny, which seemed to be identical to a photograph of her that Elsa had. However, she had no picture to go by to create an Image of Roy, and at the moment of the beep was thinking about not having a picture for him. This type of thinking was without words and was an all-at-once type experience.

In Summary, Unsymbolized Thinking was Elsa's most common type of inner experience. At time, Unsymbolized Thinking occurred alone and at other times in the company of other inner experiences.

Images

Images occurred for Elsa in 8 (28%) out of the 29 samples of her inner experience. She experienced Images in many different ways. Sometimes the Image was seen from inside her head and other times from outside her visual field. At times Elsa was "visually remembering" something or someone by consciously forming an Image of the thing or person involved. Elsa's Images were at times moving, and in 5 of the 8 Images were unclear.

In Sample #18, Elsa's Image was both moving and unclear. While reading a newspaper article about an airplane crash, Elsa had commented to her husband that an airplane had crashed on the side of a valley in Hawaii and
she was curious about that phenomenon. At the moment of the beep, Elsa was listening to her husband explain how it was possible for a plane to crash on the side of a valley. Elsa was experiencing an Image of Hawaii at this moment. Elsa stated that the Image was of the beach and the ocean. The waves on the ocean were moving, but there was no color. The Image was fuzzy and appeared to be distant. Elsa stated that there may have been trees in the Image but she could not say for sure. Elsa stated that the Image was located inside her head. Elsa was looking at her husband's face while he was speaking to her and "seeing" the Image of Hawaii in her inner experience at the same time.

Sometimes Elsa saw Images out in front of her visual field as in Sample #3. At this moment, Elsa was reading an article about teaching retarded adolescents skills. She stated that the reading was with comprehension and in Inner Speech. She was experiencing a visual Image while she was reading. The Image was of two people, a Down's Syndrome individual and a therapist. Elsa stated that there was no recollection of color but she could not be certain if there was color at the time of the beep or not. There was also no detail of the clothing since the focus of the Image was on the face of the retarded child. Elsa stated that the face of the child was clear and appeared to be looking at Elsa (facing forward in Elsa's visual field). The child was seated on a chair and the therapist was more of an awareness than an actual clear Image. The Image possessed a dreamlike
quality. It was as if the lighting were dim and everything was seen through a dark window except for the face of the child, which was very clear and bright. The Image was viewed as if from a distance and appeared to be located out in front of Elsa's visual field. It was located inside her mind but without an exact location. Although there was no recollection of movement, the experience was like "watching a silent movie while reading about it."

Images occurred for Elsa when she was attempting to remember something, as in Sample #7. At the moment of the beep, Elsa was reading in a text book, "In the only available study," and was trying to remember the study being referenced. Attempting to remember the study was as though Elsa were searching in her mind for the study. Elsa stated that she was trying to visualize the study and to remember what was coming up next. This attempt to visualize the study was experienced by an Image of a photocopy of a journal article that Elsa thought could possibly be the article that she was searching for. The Image of the photocopy was not clearly seen and Elsa could not see the words. The attempt to recall the article was felt to take place inside her head. Elsa stated that reading the words "In the only available study" was almost as though she were saying them out loud (an example of Inner Speech).

In another example of Images, Sample #15, Elsa was talking to her husband on the telephone. Elsa's husband had just told her that he was going to vacuum the house and Elsa
was thinking, in Words Present, that the floor in the kitchen needed to be washed. Elsa stated that the thinking was accomplished because "the words were just there" in the manner described in the section on Words Present. The thought that the floor needed to be washed was accompanied by other thoughts in Unsymbolized Thinking. These thoughts occurred rapidly. Elsa described this thinking as a "flood of thinking." Elsa stated that at this moment she decided, in Unsymbolized Thinking, not to tell her husband that the floor needed to be cleaned. Elsa also experienced an Image of the dirty floor. Elsa's Image consisted of a rapid succession of pictures of three and maybe more parts of the floor all seen in one complete Image. In each section of the floor Elsa could see the dust, dirt, and dog hair that had collected there. Elsa stated that this Words Present, Unsymbolized Thinking, and Imaging experience happened very quickly and that she could not remember if the Image had been in color or not because of the speed of the Image.

For Elsa, Images were sometimes seen from inside her head and other times from outside her visual field. In some sampled moments Elsa was "visually remembering" something or someone by consciously forming an Image. At times, Elsa's Images were moving. Finally, 5 of the 8 Images were unclear.

Inner Speech

Inner Speech occurred for Elsa in 8 (28%) out of the 29 samples. This phenomenon of Elsa's inner experience
occurred when Elsa had experienced the sensation of creating the words that she was thinking as though almost speaking them out loud. Frequently, Elsa was reading to herself at the moment of the beep and was Inner Speaking at these times.

At the moment of Sample #29 Elsa was reading the sentence, "Not every clinician should attempt to treat these patients without specific training in these disorders," when she was signaled by the beeper. She was reading in Inner Speech and at the same moment was also wondering, in Unsymbolized Thinking, about what specific training the disorders would entail.

Sometimes Elsa experienced Inner Speech when not reading, as in Sample #20. At the moment of the beep Elsa was driving her car slowly around one of the UNLV parking lots and looking for a place to park. She was thinking, in Inner Speech, "They're all filled." This thinking was in Elsa's voice, with her exact rate of speech and inflection. At the same moment, Elsa was thinking in Unsymbolized Thinking, "I'll have to go to the next lot." Elsa stated that this thought involved no words and was experienced in an all-at-once manner typical of Unsymbolized Thinking.

Sometimes Elsa experienced Inner Speech along with Unsymbolized Thinking and Images. At the moment of beep #14, Elsa was reading "The other three strategies." The experience of reading to herself was one of creating the words in her own voice, own inflection, etc. This
experience was typical of what has been identified as Inner Speech. At this moment, Elsa was also Unsymbolized Thinking about the researcher sitting in Dr. Hurlburt's office. There were no actual words spoken in conversation, but, rather, an "awareness" of the researcher asking Elsa questions regarding the sampling research. At the same time, there was also an Image of the researcher. Elsa could not determine if the Image was in color or not but stated that the Image seemed to be exactly as it would have been or had been in the past when she had been interviewed in Dr. Hurlburt's office.

Elsa was sometimes reading to herself and was Inner Speaking. Other times, Inner Speech was in the company of other inner experiences.

Words Present

Elsa experienced Words Present in 5 (17%) out of the 29 obtained samples of her inner experience. Words Present took place when Elsa experienced an all-at-once type of thinking in which she could clearly remember the exact words but was aware that the words occurred to her in an all-at-once unspoken manner. This type of thinking falls between Inner Speech and Unsymbolized Thinking. Like Unsymbolized Thinking, it is experienced in an all-at-once manner and like Inner Speech the words are clearly distinguishable.

In two instances (Samples #9 and 25) Words Present occurred alone and not accompanied by any other inner
experience. At the moment of Sample #25, Elsa was at home in her kitchen preparing her four year old son's school lunch. As she was taking a package of Cheetos out of the pantry, a fruit roll-up fell out. Elsa thought, in Words Present, "Should I give him a fruit roll-up or should I give him some Halloween candy." This thinking was an all-at-once experience for Elsa not accompanied by any other inner experience.

In Sample #9 Elsa was thinking, in Words Present, about whether she would be able to finish graduate school in two years. She stated that this was an instantaneous thought that "invaded" her concentration while she was studying for an exam. The Words Present were "I wonder if I can finish this program in two years." Elsa stated that she believed that this thinking was unaccompanied by any other inner experiences. Elsa stated, however, that she believed that a Feeling of anxiety about the test that she was studying for may have been present just momentarily before the Words Present.

An example of Words Present coupled with other inner experiences was Sample #15 (discussed above in the section on Images). While Elsa was talking to her husband on the telephone, her husband told her that he was going to vacuum the house. As Elsa was listening to her husband, at the exact moment of the beep, she was thinking, in Words Present, "The floor in the kitchen needs to be done too." Elsa stated that this was not in Inner Speech yet she was
aware that the words were present. This thought was accompanied by what Elsa described as a "flood of thinking" accomplished in Unsymbolized Thinking. This was an inner experience that happened so rapidly and contained so many elements of thought that Elsa could only remember some of the details. Elsa experienced a decision, in Unsymbolized Thinking, not to tell her husband about the floor. Elsa stated that this type of thinking was not as though she were forming and creating the words but rather that the words were just there in an all-at-once manner, which is typical of Unsymbolized Thinking. At this moment she also was experiencing an Image of the floor. She could see a rapid succession of three and maybe more places of the floor and the dog hair that had collected there. Elsa stated that the Unsymbolized Thinking and Image occurred very quickly. Elsa could not recall if the Image had been in color.

Words Present was an all-at-once type of thinking in which Elsa could clearly remember the exact words that occurred in her inner experience. This type of thinking falls somewhere between Inner Speech and Unsymbolized Thinking.

Just Doing

In 4 (14%) of the moments Elsa was "on task" and busy Just Doing whatever it was that she was occupied with at the moment. At these times there were no inner experiences occurring that Elsa could remember. This type of experience occurred for Elsa in 4 out of the 29 sampled moments.
An example of Just Doing occurred at the moment of Sample #19. At this time Elsa was standing at her kitchen counter and preparing a school lunch for her four year old son. She was putting her son's sandwich into a plastic sandwich bag at the moment of the beep. Elsa stated that she was just putting the sandwich in the bag and not thinking of anything that she could recall or having any inner experiences.

At the moment of Sample #21 Elsa was at her job at the UNLV Reading Center. She was readjusting the time on the stop watch that she used for timing the psychoeducational tests that she gave on her job. Elsa stated that she had to read the instructions to attempt to readjust the watch. At the moment she was concentrating on manipulating the buttons on the watch when she was signaled by the beeper and was totally absorbed in the task. She stated that she was totally unaware of anything other than the three buttons on the stopwatch that she was pushing.

Sometimes while Elsa was Just Doing she had a faint, uncertain thought that something more may have been happening and that she had difficulty grasping it. For example, at the moment of Sample #22 Elsa was again signaled at work while she was giving a client a hearing test. Elsa stated that she was on task and not aware of anything other than a sense of inconveniencing the person who was being tested. This awareness of inconveniencing the person was faint and Elsa was uncertain whether this awareness occurred
at the moment of the beep or immediately after the beep signaled her.

At times, Elsa was Just Doing at the moments that she was signaled by the beeper. At this moment she could not recall any other inner experiences occurring.

Feeling

Elsa experienced Feelings in 4 (14%) out of the 29 obtained samples. Feelings were alone, experienced with Unsymbolized Thinking, or re-experienced as something that she had done previously.

In Sample #5 Elsa was watching the news on television. A story was on about a factory in Utah that pollutes more than any other factory in the United States. Elsa stated that she was Feeling anger and disgust because of the report that she was hearing. The Feelings of anger and disgust were present and experienced as an "agitation." She could not state, however, if the Feelings were located in any specific area of her body.

At the moment of Sample #17, Elsa was talking with another person about therapists who have personal problems and the clients who go to see them. Elsa stated that she was concentrating on what the speaker was saying and was focused on the speaking voice and face as well as the words being spoken. Elsa stated that this focus was totally without effort. When the beeper signaled Elsa, she experienced a Feeling of annoyance at the buzzer for disturbing her concentration. This Feeling was not physical
but rather a mental Feeling of irritation which Elsa could not explain further.

Sometimes Feelings were accompanied by other inner experiences. At the moment of Sample #1 Elsa was reading from one of her school textbooks. At this time she was also thinking, in Unsymbolized Thinking, about the noise that she was hearing because her husband was directly outside the window using the weed eater. She was annoyed because she was unable to concentrate on the reading and could not retain any of the information. Because the loud noise of the weed eater annoyed her and prevented her from concentrating on her studies, Elsa experienced a Feeling of irritation. Elsa stated that the sound of the weed eater seemed to "get in between" herself and what she was attempting to do. The Feeling of irritation was accompanied by the sound of the weed eater that seemed to be located inside Elsa's head. The thinking, in Unsymbolized Thinking, was like an awareness that the noise was "out there" and intruding on her.

Sometimes Elsa experienced a Feeling that she had experienced before. For example, at the moment of Sample #6 Elsa was looking over notes about Single Subjects designs that she had been studying in psychology. She was remembering that she had experienced previous exposure to the material being read in a class that she had previously taken. The remembering was like being in the classroom. Elsa stated that it was "a re-Feeling" or a Feeling of
having experienced exactly the same Feeling before. She was cognitively remembering the experience of being in the classroom from the past, as well as experiencing a sensation of already knowing the material. The sensation of already knowing the material was as though she were saying the words, "I already know this stuff" but there were no words involved. This was an example of Words Present. There was a Feeling of having her time wasted as well as a feeling of accomplishment of already having known the material.

Elsa experienced Feeling in several ways. Feelings were alone, with Unsymbolized Thinking, or re-experienced.

Searching

Searching was experienced by Elsa when she was actively searching in her mind for some information. This Searching process was somewhat like going through files in her mind. This phenomenon occurred for Elsa in 2 (7%) out of the 29 sampled moments.

At the moment of beep #7 Elsa was reading the words "In the only available study" from a book and attempting to remember the study referred to. Elsa read the words almost as though she were saying them out loud (a sample of Inner Speech). Elsa was attempting to remember if she had read this study before or not. Attempting to remember was as though Elsa were Searching through her mind and attempting to see the pages of information again. Elsa stated that she was trying to visualize the study and to remember what was coming up next. She was experiencing an Image of a
photocopy of a journal article from a book. Elsa stated that the image was not clear but that she knew what the object was. She could not, however, see any of the words. She stated that it was as though her "mind's eye" were working and that she was not exerting any physical effort in attempting to accomplish this task. Elsa stated that the search was an act of "trying" to see the words of the article so that she could know what was coming next.

In the second example of Searching, Sample #8, Elsa and her husband were discussing the split brain theory and how Western Civilization had developed the left hemisphere of the brain. Elsa was thinking about the accomplishments of the right brain. She had said aloud to her husband, "People have developed their right brain functioning to varying degrees" and at that moment the beeper sounded. Elsa was looking at her husband's face and making eye contact with him while speaking to him. She was also thinking, in Words Present, about examples of right brain functioning. This thinking was like running through a list of right brain endeavors. Elsa stated that the words were not heard or seen but that she "thought them" one word after the other. The list included words like artistic endeavors, painting, and music. Although Elsa did not see it, there was another file. Elsa also experienced an awareness of the subcategories that would follow. This process was rapid and the list had started but stopped suddenly when she was signaled by the beeper. Elsa was aware that there were more
to come and that the list would have continued. The list of words were located in Elsa's head.

There were a few instances in which Elsa experienced going through files that were in her mind. This was an experience of Searching for her.

Summary

Elsa had seven types of inner experiences. The most common type was Unsymbolized Thinking, which occurred in 12 (42%) out of the 29 samples obtained. Three of these 12 inner experiences were "pure" Unsymbolized Thinking. That is, unaccompanied by any other inner experience. In the remaining 9 samples, Unsymbolized Thinking was accompanied by other inner experiences such as Inner Speech, Feeling, and Words Present.

Images were present in 8 (28%) of the 29 samples. Some Images were seen inside her head and other Images were seen from outside her visual field. Elsa experienced moving Images, in over half of her Images (5 instances) the Image was not clear.

Inner Speech occurred for Elsa in 8 (28%) out of the 29 samples. Sometimes Elsa experienced Inner Speech while she was reading to herself. Other times she experienced Inner Speech while she was busy doing something and thinking in Inner Speech. In three of the samples, two of them when Elsa was reading, Inner Speech was unaccompanied by any other inner experience.

Words Present occurred in 5 (17%) out of the 29
samples. Words Present was experienced alone (in two samples) and also accompanied by other types of inner experiences.

Just Doing was experienced in 4 (14%) out of the 29 samples. At these sampled moments Elsa was simply "on task" and not aware of any other inner experience.

Feeling also occurred in 4 (14%) of the sampled moments. Feelings were either alone, experienced with Unsymbolized Thinking, or experienced as a re-experience of something that had previously taken place.

Elsa's least often recorded inner experience was Searching that occurred twice (7%). This was a phenomenon that entailed Elsa going through what seemed to be files in her mind in search of a study in one case (Sample #7) and accomplishments of right brain functioning in the second (Sample #8).
Chapter 14

Antonio: A University Student From Brazil

At the time of sampling, Antonio (not his real name) was a 25-year-old student from Brazil. He was in his third year at UNLV majoring in Business. Over the period from July 10, 1990, to August 6, 1990, 29 samples of Antonio's thinking were obtained. Antonio was selected as a subject because he did not have any learning disabilities.

There were five clear characteristics of Antonio's inner experience: Images occurred in 15 (52%) out of 29 obtained samples, Unsymbolized Thinking in 13 of the obtained samples (45%), Just Doing in 5 out of 29 sampled moments (17%), Inner Speech and Feeling in 3 out of 29 (10%).

Images

At times, in 15 (52%) samples, Antonio experienced Images. Sometimes this was an experience of words on a screen inside his head, such as in Sample #5. At this time, Antonio was thinking about a friend who had a stroke and was losing his memory. Antonio was thinking about how upsetting this was to his friend. He was thinking, "If I didn't know where I was most of the time..." when the sentence was interrupted by the beep. Antonio stated that these words were seen in his inner experience as though they were on a screen. He could see one word at a time going across the
screen from left to right. He could not positively describe how the words looked on the screen, only that they were there. At the same time, Antonio was experiencing creating the words and saying them to himself in Inner Speech. They were in his own voice, but at a slower rate of speed than was normal for Antonio's exterior speech.

Another example of Imaged words was Sample #13. At this moment Antonio was writing about the previous beep. He was looking at the paper with his pen in his hand and he stated that he had "words in his mind" attempting to think about what he was going to write down concerning the previous sample of this thinking. At the exact moment that the beeper signaled him, he had an experience that he called a "flash of memory" and a "task on hold" to clean his glasses. The words "clean glasses" seemed to be seen very rapidly in Antonio's inner experience. Antonio stated that the words were in some way visual and that he could see them rather than hear them, although they were not clearly seen.

Sometimes Antonio would attempt to create an Image to go with music that he was listening to as in Sample #19. In this sample, Antonio was listening to a choir singing classical music, and was attempting to imagine what the choir looked liked while he relaxed and listened to the music. He was seeing an Image of people wearing white robes. One row of men could be seen from a 45 degree angle. He could see between 10 and 15 men although he was aware that there were many more people present but they were not
seen in the Image. The faces of the choir members were not seen clearly. Attempting to create this Image was an active process for Antonio. He stated that he was working, although not hard, at forming an Image of this choir that he was enjoying. The Image was fairly large, not clear and experienced as being out front of Antonio's visual field. Along with this Image Antonio was experiencing a Feeling of relaxation.

Sometimes Antonio's Images conflicted with his thoughts as in Sample #8. At this time, Antonio was experiencing Unsymbolized Thinking about reading something to kill time. An almanac that was present at his home was coming to his mind as part of the Unsymbolized Thinking experience, but he was experiencing an Image of another almanac that he owned. In his Image he could see the second almanac, which was red, instead of green as was the thought-about almanac, but lacked the details that were on the actual almanac. The Image was located inside of his head and appeared to be life-size. He could not recall specific details of his Unsymbolized Thinking.

In Sample #9 Antonio was Unsymbolized Thinking about calling a friend who had just called him. He stated that thinking about calling the friend up was an "instantaneous" thought accomplished without words or symbols. At the moment of the beep, Antonio was also experiencing an Image of the coffee shop that his friend worked in. The Image was of the coffee bar with some people seated at it. Antonio
stated that the counter was big and dark brown colored. There were no chairs present, and he was uncertain whether there were one or two people at the bar. He could see that there were people working in the coffee shop but he could not see any clear details.

In Sample #27 Antonio stated that he had many "thoughts" that were like pictures. At the moment he was sitting in his office and had just picked up his photo album and put it down. At the moment of the beep he stated that he had many thoughts that were actually present in pictures. The Images were seen as a series of pictures as if projected by a slide projector. Antonio stated that they were seen at a very high rate of speed, one after the other in his inner experience. He stated, however, that at the moment he could not isolate one particular Image or thought. It was uncertain if there was Unsymbolized Thinking as well as the Images, or whether the Images themselves somehow replaced Unsymbolized Thinking. The Images were in the same location in his visual field and were seen like a waterfall of pictures. The only Image that Antonio could positively identify was of the photo album itself. In this particular Image Antonio stated that he details were moving so fast that it seemed as though he did not really see it.

Unsymbolized Thinking

Unsymbolized Thinking occurred in 13 (45%) out of the 29 samples moments for Antonio. Sometimes Unsymbolized Thinking was a typical experience of thinking accomplished
without words or symbols. Other times, Antonio experienced a type of Unsymbolized Thinking that he called "flash of memory," which was Unsymbolized Thinking associated with a memory of something that he frequently did.

For example in Sample #7, Antonio was sitting at home and Unsymbolized Thinking about going to work. At this moment Antonio described his thinking as having what he called "flashes of memory" about the things that needed to be done to get ready to go to work. Among the necessary things to do were ironing, putting out the trash, and getting dressed. The thoughts about doing what was necessary to get ready for work were experienced in an instantaneous all-at-once manner. He could not differentiate thoughts, however, and the perception was of there being only one thought present. Antonio stated that the Unsymbolized Thinking was very rapid, and that the thoughts had an instantaneous quality about them. Since Antonio had done these chores many times in the past when preparing to go to work, this experience was a recollection of things to be done.

A clear cut example of Unsymbolized Thinking for Antonio was in Sample #4. At this moment Antonio was struggling with how to do a math homework problem. He stated that he experienced an instinctive thought that was something like "well, let me look back." He knew that this was a thought that would later become an action. This thought, in Unsymbolized Thinking, was experienced without
words or symbols and in an all-at-once manner.

In Sample #21 Antonio was experiencing Unsymbolized Thinking along with an Image. In this sample Antonio was thinking about his car being hot and how he needed to get in the car to go to work. He was experiencing an Image of himself sitting in the car attempting to turn the key in the ignition with a cloth in his hand so that he would not be burned. He stated that at this moment he was also experiencing a physical sensation of heat in his body. Antonio could not state the exact words that he was thinking only that the Unsymbolized Thinking and the Image were related to how hot the car was going to be.

At times, Unsymbolized Thinking was accompanied by an Image as well as a Feeling, such as in Sample #22. Antonio was Unsymbolized Thinking that he needed to clean the jacuzzi. He experienced a clear Image of the jacuzzi with green algae floating in it and a Feeling of discouragement along with the knowledge that it would be hard work to clean the jacuzzi. He described the Feeling as one of discouragement. It was located in his head and was a downcast Feeling.

Just Doing

Sometimes, in 5 (17%) out of 29 samples, Antonio was Just Doing something and not having any inner experiences at the moment of the beep.

In Sample #1 Antonio was trying to figure out how to use the new computer program that his office had obtained
for him. He was concentrating on the program and looking at the computer at the same time. This experience was once of concentrating on the job at hand and Just Doing.

In Sample #14 Antonio was reading a title of an article called "Nigeria Opt for Smaller Families." He was reading the words and just seeing them visually. He stated that he was comprehending the words but he was unsure how he was accomplishing that.

In Sample #26 Antonio was walking in front of the TV and he stopped to look at it for a few minutes. He was watching the television program and doing nothing else at this moment.

Inner Speech

Occasionally, in 3 out of the 29 samples (10%), Antonio experienced Inner Speech. In Sample #16, Antonio was thinking, in Inner Speech, about a friend that he hadn't seen for quite a while. Antonio stated that he was making up a conversation in his head between himself and his friend. He was thinking, "You probably won't be seeing me for the next ten months" when the beeper went off. The words were in his own voice, own rate of speed, inflection, etc. There was an emphasis on the words "ten months"; Antonio noted that these words were experienced as being somehow bolder than the other words that he was creating, but could not explain further in what way these words stood out from the rest of the sentence.

In Sample #5 Antonio was thinking in both Imaged Words
and Inner Speech about a friend who had a stroke a few years previously. The friend had been losing his memory and sometimes did not know where he was. At the exact moment Antonio was thinking "If I didn't know where I was most of the time ..." when the beeper went off. He was also seeing the words in his head as though they were on a screen. The words were seen one word at a time going left to right. Antonio stated that he could not identify the way the words looked only that they were there. He was also aware of saying the words as he was seeing them, in his own voice, same inflection, pauses, etc., but slower than his usual speech. The seeing and saying of the words seemed to overlap. He would see the word and they say it as though he were reading it at the same time that it appeared on the Image of the screen.

In Sample #17, Antonio was wanting to have a bowl of cereal while he was watching a talk show on TV. The word "Coyote" could be seen on the television screen and Antonio repeated the word to himself in Inner Speech. He experienced saying the word coyote as well as a wondering about the word. The wondering about the word seemed to be tied into a Feeling, but Antonio was very uncertain to describe the experience further.

Feelings

Antonio experienced Feeling in 3 (10%) out of the 29 obtained samples of his thinking. In Sample #22 (described in Unsymbolized Thinking) Antonio was experiencing a Feeling
tied into an Unsymbolized Thinking experience and an Image. In this sample Antonio was thinking, in Unsymbolized Thinking, about cleaning the jacuzzi and was experiencing a Feeling of discouragement. The Feeling of discouragement was located in his head. Antonio described this Feeling as a "downcast" Feeling of knowing it would entail a great deal of hard work to get the jacuzzi clean.

In Sample #11, Antonio was putting out the trash and when he went to the door he realized that the door was locked and that he did not have a key to open it. At the moment that the beeper went off, he was looking at the lock and experiencing a thought, in Unsymbolized Thinking, that he needed to get the key fast and not waste time. This thought was coupled with a Feeling of anxiety. There were no bodily sensation accompanying this Feeling. Rather, the Feeling was tied into the thought of not wasting time and getting the key fast.

In Sample #18 Antonio experienced Feeling alone. At this moment he was sitting at his desk at work and rewinding a tape. He was waiting for the tape to finish rewinding while his hand was positioned on the desk and ready to push the stop button. Antonio was experiencing a slight Feeling of anxiety in his body but he was not sure of the exact bodily location.

Summary

In conclusion, it appears that Antonio experienced five distinct types of inner experience. Most frequently, he
experienced Images in 15 (52%) out of the 29 obtained samples. This experience was sometimes one of Antonio seeing a screen in his mind with written words on it. Other times, Antonio experienced Images as an enjoyable pastime such as when he was creating an Image to go with music he was listening to. Other times, Images had a practical application such as when he was thinking about the almanac and experiencing an Image of another almanac at the same time.

Antonio experienced Unsymbolized Thinking in 13 (45%) out of 29 samples. Unsymbolized Thinking was on a continuum for Antonio. He was clear about what words he had thought in some cases and in other cases very uncertain of the wording.

Just Doing was experienced in 5 (17%) out of the 29 samples of Antonio's inner experience. In these moments Antonio was just doing something and had no inner experiences.

Feelings were experienced in 3 (10%) of the samples. Antonio experienced Feeling alone, with an Image, and with a Feeling.

Inner Speech occurred in 3 (10%) out of the 29 samples. Sometimes the words were not only created by Antonio but were also seen on a screen in an Image. Other times Antonio experienced Inner Speech alone.
Ken (not his real name) was a 28-year-old graduate student in psychology at the time of the sampling. Thirty-two samples of his inner experience were collected over a period from April 22, 1991, to May 16, 1991. During this time eight separate categories of inner experience were identified. Feeling was experienced most frequently for Ken. It occurred in 21 out of the 32 (66%) sampled moments. Ken experienced Images in 15 (47%) of the 32 samples. He experienced Unsymbolized Thinking in 13 (40%) of the moments. Words Present was experienced in 10 (31%) samples. Soul Experience occurred in 9 of the 31 samples (28%). Inner Hearing took place 3 times (10%) for Ken. Out of Body Experience occurred twice (6%). Less frequently experienced was Inner Speech, which occurred in one sample (3%).

**Feeling**

Feeling was experienced by Ken in 21 (66%) out of the 32 samples. In 8 out of the 12 samples of Feeling Ken could determine a physical location.

For example, at the moment of Sample #9, Ken was experiencing Feelings along with an Image of a woman whom he had met Saturday night in a bar. All the details of the event, including the exact Feelings experienced that night and sounds present at the bar, were present in this sample.
In the Image he could see the woman as she had appeared at the bar. She was wearing tight black leather pants and a white tube top. The middle portion of her stomach was slightly exposed and Ken could see that she had an athletic body and that the muscles in her stomach were well developed. Ken's focus was on the Image of the woman as though she were standing directly beside him at the bar while he was drinking a beer. He stated that he could experience the Feeling of his elbow as he rested it on the bar and his hand was on the beer glass. Ken stated that there was movement in the Image that seemed to be associated with looking at her. Ken was thinking, in Unsymbolized Thinking, that he was attracted to this woman. Along with this thought was an awareness that he would like to get to know her. Although the thinking was present the predominant part of the experience was a Feeling of sexual arousal located in the groin area. Ken described the experience as a "re-experience" of being there at the bar and a "re-feeling" of the actual Feelings that he was having at that time. The two processes were coupled, however, since the Feeling triggered the Unsymbolized Thinking. The sounds of the bar were also present in this experience.

At the moment of Sample #18 Ken was watching Return of the Jedi on his television set at home. He was experiencing a Feeling of awe. He experienced a thought in Words Present that went, "This person must have had a great imagination to create this." Ken stated that he was experiencing an amazed
Feeling along with Unsymbolized Thinking concerning the amount of imagination that had gone into the making the movie. Also, at this moment, Ken stated that his entire body felt relaxed.

Sometimes Ken was unable to differentiate Feelings as in Sample #22. At this moment, Ken was talking on the telephone. He was feeling either angry or depressed but he could not distinguish between the two emotions. They seemed to be central to the body but he could not determine any exact physical locations. He was thinking in Words Present "I don't have time to feel like this." Ken stated that he was sure that he was experiencing Images at this moment but they were dark and vague and he could not determine their content. There was a physical Feeling in his upper stomach and lower chest. A Feeling of anger and depression which Ken stated was not felt to be physical but seemed to be on an emotional level.

In Sample #16 Ken could not determine a bodily location for his Feelings. He was at the gym during this moment and spotting for his partner. Although he was visually attending to the spotting, he was thinking, in Unsymbolized Thinking, about school and all the work that needed to be done. He stated that he was experiencing no specific thoughts about school, just about the school work in general. He stated that the thought process was a good Feeling, and that he was Feeling "high" and "pumped up" and this was a great Feeling for Ken in general. Ken was also
aware that his body was physically tired and the his muscles were aching.

In summary, Ken experienced Feeling on many different occasions. In 8 out of the 21 Feeling samples he was able to determine a physical location for his Feelings. Nine of the Feeling experiences are included in another category, Soul Experience, since in these moments, Ken experienced Feeling in his soul.

Images

Ken experienced Images in 15 out of the 32 samples (47%). Ken experienced Images as recreations of events in his life, simultaneously, multiply, Images with no visual detail, and moving Images.

Six of the Images were recreations of actual events in his life. At times Ken's Images were a recreation of an event with additional details. In Sample #27 Ken was listening and watching MTV at this moment and not attending to anything in particular on the television. His eyes were shut and his body was tense. He was thinking, in Words Present, "I know we go somewhere, but where?" This thought was due to the recent death of his friend. He was experiencing an uneasy Feeling in his stomach. The Feeling was close to making him very nauseas. He was also experiencing an Image of Sharon, the girl who had died. In the Image, Sharon was lying on the floor with a colorful object hovering about 6 or 7 inches over her body. The colors formed a freeform shape that consisted of the colors
pure white, blood red, and a small amount of gray and a bright fluorescent turquoise blue. Her face seemed to be a radiant pure white color and a shade of blue that Ken was unable to specify. Ken explained that "somehow the colors were there at the same time." He could not see her legs, only the top portion of her body. Ken was looking at Sharon from a floor level. He could see her positioned on her back with her head tilted back. She was lying in the exact place and position that she was in at her death. The clothing, however, was not the same as it was in reality. In Ken's Image she had on a white Tee shirt with a yellow ribbon, American flag and the words "God bless our troops" on the front of the shirt.

Sometimes, as in Sample #32, the Image was a creation of Ken's imagination and not directly developed from an actual experience. At this moment Ken was thinking, in Unsymbolized Thinking, that it was time to close this chapter of his life. He experienced an Image of a large black book closing very fast with a firm soundless boom. This was not an unpleasant experience. It produced a good Feeling for Ken. There was an absence of pain and sorrow as the book in Ken's inner experience closed shut.

In Sample #29 Ken experienced two simultaneous Images. In one of the Images there was movement. Ken was sitting on the couch at this time, trying to understand what was going on in his life. Two Images were going on at one time in his inner experience. One Image was of a clown laughing at him.
The clown had white and red paint on his face and a red nose. Ken could see the red nose and the teeth more clearly than the other parts of the Image. The clown was wearing a black outfit with no buttons or zippers on the outfit. The clown was looking directly at Ken. He had very white teeth. Ken could hear an eerie laugh that was both evil and penetrating. He also experienced another Image of himself above and to the right of the Image of the clown. Only Ken's face was present in this Image. His face was white with red tears running down the cheeks in slow motion.

At times, Ken experienced several multiple Images as in Sample #23. At this moment, Ken was actively attempting to relax at this moment. His eyes were closed and Images were "running" through his mind. Ken stated that it was like watching a movie going on fast forward. Nothing was clear to him. He stated that it was all dark and empty. Ken stated that he was the central figure in these dark Images but at the same time he was sensing that he did not belong in the Images. The Images consisted of a series of visual displays that were actually stories. One story was unfolding faster than Ken was able to attend to it. Ken was certain that the Images had a clarity to them yet, at the same time, they were dark and difficult to distinguish. Ken stated that these rapidly moving Images were evil and emotionally dark. Ken stated that he was experiencing a Feeling of evil in his soul. He experienced this moment as though he were looking down into his mind.
An example of a black Image was Sample #8. At the moment of the beep Ken was riding in the back of a van on his way home from a psychology convention in California. He was feeling angry with Gary, a traveling companion on the van. Ken was talking but he was not aware of the content of his speech. He knew that he was speaking and that the words were "coming out" but that he was not in conscious control of them. He was arguing with Gary and was feeling tension in his entire body but especially in the area between his navel and his diaphragm. The muscles in his stomach were fluttering, and he described the feeling as a fluttering sensation usually referred to as "butterflies." At this moment, Ken was also thinking, in Unsymbolized Thinking, about what was going on and what would occur if it didn't stop. He was thinking, in Words Present, "I hope this doesn't ruin our friendship. This is going to have to stop or it will ruin our friendship." An Image, that Ken called a "black Image," was also occurring. He stated that he seemed to have the Image in his head and that it was as though he were looking into a black hole. The Image had no edge and the black hole appeared to have no bottom. Ken stated that the blackness was like a focus on the feeling of anger that he was experiencing.

In summary, Ken experienced several Images that were recreations of events in his life. He also experienced Images simultaneously, multiply, with no visual detail, and moving.
Unsymbolized Thinking

Ken experienced Unsymbolized Thinking in 13 (40%) out of the 32 obtained samples. This thinking experience contained no words, Images or other symbols. For Ken, Unsymbolized Thinking was always experienced along with other types of inner experience.

Sometimes Ken experienced Unsymbolized Thinking along with an Image and Feelings, as in Sample #6. While Ken was riding in a van on the way back from a convention in San Francisco, he was thinking and also experiencing an Image about some of the people he had seen on Haight Ashbury and what it would be like to live there. In the Image he could see three people, two men and one woman, walking down the street. All three people were dressed in black. The woman had bleached white hair, one of the men had bright red and the other man had bright blue hair. The people in the Image looked exactly as they did when Ken had seen them previously. The Image was clear, colorful and was in motion. The three people were walking toward Ken and he perceived them as passing by him at the exact moment that he was signaled by the beeper. He stated that the Image experience was exactly like reliving the true life experience. He was thinking, in Unsymbolized Thinking, that it would be "neat" to live that kind of lifestyle but that he would never dare attempt it. At the same moment, Ken was also experiencing a Feeling of fear about attempting to live the lifestyle. The Feeling seemed to be located in Ken's
body but he could not be certain exactly if there had been a physical location or not. Ken described two clear processes going on simultaneously. On one hand, he had a wondering of the life style and an Unsymbolized Thinking of it being a "neat" lifestyle. One the other hand, he had a Feeling of being afraid of attempting this lifestyle and was aware that this Feeling had a bodily location but he could not determine where that location was. With these two conflicting messages came a conflict that Ken described as being in his soul. Ken could not elaborate on the Soul Feeling but stated that it was an experience that effected not only his soul but also his entire being.

At the moment of Sample #26 Ken was attempting to think of something to say at the funeral of a very good friend. Ken was thinking, in Unsymbolized Thinking, about what he wanted to say but he could not formulate it into words to express his emotions. This thinking seemed to be jumbled together. Ideas seemed to be moving inside Ken's head as though he were rapidly reading across a page. He stated that he was thinking about concepts of times he and his friend had shared along with some poems that he knew. Tied into this was a need to say something very special but, at the same time, he was unable to think of anything to say. He stated that he was Feeling angry and that the Feeling was of his brain about to explode if he did not think of something. Ken explained this as a dark, ugly, evil Feeling.
In Sample #20, Ken experienced multiple Unsymbolized Thinking and Words Present. At this moment Ken was sitting on the porch of his house and thinking multiple thoughts. Ken stated that his thoughts were like "concepts" in his head. He stated that the thoughts were not clear but that they involved his questioning about what his purpose in life was and why he was here. He was also thinking, in Words Present, "What's my purpose. Why am I here." At this moment Ken was experiencing a sad Feeling in his head; a Feeling "like crying inside." He was also experiencing an Image. It was an Image of Ken crying, and although it contained no boundaries, Ken described it as photo-like. The Image was of Ken's entire body but his focus was on his face. The Image seemed to be located out in front of his visual field. Ken stated that the entire Image seemed to be washed with a light blue color.

For Ken, Unsymbolized Thinking was always experienced along with other types of inner experience. Sometimes it was in the company of Inner Speech, Soul Experience, Words Present, Feelings, Images as well as multiple Unsymbolized Thoughts.

Words Present

Ken experienced Words Present in 10 (31%) out of the 32 samples. This experience was one of an all-at-once type of thinking that was accomplished in words.

In Sample #28, Ken was forcing his eyes to remain open while he was thinking, in Words Present, "I know if I lie
down the Images will come back." He was physically tired at
this moment but afraid to fall asleep. The fear was
experienced as a Feeling that was new to Ken and one that he
could not describe.

Sometimes Ken experienced Words Present along with
Feeling. At the moment of Sample #21 Ken was aware of being
physically tired and tense. His arms were crossed tightly
across his chest. At this time, he was also thinking in
Words Present, "I need to do something to increase my energy
level." He was experiencing a Feeling of anxiety. This was
a Feeling located in his entire body. This Feeling was of a
fluttering in the stomach and was located between his
diaphragm and waist. The tired Feeling was a physical
sensation. The anxious Feeling was an emotional Feeling but
it did have an overall effect on Ken's body because he
stated that it created a Feeling of tension in his body.

In Sample #14 Ken experienced a "recreation" of an
incident previously experienced. In this case, however, the
incident had happened moments before and lacked the minute
details that were present in Sample #9 (discussed in Feeling
above). While Ken was driving his motorcycle on the way to
the gym, he passed an accident. After passing the accident,
he was thinking, in Words Present, "I wonder if someone was
hurt." Ken experienced an Image of the red car rolled over
on its roof as it had appeared in reality moments before.
Ken stated that the Image was a vision of exactly what he
had just seen as though he were driving by all over again.
It was an "instant replay" of the accident scene. He experienced a sensation of turning to look at the accident as he rode by it. He experienced a feeling of uneasiness in his stomach as a result of seeing the damage that the wreck caused to the vehicle involved in it. The feeling was located in Ken's stomach but he could not explain further.

In Sample #18 Ken experienced Words Present and Unsymbolized Thinking. At this moment he was watching Return of The Jedi. He stated that he was experiencing an awe and an amazement at the amount of imagination that had gone into making the movie. The awe and amazement were an experience of Unsymbolized Thinking for Ken. He was thinking, in Words Present, "This person must have had a great imagination to create this." He was experiencing a relaxed feeling in his entire body.

For Ken, Words Present was an experience of an all-at-once type of thinking. This thinking, making it different from Unsymbolized Thinking, was accomplished in words that were present in Ken's awareness.

Soul Experience

Soul Experience was a particular type of Feeling that occurred for Ken in 9 out of the 32 samples (28%). During these moments Ken's Feeling seemed to be located in his soul or his essence. Ken experienced difficulty describing these essential moments of his inner experience. An attempt was made, however, to describe these moments as thoroughly as possible. They are examples of Feeling yet present us with
another unique type of experience for Ken.

For example, in Sample #1 Ken was walking up the stairs at the psychology department while he was talking to a friend about the abnormal psychology test that she had just gotten back from her professor. Ken was telling the girl that she got a perfect score. The beep went off when he was telling her about her score. Ken stated that he was experiencing a good feeling. While he was talking he was also laughing and feeling relaxed. He described the relaxed feeling as a positive sensation free of stress. The feeling had a physical location for Ken that was in his torso from his stomach up to his neck. The good, relaxed feeling was energizing for Ken. He described it as a feeling of energy in his soul. With this feeling of energy in his soul, Ken also experienced an awareness that the energy would "carry him through," coupled with an additional awareness that now that he was being energized he would be able to do better work. Ken could not further explain how this awareness came about other than it was linked to his being happy about having been energized and this was related to the overall experience of feeling positive.

At the moment of Sample #5 Ken was standing in the student union and looking out the doors. He was thinking, in unsymbolized thinking, about having gone out to dinner the night before and how much fun he had. He was experiencing a good, comfortable feeling of "fitting in" for Ken. Ken stated that the feeling of being comfortable was
located in his soul and was a Feeling of belongingness. The Feeling of belongingness was an all-over Feeling of making the right decision and that decision Felt good. At the same time, Ken was experiencing an Image that was a reenactment of the dinner that he had eaten with a friend the night before. In this Image everything was as it actually had been. Ken was sitting with his friend at Wendy's restaurant. They were sitting next to each other and eating salad. Everything in the Image was clear and in color.

Sample #19 was an example of a Feeling that Ken experienced in his soul. While Ken was sitting on the front porch of his house, he was listening to music. His eyes were shut and he experienced a gray Image. He could not see himself in the Image but he experienced an awareness of himself in the Image. The Image itself consisted only of a vast grayness that seemed to surround him completely. The experience was as though he were seeing from the point of view of a third person and looking down upon himself from an angle that was off to one side and above. Ken experienced a Feeling of emptiness in the part of his being that he described as his "essence." The Feeling of emptiness was located in his upper torso, mostly in his chest area. He described this Feeling as being a "hollow" Feeling. He was aware of the music playing in the background. It was a song called "Hell is for children" but he was not attending to the music. Ken stated that he was paying attention to the vast grayness in his inner experience.
In summary, Soul Experience occurred in 9(28%) of Ken's 32 samples of inner experience. Soul Experience was always a Feeling experience. It was more than a Feeling experience, however, since the Feeling had a distinct location in Ken's soul. Ken explained that this was an extremely difficult type of experience to describe.

**Inner Hearing**

In two (6%) out of the 32 samples Ken experienced a phenomenon called Inner Hearing. At these moments Ken could hear words spoken in his inner experience.

In Sample #30, while trying to eat breakfast, Ken was experiencing an Inner Hearing of Sharon, his friend who had died, which seemed to come from above and to the right of Ken's visual field. Ken stated it was very much like the experience of an Image, but without the picture. Sharon was saying to him, "wake up and stop questioning what you did - it wouldn't have mattered." Although there was no picture, there was a perception experienced by Ken of this being an Image. Ken was also experiencing a Feeling of sorrow and emotional emptiness. The Feeling was experienced physically all over his body, on the back of his head, deep within his stomach as well as in his mind.

In Sample #31 Ken experienced an Inner Hearing but he could not determine what words were spoken. This Inner Hearing experience brought with it a Feeling of joy for Ken. While he was standing on the front porch and looking at the sky, Ken experienced an Image. The Image was very real to
Ken and he stated that it was as though he were actually part of the Image itself. Ken could see that there was water in the background and he could see the green grass and flowers on the fields. He knew that Sharon was in the Image because he could sense her presence, but he could not actually see her. Ken sensed that she was trying to explain something to him but he couldn't understand what it was. He had a full bright, joyful Feeling and felt as though Sharon were in his soul and talking to him. He Felt as though Sharon were actually speaking to him but he could not comprehend the words she was speaking only the positive Feeling that the words produced.

Out of Body Experience

Ken experienced two (6%) Out of Body Experiences. In these samples Ken felt as though he had left his body.

At the moment Sample #7 Ken was dozing off while driving in a van crowded with people returning to Las Vegas from a trip to California. He stated that he was somewhere between being asleep and awake. Ken said that the sound of the beep made him aware that he was having an Out of Body Experience. This experience created a sensation of floating off. He was aware of the voices inside the van, but Ken was aware of not having any boundaries at that moment and knew that he was drifting into another level of consciousness. This awareness was a separate sensation from an awareness of his physical body. Ken stated that a part of him seemed to be separate from his physical self. This other part of
himself seemed to have a location of being outside Ken's body and about two feet away. He seemed to be aware of being outside the van and in an area much larger than the van yet, he had an awareness of being inside the van at the same time. The sensation was one of being disconnected and free. This experience was very pleasant for Ken. It was a sensation of being able to encompass everything for miles around.

In Sample #24 Ken was uncertain about what was happening in his inner experience. At the moment that Ken was signaled by the beeper he stated that he was not doing anything but that the sound of the buzzer made him aware of that he was awake but that he seemed to be physically present only. He experienced a sensation of being disconnected in his soul. He stated that he had an awareness of being incomplete at this moment. At the moment he was unaware of any bodily sensations or thoughts.

In summary, Out of Body Experience was a difficult to describe phenomenon for Ken. It was a moment when he experienced a sensation of having left his body and of being disconnected.

Inner Speech

On one (3%) occasion Ken experienced Inner Speech. At the moment of #2 he was sitting in the computer lab at school. He was talking to himself, in Inner Speech, and saying, "I don't know if I want to take her advice." This thought was concerning some advice that he had been given.
He was thinking, in Unsymbolized Thinking, about the advice and attempting to decide if he should or should not take the advice. Ken stated that the words of advice "were there." They seemed to be heard being spoken to him in his inner experience. He was not certain if the words were in his own voice or in the voice of the individual who had given him the advice. He was also having a Feeling of anxiety at the same moment that was experienced as a tenseness in the stomach muscles, clearly in the area of the diaphragm and above the navel. Ken stated that it was like a "band of tension" across his stomach.

Summary

Ken experienced eight different types of inner experience. Feeling was experienced by Ken in 21 (66%) out of the 32 samples. In many cases Feeling had a physical location in Ken's body. Many of Ken's Feelings were also Soul Experiences. In these samples, Ken experienced his Feeling in his soul.

Ken experienced Images in 47% (15/32) of the samples. He experienced Images as recreations of events in his life and simultaneously. He also experienced multiple Images, Images with no visual detail, and moving Images.

Unsymbolized Thinking occurred for Ken in 13 (40%) out of the 32 obtained samples. This type of inner experience contained no words, Images or other symbols.

Ken experienced Words Present in 10 (31%) out of the 32 samples. This experience was one of an all-at-once type of
thinking that was accomplished in words.

Soul Experience, a unique type of Feeling experience, occurred for Ken in 9 out of the 32 samples (28%). During these hard to describe moments Ken's Feeling seemed to be located in his soul or his essence.

In two (6%) out of the 32 samples Ken experienced a phenomenon called Inner Hearing where he could hear words spoken in his inner experience.

Ken experienced two (6%) Out of Body Experiences. During these moments, he felt as though he had left his body.

Inner Speech occurred once (3%) for Ken. At this moment Ken was experiencing a type of inner thinking experience that was almost like talking aloud.
Bibliography


