Running Head: MODELS OF LEARNING

Educational Implications Of Three Models Of Learning

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Abstract

Learning preferences as defined by Rita and Kenneth Dunn, Howard Gardner's multiple intelligences theory, and Walter Barbe and Raymond Swassing's learning modalities model are discussed. The historical progression of home education is related to an overview of the curriculum options available to home educators. Learning modalities are applied to home education in order to give parents practical advice and help for teaching their children. The Swassing-Barbe Modality Index was given to home school parents and children in order to identify their learning modalities.

Educational Implications Of Three Models Of Learning

Models of Learning

Students are better able to learn when their learning preferences are being attended. Students are able to communicate their knowledge through their individual intelligences. Students also perceive information in their dominant modality, and so it is important that educators are aware of their students' modalities. Traditional and home educators need to be concerned with giving their students the best instruction and education possible. They could benefit from catering to the specific needs of their students; for this reason, educators should take the time to identify their students' modality strengths. Educators need practical and useful information that serves as a basis for planning instruction around their students' learning preferences, multiple intelligence, and modality strengths.

Rita and Kenneth Dunn Learning Preferences

Origin of Model

The Dunn and Dunn Learning Preference Model is composed of eighteen basic elements. The environmental elements include sound, light, temperature, and design. The emotional elements include motivation, persistence, responsibility, and structure. The sociological elements include working with peers, by themselves, in a pair, as a team, with an adult, and in a variety of group designs. Finally, the physical elements include perception, intake, time, and modality (Martin & Potter, 1998). Rita and Kenneth Dunn (1972) created their model because they saw a need for students to have individualized instruction and avoid the canned curriculum for every student. They felt

that students' individual strengths and interests were being ignored and the students' weaknesses were hindering their learning experience. A child's learning preference is a combination of factors that describes how he learns.

Learning preference is defined as the way that students of every age are affected by their immediate environment, individual emotionality, sociological needs, physical characteristics and psychological inclinations when concentrating and trying to master and remember new or difficult information or skills. The Dunns believe that students learn best only when they use their unique learning preference characteristics to their advantage; otherwise, students study and they forget what they tried to learn (Carbo, Dunn & Dunn, 1991). According to Rita Dunn, learning preferences must be identified with an instrument because teachers cannot possibly identify in all students all the characteristics of learning preference. She also stated that some of the aspects of a student's learning preference are not observable. Also, certain behaviors are often misinterpreted or misunderstood (Dunn, 1990).

Description of Model

Environmental preferences. Rita and Kenneth Dunn have identified several environmental preferences that make up an individual's learning preference. The environmental preferences are basically biological in nature. One of these environmental preferences is sound. Some students need absolute silence when they are trying to study or they cannot concentrate. When they hear noises that others may not notice, they are distracted and become irritable. Some students become so involved in their own thoughts that they block out everyone else. Still another student can be absorbed in his own

thoughts and still be in tune with significant sounds in his environment. Other students need to listen to the radio or television in order to concentrate. These students could be using the music or voices to block out any other distracting sounds (Carbo, Dunn & Dunn, 1991).

Another environmental preference is the amount and kind of light. One person might require a brightly lit room, while another softer illumination. The important issue to consider when determining the amount and type of light in a room is that the person should be able to see comfortably without damaging his eyesight (Tobias, 1996). According to Keefe (1987), few learners are greatly affected by light variations.

Another environmental preference is design, which refers to the space that a person prefers. One person might prefer to sit in a more formal study area such as at a desk, chair, or table. Another person might prefer to sit on the couch with his materials spread around or to lie on a bed while studying. The important factor to consider when planning the study space is to determine if the work will be completed (Tobias, 1996). According to Carbo (1991), no direct relationship exists between how one sits and the amount of concentration involved in what is being studied.

Another environmental preference is the temperature of the room. Each person has a specific temperature range in which he feels comfortable. For some students, temperature may not be an issue, but for those who cannot concentrate unless the room is comfortable, it can be a very critical issue (Tobias, 1996). Many find it hard to work with wide temperature variations (Keefe, 1987).

Emotional preferences. Rita and Kenneth Dunn have identified several emotional preferences that make up an individual's learning preference. The emotional preferences are basically developmental in nature and emerge as a response to the student's experience at home, in school, at play and other environmental conditions. One of the elements that comprise part of Dunn and Dunn's emotional preferences is motivation. Motivation correlates with achievement. When a student cannot learn either because of his inability or the instructor's inability, the student simply turns off. This is often seen as aggression or hyperactivity; at times the student drops out of school or becomes negative and apathetic to learning. Students can be motivated to learn when they are taught through their learning preferences, when they are given material on their level and in small sequences, when they are encouraged and given many opportunities to succeed, when they are provided immediate feedback and when they are supervised during the learning process. When these students begin to see their achievement, their motivation and academic success increase.

Another emotional preference is persistence. The Dunns found persistence to correlate with IQ. Persistence is a student's ability to remain on task for extended periods of time. Students who are not persistent can become motivated and are able to learn more, but require frequent breaks and appear to have a short attention span when involved in academic activities. These students have a long attention span when doing things that are interesting to them (Carbo, Dunn & Dunn, 1991).

Another emotional preference is responsibility, which is the capacity students possess to follow through on a task without direct or frequent supervision (Keefe, 1987).

Responsible students follow through on assignments, complete them to the best of their ability, and often do not need continuing supervision. Responsible students require a clearly stated objective or task that can be understood and mastered, the resources needed to teach the required information on their level, a time the assignment should be completed, an indication of possible assistance, suggestions for checking progress and weaknesses, and alternative ways in which their achievement can be demonstrated. Many students appear less responsible because they revert to playing or daydreaming when a task becomes too difficult. Sometimes these students may seek interaction with their classmates or cause a disturbance to fulfill a need for interaction. These students require instructional methods much different from responsible students. Students who are responsible often try to do exactly what they are told, but the reverse is not always true; students who do not do as they are asked are not always irresponsible. The nonconformist students often require choices and will complete the tasks they commit to completing (Carbo, Dunn & Dunn, 1991).

Another aspect of a student's emotional preference is a student's need for structure, which is determined by the amount and kind of structure students need (Keefe, 1987). Some students require a great deal of structure and feel secure and work well with it. They like to know exactly what is required of them even before they begin a project or assignment. Some students are very self-structured, and when they are exposed to external structure they are suffocated. These students require some direction such as the end result or goal, but need many choices and options in order to relieve the tension they usually live with daily.

Sociological preferences. The sociological preferences identified by Rita and Kenneth Dunn include learning alone, learning with others, or using a variety of these ways. Some students resist learning with adults since their desire to please often causes them to freeze, and they are then not able to produce a response. Some students prefer authoritarian personalities which give them structure, directives, detailed assignments, and mandated expectations. Other students respond to flexible instructors who offer choices, self-initiated projects, and partnership in the learning process. Some students like to learn alone and cannot study with a group, while other students like to study with in a group and cannot concentrate or focus on the important items. It is not important with whom a student learns, but rather that he learns.

Physiological preferences. Rita and Kenneth Dunn (1972) have identified several physiological preferences in regards to their learning preferences model. Like the environmental preferences, these are biological in nature (Carbo, Dunn & Dunn, 1991). One of these preferences is perception. People learn through their different senses. Approximately 20 to 30 percent of the school-aged population remember what they hear, 40 percent remember what they see, others must use manipulative ways to internalize information, still others cannot learn unless they use the information in a real-life situation.

Another physiological preference is time and is displayed in the time of day that a person is most efficient. Every person has a certain time of day or night when he is at his best (Keefe, 1987; Tobias, 1996). These differences are usually reflected early in childhood sleeping patterns and are also reflected in the body's circadian rhythms (Keefe,

1987). Educators and parents can help their students use their time more productively by working during the time they are most productive and not working against their internal clock (Tobias, 1996).

Another physiological preference is intake, referring to a person's need to eat and drink while concentrating. Adults can regulate this need fairly easily; however, students are not often offered this option while doing homework or sitting in class (Tobias, 1996).

Another psychological preference is the need for mobility. These differences include the need for change in posture or location. This difference could be age and sex related since it is noted that younger learners and males generally require more mobility (Keefe, 1987).

Psychological preferences. Rita and Kenneth Dunn (1978) have identified three psychological preferences with regard to their learning preferences model. The first psychological issue is global versus analytic. Analytical students piece details together to form an understanding of the material. Global students require an overall comprehension first and then they can pay attention to the details.

Another psychological preference is hemispheric preference. The two sides of the brain perform different functions. It is believed that the differences caused by either the right or the left side's higher arousal responses may be related to cognitive and personality functions. Right preferenced students are less bothered by sound and other stimulants that are distractors to left preferenced students when studying, often prefer dim light, usually require an informal design, are less motivated toward conventional schooling, are less persistent, prefer learning with peers, and prefer tactual more than

auditory and visual instruction. Right and left dominant students have different environmental and organizational needs when concentrating as well as different motivational and personality characteristics (Carbo, Dunn & Dunn, 1991).

Another psychological preference is impulsiveness versus reflectivity. Impulsive students are those who become enthusiastic and call out answers, behave spontaneously, and act before they think. Reflective students behave thoughtfully and seem more responsive to controls (Carbo, Dunn & Dunn, 1991).

Current Application of Model

Small-group instructional techniques. Small-group instructional techniques can be used to accommodate the elements of light, temperature, design, time, intake, and mobility as well as the elements of persistence, and responsibility. Students who prefer to work alone or with adults and those who do not require structure are not going to benefit as much from small-group techniques. Small-group instruction can occur in a Circle of Knowledge, team learning, brainstorming and case studies.

The Circle of Knowledge reviews and reinforces previously learned material. It provides a framework for review where students can learn more or solidify what they have already mastered. This approach allows students to review previously learned material in an interesting way. It also allows students to focus their thinking on one major concept at a time. Students can contribute to a group effort as part of a team. Students serve as catalysts for additional responses. Students develop ingenuity in helping other team members to contribute to the group. Finally, students learn and are exposed to information without becoming bored.

Team learning can be used to introduce new material and uses both factual and inference questions. This approach allows students to gain all of the advantages of peer interaction and support. This approach produces enthusiasm, motivation, good spirits, positive results, division of labor, responsibility, persistence, self-image, and group recognition of individual efforts.

Brainstorming is a process in which students are given a single problem and asked to storm their brains for ideas. Each participant is encouraged to call out his thought the instant an opening presents itself. This process allows students to release creative energy and helps students plan and solve problems. This approach appeals to the student's personal motivation and does not suppress spontaneity. Brainstorming is stimulating in that it offers a unique and rapid-fire method that builds enthusiasm in all the students. It is positive because it allows quiet students to participate and students who usually dominate classroom discussions are forced to brief responses. It keeps students on track and eliminates irrelevant stories. Brainstorming allows students to be spontaneous and creative. It is efficient and productive because it generates many different ideas and solutions in a small amount of time. It also builds self-image in the participants because their ideas are validated. Group cohesiveness is also increased because the members of the group begin to feel a part of the whole. Finally, brainstorming is ongoing and problem solving because suggestions can be modified and used in new situations.

The case study develops analytical skills and builds empathy and understanding of people as they work together to solve problems or cope with crises. Case studies provide a strategy for developing material relevant to the students. It can be stimulating

and meaningful if student identification is encouraged and the debate includes different points of view on recognized problems. They can be safe and nonthreatening to students who enter the debate without personal attack. Finally, case studies provide training and development in problem solving, analysis, planning and arriving at conclusions in learning and real life situations (Dunn & Dunn, 1978).

Contract activity packages. Contract Activity Packages (CAPs) are one of the basic methods of personalizing instruction through individual learning preferences (Carbo, Dunn & Dunn, 1991; Dunn & Dunn, 1978), interests, ability and achievement levels. They are effective for gifted and above-average students and can be modified to stimulate the interests of average students. They add multisensory resources and structure to the student's learning experience (Carbo, Dunn & Dunn, 1991). CAPs are more effective than a large-group lecture or discussion because they allow students to pace themselves. They also allow students to learn concepts on their individual academic level. CAPs allow students to work independently, and they are ultimately responsible for their own learning (Dunn & Dunn, 1972; Dunn & Dunn, 1978). CAPs allow students to pace themselves so they can learn the material as quickly or slowly as they need (Dunn & Dunn, 1972). CAPs also reduce frustration and students' anxiety because they advance independently. CAPs capitalize on individual student interests (Dunn & Dunn, 1972; Dunn & Dunn, 1978). Finally, CAPs also assist the nonreader, because they provide a variety of media resources to fill in the information that they would miss through reading materials (Dunn & Dunn, 1972).

A properly designed Contract Activity Package contains all of the following components. Objectives must be simply and clearly stated and list exactly what the student is required to learn. The student must be provided with a list of resource alternatives that incorporate the senses. The student should be able to apply the new information in a variety of activity alternatives depending on their perceptual strength or modality. The student should also have a variety of reporting alternatives in which they may share their new information with their classmates. Since some students learn best in the context of a group, students should be provided with a variety of small group activities, such as the ones already discussed. Each CAP should have a test attached to it. The test can be used as a pretest to identify how much a student already knows about a particular topic. It can also be used as a self-test to identify how much a student knows and how much he or she might need to learn after completing the CAP. The test can finally be used as a posttest after all of the activities and assessments have been completed (Carbo, Dunn & Dunn, 1991).

Programmed instruction sequences. Programmed instruction sequences (PISs) are instructional packages of material broken down into small and simple steps that are completed without the direct supervision of the instructor. It is important that the students using these PISs are motivated to learn the contents of the package (Dunn & Dunn, 1978). Programmed instruction provides a valid alternative for average and above average students who do not respond to conventional instruction approaches.

Programmed instruction should be constructed with the following principles in mind. The first principle is that only one item is presented at a time. Material is

presented in a simple written statement to which the student must respond. The second principle is that the student is required to be an active learner. Students cannot progress through the program without an accurate response. The third principle is that the student is immediately informed of his or her accuracy of each response. The student receives immediate feedback and reinforcement. The fourth principle states that the student may not continue into the next phase of a program until each previous phase has been mastered. The student's base of knowledge is complete before he or she is exposed to new ideas. The fifth principle states that the student is exposed to material that gradually progresses from the easy to the more difficult. The final principle states that as the students proceed in the program they are provided with fewer hints (Carbo, Dunn & Dunn, 1991).

Multisensory instructional packages. Multisensory instructional packages (MIPs) are an important teaching approach because they respond to the entire set of learning preference characteristics that exemplify the student who is having difficulties learning. MIPs constitute an approach that appeals to many students with varied learning differences (Carbo, Dunn & Dunn, 1991) and on several academic levels. Using this approach, students can concentrate on the material for the amount of time that suits them. Students work independently or in small groups with materials that are self-corrective (Dunn & Dunn, 1978).

All MIPs have the following four basic elements. The first element is that each package focuses on a single concept. The cover and title should reveal the contents of the package. Regardless of the topic students know exactly the focus of the MIP and can

choose if they need to use it as an introduction to a new topic or to reinforce information they have already learned. The second element of MIPs is that at least four senses are used to learn the contents. The third element of all MIPs is that feedback and evaluation are built in to the package. Tests are included in the package and students may respond in a variety of ways. Correct responses may be checked as the items are completed. Directions provide immediate feedback and self-evaluation. Mistakes can be corrected through repetition of the directions and in comparison to prepared responses. The final element common to all MIPs is that learning is private and aimed at individual learning preferences. Only the teacher and the student know how well the student is doing (Carbo, Dunn & Dunn, 1991; Dunn & Dunn, 1978).

Tactual and kinesthetic materials. Tactile and kinesthetic (T/K) resources should be developed and incorporated to regular instruction for those who are having difficulty learning as well as gifted students. These materials can be used in a variety of settings and can accommodate for the student's individual learning preferences.

Tactual and kinesthetic materials vary in design and purpose but are generally simple to create and use. One type of T/K resources is the learning circle, which can be used to review skills. It is a large circle divided into eight different sections with each section containing a different problem to be solved or task to be completed. Students use manipulatives such as clothes pins to answer each question (Carbo, Dunn & Dunn, 1991; Dunn & Dunn, 1978). Another type of a T/K resource is the learning strip which is similar to the learning circle. The learning strip and the learning circle are both excellent resources for introducing or reinforcing facts or skills that students are required to learn

(Dunn & Dunn, 1978). Task cards can be designed in any shape and can include any number of tasks to be completed (Carbo, Dunn & Dunn, 1991). Task cards should be self-corrective. They permit students to recognize whether they understand and can remember the material. Task cards also allow students to be free from anxiety since they are the only ones to see the errors made. Task cards enable students to find the correct answers when they make mistakes. Finally, task cards allow the teacher to be free to work with other students. Other T/K resources include flip-chutes, electro boards, pic-a-holes, and a variety of word and physical activity games (Carbo, Dunn & Dunn, 1991; Dunn & Dunn, 1978).

Howard Gardner's Multiple Intelligences

Origin of Theory

Multiple Intelligences refers to Howard Gardener's theory, published in his book *Frames of Mind* (1983), that intelligence is the capacity to solve problems or fashion products that are valued in one or more cultural settings. The first statement of Gardner's theory included logical-mathematical intelligence, linguistic intelligence, spatial intelligence, musical intelligence, bodily-kinesthetic intelligence, interpersonal intelligence and intrapersonal intelligence. Gardner later expanded his theory to include naturalist intelligence. Gardner argued that multiple intelligences are developed through both biology and culture. Gardner further stated that every person is born with all eight intelligences; however, each person develops a different set of intelligences. Supporters of Gardner's theory believe that the emphasis on the importance of developing mathematical and linguistic intelligences is unfair. Since all students learn differently,

students should also be assessed differently in a manner that is consistent with their individual set of developed intelligences (Brualdi, 1996).

According to Cynthia Tobias (1996), IQ tests are not accurate at portraying how intelligent a person is and how successful a person will be because they measure only a portion of one's intelligence. She stated that there are many ways to be smart, and IQ tests do not measure many of the intelligences suggested by Howard Gardner.

Howard Gardner created Multiple Intelligences, a psychological theory about the mind, based on research from such fields as psychology, sociology and biology ("All kinds," 1999). He first introduced the theory of multiple intelligences because he was critical of current views of intelligence within psychology (Gardner, 1995). The theory is a critique of the idea that humans are born with a single intelligence, which cannot be changed and is measured through psychological tests. Most intelligence tests measure lingual and logical intelligence which are only two of Gardner's multiple intelligences ("All kinds," 1999).

Description of Theory

Verbal-Linguistic Intelligence. The Verbal-linguistic intelligence is the capacity to use language, one's native language and perhaps other languages, to express thoughts and to understand other people (Checkley, 1997). It involves having a mastery of language and includes the ability to effectively manipulate language to express oneself rhetorically or poetically and also allows one to use language as a means to remember information (Brualdi, 1996). Verbal-linguistic intelligence measures verbal abilities such as reading, writing, speaking, debating, and particular skills in word games and semantics

(Tobias, 1996). Poets especially demonstrate linguistic intelligence, but also any kind of writer, orator, speaker, lawyer, or a person for whom language is an important element of a trade, exhibit the verbal-linguistic intelligence (Checkley, 1997).

Logical-Mathematical Intelligence. Logical-mathematical intelligence consists of the ability to think in numbers, detect patterns, reason deductively (Tobias, 1996) and think logically and is most often associated with scientific, mathematical and philosophical thinking (Brualdi, 1996). People with a highly developed logical-mathematical intelligence understand the principles of a causal system the way a scientist or a logician does or can manipulate numbers, quantities, and operations the way a mathematician does (Checkley, 1997).

Kinesthetic Intelligence. Kinesthetic intelligence is the ability to use one's mental faculties to coordinate one's own bodily movements. Kinesthetic intelligence challenges the popular belief that mental and physical activity are unrelated (Brualdi, 1996). Kinesthetic intelligence allows a person to use his or her body skillfully. This intelligence is especially important for surgeons, actresses, artists, and athletes. Students with kinesthetic intelligence are often reprimanded for their constant and restless movement; however, if properly cultivated it will likely benefit them in their careers (Tobias, 1996).

Visual-Spatial Intelligence. Visual-spatial intelligence gives a person the ability to manipulate and create mental images in order to solve problems (Brualdi, 1996). It is also the ability to think in vivid mental pictures, restructuring an image or situation in one's mind (Tobias, 1996). This intelligence is not limited to visual domains; in addition,

Gardner made the note that visual-spatial intelligence is also formed in blind children (Brualdi, 1996). Examples of visual-spatial intelligent people are sailors, pilots, chess players, sculptors, painters, architects, and topologists (Checkley, 1997).

Musical Intelligence. Musical intelligence is the ability to think in music and includes the ability to recognize and compose musical pitches, tone, (Brualdi, 1996; Checkley, 1997) rhythms and melodies (Brualdi, 1996; Checkley, 1997; Tobias, 1996). Musical intelligence is also displayed as a general appreciation for orchestration of sounds and words (Tobias, 1996). A person must have auditory functionality to develop this intelligence in relation to pitch and tone, but it is not needed to develop the knowledge of rhythm (Brualdi, 1996). A person does not need to be a professional musician in order to have musical intelligence (Tobias, 1996).

Interpersonal Intelligence. Interpersonal intelligence refers to the ability to understand the feelings and intentions of others (Brualdi, 1996). Interpersonal intelligence allows a person to intuitively understand and get along with all kinds of people. People with this intelligence are sought for friendship and confidence (Tobias, 1996). Interpersonal intelligence is of utmost importance to teachers, clinicians, salespersons, politicians and anyone who deals with other people (Checkley, 1997).

Intrapersonal Intelligence. Intrapersonal intelligence is the ability to understand one's own feelings and motivations (Brualdi, 1996). Intrapersonal intelligence is often expressed best in solitude. It is a natural gift for understanding oneself, knowing who one is, (Checkley, 1997; Tobias, 1996) what one can do, what one wants to do, how one

reacts to things, what sort of things to avoid, and to what things one naturally gravitates (Checkley, 1997).

Naturalist Intelligence. Naturalist intelligence is the ability to recognize and classify plants, minerals, and animals, including rocks, grass and all variety of flora and fauna. The ability to recognize cultural artifacts like cars may also depend on the naturalist intelligence (Checkley, 1997).

Current Application of Theory

Accepting Gardner's theory of Multiple Intelligences has several implications for educators. The theory states that all the intelligences are needed to function in society, and teachers should recognize all the intelligences as being equally important. The theory implies that educators should recognize and teach to a wider range of talents and skills. Another implication for educators is that they should structure their presentations of the material in a style that appeals to most or all of the intelligences represented. A varied presentation not only excites students, but also allows teachers to reinforce material in a variety of ways and can facilitate a deeper understanding of the subject material (Brualdi, 1996).

According to Gardner, educators who favor education for understanding and going deeper into the topics that allow students to understand the material and apply their knowledge to new situations can easily incorporate the multiple intelligences into their lessons. Educators can approach a topic in any number of ways using analogies and metaphors for different domains as well as presenting ideas in a number of different languages or symbol systems. Gardner did not hand down a prescribed set of curriculum

choices for educators to follow; however, he believes that if educators value the differences among students and take them seriously, that will be seen in how they teach their students ("All kinds," 1999). Since every child has a different set of developed intelligences, it is virtually impossible to appeal to all the intelligences all of the time; however, educators can show students how to accommodate their more developed intelligences to assist in learning material that appeals to their weaker intelligences (Brualdi, 1996).

In terms of assessment, educators should create an intelligence profile for each student. This allows educators to assess properly the student's progress. Traditional testing requires students to demonstrate their knowledge in a predetermined manner. Therefore, a better method of assessment allows students to demonstrate knowledge using their set of developed intelligences, which can be done through the use of student portfolios, independent projects, student journals, and creative tasks that appeal to the students' intelligences (Brualdi, 1996).

Lesson designs. When adapting lesson designs, teachers should first identify the concepts they wish to teach and identify the multiple intelligences that seem the most appropriate for communicating the content, setting up "instructional menus." Whether students are to select these instructional menus to learn the material or if they are assigned as homework rotating through the eight menus over a period of eight weeks is up to the discretion of the teacher. This approach allows students to confront their weaknesses and engage their strengths. Teachers should choose the appropriate intelligences for each instructional unit, but not avoid those they feel uncomfortable with.

Interdisciplinary curriculums. Many elementary teachers have readily embraced Gardner's Multiple Intelligences theory into their instructional practices. However, they often do not recognize the direct application of the theory. Secondary teachers can also incorporate this theory into their teaching by using interdisciplinary curriculums. Most high schools offer a liberal arts program and thus have a comprehensive multiple intelligences curriculum. Teachers can make the most of this by highlighting the different intelligences. This can be done in many cases by simply adding a stronger arts program or adding learning stations in the teachers' classrooms or bringing in community experts to mentor their students.

Student projects. Another way to incorporate the theory of multiple intelligences into the classroom is by promoting self-directed learning. Students can design research projects which naturally draw on a number of intelligences. Several guidelines should be established with student directed projects. The first is that students should state their goals for the projects. The second guideline is that students should put their goals into the form of questions to be answered. Students should then list at least three general sources of information that they will use. Next, students should describe the steps they will use to achieve their goals. Students should also list at least five main concepts or ideas they wish to research. Students should then list at least three methods they will use to present their projects to their classmates. The students should organize their projects into a timeline for completion. Finally, students should decide how their projects will be evaluated. Through using student directed projects, students use many of the intelligences and develop valuable independent learning skills.

Assessments. Teachers can also incorporate multiple intelligences into their assessments. Students should be expected to demonstrate higher-order thinking skills, generalize what they learn, provide examples, connect the content to their personal experiences, and apply their knowledge to new situations. At times students may also choose the way they demonstrate what they have learned. Teachers can establish guidelines for quality work, but leave the students to choose the final product.

Apprenticeships. Apprenticeships can also be set up in the elementary and secondary school setting. These apprenticeships should not track students into career paths, but instead contribute to a well-rounded liberal arts education. Students should participate in three apprenticeships: one in an art form or craft, one in an academic area, and one in a physical discipline. Through these apprenticeships, students learn that mastery is gained gradually with effort and discipline over time (Campbell, 1997).

Barbe and Swassing Learning Modalities

Origin of Model

Walter Barbe and Raymond Swassing (1979) defined Learning Modality as any of the sensory channels through which an individual receives and retains information. They believe that the critical component of their definition is "receives and retains" which implies that sensation, perception and memory constitute what they call modality. The three modalities are visual, auditory, and kinesthetic. Barbe and Swassing believe that the key to how children learn lies within children and is their individual learning modality. They developed their learning model because they felt that it was unfair to students that their weaknesses were emphasized in education and they must spend

countless hours reciting and rehearsing their deficits and weaknesses, not their strengths. They sought to find a way to teach that is both enjoyable and helpful to students in overcoming their weaknesses.

Barbe and Swassing's learning modality model encompasses the idea of sensation, perception, and memory. Their concept of modality aims at being comprehensive and functional and considers all the steps between sensation and the individual's behavior. Their view of modality strength is defined as the ability to perform an academically relevant task. The definition they proposed includes the role of heredity and environment in shaping an individual's modality strength. They also acknowledged that modality preferences exist although the manner in which a student is most comfortable receiving information is not always in agreement with the way that information is most efficiently received and processed.

Barbe and Swassing state that in younger children learning modalities are readily observed. However, as a person matures and is exposed to more teaching experiences his learning modalities become more integrated, and he is more capable of transforming information from one modality into their dominant modality. They also state that when a situation becomes stressful an adult will revert back to their dominant modality in order to solve the issue (Barbe & Swassing, 1979).

Description of Model

Learning modalities describes the various modes a person uses to remember. When people need to remember information, they use three basic modes: auditory, or

hearing; visual, or seeing; and kinesthetic, or movement. Each person uses all three, but is most effective when using the strongest mode.

Visual. A visual learner will often be accused of daydreaming while talking to someone; however, he is actually trying to picture what is being said in order to understand the information he needs to remember. Visual learners will use highlighting when they are reading or will color code their notebooks and files. They are almost always helped by using visual aids such as flash cards, pictures, charts and graphs. For specific characteristics of visual, auditory and kinesthetic learners see Appendix A.

Auditory. A person with an auditory modality as the primary modality will frequently need to talk through his or her thought process and will talk out loud even when there is no one else in the room. The person with the auditory modality needs to hear himself say what he needs to remember. An auditory learner thrives on verbal drill and repetition. He often needs silence while working or concentrating because noise interferes with his ability to remain focused.

Kinesthetic. Kinesthetic learners are often accused of being restless because they need to work in short time spans and often are moving some parts of their bodies constantly. For highly kinesthetic students, school is torture when they have to sit still without a break for long periods of time. Kinesthetic students actually learn more when they do not have to sit still because they are not distracted by the need to get up and move (Tobias, 1996). Barbe and Swassing defined the kinesthetic modality as including large muscle movements, small muscle movements and the sense of touch.

Mixed Modality. An individual's dominant modality is the channel through which information is processed most efficiently. The dominant modality is readily observed in children. As children mature, their modalities become integrated to transfer information from one modality to another. In adults it is more difficult to identify a single dominant modality; however, when a situation is stressful or becomes difficult they will generally resort to the dominant modality. Many people evidence a secondary modality on which they can rely. This is especially important in an educational setting because it is not always possible to benefit from a person's dominant modality. A secondary modality is not as efficient as the dominant modality. However, it can enhance the dominant modality. Mixed modalities occur when no single modality is clearly dominant. Mixed modalities occur most often when students are given equal opportunity to exercise each of the modalities.

Current Application of Model

Basic skill areas. The achievement of fundamental skills is greatly dependent on the student receiving and retaining information in his or her strongest modality. These fundamental and basic skills are taught in the early elementary school years at which time children still rely on their dominant modality. Learning occurs best when the teacher's modality and the student's modality match because the teacher will be prone to present information in the student's most efficient modality.

Reading. Reading is mostly visual in nature. However, there are ways to help students learn to read with either auditory or kinesthetic modalities. One of the easiest ways to teach reading to auditory learners is through the use of word attack skills by

focusing on the sounds of letters. Kinesthetic learners can use their fingers to point to what they are reading. For kinesthetic learners, learning can be encouraged in two ways. The first way is through the use of actual physical activity such as writing on the chalkboard, counting on their fingers, pointing with their fingers or any other way that includes physical activity or movement. The second way is through the use of indirect or vicarious experience. The student imagines participation in physical activity or the use of games that use imaginary movement such as riding a surfboard or climbing a mountain in order to gain new information.

Handwriting. Handwriting is essentially a kinesthetic task that has some visual components and no auditory components. Handwriting can be taught through the use of models that visual students must duplicate. Handwriting instruction for the auditory learner can be taught through oral directions giving the letter name or the order of strokes. Handwriting instruction for the kinesthetic learner includes tracing, motioning or writing on a chalkboard.

Arithmetic. Arithmetic is the skill area that is most easily adapted. Arithmetic involves memorization and manipulation, which are understood better when the student has the opportunity to use their dominant modality. Although the majority of materials for arithmetic are kinesthetic in nature, visual and auditory methods can also be incorporated. Visual learners do not need to use actual manipulatives, but instead they can use workbooks in order to memorize the rules involved. Auditory learners will use repetition to memorize mathematical rules.

Spelling, Visual learners will learn spelling words by having visual models of correctly spelled words. They will point out the sequence of letters in words, draw shapes around the word to see its configuration or emphasizing visual similarities and differences between words. The visual learner will write a word and then see if it looks right. The auditory learner will focus on the sounds of words as the basis of spelling instruction. Auditory learners will listen to the correct pronunciation of a word, count the syllables in a word, listen for the sounds of the vowels and identify the individual phonemes (Barbe & Swassing, 1979).

General tips for modality instruction can be found in Appendix B. Appendix C contains specific instructional activities that can be used with the three learning modalities (Barbe & Swassing, 1979; Carpenter, 1997-2002).

Home School

According to Patricia Lines (1991), home school is defined as, "instruction and learning, at least some of which is through planned activity, taking place primarily at home in a family setting with a parent acting as teacher or supervisor of the activity, and with one or more pupils who are members of the same family and who are doing grade K-12 work" (p. 10). Although this definition is not completely adequate it does approximate what state compulsory education laws seek to cover.

Historical Progression of Home Schooling

Home schooling is not a new phenomenon; in fact what today is considered to be the traditional school setting is a relatively new development. Home schooling was a necessity in the American Frontier. Home schooling began to fade in the late 19th

century and the early part of the 20th century before the drive for compulsory schooling and the public goal of seeing all students graduate from high school. Recently, home schooling has seen much growth. According to a study of curricular enrollments in the early 1970s, between 10,000 and 15,000 children were schooled at home. In the fall of 1983, this estimate grew to include between 60,000 and 125,000 children. In the fall of 1985 between 122,000 and 244,000 children were in home schools, and by the fall of 1988, this number grew to between 150,000 and 300,000 (Lines, 1991). In a recent study the number of home schooled children in 1999 had grown to 697,000 (US Department of Education, 2001).

Parents home school their children for a variety of reasons. Several studies concur that religion is the number one reason parents choose to home school their children. Other reasons parents choose to home school their children are that parents have more control over what their children learn; home schooling also reduces the effect of peer pressure, improves the quality of family life, and increases the time parents can spend with their children. Another study found that parents choose to home school their children in order to enable greater contact between parents and their children, and enable their children to have a better concept of self (Lines, 1991).

Overview of Curriculum Options

Many options are available to parents who wish to home school their children. In a study conducted by Dr. Brian D. Ray (1997a), a survey of the most commonly used programs was collected. It was found that over 71% of the parents hand picked their materials, combining components from different curriculum packages and custom

designing the curriculum to suit the needs of their children, their family's lifestyle, and government regulations. Close to 24% of parents used a complete curriculum package purchased from a provider. These curriculum packages included language, social studies, mathematics, and science material for a full year (Ray, 1997b). The study stated that 3% of the parents used satellite schools as the source for their curriculum instruction. Less than 1% of parents used a home school curriculum package prepared by their local public schools. A number of parents chose to implement more than one of these methods (Ray, 1997a). According to Michael Farris (1997), there are four basic sources for curriculum information: home school conventions, home school magazines, state and local home school groups, and books.

Hypothesis

Home schooling thrives on individuality. Parents can choose the curriculum that best suits their children's academic needs. Parents can use the various learning theories to tailor their children's education around their individual learning preferences, their multiple intelligences, and their learning modality strengths. While it is easy to see some overlap in the three learning theories, each of the theories offers unique tools to identify a student's best learning environment.

This research was conducted on Barbe and Swassing's learning modality model for several reasons. The first reason that this particular research was conducted was due to the ease and availability of the test materials. Two tests were found based on Dunn and Dunn's research. However, these tests are more difficult to administer and the results can be skewed since they are based on self-report. No instrument was found for Howard

Gardner's multiple intelligences theory. Assessing multiple intelligences must be conducted in a way that is "intelligent-fair" in ways that examine the intelligence directly (Gardner, 1995). The Swassing- Barbe Modality Indicator (SBMI) is relatively simple to use and was readily available to the researcher. The Learning Styles Inventory consists of a number of questions indicating the student's preferences. The danger of self reporting is that students may respond according to how they think they should respond. The second reason that the SBMI was used was due to the directness and simplicity of the learning modality model. Since the learning modality model uses the senses for perception it is easier to recognize, and instruction is easily tailored to accommodate for the learning modalities. Both Dunn and Dunn's learning preferences and Howard Gardner's multiple intelligences theories use specific vocabulary that can be difficult to understand.

The research set out to address two issues. Hypothesis I is that there is a relationship between the parents' learning modality and their child's learning modality. According to Barbe and Swassing's definition learning modalities include both a genetic component and an environmental component. Hypothesis II is that there is a predominant learning modality among home schooled students. Since children may be developing learning modality preferences from both natural and environmental aspects (Barbe & Swassing, 1979).

Method

Participants

Participants were invited from the Central Virginia Home Educators' Conference held in southwestern Virginia in the spring of 2002. There were 11 participants and included 10 females and 2 males. Eight participants were adults, and 3 participants were children. Six of the adult participants were in the 30-39 age category and two were 40-45. Participants included one mother and her son and one mother with her two daughters. Six of the participants were right hand dominant, three were left hand dominant, and the handedness of two subjects was unknown. Table 1 gives the demographic information for the participants.

Table 1

Demographic Information for Participants

Participant	Age	Sex	Handedness
A	5-15	Male	Left
B	36-45	Female	Right
C	36-45	Female	Right
D	26-35	Female	Right
E	36-45	Female	
F	36-45	Male	
G	36-45	Female	Right
H	36-45	Female	Right
I	5-15	Female	Left

J	5-15	Female	Left
K	36-45	Female	Right

Materials

The Swassing-Barbe Modality Indicator (SBMI) was used to identify the participants' primary and secondary modalities. The SBMI is a matching-to-sample task, which is to say that a stimulus is given and the respondent is asked to reproduce the sample. The stimulus items in the SBMI are shapes arranged in sequences of increasing lengths. The shapes used are a circle, square, triangle and heart. The response items are loose plastic shapes of the same size, color and texture as the stimulus strip.

The first part of the indicator is the visual test. Participants were told that they would be given a plastic strip containing a series of shapes to view. They would use the loose plastic shapes to recreate the sequence of shapes seen on the plastic strip. Participants were given the first strip, which is a sample strip to see if the participant understood the instructions given. The strip was placed in front of them, and the participant was given approximately twenty seconds to view the strip. The strip was then removed, and the participant must recreate what they saw using the loose plastic shapes. Testing continued until the participant gave an incorrect response in two consecutive sequences.

The second part of the indicator is the auditory test. The participants were instructed that they would be read a series of shapes, and they must recreate what they heard with the loose plastic shapes. The first sequence was read as an example, and the

participant used the plastic shapes to recreate the sequence. Again, testing continued until the participant made an error in two continuous sequences.

The third part of the indicator is the kinesthetic test. Participants were given the instruction that they would have to close their eyes and feel the sequence of shapes with their hands. They would then recreate the sequence of shapes. Participants were asked to close their eyes and were asked for their dominant hand. Their hand was placed on the first shape in the sequence and given approximately twenty seconds to feel the strip. Participants then were asked to open their eyes and recreate the sequence with the loose plastic shapes. Testing continued until the participant made an error in two consecutive sequences. The total number correct for each test was recorded and divided by the total number correct for the indicator. The percentage for each test was recorded. Throughout the testing, the participants were observed and at the end of each test, the participants were asked how they arrived at their answers.

A factor analysis on modality raw scores of the Swassing-Barbe Modality Indicator showed three factors: Visual, Kinesthetic, and Auditory, all of which showed relationships to short-term memory. There was a relationship between modality scores and achievement as measured by the Comprehensive Tests of Basic Skills. A test-retest reliability coefficient was computed at 0.58 for the total test. The reliability coefficients for the separate scales are in the range of 0.61-0.67. (Kerr, n.d.).

Procedures

Participants who attended the conference were given folders with their registration materials. Included in the materials was a flyer announcing the availability

and location of the modality testing. Participants were asked to sign up for an available time slot. Participants were asked to complete a simple questionnaire that included basic information such as name, address, phone, and email. They were also asked their age, if they were currently home schooling their children, or if they were currently being home schooled. Upon completion of the questionnaire, participants were given the SBMI. See Appendix D for a copy of the questionnaire and test score sheet (Barbe & Swassing, n.d.).

Results

The interpretation of the modality percentage scores was based on Barbe and Swassing's (1979) observation that a difference of about five points corresponds to an educationally relevant difference. The dominant modality was indicated by a difference of about five percentage points above the other modality percentage scores. The secondary modality was indicated by a five-point difference above the third modality percentage score.

Table 2 gives the percentage scores for the participants' learning modalities. Four participants were dominantly visual. One participant was dominantly auditory. Two participants were dominantly kinesthetic. One participant was primarily kinesthetic and secondarily visual. Two participants were primarily visual and secondarily auditory. One participant was primarily visual and secondarily kinesthetic. One participant was primarily auditory and secondarily kinesthetic. Two participants had a mixed modality that incorporated all three modalities. One participant had a mixed modality that

incorporated the visual and auditory modalities. One participant had a mixed modality that incorporated the auditory and kinesthetic modalities.

A Spearman correlation was performed and several significant correlations were found. A significant positive correlation (0.814, $p<.01$) was found between age and the kinesthetic score. A significant negative correlation (-0.735, $p<.01$) was found between percent kinesthetic and percent visual. A significant positive correlation (0.730, $p<.05$) was found between the kinesthetic raw score and handedness. A significant negative correlation (-0.661, $p<.05$) was found between age and percent visual. A significant positive correlation (0.616, $p<.05$) was found between the kinesthetic raw score and the auditory raw score.

Table 2

Results of Learning Modality Testing

Participant	% Visual	% Auditory	% Kinesthetic
A	40	34	26
B	35	31	33
C	59	13	28
D	42	42	23
E	26	40	33
F	27	36	38
G	31	33	36
H	28	27	44
I	61	23	17
J	50	26	24
K	38	18	44

Discussion

Eleven participants completed the modality testing procedures, while eight participants only completed the initial questionnaire and were not tested for their modality due to time restrictions. These eight participants were not included in the testing results. It was found that there was no significant primary dominant modality among home schooled students. The data supports the tendency of learning modalities to be formed by the learning modality in which a person is taught. Although the data

demonstrates more individuals who have a visual modality the hypothesis that this is a predominant learning modality among home schooled students can not be supported due to the limited number of test subjects.

Two sets of parent-child units were tested. Participant C was the mother of participant A. It is interesting to note that they were both dominantly visual. However, their secondary modalities differed. The mother was secondarily auditory while the child was secondarily kinesthetic. Participant B was the mother of participants I and J. Participant B had a mixed modality incorporating all three modalities. Participants I and J were both dominantly visual. Participant I was secondarily auditory while participant J showed no secondary modality. In both of these cases it is interesting to note that the children's dominant modality matched that of their parent's. Barbe and Swassing (1979) suggest that teachers will use their dominant modality in their instruction as a means of organizing their information as well as using teaching aids that express their modality. It is possible that these parents are teaching their children in their dominant modality and thus projecting their modality on their children.

This study began with the goal of studying a sample of home schooled students and a sample of students in a traditional school setting. However, this was not possible due to the limited time of the research and as such the present research was limited due to the small sample size. The research can be further enhanced by looking at several factors. Another study can be conducted with a larger sample size in order to identify the existence of a dominant modality among home schooled students versus the dominant

modality of students in a traditional educational setting. This research could be enhanced by also looking at the curriculum used by home schooling parents.

Appendix A

Characteristics of Modality Strengths

Visual

- Learning Style—learns by seeing; watching demonstrations
- Reading—likes description; sometimes stops reading to stare into space and imagine the scene; intense concentration
- Spelling—recognizes words by sight; relies on configuration of words
- Handwriting—tends to be good, particularly when young; spacing and size are good; appearance is important
- Memory—remembers faces, forgets names; writes things down, takes notes
- Imagery—vivid imagination; thinks in pictures, visualizes in detail
- Distractibility—generally unaware of sounds; distracted by visual disorder or movement
- Problem solving—deliberate; plans in advance; organizes thoughts by writing them; lists problems
- Response to periods of inactivity—stares; doodles; finds something to watch
- Response to new situations—looks around; examines structure
- Emotionality—somewhat repressed; stares when angry; cries easily, beams when happy; facial expression is a good index of emotion
- Communication—quiet; does not talk at length; becomes impatient when extensive listening is required; may use words clumsily; describes without embellishment; uses words such as *see, look, etc.*

- General appearance—neat, meticulous, likes order; may choose not to vary appearance
- Response to the arts—not particularly responsive to music; prefers the visual arts; tends not to voice appreciation of art of any kind, but can be deeply affected by visual displays; focuses on details and components rather than the work as a whole (Barbe & Swassing, 1979)

Auditory

- Learning Style—learns through verbal instructions from others or self
- Reading—enjoys dialogue, plays; avoids lengthy description, unaware of illustrations; moves lips or subvocalizes
- Spelling—uses a phonics approach; has auditory word attack skills
- Handwriting—has more difficulty learning in initial stages; tends to write lightly; says strokes when writing
- Memory—remembers names, forgets faces; remembers by auditory repetition
- Imagery—subvocalizes; thinks in sounds, details less important
- Distractibility—easily distracted by sounds
- Problem solving—talks problems out, tries solutions verbally, subvocally; talks self through problems
- Response to periods of inactivity—hums; talks to self or to others
- Response to new situations—talks about situation, pros and cons, what to do
- Emotionality—shouts with joy or anger; blows up verbally but soon calms down; expresses emotion verbally and through changes in tone, volume, pitch of voice

- Communication—enjoys listening but cannot wait to talk; descriptions are long but repetitive; likes hearing self and others talk; uses words such as *listen, hear,* etc
- General appearance—matching clothes not so important, can explain choices of clothes
- Response to the arts—favors music; finds less appeal in visual art, but is readily able to discuss it; misses significant detail, but appreciates the work as a whole; is able to develop verbal association for all art forms; spends more time talking about pieces than looking at them (Barbe & Swassing, 1979)
- Prefer to get information by listening; they need to hear it to know it.
- Have difficulty following written directions.
- Have Difficulty with reading.
- Have problems with writing.
- Have an inability to read body language and facial expressions. (Carpenter, 1997-2002)

Kinesthetic

- Learning Style—learns by doing; direct involvement
- Reading—prefers stories where action occurs early; fidgets when reading, handles books; not an avid reader
- Spelling—often is a poor speller; writes words to determine if they "feel" right
- Handwriting—good initially, deteriorates when space becomes smaller; pushes harder on writing instrument
- Memory—remembers best what was done, not what was seen or talked about

- Imagery—imagery not important; images that do occur are accompanied by movement
- Distractibility—not attentive to visual, auditory presentation so seems distractible
- Problem solving—attacks problems physically; impulsive; often selects solution involving greatest activity
- Response to periods of inactivity—fidgets; finds reasons to move; holds up hand
- Response to new situations—tries things out; touches, feels; manipulates
- Emotionality—jumps for joy; hugs, tugs, and pulls when happy; stamps, jumps, stomps off and pounds when angry,; general body tone is a good index of emotion
- Communication—gestures when speaking; does not listen well; stands close when speaking or listening; quickly loses interest in detailed verbal discourse; uses words such as *get, take.*
- General appearance—neat but soon becomes wrinkled through activity (Barbe & Swassing, 1979)
- Response to the arts—responds to music by physical movement; prefers sculpture; touches statues and paintings; at exhibits stops only at those in which he or she can become physically involved; comments very little on any art form
- Prefer hands-on learning.
- Often can assemble parts without reading directions.
- Have difficulty sitting still.
- Learn better when physical activity is involved.
- May be very well coordinated and have athletic ability. (Carpenter, 1997-2002)

Appendix B

Tips for Visual Learners

- Use color
- Illustrate ideas as a picture
- Study clutter free
- Use visuals in text
- Use "Mapping" for taking notes
- Visualize notes

Tips for Auditory Learners

- Use tapes for reading and for class notes.
- Learn by interviewing or by participating in discussions.
- Have test questions or directions read aloud or put on tape.
- Study in a quiet place
- Read out loud
- Study orally
- Participate in discussions
- Use a tape recorder
- Use jingles or mnemonics
- Use story telling

Tips for Kinesthetic Learners

- Engage in experiential learning (making models, doing lab work, and role playing).
- Take frequent breaks in study periods.
- Trace letters and words to learn spelling and remember facts.

- Use computer to reinforce learning through sense of touch.
- Memorize or drill while walking or exercising.
- Express abilities through dance, drama or gymnastics.
- Move when studying
- Use your fingers to name ideas
- Work while standing
- Chew gum
- Listen to music while studying (Barbe & Swassing, 1979; Carpenter, 1997-2002; Tobias, 1996)

Appendix C

Activities for Visual Learners

- Allow the child to create with various arts and crafts
- Give the child opportunities for solving puzzles or inventing
- Let the child design a "play corner" in his/her room
- Visit art museums
- Let the child use a camera to take pictures of family and friends for a project
- Provide a variety of art mediums such as paint, crayons and magic markers for the child to use
- Play games such as Pictionary or cards

Activities for Auditory Learners

- Talk to your child whenever you are together.
- Tell your child about an interesting story you read in the newspaper.
- Describe a conversation you had at work with a friend.
- When you go shopping together, describe what you're buying.
- Get in the habit of narrating everyday chores.
- Ask open-ended questions
- Tape your child singing a song or telling a story.
- Revisit a favorite old story.

Activities for Kinesthetic Learners

- Use sidewalk chalk to learn shapes, letters and numbers
- Use a carpet with the alphabet written on it and have children run and jump on the letter you call out

- Use sand, finger paint or shaving cream to write letters, numbers, or create and solve math problems
- Play dress-up and act out a book
- Make finger puppets to go with a story
- Build a reading fort
- Make and serve a meal from a book
    - Play board games that use counting and paper money
    - Plan and shop for a meal
- For mouse skills, play Solitaire (Barbe & Swassing, 1979; Carpenter, 1997-2002; Tobias, 1996)

Appendix D

Test Subject Questionnaire

Name_____

Address _____

_____

Phone _____

Email _____

Age _____

Home school YES NO

I would be interested in further research for this purpose only. YES NO

By signing, I release my learning modality test results to be used for research purposes only. The results will be combined and analyzed in a Senior Honors Thesis as a requirement for graduation from the Honors Program at Liberty University. I also agree to further research for the same purpose, only if I am contacted.

_____ _____

Signature Date

Visual raw score _____ = %
Total raw score

Auditory raw score _____ = %
Total raw score

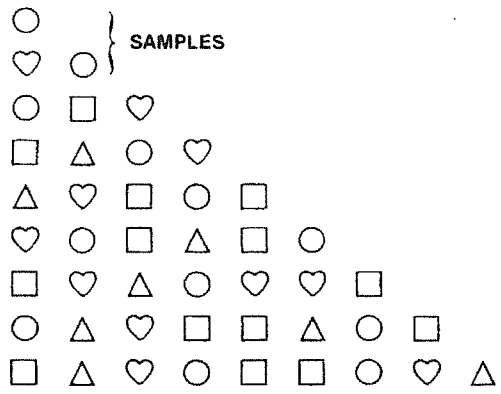
Kinesthetic raw score _____ = %
Total raw score

SWASSING—BARBE MODALITY INDEX RECORD SHEET

_____ Date: _____

Name: _____ Examiner: _____

Birthdate: _____ Sex: F____M____ Grade: _____ Dominant Hand: L____R____



VISUAL TEST:
Show set of shapes; follow timing guidelines as outlined in directions. Remove card at end of time limit or when child indicates she/he is finished if before allotted time. Child assembles sequence just seen. Mark answer sheet. Stop test when child has made errors on two consecutive sets.

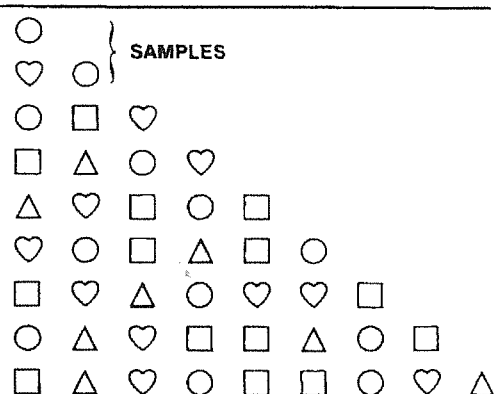
TOTAL VISUAL CORRECT: _____

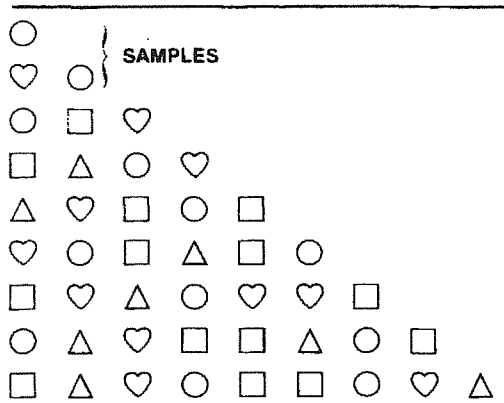
Before proceeding, ask child how she/he arrived at answer _____

AUDITORY TEST:
Read aloud the names of shapes in sequence at rate of one per second. Child assembles sequence of shapes just heard. Mark answer sheet. Stop test when child has made errors on two consecutive sets.

TOTAL AUDITORY CORRECT: _____

Before proceeding, ask child how she/he arrived at answer _____





KINESTHETIC TEST:
Holding shield so child cannot see shapes, put set in front of child; place child's dominant hand on first shape on left; child may use both hands. Do not speak during test. If child accidentally skips a shape, place her/his hand on missed shape. Follow timing guidelines as outlined in directions; remove set and shield. Child assembles sequence. Mark answer sheet. Stop when child has made errors on two consecutive sets.

TOTAL KINESTHETIC CORRECT: _____

Ask child how she/he arrived at answer _____

_____

VISUAL CORRECT: _____

AUDITORY CORRECT: _____

KINESTHETIC CORRECT: _____

TOTAL CORRECT: _____

PERCENTAGE VISUAL: _____%

PERCENTAGE AUDITORY: _____%

PERCENTAGE KINESTHETIC: _____%

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