HANDWRITING, POSTURE AND THE USE OF PENCIL GRIPPER

by Dennis Hoover, Vision Therapist

HANDWRITING AND LEARNING DISABILITIES

Many children with learning difficulties also have writing difficulties. One is usually a concomitant of the other. Ernest J. Kahn , O.D., discovered after administering the copy form test to many of his patients that:

1. Practically all nearsighted children held their pencil no more than a quarter of an inch from the tip.
2. Almost all children with learning difficulties exhibited some form of bizarre pencil grip and fine motor incoordination.
3. In all instances of improper pencil grip, the fingers blocked the line of sight from the pencil tip to the eye, causing the writer to bring the head to the side and/or down closer to the page in order to see what was being written.[1]

For many years most school systems have tended to de-emphasize the importance of handwriting. As a result, many poor handwriting practices have been allowed to become ingrained habits. Educators have felt that the child will eventually "grow out of it" and change, but this is seldom the case. As a veteran of many years in junior high classrooms, I have found that most teachers bemoan the sad state of handwriting in today's students, yet feel that they do not have the time to try to correct students' handwriting and still teach the assigned curriculum. Some even state that "It's too late to change it now" or "It's not my job." No one seems to want to take on the responsibility of trying to make a change. The way students hold a pencil or pen to write, the manner in which they orient their paper, their posture while writing, and the way in which they form their letters will be carried over to adulthood unless someone lets them know that they are doing something wrong. Awareness of the problem is the key to making a change.

Many of those who work with learning-disabled children have found that these children, in addition to having problems with reading, also have problems with handwriting. Some feel that poor handwriting is the *cause of* many reading problems. Such an opinion was expressed by E. A. and D. C. Enstrom in an article in *Building Handwriting Skills.*[2]

> Children have been asked to write meaningful material before they have learned to write. Mistakes, wrong moves, incorrect sequence, etc. have been shrugged off as unimportant while incidental approaches have been encouraged. As a result, many early handwriting problems have been permitted to become established as habit. This, we contend, is responsible for many of our serious reading problems from which 15% of our children suffer.
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> Reports show that children with learning disabilities, in addition to having reading problems, *always* reverse letters, invert letters, place letters and numerals on their sides, mirror their writing, and in general have numerous handwriting problems. These errors have been reported as *additional* problems. From our observation over many years in working with all types of disability, such writing is the *cause* of reading problems. Such errors are not just a tag-along relationship.

Whether enough research has been done to prove the opinion of these authors may be in doubt, but the fact remains that poor handwriting habits and reading problems often do occur together.

Cognizant of these findings of others and also of our own observations of similar patients, we feel that a very useful part of our vision therapy for children who have learning-related visual disabilities is working with their handwriting. In our program we teach the three basic motions of handwriting, proper posture and paper holding techniques, proper use of the pencil gripper, and then we give the writer a chance to practice putting all these together

to come up with a less stressful and comfortable style of handwriting.

One of the reasons many children have writing difficulties is that pencils do not fit the fingers in a natural manner. Holding the pencil properly with the thumb, index finger and middle finger surrounding it forms a triangle, yet most pencils are six- sided or round. Because of the misfit, the child often exerts so much pressure to grip the pencil that the fingertips or knuckles turn white. He may try to grip the pencil with four fingers, tuck his thumb under, or develop any of a number of stressful and unusual grip styles. Most of these result in rapid fatigue and the deterioration of the quality of the handwriting.

Another major cause of poor handwriting habits is the fact that many children are handed pencils early in their school careers and are then asked to write before they have developed the necessary hand control. In their book, *Thinking Goes to School*, Hans Furth and Harry Wachs (available from VisionExtension, 2912 S. Daimler St., Santa Ana, CA 92705) stated, "To impose higher levels of movement thinking on a child who functions at a lower movement thinking level is similar to imposing structured academics too soon."[3a] Given the task of writing, the child will do his best to comply, but may not have the control needed to do a satisfactory job. He will come up with *some* way to get the job done, but his method may be an undesirable one. If he is not shown another way of doing the job, he will stick with the one he has learned and it will soon become a habit, often lasting into adulthood.

In an article on handwriting readiness, Geraldine Kimmell wrote:

> The coordinative muscular action that is involved in executing any form of handwriting seems to be a voluntary action for most persons, but for many individuals, and in particular for the dyslexic or disgraphic, the effort involved in executing handwriting makes it a serious and frustrating experience. The result of this labored effort is a stilted and nonfluent pattern of symbols. This forced endeavor requires such rigid concentration that extreme fatigue can result. Just to properly grasp a writing instrument poses a real challenge for many children. When this difficulty is noted in a child, it may be that the finger muscles, particularly the finer ones, have not been fully developed. This condition could be attributed to an insufficiency of manipulative practice in infancy. All small children should experience hour after hour of handling, twisting, grasping, clutching and squeezing objects in order to develop the finer muscles of the hands and fingers in a natural and gradual way.[4]

The author then lists a number of exercises which can be used as a "conditioning" program to better prepare children for handwriting success.

While some children may have developed the fine motor control needed for handwriting by the time they are of school age, others will take much longer. Yet, since they have been placed in a goal oriented situation, they will strive to comply somehow with the assignment given by the teacher. We often hear the term "reading readiness," a time when the child is developmentally ready for reading. We seldom hear of "writing readiness." Many times it is just assumed that the child will be able to do the task assigned by the teacher, and that poor handwriting is just due to sloppiness or not taking enough care in doing the activity. Again, Furth and Wachs wrote, "If the child has not yet developed the thinking pattern of sequential finger control and coordinated action of finger, arm and eye movement, some of his mental activity will be diverted: 'How should I hold the pencil?' 'How should I move my hand?' 'Where should I look?' This preoccupation with movement control may detract from high-level thinking that should go into the solution of the task.[3b]

THE GRIPPER

In order to make it easier for a writer to hold the pencil properly, a variety of pencil grippers have been invented. In our office we prefer the triangular shaped gripper made by Hoyle Products Inc., 302 Orange Grove, P.O. Box 606, Fillmore, CA 93015, (Phone 800-345-1950). The function of the gripper is to provide a fairly large triangular form which can be easily controlled by the thumb and two fingers with a minimum of effort. After learning its proper use, children will write better with much less effort. The soft flexible material of the gripper also helps prevent writing fatigue or "writer's cramp."

For children we cut the regular size grippers in half. C supplier makes them about 1 5/8" long. We find this a bit

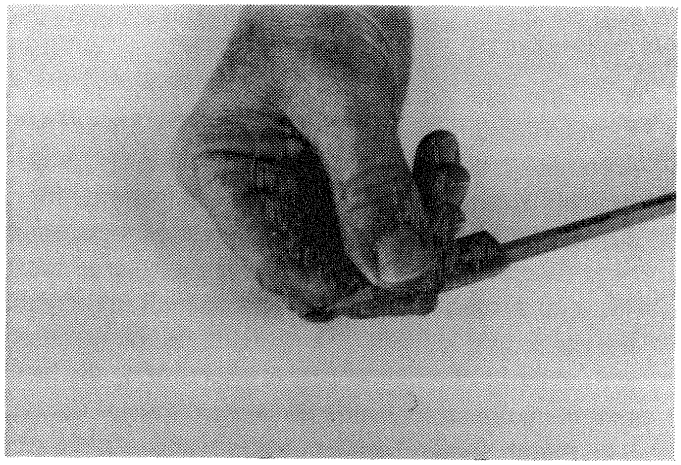

Figure 1.

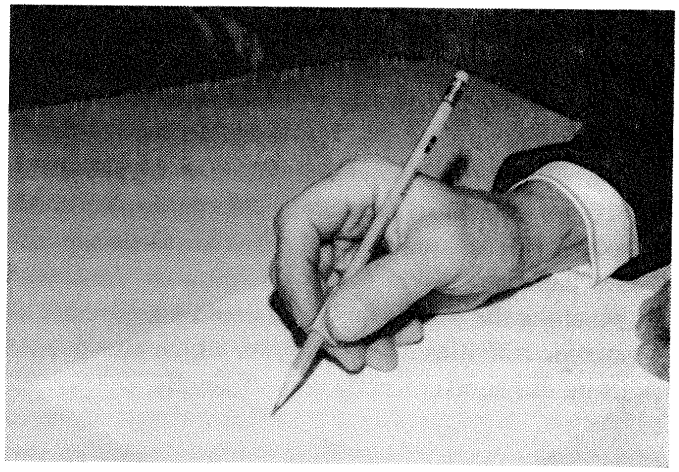

Figure 2.

long for small hands to use when practicing some of our handwriting exercises. When each one is cut in half it fits better and, more importantly, it insures that the thumb and two fingers are placed opposite each other rather than at varying distances from the end of the gripper. This position takes the least amount of effort and energy to stabilize the pencil.

At first we tell our patients to use the gripper only while doing their vision therapy grip work, as we want to make sure it is being used properly. In a sense, they are developing new "software" to run their writing "computer" and we must make sure we have removed all the "bugs" from the program before we start using it. After a few weeks' work, we then ask them to start using it at school or at work. Many seem to appreciate the gripper at this point, and we often get requests for an extra one or two to use on their pen, other pencils, etc.

The gripper should be placed over the pencil by sliding it onto the pointed end until the bottom edge of the gripper is about the width of the writer's thumbnail above the edge of the painted area (see Figure 1).

In use, the bottom side of the gripper rests on the middle finger (see Figure 2). The thumb and index finger are placed on the two remaining sides. The index finger should be in a relaxed convex curve. If too much pressure is applied by this finger it will tend to bend downward toward the pencil and the top of the first joint will turn white. Watch for this and remind the writer to relax and "keep the curve." We often ask the writer to think of the hand as if it were a glove full of Jell-O, with no bones or stiff parts. All movements are made with a minimum of pressure. To complete the triangle, the thumb is placed on the other side of the gripper. The ring and little fingers should be curved and resting on the paper. These two fingers, along with the side of the hand, are the parts which touch the paper and provide a fairly stationary "stage," atop which the thumb and two fingers "perform."

As to the question, "What about the left-handed writer?", our answer is that there is no difference. The grip is the same and all movements are the same. Unfortunately, some left-handed writers have developed a "hook" or backhanded writing position in which the wrist is curved inward toward the forearm and the point of the pencil is facing the writer's body. This type of stance may take longer to change. An entirely new behavior pattern needs to be developed instead of refining an existing behavior. In our opinion, it is a worthwhile endeavor. We are bilateral organisms and there is no reason why the writing implement should be held differently in one hand than in the other, except for the very minor point that the left hand may partially hide what has already been written as it moves across the page. The greater relaxation and flexibility of the hand in writing with the wrist straight far outweighs this problem.

Correct Posture

Correct handwriting posture is very important and should be continually emphasized. Both feet should be on the floor, with the body very slightly turned to the left for right-handed writers and to the right for left-handed writers. The position of the paper is also very important. In many cases, just learning how to correctly orient the paper may help poor handwriting. The right-handed writer should have the paper turned so that the bottom left-hand corner points directly to the navel. The left- handed writer should have the bottom right-hand corner pointing to the navel. The paper is aligned in such a manner that the sides of the paper are parallel to the writing arm when it is resting on the paper.

The non-writing hand should be kept resting on the side of the paper, with the elbow on the table. This allows an open view for writing, puts the body in balance and keeps the paper from moving while writing takes place. The non-writing hand is not just a "paperweight." It plays a very important role in paper orientation while writing. Its role is much like that of a typewriter roller as it moves the paper up to prepare for writing on the next line. Teaching the role of this hand is often neglected, so we include activities in our program which give practice in using this hand correctly and efficiently.

The elbow and forearm of the writing hand must lie on the desk. It is better to keep the elbow in place and move the paper upward as writing is done, and as the paper is kept in place the wrist will start to turn as the writing hand moves across the page from line to line.

The distance from the eyes to the paper should be the distance from the elbow to the middle knuckle, i.e., the Harmon distance. You may have to bring the patient's attention to this several times during the activities, as many may have formed a habit of getting much closer to the paper when they write or read.

Ideally, for most efficient writing (or reading), the desk should be sloped at a 20 degree angle. The chair should be high enough so that when one is seated at a flat desk, the extended forearms will rest on the table at a 90 degree angle (parallel to the floor) and the thighs will also be parallel to the floor as they rest on the chair.

THREE BASIC MOVEMENTS

While there are many systems available for teaching proper handwriting which attack the problem in various ways, we choose to break down all handwriting into what we feel are the three basic movements. In our therapy room, we refer to these movements as "Windshield Wipers," "Mr. Wrist," and "Push-Pull."

In doing "Windshield Wipers," the arm and wrist are held straight while the arm pivots on the elbow, moving back and forth across the page. Usually we have the patient practice the movement first without using a pencil, just to get the feeling of a free, easy swing moving across the page from the left side to the right. Watch to make sure the wrist is kept straight and that the whole arm moves as a single unit from the elbow. When using the pencil, do not worry about neatness at this stage. You are interested in getting a free and easy movement combined with a non-stressful grip. The pencil should make an even arc from one side of the paper to the other and back again. Retrace the same pathway about 50 times. Strive for light pressure. We often have "lightness contests" with the patients to see who has the lightest pattern after 50 strokes back and forth. The pressure must be enough to hear the sound, otherwise you may get some creative "beat the system" cases of lifting the pencil slightly above the paper so it will not make contact. Be on the alert for the tendency of many writers to start turning the hand so that the palm starts facing downward toward the paper. The thumb should be about as high above the paper as the base of the middle finger while writing.

After acquiring the ability to do "Windshield Wipers" correctly, we move on to a paper orientation activity. As the patient starts his "Windshield Wiper" motion across the center of the paper from the left edge to the right, the non-writing hand rotates the paper in a counterclockwise direction under the writing arm. This rotation continues until the "Windshield Wiper" pattern is now moving from what was formerly the top and bottom of the paper. The rotation can then be continued until the paper has been rotated 360 degrees, and the paper is filled with the strokes made in all directions. Remember, the "Windshield Wiper" action is continued throughout the activity, always in the same plane, while the paper is being moved.

When proficiency in paper orientation technique has been achieved and the "Windshield Wiper" stroke has been mastered, we then move on to "Mr. Wrist." This motion is similar to "Windshield Wiper," but involves only the wrist pivoting back and forth on the bone at the base of the hand. The arm should remain relatively motionless as the writer does about 10-20 back and forth strokes, using this wrist action. Because of the positioning, the pattern produced will be more slanted. After practice, have the patient do a "Windshield Wiper" pattern across the page, then do several slanted cross strokes, using the "Mr. Wrist" action as shown in Figure 3.

Figure 3.

Probably the hardest of the three basic movements to learn, yet one of the most important, is "Push-Pull." In this motion, the three fingers on the gripper are thrust forward together, pushing the pencil outward, than all three fingers are pulled back toward the palm of the hand, with the pencil gliding back and forth over the groove between the base of the thumb and the forefinger. Many lack the fine motor control needed to do this properly, so be patient and do not expect all of them to be able to retrace a line over and over again until they have had a bit of practice. You are more likely to get a wide variation in directional movement here than in any of the other two movements.

After one or two weeks of practice with the above motions, most will be ready to move on to the next step. Here we start drawing circles, alternating clockwise and counterclockwise across the page as shown in Figure 4.

Figure 4.

Each should be retraced at least 10 times and drawn as lightly as possible. At first, make them large. If using lined paper, make them two or three lines high and don't worry about staying inside the lines. This activity involves putting "Mr. Wrist" and "Push- Pull" together to make the circles, and using the "Windshield Wiper" action to move across the page. As practice continues, make the circles smaller and, eventually, fit them between the two lines on lined paper.

The next step after showing the ability to make fairly round, light circles in either direction is to produce spirals or coils in both clockwise and counterclockwise directions. Here the "Windshield Wiper" motion is more pronounced as the hand moves across the page, separating the circles as they are drawn (see Figure 5). Again, as the writer shows increased ability to do this easily, reduce the size to fit between the lines on lined paper.

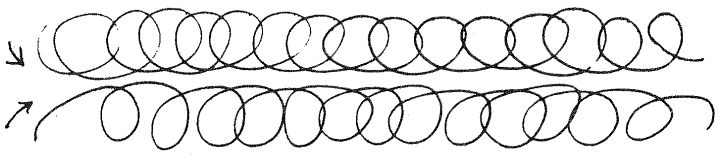

Figure 5.

Figure 6.

Next, we start combining letters of the alphabet. At first we choose terms like "big loop, little loop" and "sea shore," rather than calling them by letter names. The "big loop, little loop" combination is really a series of alternating "e" and "l" letters, as seen in Figure 6. This is a particularly effective practice concentrating on the "Push-Pull" movement.

The "sea shore" is a line of "c's," which look like waves at the sea shore. Look for reasonably uniform letters moving across the page in a straight line as shown in Figure 7.

Figure 7.

Following these activities we may use a series of "s's," "q's," and other single letters in rows across the page, then we start putting together combinations such as "p"-"q," "w"-"v," etc. At the end of their grip work program we ask them to write some of their school spelling words for us and bring them in. It is sometimes interesting at this point to join with them in comparing their new handwriting with samples obtained before going through the gripper training. While not everyone is able to produce ideal handwriting in the fairly limited time available, we are satisfied if we have been able to reduce the amount of stress produced by writing and have made correct posture, hand movement and paper alignment a natural habit. Usually we spend seven to eight sessions of about 10-15 minutes each to go through the program from start to finish. This length of time is somewhat limited if the goal is to change very poor illegible handwriting into perfect and completely legible writing, but as vision therapists this is not our goal. Once we have given our patients the correct "tools" for the job, they can then refine the end product as much as they desire.

While some may wonder if it is part of our job to teach proper handwriting, we believe it is. If we are to fulfill our role in improving the visual health of the patient,

something must be done to teach proper posture while writing. After all our work in vision therapy, if the patient still bends his head over to the side to see what is being written (as many who have never been taught differently will do), we are losing part of the battle. Vision guides the hand and body. If the mechanics of writing are "warped," then possessing excellent vision will not help. How a child writes affects his or her total posture, and considering the amount of time spent in writing, it is critical for someone to take the responsibility for this.

Finally, the question might be asked, "What good is accomplished by this program?" The end results of our efforts are shown by greatly reduced stress at a near visual task such as handwriting, better posture in writing, which leads to less fatigue and therefore increases the amount of time in which the writer can stay on task, an improved self-image in many patients due to visible improvement in their writing and a general feeling that writing is now an easier activity than it was before.

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