

OUR HANDS BELONG TO LEVITY

by Ingun Schneider

An infant is being carried by her mother in a front-pack. The infant is awake and her little arms hang downwards, hands pulled down by gravity. Another infant, in a baby-buggy being hurriedly pushed by her mother on a busy sidewalk, is lying peacefully on her back. The infant is barely visible under the protective hood. The infant's hands are raised above her head and she is moving them gently as she gazes intently at them. Seemingly unaffected by her mother's haste, she gives the impression of being at peace and thoroughly enjoying getting to know her hands.

Part of my work as a Waldorf educational support teacher is assessing school-age children. Sometimes I work with an entire class as part of a class screening and sometimes with individual children who are having difficulties in school. The way many of the students grasp a pencil is tense and/or awkward. When I ask them to do various fine motor activities I notice difficulties with finger differentiation. Several of all of the fingers work as a unit rather than as separate fingers, which would be more efficient and less tiring. This may be surprising since students in a Waldorf school do many activities that involve the hands, from playing the flute or recorder to drawing, knitting and sewing. However, if one looks at how these children engage their hands in these activities one notices a lot of tension or in contrast quite loose and almost floppy work. When the children draw figures of people they often leave out the hands as if they aren't quite sure that the hands live at the end of the arms.

Having studied the development of hands for many years, as a physical therapist, interested parent and teacher, I have developed a theory of why so many children (and adults) today have difficulties performing fine motor tasks, including writing by hand. When they write their hands are unnecessarily tense; they are awkward in the use of tools; and they lose interest in handcrafts, saying that they are not good at them.

My theory has several components. First of all, in order for hand coordination to develop fully, structural alignment in the neck and/or shoulder areas is necessary. This is because the nerves that innervate the hands leave and enter the spinal column at the neck and then go through the shoulders and down the arms.

Problems in this area can begin at birth. Sometimes a child's neck and/or shoulder area (including the collar bone) has been quite compressed during the birth process. This is especially common if the newborn had broad shoulders or if forceps or vacuum extraction was used to help the baby out of the birth canal.

Also, if the newborn or young infant is carried in an upright position for long periods there is a possibility of disturbing the alignment of the neck and shoulder girdle. Even if parents and caregivers support the infant's head while carrying her in an upright vertical position, the infant has to contribute effort from immature musculature towards maintaining the vertical head position.

On the other hand, when the infant is lying flat on the back or cradled on her side in the parent's arms the neck muscles are not strained before they are ready. The infant can begin to turn her head from side-to-side, lift her head up to look at somebody, or turn toward the breast to nurse. These movements help the neck muscles to mature and strengthen gradually.

By the time the infant has figured out how to sit up from a lying down position on his own by around nine/ten months old, the neck is strong enough to carry the head upright and the infant is able to engage all muscle groups in a balanced way. Then it is time for parents to carry him upright in a front- or back-pack or seat him in a high chair for eating.

The important point is that today we often put our infants into the upright position before they are ready. Even if the front-pack or back-pack has support for the head, this is usually not sufficient. If the birth process hasn't compromised the neck and shoulder girdle too much, a few minutes in the upright position won't hurt, but it is better to err on the side of caution.

Putting an infant in the upright situation before the neck and shoulder musculature is mature compromises the development of the hands in another way. The hands usually dangle down or perhaps, with a slightly older infant, the hands grab part of the pack and hold on to it. In either case, when an infant is carried or even is propped in an upright position, her hands do not easily find each other, cannot touch or hold each other. Also, when a child is in a front- or back-pack, she cannot easily see her hands. The eyes do not guide the movements of the hands. This is an important part of the development of eye-hand coordination, which is the basis for many future tasks, writing by hand among them.

In contrast, when the young baby is lying horizontal on a floor or other flat

surface, the support received by the spine (including the neck) allows him to lift up his arms so the hands are right above the face. There is little pulling down by gravity since the shoulder joint—the fulcrum on which the arms and hands move—is right below the hands. The hands can play with each other or with the beams of sunlight coming through a window for a long time without the arms tiring. If the baby is propped up even only 30 or 45 degrees, the hands are now much further from the fulcrum and the weight of the arms is greatly increased. The levity of the hands and the ease with which they can play with each other—present in the flat-on-the-back position—are lost.

During the first year of life the infant moves from lying on his stomach, to raising his upper body, to crawling like a lizard, to creeping on hands and knees, to standing upright and finally to walking. In this development the hands play an important role. The hands support the initial lifting of the upper body from the prone position. When the child creeps, the hands use a similar gesture to the feet in walking. They swing outward a tiny bit, then forward in the direction of the creeping. The hands' task is to connect with gravity so the upper body can be supported enough to allow for locomotion.

About three months later, the baby has figured out not only how to pull himself up into standing, but also how to balance on the much smaller surface of the two feet and still manage to move forward in the direction he wants to go. Now the hands are truly freed from gravity and can begin to take on their birth right: freely creating, giving and receiving gifts of human kindness.

This process leading to standing and walking is important for the proper development of the hands. When the hands are used to support the upper body's weight they experience pressure on the palms. The steady pressure experienced over and over again against the palms as the infant creeps or crawls around the room integrates and mitigates the palmar reflex. The palmar reflex causes the infant, when pressure is applied to the palm, to clench the hand and to grab and hold tightly to whatever has applied the pressure. If the infant retains even a small measure of this reflex she will be unable to grasp and let go of objects in a coordinated way. The later coordinated use of the hand, as in holding and writing with a pencil, will be negatively affected. Many school-age children have vestiges of this reflex which results in unnecessary tension in writing by hand and a dislike of the activity.

The positions into which we place our infants can thus support or delay the development of the hands. We have our precious hands for giving and receiving,

for lifting into levity far above our heads, for communicating via writing and gesture, for making useful and/or beautiful things that we and others can use and enjoy, for playing instruments, for meeting our own needs, and for supporting others in their need.

BOX:

Practical Measures For Improving Manual Coordination:

If a parent has a child who has not fully developed his fine motor coordination, I suggest several steps that address each of the issues raised in the article.

A first step is to have the child evaluated and, if necessary, treated by an osteopath or other health practitioner who uses cranio-sacral therapy. This therapy is gentle and non-invasive, but can invite correction of subtle structural misalignments of the head, neck, and shoulders.

Next, I teach the parents how to do a pressure massage of the child's hands and fingers. It is helpful to begin at the shoulders and work down the arms to the hands and fingers. The pressure applied is rhythmical, moving gradually from light to firm and back to light. The parent's touch gives the child an external tactile experience but also a new internal, proprioceptive experience of the arms and hands. If done regularly such pressure massage will result in improved fine motor coordination.

Then I encourage parents to introduce activities that put weight onto the child's hands. These also bring new proprioceptive experiences and integrate vestiges of the palmar reflex. Walking on all fours like a crab, from leaning forward with hands on the floor and kicking the legs up like a donkey, and swinging between two desks while the hands carry the body's weight can all be effective. Sitting on one's hands (palms down) on a firm chair and pushing the body up—a seated push-up—is another fun way to get weight onto the hands for the school-age child. For all ages kneading dough is fun as well as rewarding as the baking bread spreads its aroma through the house.

Another interesting activity that brings a new experience of the hand is the finger-tug-o-war. The child links his index fingers ("pointers") together in front of the body, with elbows out to the side, and pulls strongly in opposite directions for about 5 seconds, then moves on to the other fingers. The book *The Extra Lesson* describes other helpful hand exercises including the "hand-expansion-contraction" and the "wool winding" exercise.

I also give the child an imagination or mental picture of the physiologically correct grasp on the pencil. To older students I explain that the thumb and the index finger have more area in the sensory and motor areas of the brain. Thus is it easier to write using these two digits as the main manipulators, with the middle finger supporting them from under the pencil and the last two fingers involved in supporting the hand on the writing surface.

I might also explain that the human hand, like the human foot, has two arches—longitudinal and transverse—and that these arches are unique to the human being. One of the hand arches is seen when the hand is flexed and the fingers move toward the heel of the hand. This arch tends to be well developed. The other arch goes from between the middle and ring fingers to the middle of the wrist. It is activated when the little finger and the ring finger steady the hand while the thumb, pointer and middle fingers manipulate the pencil, chopsticks, paintbrush, or other tool that requires this kind of fine motor movement.

SUGGESTED READING:

The Extra Lesson and Teaching Children Handwriting by Audrey McAllen.

"Supporting the Development of the Human Hand", article by Ingun Schneider in The Developing Child: The First Seven Years, Gateways Series Three.

The Hand: How its use shapes the brain, language, and human culture by Frank Wilson.