LEFT SIDE AT RIGHT

Netsivi Ben-Amots
Haifa, Israel

Dedicated to the memory of Isaac Asimov

1. THE FACTS

There are left-handed persons. They write with their left hand, and there are other actions that they do differently from most other people. It is easy to see whether a person is left-handed by noticing the hand used when writing. Left-handed people are the minority. Right-handed people are the majority – more than 90%. In places where people do not write, right-handiness is determined by the hand that holds the hammer or throws the spear. In these places also right-handed people are ib the majority.

A special coordination test, uses an instrument with two rotating handles, for following a curved line on a plane. One handle is on the right side, and it activates the horizontal motion (by a mechanical worm transmission), and the other handle is under the instrument, and activates the vertical motion.

In this instrument, a left-handed person will get bad results. It does not mean that left-handed people lack coordination. Rather, it means that this instrument is not appropriate to test the coordination of a left-handed person. Indeed, there is also a similar instrument, for left-handed persons, in which one handle is on the left, and the other handle is under the instrument. The results of the tests represent the coordination of a left-handed person. If a right-handed person is tested with the instrument for left-handed persons, he will fail just like a left-handed person who is tested with an instrument for right-handed persons.

A left-handed person knows that he is left-handed. If he will be asked to be tested with an instrument for right-handed persons, he will immediately see that a right-handed person will succeed, but a left-handed person will fail. He may then complain and ask to

be tested with an instrument for left-handed persons. Apparently there is a remedy for left-handed persons.

The connections between the nerves and the limbs of the body are such that in each person the half of the brain in one side, is connected to the opposite half of the body. This rule has no exceptions. The left half of the brain activates the right hand, and the right half of the brain activates the left hand.

Today it is known that the two halves of the brain are different. In a right-handed person, the left half of the brain is responsible of the motor actions and language. The right half of the brain is responsible for abstract perception.

This is the accepted concept today. It is easy to see with which hand a person writes, and then know which half of the brain is responsible.

Today it is known that there are physiological differences between the half of the brain that is responsible for motor actions and language, and the other half that is responsible for abstract perception. So, it is more accurate to say that a person whose half of the brain that is responsible for motor actions and language is in his left half of the brain, is a right-handed person. A person whose half of the brain that is responsible for motor actions and language is in his right half of the brain, is a left-handed person.

Before a person is born, the side of the brain that is responsible for motor action and language, and the side responsible for abstract perception, are already fixed in his brain. Apparently right-handedness and left-handedness are determined before birth.

Yet the use of the hands during the first two years also has an influence. What influence does the use of the hands have in the first two years? It is important to consider another line of reasoning. It was indeed found that mothers tend to hold their babies with one side leaning on the mother's body, while the other side is free. So, one of his hands is limited in motion, while the other hand is free to move, touch and hold things.

A baby who was held so that his right hand was pressed to the mother's body, and his left hand was free, has a greater chance to grow up as a left-handed person than a baby who was held so that his left hand was pressed to the mother's body, and his right hand was free. There are more reasons for becoming a left-handed person.

It was found that in abuut half of the left-handed persons investigated, and in 99% of the right-handed persons, the writing hand is activated by the half of the brain that is responsible for motor action and language. It was noted that the remaining 44% of the left-handed persons, and 1% of the right-handed persons, the writing hand is activated by the half of the brain that is responsible for abstract perception, imagination, and three-dimensional perception. See Restak (1979), Levy and Reid (1976), and references therein.

The reader is referred to the book *The Brain - the Last Frontier* by Restak (1979). Chapter 10 gives a fascinating description of how Dr. Jerre Levy of the University of Chicago found that indeed there are right-handed persons whose brain is "left side right," because they hold the pen in a special way, similar to the way that those 44% of the left-handed person whose brain is "left side right" hold the pen. See Figure 27 in Restak (1979), and the same figure in Levy and Reid (1976). In these persons, the half of the brain that governs language is not the half brain that governs the writing hand.

The researchers explain further, that left-handedness is determined by many factors. It is possible that a right-handed person will jump with his left leg. There are more important factors, especially the "directing eye." If you learned to shoot, you may remember the command "close the non-directing eye."

It is possible that a person whose motor half of the brain is on the right side, his left hand was pressed to the body of his right-handed mother when he was an infant, and he grew up to be a right-handed person, who jumps with his left leg. The investigations are not that exact, because it is easy to check each person after starting the test. Naturally it is difficult to check experiences that happened many

years ago. Try to find and prove if a person that writes with his right hand and jumps with his left leg remembers how his mother held him when he was a baby.

It was measured that the "motor" half of the brain needs a somewhat larger blood supply then the "imagination" half. If there is an insufficient supply of blood, fainting may occur. Therefore, the "normal type" may faint suddenly. In some cases the "left side at right type" may feel a short moment of motoric inability or limitation or even paralysis before fainting, when he tries to move or act without the essential regular help from his "motor" half of his brain.

A dissymmetry exists in the position of the heart and lungs in the body. The normal person has a heart that is on the left side of the chest. This person also has a right lung with three lobes and a left lung with two lobes. There are cases where the heart is on right side of the chest. This person also has a right lung with two lobes, and a left lung with three lobes. This opposite case is very rare, one in a few ten million of people. We do not know about any association between the right heart and left-handedness, right-handedness or the "left side at right" situation in about half of the left-handed people, nor in 1% of the right-handed people.

These are the facts, yet not all the researchers agree on these facts. Later I will discuss the meanings.

2. MEANINGS

Apparently the personality of an individual is determined by the half of the brain that governs the hand that writes.

If the half of the brain that is opposite the hand that writes and governs it, is also the half of the brain that is responsible for the motor actions and language, the person will be the "normal type" person, (whether he is right-handed or left-handed). If the half of the brain that is opposite the writing hand and governs it, is also the half of the brain that is responsible for the abstract per-

ception, imagination and three-dimensional perception, the person will be the "unusual type" person, whether he is right-handed or left-handed.

There is an opinion that the personality is in the half of the brain that rules. The half of the brain located opposite the writing hand determines the actions. If this is the motor half of the brain, it sends a command to the opposite hand to act. If the "non-motor" half of the brain rules, it orders the motor half of the brain, which in turn sends back an order to the non-motor half brain, to command the opposite hand to act. The meaning is longer response time.

This was physiology. What about psychology? This is very different. If the ruling half of the brain is responsible for language, it will be easier for the ruling half of the brain to express itself by language. If the ruling half of the brain is not responsible for language, it will have to get help from the other half that is responsible for language. There is another difficulty: The ideas may be more sophisticated, and maybe even better, because this is the half of the brain that governs abstract perception, and imagination. This half translates them to language and the simpler language of the second half brain is needed. And a third difficulty exists. Most of the listeners are people whose ruling half of the brain does not govern abstract perception and imagination. They are people who think with other concepts. Persons whose ruling half of the brain does not govern language will have difficulty explaining themselves to others, and to express their ideas and opinions either in speech or in writing.

What about thinking? Persons whose ruling half of the brain is responsible for the abstract perception and imagination can find solutions to a certain problem which are entirely different from the solutions that persons whose ruling half of the brain is responsible for motor action and language. Both kinds of thinking may solve problems. However, in very difficult problems only the "abstract" persons will find a solution and is sometimes unable to explain it to

the "motor" person.

In cases of serious epilepsy, an operation may prevent attacks by separating the two halves of the brain. In a "motor" person, whose two halves of the brain are disconnected, his imagination, abstract perception and three-dimensional perceptions may be damaged. In an "abstract" person, whose two halves of the brain are disconnected, his language and motor ability will be severely damaged. I guess that epilepsy is less common in "abstract" persons, and they do not require this operation.

Some people think that the "abstract" half of the brain has an important task regarding memory. If so, then an "abstract" person may have a good memory.

We started the paper with coordination tests. In psychometric tests the "abstract" person will succeed more than the majority of people.

Today psychologists have their patients undergo personality tests, which check characteristics like passiveness, aggressiveness, decisiveness, etc. These tests were made for the majority of people whose "motor" half of the brain rules. These tests were made by psychologists whose "motor" half of the brain rules, and checks the deviation from the optimum for "motor" personality.

We have seen that it is impossible to find the coordination of a left-handed person with an instrument built for right-handed persons. Similarly, it is impossible to check the personality of a man with "abstract" traits, using a psychological test designed for one with a "motor" personality.

Here the situation is not like that with left-handed persons. There are no tests for people with an "abstract" personality. It is difficult to recognize such a personality. Most of these people do not know that they have such a personality. Even if a person knows it, when he answers the questions in a test he will be ruled out as having too low or too high a self-image. Psychologists do not agree on all the psychological theories. Many psychologists do not know about the

physiological difference between the "motor" half of the brain and the "abstract" half of the brain (or on what Jerre Levy discovered). Psychologists know that there are many alternate psychological theories that even contradict each other. See a survey of theories in Coren (1992). For most of the psychologists who know about Jerre Levy's findings, this is only an additional theory, one among many, and not necessarily correct. To admit that there is a unique type of person because of what was discovered is out of the question. Tests designed for this type of person are invalid for most psychologists.

For important positions and jobs it is common to use psychological tests. Society often rejects people with the talents of abstract perception and imagination that may very well be needed. Thus society rejects the benefit of their innovative and exceptional minds. However, these people have no other alternative but to be independent, but their persuasive and expressive and presentation skills are not sufficient.

We highly recommend reading the story by Asimov (1959) *Profession*, in his book *Nine tomorrows*. This is a science fiction book. Asimov predicted that the education and the tests for fitness for professions are not suitable for a small minority of persons who must find their way alone, with the help of psychologists. Today, the tests are not suitable for a small minority of persons who must find their way alone. These persons are considered to be disqualified by psychologists.

Isaac Asimov passed away in 1992, (the year I wrote this paper), without seeing even one of his hundreds of science fiction stories and predictions come true. Asimov's prediction, that the tests are not suitable for a minority of people, who must then find their way alone is true, even more so than Asimov predicted.

Handedness is not a trivial subject. There are many more relevant factors than those mentioned in this short article. It is by no means a black and white. Rather, it is something like a "dark-grey" and "light-grey" issue. The interested reader may learn more details in

chapters 6 - 8 of Coren's comprehensive survey (1992).

Our article hints at about at least a possible explanation of facts usually hidden in the shadows. I think that many will oppose the second part of this paper. Those who look for research subjects might want to prove or invalidate, with experiments, measurements and explanations of the ideas that were presented in this paper.

REFERENCES

[1] Asimov, Isaac, *Nine Tomorrows: Tales of the Near Future*,
- Doubleday, Garden City (1959)
- Dobson, London (1963)
See the story: *Profession*.

[2] Coren, Stanley, *The Left-hander Syndrome*,
- Murray, London (1992)
- Free Press, MacMillan, New York (1992)

[3] Levy, Jerre, and Reid, Marylou, *Variations in writing posture and cerebral organization*, Science, v. 194(4262), pp. 337-339 (15.10.1976)

[4] Restak, Richard M., *The Brain - the Last Ffrontier*, Chapter 10,
- Warner, New York (1979)
- Doubleday, Garden City, New York (1979).
See Figure 27.