

Writing with the other hand unequivocally exposes the presence of two foci - The act of writing requires the compelling collaboration between an internal and an external focus

Writing with the other hand unequivocally exposes the presence of two foci - The act of writing requires the compelling collaboration between an internal and an external focus



Caught In A Line

The explanatory model of all motoric motoric actions

N.J. Mol

August 2023 ©

Introduction:

Traditionally, science has assumed that one motor action encompasses one focus. This assumption has seemingly been so logical that it has never been questioned. However, this has led to the absence of a plausible explanation for the functional perception processes underlying the execution of all motor actions, even after 150 years of movement sciences. In 2016, an explanatory model was found that is capable of identifying all functional perception processes within any imaginable motor action. Beyond any reasonable doubt it conversely demonstrates that every motor action can only be executed through a compulsory coupling of two foci: an internal (secondary) focus must always be directed at an external (primary) focus. In which it should be explicitly noted that these two foci represent entities that fundamentally differ from current scientific terminology.

The explanatory model emphasizes that the essence of a motor task always involves the movement of an action object outside our body along an action trajectory shape, but that the action object will never be capable to move on its own along that line. The action object is often an inanimate object (spoon, tennis racket, ball, letter, pointer (pc) etc.) that we hold during an action, and even though the fingertips, during a grasp action with the hand on the outside, consist of living cells, we absolutely aren't capable of moving them there. The explanatory model unequivocally shows that initiating the movement of an action object outside our body is only possible by using secondary perception of autonomous movements within our body.

Compared to the current state of science, the explanatory model represents a revolutionary breakthrough, revealing that two foci must enter into an obligatory connection simultaneously, and this universal stacking of two perceptions of two autonomous movements occurs in every motor movement action. They are clearly autonomous because they belong to two incompatible worlds. Observations of movement inside and outside the body are actually never able to overlap.

This article focuses entirely on the motor action of writing. It is a rare type of action because the action trajectory shape becomes partly visible. The article convincingly demonstrates that only the pen tip c.q. the movements of the pen tip, similar to a marble in a marble run, executes this action trajectory shape. Solely this movement encompasses the essence of the task. For this reason, primary attention should be directed towards the external movement of the pen tip. The tip of the pen can only be moved with completely different movements within the body that only reach the outside of the pen. The attention required for this should serve the main goal and is therefore referred to as secondary (internal) focus. Furthermore, the explanation shows that all conceivable motor actions are based on these same two foci. Due to this universal nature, the explanatory model creates the most ultimate conceivable ecological argument. The article does not delve deeply into the differences with the current state of science because there is still no clear consensus on this subject within the scientific community.

The primary focus in relationship to the movement of the tip of the pen encompasses the perception of movement outside the body

The explanatory model of all motor movement actions, as demonstrated in writing, shows that only the pen tip, or the movements of the pen tip, will execute the essence of the task and therefore represents the primary focus within this action. The explanatory model provides scientific evidence that a motor movement action always involves two successive autonomous phases. The tactical consideration first

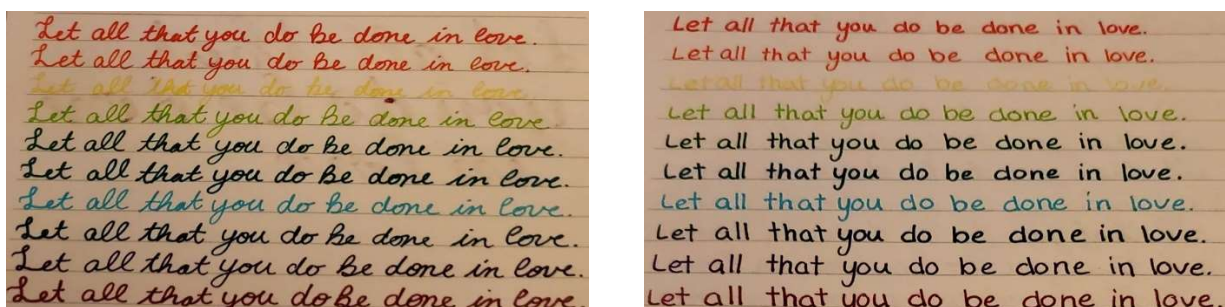
Writing with the other hand unequivocally exposes the presence of two foci - The act of writing requires the compelling collaboration between an internal and an external focus

aims to create a perceptual image of a latent action trajectory shape over which, in this case, the tip of the pen or the movements of the tip of the pen promises to become successful, and only then proceeds to actual action.



Images: Writing is a process centered around the creation of text. So the essence of this task is exclusively accomplished through the autonomous movements of a pen's tip and that is why this is the main process we need to behold with our attention. Typically in a ball-point pen a small ball is situated at the end of the pen which releases a continuous flow of ink drops, shaping specific letters, words, or word parts within a line segment shape. The motion of this rotatable ball exactly resembles a moving marble navigating through a marble run. The marble-marble run relationship unequivocally shows that within any imaginable motoric action the actual position of the marble c.q. the action object will always represent the exact boundary between the manifest and latent part of the action trajectory shape. Within most motoric actions the action trajectory remains invisible but within the act of writing the shape becomes partly visible. So the red part of the word in the left image is thus the visible segment, and the invisible part is represented in pencil, containing the perceptual image of the still latent action trajectory shape. However, during handwriting exercises (right image), the perceptual image in pencil is utilized to reinforce and/or enhance the quality of the (cognitive) perceptual image.

When we factually start the action, we use the pen tip to fill in the perceptual image of the latent action trajectory shape. So within the primary focus, this is the essential process that our perceptual systems must guide, and surprisingly, science has overlooked this process entirely until now. In upcoming articles, it will become evident that the pen tip's completion of the action trajectory shape provides the crucial *tau*-value, which is intricately linked to the secondary focus and will be explained how the cortical streams have to mediate this process.



Images: The explanatory model demonstrates that within every imaginable motor action, an autonomous internal focus must be directed towards an autonomous external focus. This insight reveals the scientific evidence that we can never execute any action trajectory shape identically, as it involves the stacking of observations from autonomous movements that belong to two incompatible worlds. For instance, you have never picked up a coffee cup in the exact same way or performed a free throw in basketball in an identical manner. Similarly, you will never be able to produce one letter, word, or word part identically. As to which the explanatory model right away emphasizes that this was never

the intended goal. Creating form similarity is so much more efficient and effective that a parsimonious resourceful organism would never have developed otherwise.

Within the tactical action we maybe construct perfect sleek perceptual images of the words we intend to write within sentences. However, due to the fact that the movement of the pen tip can only be executed through the observation of an entirely different autonomous movement, the pen tip will inevitably deviate from that "*perfect*" original perceptual image at any position P within the action trajectory shape. This process, therefore, needs to be guided by the dual and mutual interaction of the cortical streams, which represents the brilliant ecological solution of the body to execute every motor action in the most efficient and effective manner. The ventral stream and dorsal stream continuously interact to correct the inevitable deviations, but this interaction requires a small reaction time¹. As a result, we (conform Bernstein) can never execute one motor action identically and the tip of the pen will always follow a constantly varying zigzag pattern during writing.

The secondary focus in relationship to the movement of the tip of the pen encompasses the perception of movement inside the body

When one starts to realize that the primary focus solely concerns the movements of the tip of the pen, it implicitly becomes evident that the pen itself isn't capable to move at all. This analogy is strikingly similar to a ball during a free throw in basketball or various other inanimate objects like tennis rackets, cricket bats, spoons, knives, bottles, pointers (pc) and more, which clearly never move on their own. But even when we grasp a coffee cup with our hand, the explanatory model demonstrates that the hand, and consequently the relevant fingertips, must also be considered as lifeless action objects.



Images: A pen is merely a tool used for a particular type of writing. We can also write with a finger, stick, paintbrush, and so on. And even if we write directly in the sand with a finger it doesn't matter.

The stacking of two autonomous foci will always exhibit the same universal cooperation. Although you could remark that when using a pen, stick, or brush, there might be a longer distance between the secondary and primary focus, which could potentially result in a greater degree of deviations.

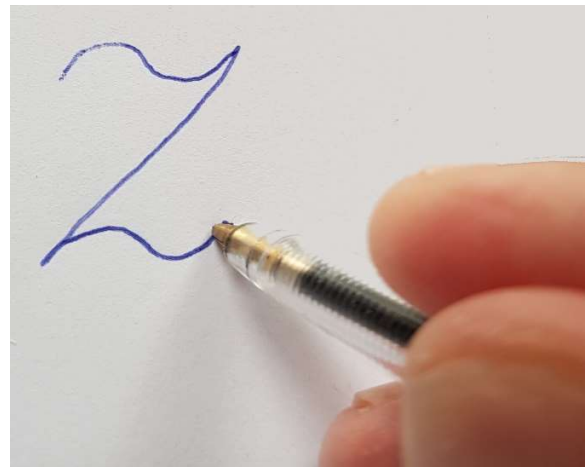
The outer layer of the fingertips does comprise living cells, but it is absolutely incapable of moving the fingertips in an action trajectory shape outside the body with those living cells. We can only induce

¹ The specific reaction time concerning cortical streams in relation to the explanatory model has never been examined. General information and empirical experiences provide an indication that the reaction time is estimated to be around 0.1 seconds; "It takes about one-tenth of a second for information about the visual scene to reach the back of the brain or the occipital lobes. During the next tenth of a second, the visual information is analysed in two separate ways. Figure 2 shows the two pathways of the dorsal stream and the ventral stream. The dorsal stream runs from the occipital lobes to three locations, the back of the brain at the top (called the posterior parietal lobes), a vertical strip of brain in the centre (called the motor cortex) and the front of the brain (called the frontal cortex). The ventral stream runs from the occipital lobes to the back of the brain at the bottom (called the temporal lobes)": Cerebral Visual Impairment - Working Within and Around the Limitations of Vision; Gordon N Dutton; http://www.liv.ac.uk/~pcknox/Publications/trimble/CVI%20chapter%20for_hers-Dutton.pdf

Writing with the other hand unequivocally exposes the presence of two foci - The act of writing requires the compelling collaboration between an internal and an external focus

movement in the outer layer of the fingertips through internal body movements. While they may approach the outer surface of the fingertips, they will always remain within the confines of the body. In the case of a writing action, we can only haptically perceive the (outer surface of the) pen with the (outer surface of our) fingertips, and we can only proprioceptively² sense how movements within our body influence the haptic contact with the pen.

The purpose of the task within a motoric action is implicitly connected to the observation of the primary focus, leading us often to be unaware of the secondary focus during many motor actions, especially when they involve simple observations like within writing. However, in highly complex motor actions, such as a tennis serve, attention is conversely only directed towards the secondary focus c.q. the serving technique. Completely ignoring the fact that the primary focus compels the realisation of an outgoing ball trajectory shape (OBT). Which is the sole essence of a tennis service.



Images: Writing with the other hand clearly exposes the presence of two foci which can be noticed within any imaginable motoric action

With some practice, you can consciously perceive the two foci simultaneously within many motor actions. For instance, in a grasping action, you can perceive the movement trajectory on the outside of your body while also focusing on movements on the inside of your body. Which exactly includes ordinary writing tasks as well. Furthermore, you can try to find examples that deliberately confront you with the autonomy of the internal and external focus within motoric actions. In the case of a writing action, this search is rather simple. If you attempt to write with your non-dominant hand, you will quickly become aware of the two autonomous foci. It will definitely require much more effort to execute the same perceptual image of the letter, word, or word part in a somewhat readable manner.

² Proprioceptive perception comprises two autonomous aspects: Limb Position and Movement. The explanatory model makes a clear connection between these two proprioceptive phenomena and their relation to using the pen effectively. The overall pen displacement technique is influenced by our awareness of limb position, allowing us to control the general movement of the pen on a piece of paper. On the other hand, where perception is specifically transferred to the exact movement of the tip of the pen is essential for precise writing actions.