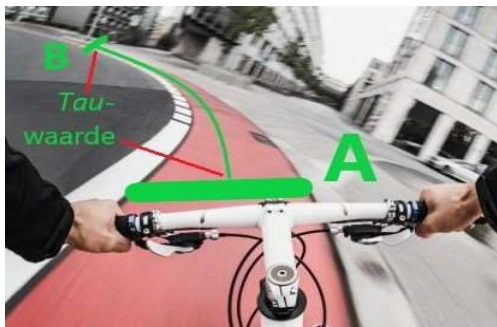


Car driving requires a compelling coupling of a secondary (internal) focus to a primary (external) focus –
Driving and bicycling encompass identical perception processes

Car driving requires a compelling coupling of a secondary (internal) focus to a primary (external) focus - Driving and bicycling encompass identical perception processes



Caught In A Line

The explanatory model of all motoric movement 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 (pen, spoon, needle, key, 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 car driving. It presents compelling evidence that only the car c.q. the movements of the car itself, akin to a marble in a marble run, executes this action trajectory shape, thus accomplishing the task's essence. For this reason, primary attention must be directed towards the external movement of the car. The car can only be set in motion by entirely different movements within the body that only extend to the outer part of the steering wheel and the pedals of the car. The attention required for this must serve the main objective, hence referred to as the secondary (internal) focus.

What makes this publication particularly remarkable is that it vividly demonstrates that driving and cycling¹ require identical perception processes. In both actions, the steering wheel can only correct deviations in width (zigzag process) of the action trajectory shape. The pedals, on the other hand, can only mediate the length (accordion process) of the action trajectory shape².

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 within biking encompasses the perception of movement outside the body



Images: Car driving solely encompasses moving oneself from point A to point B using a car. The essence of this task is exclusively carried out by the autonomous movements of the car, making it the primary process we need to observe. In this process, the car follows an action trajectory shape akin to the movement of a marble within a marble run. In any imaginable motoric movement action, the current position of the marble c.q. the action object will serve as the precise demarcation between the manifest and latent parts within the action trajectory shape. It is abundantly clear that the fairground ride car will never start moving on its own, hence there will never arise a need to perceive an action trajectory shape within a primary focus.

In abstract terms the egocentrically formulated will while car driving encompasses the movement from A to B³. In relationship to this egocentric formulated objective the explanatory model demonstrates that solely the car, or rather the movements of the car, will execute the essence of this task, thus constituting the primary focus within this action. In addition the explanatory model provides scientific evidence that any motoric movement action comprises two subsequent autonomous phases. In the first, a tactical consideration aims to establish a perceptual image of a latent action trajectory shape in which, in this case, the car or the movements of the car will most likely succeed in the intended action. Only then does one proceed to the factual execution of the action. So when we subsequently are going to carry out the action, we fill in that perceptual image of the latent action trajectory shape with the

¹ https://www.researchgate.net/publication/372941732_Bicycling_versus_a_hometrainer_-_Bicycling_encompasses_the_obligatory_linking_of_a_secondary_internal_focus_to_a_primary_external_focus_A_hometrainer_solely_requires_a_secondary_internal_focus?_sg%5B0%5D=1cZ83Nb97Cyy3ERNuhwMxHKMj8aTXzogT7YwT7keZ1vz_Wl6B7Mkg6A3S5D7N70DAN1oZxF2hBBMora5u7fViQy7LC66ppv1_UVavBh.qQ6avdVwJfKaRh5s5iw3ZGb7OG-Qsa1XBjtSPUR1M71YjzVsTrjvTfDwy81Xb4Io749jHtZ8WE1xFz26YKYBEQ

² Upcoming publications will precisely explain how the cortical streams mediate those two autonomous phenomena separately.

³ The explanatory model defines all actions in which the primary egocentric objective involves a distinct movement from A to B as motoric movement action *moving A-B*. This encompasses activities such as walking, cycling, sailing, swimming, boating, skiing etc. etc..

car. Therefore, within the primary focus, this is the essential process our perception processes must guide, a process that science has entirely overlooked thus far. Subsequent articles will reveal that filling in the action trajectory shape by the car yields the crucial *tau*-value to which the secondary focus is compellingly linked and will be explained how the cortical streams mediate this process.



Images: The explanatory model demonstrates that within every conceivable motoric movement action, an autonomous internal focus must be pointed at an autonomous external focus. It thereby provides insight into the scientific evidence that we just aren't capable to produce an identical action trajectory shape, as it involves a stacking of two perceptual images of autonomous movements that belong to two incompatible worlds. For example, you have never taken hold of a coffee cup in an identical manner, or performed a free throw in basketball in an identical way. In the same vein, you will also never be able to produce identical forms of action while driving a car c.q. you will never be able to drive one meter in an identical manner.

Maybe we do construct perfect straight action trajectories when we create (latent) perceptual images of the future positions of the car within a driving action. However, due to the fact that you can only execute the movement of the car with the perception of an entirely different autonomous movement, the car will inevitably deviate from that "*perfect*" original pre-perceptual image at every position P within the action trajectory shape. This process is, therefore, guided by the double and mutual process of the cortical streams, representing the brilliant ecological response of the body to execute every motor action in the most efficient and effective way possible. The ventral and dorsal streams continuously interact with each other to correct the inevitable deviations, but this interaction does require a (very short) reaction time⁴. As a result we can never perform one motor action identically (conform Bernstein) and the car will always follow a different zigzag pattern while driving.

The secondary focus within car driving encompasses the perception of movement inside the body

When one starts to realize that the primary focus within car driving solely concerns the movements of the car, it implicitly becomes evident that the car 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. The outer layer of the fingertips does comprise living cells, but it is absolutely incapable

⁴ 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

of moving the fingertips in an action trajectory shape outside the body with those living cells. We can only induce 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.

When driving a car, as is the case with cycling, one must translate this into two autonomous processes. The width of the action trajectory shape (zigzag process) can only be mediated by the steering wheel, and the length of the action trajectory shape (accordion process) can only be mediated by the (foot) pedals. In the case of the steering action, we can only haptically perceive (the outer surface of) the steering wheel with (the outer surface of) our hands. In the case of the pedal action, we can only haptically perceive (the outer surface of) the pedal with (the outer surface of) the soles of our shoes. Then, we can only proprioceptively⁵ perceive how movements within our body influence the haptic contact between the hand/steering wheel and sole/pedal, respectively.



Images: Within this article, it must, of course, become entirely clear that driving and cycling demand exactly the same functional perceptual processes. The steering wheel can only adjust the action line form in width, and the pedals can only adjust the action line form in length.

Also within car driving, the essence of the task is implicitly linked to the observation of the primary focus. This often results in us being unaware of the secondary focus during many motor actions, particularly because these are frequently simple observations. However, in highly complex motor actions such as a tennis serve, attention is exclusively directed towards the secondary focus (the serving technique), completely disregarding the fact that the primary focus involves creating an outgoing ball trajectory (OBT). With some practice, you can consciously perceive the two foci simultaneously within many motor actions as well as within car driving. If you frequently change cars you will have to reset the secondary (internal) focus towards the primary (external) focus constantly.

⁵ Scientific research has demonstrated that proprioceptive perception encompasses two autonomous phenomena, namely: 1. *Limb Position* (LP) and 2. *Movement* (M). The explanatory model clearly illustrates this within the context of car driving as well. LP is linked to the overall car driving technique, while M pertains to the specific point where this overall perception needs to be transferred to the steering wheel and to the pedals.