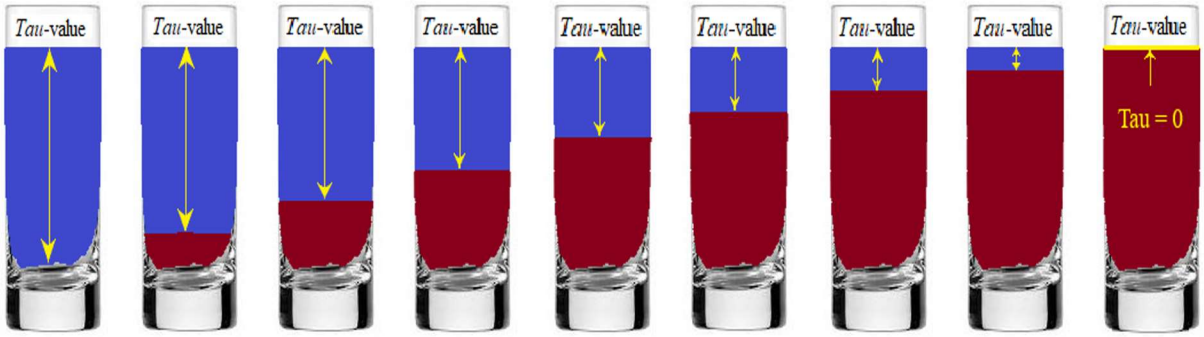
Pouring is a rare motor action because the action trajectory shape becomes visible - Pouring requires a compelling coupling of a secondary (internal) focus to a primary (external) focus



Caught In A Line
The explanatory model of all motoric motoric actions

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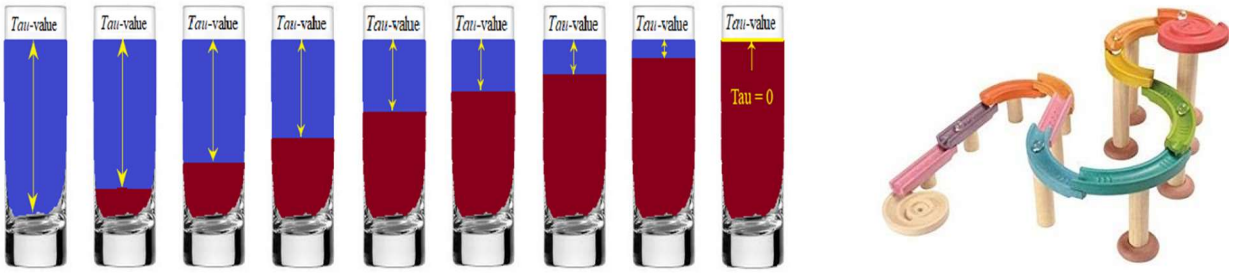
Introduction

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 100+ 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 motoric 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 motoric movement action of pouring. The article convincingly demonstrates that only the liquid level, i.e., the rising (moving) liquid level in the glass, similar to a marble in a marble run, executes this action trajectory shape and thereby accomplishes the essence of the task within pouring. For this reason, primary attention must be directed toward the external rise c.q. movement of the liquid level. The liquid level can only move with entirely different movements within the body that only reach the outside of the bottle (or kettle, etc.). The attention required for this must serve the main goal and is therefore referred to as the secondary (internal) focus.
Furthermore, the explanation also 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 ecological argument imaginable. The article does not delve deeply into the differences with the current state of science, as there is still no clear consensus on this topic within the scientific community.

The primary focus when filling a glass involves the perception of a movement outside the body

The explanatory model of all motoric movement actions, in the context of pouring, demonstrates that only the liquid level c.q. the rising liquid level, carries out the essence of the task and thus constitutes the primary focus within this action. The explanatory model provides scientific evidence that any motoric action always consists of two consecutive autonomous phases. In the first phase, a tactical consideration aims to create a perceptual image of a latent action trajectory, in this case, the shape of the liquid or the movements of the liquid, which will lead to success. Only after achieving this perceptual image does one proceed to the actual action.



Images: Pouring is solely about filling a glass. The essence of this task is exclusively carried out by the autonomous movement of the rising liquid in the glass, and therefore, that is the primary process we need to observe. Although it may be somewhat harder to discern here, the liquid level follows an action trajectory shape just like in any conceivable action. Exactly akin to how a marble travels along a marble run. In any conceivable motor action, the current position of the marble c.q. the action object will precisely mark the division between the manifest and latent parts of the action trajectory. In the illustrations of the glasses, the current liquid level at position P(0) precisely marks that division. The positions already traversed are marked in red, while the latent positions yet to be traversed are in blue.

When we factually start to execute the action, we are essentially filling in that perceptual image of the action trajectory shape with the liquid (from the bottle, kettle, etc.). So, within the primary focus, this is the essential process that our perception processes must guide, and surprisingly, science has overlooked this process entirely until now. In subsequent articles, it will become evident that filling in the action trajectory with the liquid yields the essential *tau*-value to which the secondary focus is compellingly linked and will be explained how the cortical streams have to mediate this process.

Images: The motoric movement action *pouring* is unique because it is one of the few actions where the action trajectory shape becomes visible. Similar to writing, droplets are poured at a microscopic level. The first arriving droplets create the manifest part of the action trajectory.

We might indeed form perfectly straight action trajectories when we create perceptual images beforehand during pouring. However, due to the fact that you can only execute the movement of the liquid level in the glass through the perception of an entirely different autonomous movement, the liquid

level in the glass will inevitably deviate from the 'perfect' original perceptual image at every position P within the action trajectory. This process, therefore, needs to be guided by the double 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 time[1]. As a result, we (conform Bernstein) can never execute one motor action identically and the rising of the liquid will always follow a constantly varying zigzag pattern during pouring.

The secondary focus when filling a glass involves the perception of a movement inside the body

When observing the pouring process and realizing that the primary focus concerns only the movements of the liquid level in the glass, it becomes evident that we cannot actually move the liquid itself. This principle applies not only to a ball in a free throw in basketball or various other inanimate objects like tennis rackets, bicycles, cricket bats, spoons, knives, pens, 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. While the outer surface of our fingertips consists of living cells, we cannot move them along an external action trajectory shape outside the body with those living cells. We can only move the outer surface of the fingertips through internal movements within our body. These movements bring them close to the outer edge of the fingertips, but they still remain within the confines of the body. Similarly, in the case of pouring a liquid, we can only haptically perceive the bottle with the (outer surface of) our fingertips, and we can only proprioceptively[2] sense how movements within our body affect the haptic contact with the bottle.

Image: Filling a glass is just one specific way of pouring. A significant percentage of mankind will have to visit a rest room multiple times a day and have lots of troubles “pouring” effectively and at a

[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

[2] 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 cycling as well. LP is linked to the overall cycling technique, while M pertains to the specific point where this overall perception needs to be transferred to the pedal.

water pump, we use a pumping mechanism to pour water into a bucket. However, the method doesn't matter. The stacking of two autonomous foci will always reveal the same universal collaboration.

Also within pouring, the goal of the task is implicitly linked to the perception of the primary focus, which often leads us to be unaware of the secondary focus during many motor actions, particularly because these often involve straightforward perceptions. However, in highly complex motor actions like a tennis serve, attention is solely directed at the secondary focus (the service technique), completely disregarding the fact that the primary focus involves creating an outgoing ball trajectory (OBT). With some practice, you can consciously perceive both foci simultaneously within many motor actions. For instance, in a grasping action, you can perceive the action trajectory on the outside of your body while simultaneously focusing your attention on movements within your body. Which is exactly what can be experienced during a pouring action.