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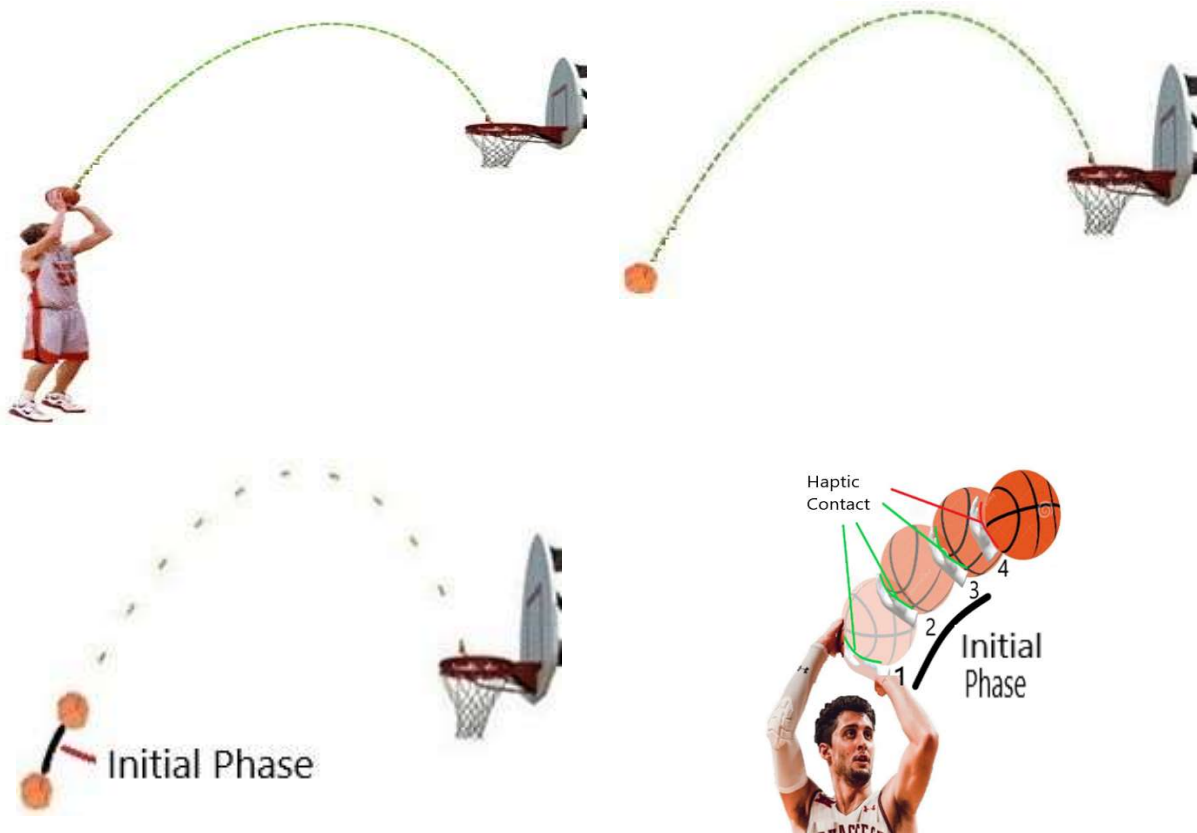
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Caught In A Line

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 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 (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 over an action trajectory shape on the outside of our body. The explanatory model unequivocally shows that initiating the movement of an action object along an action trajectory shape 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 free throw in basketball. It presents compelling evidence that only the ball c.q. the movements of the ball 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 ball. The ball can only be set in motion by entirely different movements within the body that only extend to the outer surface of the ball. The attention required for this must serve the main objective, hence referred to as the 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 within throwing encompasses the perception of movement outside the body

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The egocentrically formulated intention during a free throw is to get the basketball into the basket. The explanatory model of all motor movement actions demonstrates that solely the ball, or rather, the movements of the sole ball, will execute the essence of that task and thus constitutes the primary focus within this action, and in addition the explanatory model provides scientific evidence¹ 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 ball c.q. the movements of the ball will most likely succeed. 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 basketball. 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 ball 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 execution of a free throw solely encompasses the relocating of the basketball into the basket. The essence of this task is exclusively carried out by the autonomous movements of the ball, making it the primary process we need to observe. In this process, the ball follows an action trajectory shape akin 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.

Maybe we do construct perfect straight action trajectories when we create (latent) perceptual images of the future positions of the ball when we execute a free throw in basketball. However, due to the fact that you can only execute the movement of the ball with the perception of an entirely different autonomous movement, the ball will inevitably deviate from that "*perfect*" original pre-perceptual image at every position P within the action trajectory. 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 time². As a result we can never perform one motor action identical-

1

https://www.researchgate.net/publication/371912704_The_scientific_proof_that_we_primarily_start_with_the_construction_of_a_perceptual_image_of_an_outgoing_ball_trajectory_shape_prior_to_the_factual_execution_-_The_complete_explanation_of_the_free_throw

² 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

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ly (conform Bernstein) and the basketball will always follow a different zigzag pattern while executing a free throw. Upon which the explanatory model hastily emphasizes that achieving an identical execution of motor actions has never been the objective of parsimonious organisms and therefore doesn't fit into an ecological evolution. Generating form similarity is far more efficient and effective.



Images: The explanatory model of all motoric movement actions has demonstrated beyond any reasonable doubt that we effectively cannot throw a ball into a basket³. In a tactical phase preceding the actual execution, we can only reduce a perceptual image of an whole (latent) action trajectory shape between the ball and the basket to an initial phase where there is haptic contact between the hand and the ball. The explanatory model regards this as an undeniable fact.

The secondary focus within throwing encompasses the perception of movement inside the body

When one starts to realize that the primary focus solely concerns the movements of the ball, it implicitly becomes evident that the ball itself isn't capable to move at all. This analogy is strikingly similar to 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 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. In the case of a free throw in basketball, this concept needs to be translated to the outer surface of the ball. We can only haptically perceive the ball with (the outer surface of) the hand and can only proprioceptively⁴ perceive how movements within our body influence the haptic contact between the hand and the ball.

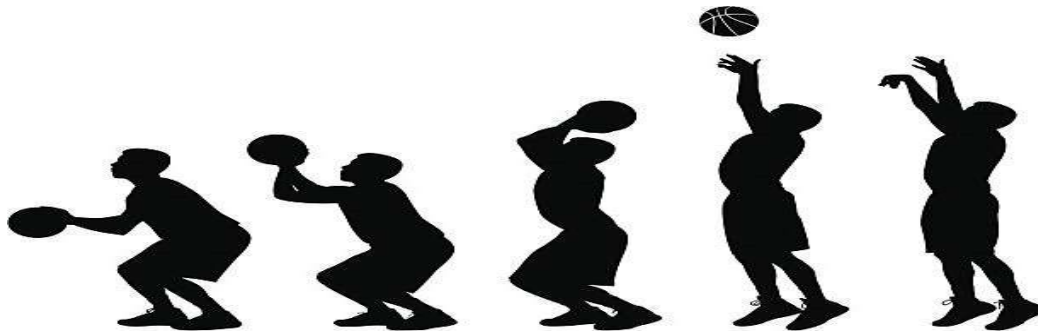
frontal cortex). The ventral stream runs from the occipital lobes to the back of the brain at the bottom (called the temporal lobes)”: Cerebral Visual Impairment - Working Within and Around the Limitations of Vision; Gordon N Dutton; http://www.liv.ac.uk/~pcknox/Publications/trimble/CVI%20chapter%20for_hers-Dutton.pdf

https://www.researchgate.net/publication/372335518_You_Can't_Throw_a_Ball_into_a_Basket_You_Can_Solely_Manipulate_the_Ball_during_Haptic_Contact_-_Novel_Insights_within_Free_Throws_and_all_Throwing_Actions?_sg%5B0%5D=jtLBA8eR0UMeqSbgVzTnV7sfRDNDWD084C7c8tgFbzuAAxWusMbA6Xgn3EbYh6wuH_8sijqgZ4lvRrOvd_-5ta2GxMk1bYQkat4IBNyI.ApjK07Vmh9XR8KoDvbJFp2UbS5cJDEJVLZRVhyZpY8kLQKPOphun0czaCj4bqi3BHq03kix4j5y_L5yX7OSig&_tp=eyJjb250ZXh0Ijp7ImZpenN0UGFnZSI6InByb2ZpbGUiLCJwYWdlIjoicHJvZmlsZSJ9fQ

⁴ Scientific research has demonstrated that proprioceptive perception encompasses two autonomous phenomena, namely: 1. Limb Position (perception of limb position) and 2. Movement (perception of motion), which the ex-

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The movement of the ball on the outside of our body can only be achieved by a system of movements on the inside of our body. The explanatory model defines the entire system of movements required for the displacement of the ball as a technique model and notes that performing a free throw involves a simple technical model. However, despite this realization, it remains a complex constellation of multiple types of movements where no superior technical model can be identified. In a classical execution of a free throw, it can only be observed that there is leg, torso, arm, hand (palm), and fingertip action involved. It can actually be determined that you have never executed a single free throw with an identical constellation of movements, and even if you were to try, you couldn't because the complex components within the technical model cannot be controlled or executed⁵ identically.



Images: In the case of the free throw, there is no apparent superior technical model⁶. In a classic execution of a free throw, it can only be determined that there is foot, leg, torso, arm, hand (palm), and fingertip action involved within a complex dynamic system. In which you can only remark that you have never executed a single free throw with an identical constellation of movements.

In many motoric movement actions, we do not consciously become aware of the existence of two foci, as they often involve straightforward observations. However, during a free throw in basketball, you can indeed learn to distinguish between the internal and external focus and experience them in the appropriate interconnected manner.

planatory model within grasping clearly links to the overall grasping technique and the specific location where, in this case, that perception must specifically be directed towards the haptic contact between the hand and the coffee cup.

⁵ The ultimate achievement within an optimization process is to establish form similarity, ensuring that the fluctuation boundaries of occurring deviations remain within certain values. This essentially provides the most ecological rationale. The purpose of our perceptual processes has never been to perform identical actions. Creating form similarities is infinitely more parsimonious.

⁶ In sports like the high jump, there is indeed a clear superior technical model. The Fosbury flop is the leading technique above methods such as the straddle or various scissor jumps. Similarly, in tennis serving, there is a distinct superior (professional) technical model. Grips (Eastern/Continental) that enable internal shoulder rotation are much more efficient and effective than, for instance, grips like the Western grip for serving.