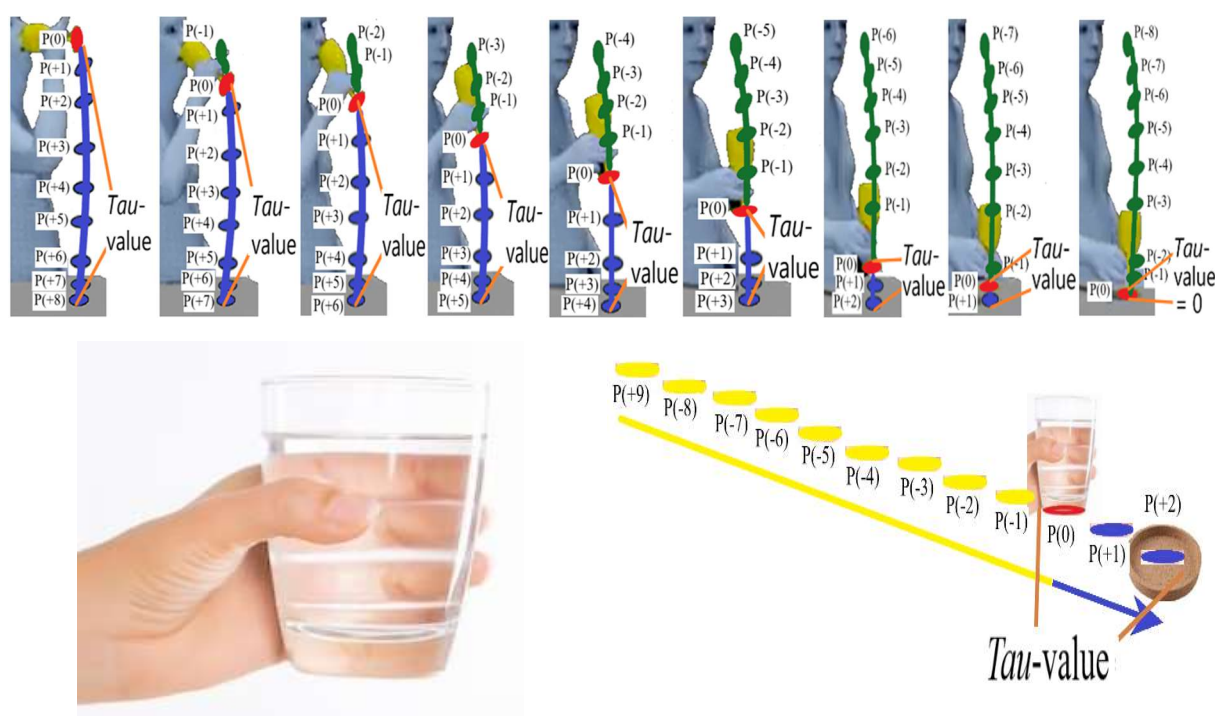


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Caught In A Line

The explanatory model of all motoric movement actions

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<https://www.explanatorymodel.nl/common-daily-actions/placing>

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 emerged that is capable of identifying all functional perception processes within any imaginable motor action. With near certainty, it shows that every motor action involves the perception of three autonomous foci interacting with each other.

When placing a glass on a coaster, this interaction involves one focus that remains solely occupied with the movement of the coaster, which can be universally characterized as a catching action. The other two foci, conversely, are only concerned with the egocentric action and involve the movement of (the bottom of) the glass, which can be universally characterized as a throwing action.

Within this egocentric throwing action, scientific evidence indicates that an internal (secondary) focus must always be directed at an external (primary) focus. In relationship to which it must expressly be noted that these two foci represent entities that fundamentally differ from the current scientific terminology.

Regarding the external (primary) focus, it can be observed that science has so far missed truly everything. Therefore, it will now be comprehensively discussed within a wide spectrum of motor actions, and this publication now reveals all aspects of the primary focus within the motoric movement action *placing* (placing a glass on a coaster). Within this publication, it should become clear that the action trajectory shape within this action consists of one uninterrupted c.q. of one interconnected series of positions P of only the (bottom of the) glass and that solely the movement of the (bottom of the) glass within this action trajectory shape yields the essential *tau*-value. Which must also serve as evidence that this phenomenon occurs within any conceivable action.

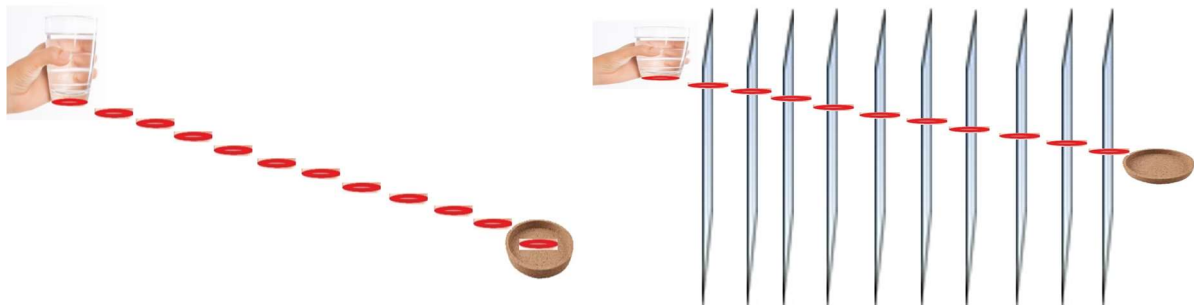
Solely the movements of the (bottom of the) glass encompass the essence of the task c.q. the external (primary) focus

The category of motor actions discussed by the explanatory model involves conscious actions, where it is assumed that an egocentric will is first formulated. For example, in eating, we must first express the desire to satisfy hunger, and in writing, there must first be a need to create, for example, a brilliant book. Thus, before wanting to place a glass, there is always a desire to do so. The explanatory model

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of motor actions sees this as an indisputable factual given but has to criticize this assumption. The egocentrically formulated will, at the functional level, in eating is essentially not about satisfying hunger, and in writing, it is not about writing that great book. The explanatory model shows that this is factually incorrect and that we can only move food and a pen tip over an action trajectory shape towards, respectively, the mouth and across the paper when the action is actually executed. Or with other words: the desire to f.e. write brilliant articles is translated into the actual execution of that action. Analogously, we can only move (the bottom of) the glass towards a coaster, which determines the essence of that action, and therefore, only this given should be viewed as the external (primary) focus.

The tactical movement action (TMA) within placing a glass on a coaster



Images: First, an egocentric will must be formulated that we want to perform a motor action in relation to a glass and a coaster. From the current position of (the bottom of) the glass, we consecutively create a perceptual image of a latent action trajectory shape of how we will then reach the coaster (left). This happens as part of a tactical action in which two important goals are considered. First, it must lead to a successful action, and additionally, ecologically evolved organisms want to perform an action as economically as possible. The explanatory model of the motoric movement action provides scientific evidence that, although we look at obstacles (which would hinder a successful action) within the environment (right), visual perception within that context is only aimed at creating an action trajectory shape that allows an uninterrupted continuous line from positions P of the (bottom of the) glass. This means that we, beforehand, primarily perceive the positions P where there is *nothing* (!) to see, and thus, this is also the essence of the tactical action in the image on the left, where there appears to be no physical obstacles between the glass and the coaster on the (action) path.

The explanatory model of the motoric movement action demonstrates that after formulating an egocentric goal, we always engage in a tactical consideration¹, prior to any execution, to determine how we can bring the action object to the goal location within successive positions P. In the context of the discussed action, we always create a perceptual image of a latent action trajectory shape, allowing the (bottom of the) glass to be moved successfully toward the coaster.



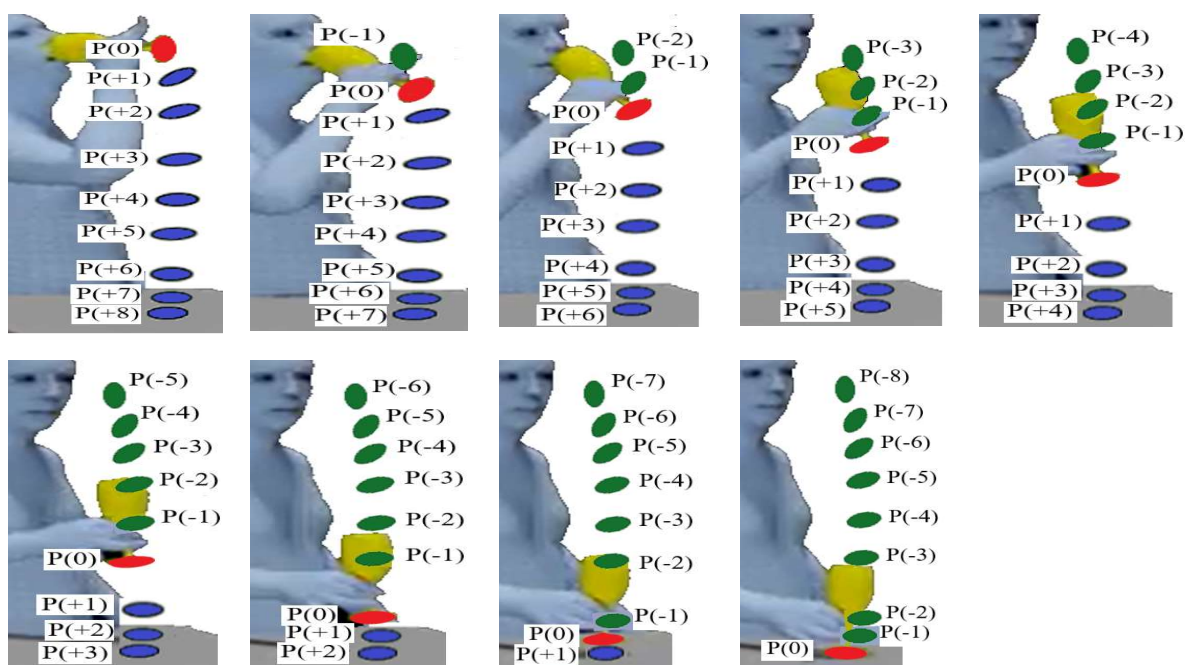
¹ The scientific evidence has been unequivocally provided for all grasping actions and all throwing actions, and can be easily universally extrapolated to any conceivable action. N.J. Mol; *Grasping encompasses two consecutive autonomous phases – The scientific proof that we tactically construct an action trajectory shape prior to the factual execution of that exact same action trajectory shape.*

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Images: It is not straightforward to present an animation that accurately represents the latent action trajectory shape being constructed. The image on the left very clearly displays the shape of the trajectory, in which all contiguous points P are distinctly weighed. However, it does not illustrate that within the construction of the trajectory shape, all dimensions of the (bottom of the) glass are also precisely weighed, as shown in the image on the right. The perceptual image we pre-construct of the trajectory might possibly contain a hybrid blend of these two animations.

The factual movement action (FMA) within placing a glass on a coaster

After determining a perceptual image of a latent action trajectory shape, we proceed to actually carry out the action. This process effectively starts with bridging the gap from the current position of the (bottom of the) glass $P(0)$ to the next position $P(+1)$ within the action trajectory. Although our ultimate intention of course is to reach the coaster, the explanatory model clearly demonstrates that our perception processes in this phase are solely focused on traversing the empty space between the (bottom of the) glass and the coaster. Which at a micro-level shows, that essentially only the positions $P(-1)$, $P(0)$, and $P(+1)$ matter to us during this bridging process.



Images: In an animation, the progression within an action trajectory shape can be depicted as follows. Within any conceivable action, the action object can successfully execute the action only by first occupying the next position $P(+1)$ within the action trajectory. The current position $P(0)$ then shifts one step forward, and a manifest position $P(-1)$ is added. This process repeats with every new position $P(0)$ until the end of the action trajectory is reached. To comprehend the perception processes at the most fundamental level it is of the utmost importance that you start to understand that the latent part of the action trajectory shape will factually need to sprout from the already manifest positions $P(-x)$.

The perception-action coupling within placing a glass on a coaster

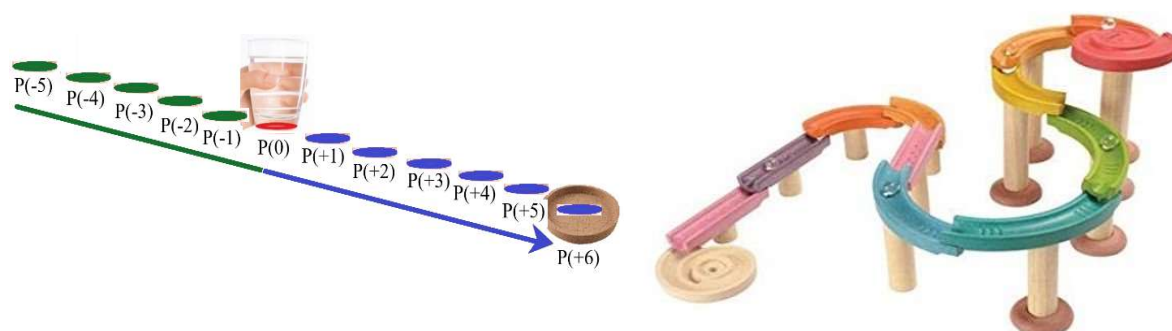
With the preceding argumentation, the explanatory model of the motoric movement action now provides a comprehensive and universal explanation of how perception is linked to action within any conceivable task. The animations in the previous section illustrate that the action object maintains a fixed relationship with the perceptual image of the action trajectory shape. This becomes easier to

comprehend when envisioning a marble in a marble run. In this analogy, you will become much more aware that the perception-action coupling is a unified phenomenon where only a single change occurs every ongoing time span. Within the marble run it becomes quite visible that during the actual execution, each position $P(0)$ serves as the precise separation between all already manifested positions $P(-x)$ and the latent positions $P(+x)$ yet to be traversed.

Through this explanation of the perception-action coupling, the explanatory model can precisely demonstrate how organisms must have evolved within an ecological framework. However, delving into this subject exceeds the scope of this publication. Instead, several crucial points will be highlighted concerning the functional perception processes within this motor action.

It's imperative to recognize that while the ultimate goal is to reach the coaster, during the execution of the action, we are solely engaged in bridging the (bottom of the) glass through empty space where seemingly nothing is happening. It can be observed within any conceivable action that we spend relatively more time bridging this nothingness than in actual observable activity. The explanatory model, however, unequivocally shows that not only the end goal matters, but all positions P between the (bottom of the) glass and the coaster are equally significant.

Additionally, it must be remarked that the action of the (bottom of the) glass at $P(0)$ can be perceived distinctly, yet no fixed unit of time can be attributed to it. Each unit of time can be divided into a thousand smaller units, and these units can be further subdivided, leading the explanatory model to argue that the action at $P(0)$ fundamentally takes such a brief time span that it only gains significance in relationship to perceptions of the adjacent time frames. In other words, perceiving the current position of the (bottom of the) glass solely gains meaning through the adjacent future "actual" positions $P(+x)$ and the adjacent manifest "actual" positions $P(-x)$ of the (bottom of the) glass. Within which the overarching idea is to emphasize that perceptions within any conceivable action mainly pertain to one single phenomenon wherein the perception of the action also compels a perceptual image, but primarily that they are absolutely interdependent.



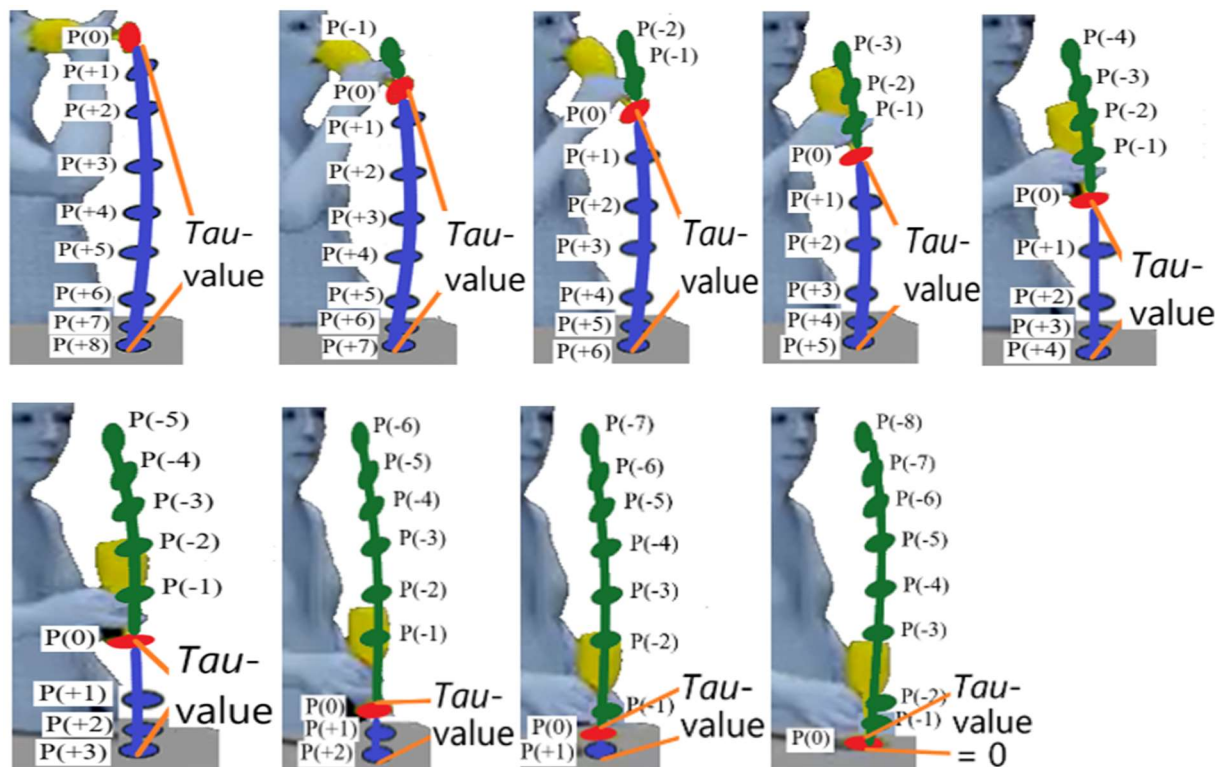
Images: Within many motoric actions the action trajectory shape will not become visible, making it challenging to depict with animations. Conversely, the marble within the marble run, is capable to vividly illustrate this concept. It clearly showcases one single phenomenon wherein the marble, at each position P , delineates the precise separation between all already manifested positions $P(-x)$ and all latent positions $P(+x)$. Additionally, it exemplifies one of the essences of the (perception-action) coupling. If we couldn't perceive the marble run, the movements of the marble would lack essential context, and conversely, without the marble, we would be completely unable to perceive any coupling as well. There is a compelling interdependent relationship, and without that coupling, we would never, under any circumstances, be able to execute any motoric movement action.

The *tau*-value in relationship to placing a glass on a coaster

The explanatory model of the motoric movement action demonstrates with the aforementioned perception-action coupling that the perception of each position of the (bottom of the) glass c.q. the action object within the action trajectory shape is equally important. However, as the (bottom of the) glass approaches the end of the action trajectory shape, the task c.q. the egocentrically formulated goal starts to

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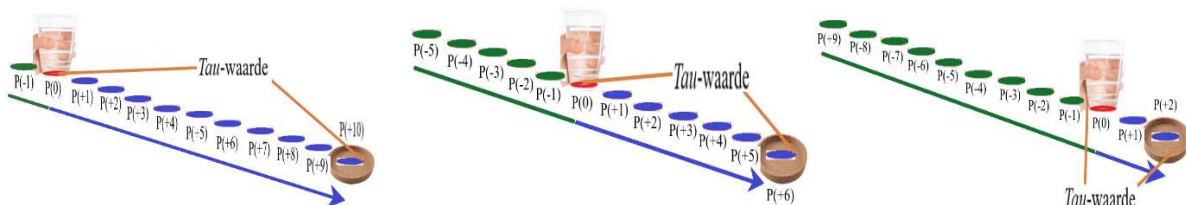
become finalized. Within any imaginable motor action, the action object will universally traverse the action trajectory shape until there are no latent positions P left. Within his *tau*-coupling theory, D.N. Lee referred to this phenomenon as the closing of the gap c.q. as the *tau*-value approaching to zero.



Images: Within the perception-action coupling, the (bottom of the) glass will traverse all latent positions P that are tactically predetermined within a perceptual image of an action trajectory shape. With each successive position P of the (bottom of the) glass, the *tau*-value will decrease, until it eventually approaches zero c.q. becomes zero.

The perception of the *tau*-value in relationship to placing a glass on a coaster

Perceiving the *tau*-value within the external (primary) focus is an essential process because, within a strict *tau*-coupling, it needs to establish a compelling relationship with the internal (secondary) focus to ensure the success of the action. When it is observed that the (bottom of the) glass is approaching the coaster, the perception within the internal focus must ensure that the bodily movements related to the movement of the (bottom of the) glass are appropriately slowed down and adjusted so that the (bottom of the) glass neatly reaches the coaster.



Images: The *tau*-value can be perceived in two autonomous ways. You can either observe how the green manifest action trajectory shape takes over the blue line or at the most basal level you could solely observe with what speed the blue line, representing the still latent action trajectory shape, is disappearing. Within which you factually solely observe how the latent (blue) gap is closing.

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Perceiving the *tau*-value approaching to zero can be observed in two autonomous ways. The first way involves filling in the perceptual representation of the entire latent action trajectory shape with the manifest positions P of the (bottom of the) glass. In animations, this should be depicted as the green line taking over or filling in the blue line. The other way involves a much more fundamental way of perceiving the *tau*-value. In contrast to the first way, this is solely based on the disappearance of the latent positions P from the perceptual representation of the entire latent action trajectory shape. Which means that you solely observe with what speed the blue line disappears.