The complete *tau*-coupling theory - *How movement is actually guided* - The misconceptions and omissions within Lee's *tau*-coupling theory

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

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"*If there is a single take-home message from this article it must be that guiding movement purposively is the origin of being. All living creatures from the largest mammal to the tiniest microbe need to do this to live. Therefore to understand what it is to be alive we must understand how movement is guided. We need to grasp this at different levels - anatomical, physiological, neural, molecular, genetic - but first and foremost we need to understand it at the behavioural level. Only then can we ask informed biological questions at lower levels, and so avoid not seeing the wood for the trees.*"[1]

At first D.N. Lee's *tau*-coupling theory was welcomed with lots of enthusiasm. Within the phenomenon of the *tau*-value he inter alia elucidated that long jump athletes within their approach to the take-off board, bees towards a flower and gannets towards the surface of the sea (visually) bridge a *gap*. He defined this gap as: "The changing gap between the place you are in now and the place where you want to be in." In which can be observed that the place where you want to be in is the place where the *tau*-value became zero and according to Lee this needs to lead to a coupling of a (motorical) jump/push-off in relationship to the long jump athlete when he approaches the take-off board, a (motorical) landing in relationship to the bee and to an exactly in time (motorically) aligned tucking in of the wings of a Jan-van-Gent due to which it can penetrate far into the sea.

"3.1 Action-gap
An action-gap is defined, in general, to be the changing gap between two measurable states. For example, the changing gap between the measurable state an animal is currently in and the goal state that it wants to be in is an action-gap."[2]

However the preliminary exhilaration within the scientific community was considerably tempered due to the fact that, within the gap, the exactly right observed and clearly to be experienced *tau*-value wasn't explained with the correct set of perception processes and was linked to numerous other *tau*-values which in comparison were not clear at all and couldn't be acknowledged c.q. recognized within one's own empirical experiences. So even though the phenomenon of the gap became quite clear the explanation of the involved perception processes remained rather hazy and of course that could never lead to the functional coupling of any *tau*. Lee's *tau*-coupling theory just remained promising and definitely couldn't redeem its initial claim.

In spite of the fact that Lee expressed very interesting thoughts he never acquired the understanding of the substantive origin of the *tau*-values[3].
"*The second point concerns the connection between the hand and the object. When watching a fielder catching a ball one can get the impression that the ball is physically connected to the hand, even before the catch is made. It is as if hand and ball are connected by invisible elastic that draws them together. There is, in fact, a physical connection between the hand and the ball before contact is made. It is not, of course, a material connection like a piece of elastic. Rather it is an informational connection[4], more like that between an operator and a radio-controlled model plane."*[5]
Probably the ruling and never ever doubted idea that just one focus of attention is possible c.q. that only one focus of attention is necessary within one motoric movement action caused that Lee was never capable to discover two *tau*-values in relationship to the fielder. He was never able to link a ball

[1] David N. Lee; *How movement is guided*; p. 36.
[2] David N. Lee; *How movement is guided;* p. 5/6.
[3] If Lee could have linked the actual position of the long jump athlete to the manifest and latent places P of the athlete, which the athlete will always have to peruse, in relationship to the approach-run towards the take-off board then he would have seen that also in here a marble within a marble run marks the exact division between the manifest and the latent part within the approach. This would immediately have dismantled the complete perception-action dichotomy and it was also more than likely that he then would be capable to link the explanation of the cortical streams to this phenomenon.
[4] Also discover this *informational connection* c.q. this *informational relationship* within the description of the marble run;
https://www.researchgate.net/publication/336880958_The_explanatory_model_of_all_motoric_movement_actions_-_The_Marble_Run
[5] David N. Lee; *Tau in Action in Development*; p. 4.

to an incoming ball trajectory shape within one focus and to link a second focus to the movement of the fielder's catching glove within the line segment shape of his catch technique. The *informational connection* that Lee mentions is actually vested within the relationship of respectively the ball and the glove to their autonomous manifest and latent positions P. The separate ball and the separate glove will then enable you to construct two perceptual images of latent action trajectory shapes and then the latent intersection point of those two line segment shapes encompass the aforementioned *invisible elastic.* The invisible connection which actually will take care that at a certain moment the ball and the glove will at least touch each other. Or to phrase it differently that will cause a collision between the mouse and the cat which is extensively expressed within the motoric movement action *cat and mouse game*.

Conversely to Lee's *tau*-coupling theory the explanatory model of the motoric movement action now elucidates the complete functional *tau*-coupling and clarifies all misconceptions and omissions within Lee's theory with the help of the motoric movement action *cat and mouse game*. In the first place the explanatory model clarifies that within every imaginable motoric movement action the leading *tau*-value is always *afforded* (!) due to an implicit *catch action* (!) of an environmental object. Usually we observe lots of environmental objects as standing still (the coffee cup at the table, the take-off board within the long jump, the leaf for the bee) in which a *zero*-movement and a related *tau*-value of zero can be perceived but within the motoric movement action *cat and mouse game* in which specifically ball sports are assessed always a moving ball within an incoming ball trajectory shape is involved. It is a fact that all consecutive places P of a ball always need to be connected and accordingly the explanatory model clarifies that within our perception processes the latent part of a ball trajectory shape will have to sprout from the manifest part. So the actual position of the ball determines the actual action but in regard to the manifest places P it also casts its shadow forward and it is just a mere fact that the manifest positions reveal the future latent positions of a ball[6]. The aforementioned provides the fact that the actual place of a ball marks the exact division between the manifest and the latent incoming ball trajectory shape and if one determined a specific contact point $P_{(contact)}$ where one wants to hit/touch the ball then you are now capable to understand that the *tau*-value of the latent part of the incoming ball trajectory shape needs to approach zero when the environmental object actually arrived at the contact point.

The leading *tau*-value within the catch action of the environmental object can be understood relative easy and also the following c.q. dependent *tau*-value, which vice versa encompasses a throw action from the animal towards the environment, is not that difficult as well. Just like the ball within an incoming ball trajectory shape develops a *tau*-value, conform a marble within a marble run, so the catching glove of a fielder or the tennis racket head of a tennis player also fills an action trajectory shape. Within our perception processes also all the consecutive places P of a catching glove need to sprout from each other and so also in there the explanatory model shows that the latent part of a catch glove-action trajectory shape c.q. a *catch*-technique line segment shape will always have to sprout from the manifest part. So also in here the actual position of the glove determines the actual action but in regard to the manifest places P it also casts its shadow forward. The aforementioned provides the fact that the actual place of the glove marks the exact division between the manifest and the latent part of the present catch technique and if one determined a specific contact point $P_{(contact)}$ where one wants to touch/catch the ball then you are now capable to understand that the *tau*-value of the latent part of the *catch*-technique line segment shape also needs to approach zero when the glove actually arrived at that contact point.

So conversely to Lee the explanatory model now exactly shows all aspects of the two, single and sole, *tau*-values which belong to the functional *tau*-coupling. In relationship to Lee's *tau*-coupling and in relationship to current scientific mindsets the biggest misconception encompasses the fact that a

[6] In regard to this phenomenon the explanatory model of all motoric movement actions uses the term *precise global*. A manifest ball trajectory shape will not exactly reveal all future latent places P but conversely it will indicate *precisely* within which *global* fluctuation borders the latent part will develop. The explanatory model advocates that without such a *precise global* image not one action can ever be executed because without any starting point the situation would remain to be too open c.q. would remain too global. So it doesn't matter if the perceptual image of a latent ball trajectory shape remains at a very global level. As long as a perceptual image is there the perception processes will refine this perceptual image later on within a compelling optimization process.

motoric action mustn't be assessed as one and undivided but that it compels two completely autonomous phenomena which *prior to* (!) the actual execution of an action must lead to two (autonomous) perceptual images of latent action trajectory shapes and that *a* (!), also previous, determined (perceptual image of a latent) intersection point of those two action trajectory shapes is just capable of helping the *tau*-values to approach zero during the actual execution of the motoric movement action.

But the explanation of all required functional motoric and perception processes doesn't stop here. In contrast to the aforementioned relative simple explications of the two involved *tau*-values a much more complex obligatory part needs to be clarified. It is much more difficult to grasp because it is situated much further from current mindsets and you cannot easily check it within your own empirical experiences.
We are definitely capable to construct the *tau*-value of our own, dependent c.q. following, throw action ourselves but it can only be produced due to two autonomous complex subsystems both with their own set of exclusive perception processes. Exactly within this part Lee's remark in relationship to the model plane becomes evident. The (movement of the) model plane (over an action trajectory shape) is indeed controlled *somewhere else* (!) by the operator. Lee's big misconception however compels the fact that only the glove of the fielder is the model plane that we actually are able to control and definitely not the ball within an incoming ball trajectory shape. We will never be able to sec influence matter within the environment c.q. we will never be able to influence environmental objects and as a consequence we just will have to passively endure the *tau*-value of the environmental object. Conversely we indeed are capable of influencing a catching glove, a tennis racket head, a tip of a pen etc. ourselves. However the perception of the movement of those environmental objects within a perceptual image of a latent action trajectory shape is separated from the perception of the *execution* (!) of that actual movement (of those environmental objects within a perceptual image of a latent action trajectory shape). So with movements on *the inside of our body* (!) we control movement on *the outside of our body* (!) and those matters need an autonomous set of perception processes because they belong to two irreconcilable worlds. Or with other words we are only capable to actualize the primary movement of the catching glove within an action trajectory shape on the outside of our body with completely different movements on the inside of our body. So within the grasping of a coffee cup, in which a throw action of the relevant fingertips is involved, we need to (visually/proprioceptively) observe the position of the fingertips within an action trajectory shape on the outside of our body and *simultaneously* (!) we need to (proprioceptively) observe the grasping technique within our body. The explanatory model shows that the observation of the movements of the fingertips within an action trajectory shape needs to be executed simultaneously with the observations of the *execution* (!) of that movement but that they both remain completely autonomous perception processes. Exactly conform the *operator* needs to (visually) observe the movements of the plane and simultaneously needs to (proprioceptively) perceive the actions he needs to execute at the *radio control panel*[7].
By now an attentive and well-educated scholar would already have drawn the conclusion that with the aforementioned the explanatory model exactly describes the two already discovered phenomena in relationship to the proprioceptive perception processes. Scientific research already established that there is a distinct difference between the proprioceptive perception processes towards *movement* and the proprioceptive perception processes towards *limb position* (Jeannerod, Gandevia, Proske e.a.) and that is exactly what the explanatory model distinguishes within the aforementioned autonomous foci. The proprioceptive perception processes in relationship to *movement* is pointed at the observation of movement within an action trajectory shape outside of our body and the proprioceptive perception processes in relationship to *limb position* is pointed at the observation of movements c.q. technique on the inside of our body.

[7] Realise that the same can be applied to car driving and riding a bike in which the action trajectory shape of the car and the bike are visually observed while at the same moment the contact of the relevant pedals are experienced proprioceptively. But also within the movement of a cursor at a pc-screen.

If we finally evaluate Lee's original work: *How movement is guided*, and compare it to the explanatory model of the motoric movement action then one is able to conclude that just a minor aspect[8] was appointed correctly but that it hosts lots of major misconceptions and omissions. So many more that one can honestly conclude that the title was far too pretentious for what it actually delivered. With a complete universal clarification the explanatory model reveals all functional motoric and perception processes within every imaginable motoric movement action and provides the clear understanding that only the explanatory model is authorized of using this title. Within the motoric movement action *cat and mouse game* you will find the final description of all motoric and perception processes within every imaginable motoric movement action and due to this final work you are now able to obtain *how all movement is guided* c.q. *how all movement arises*.

[8] In retrospective one is able to conclude that Lee only was right in relationship to the empirically to be perceived phenomenon of the *gap* and the *tau*-value within there which needs to approach zero. But the description of the involved perception processes within there were already not correct. It is not a linear phenomenon like Lee shows it but a much more complex phenomenon in which a manifest line segment shape fills a latent action trajectory shape.

The motoric movement action *cat and mouse game*

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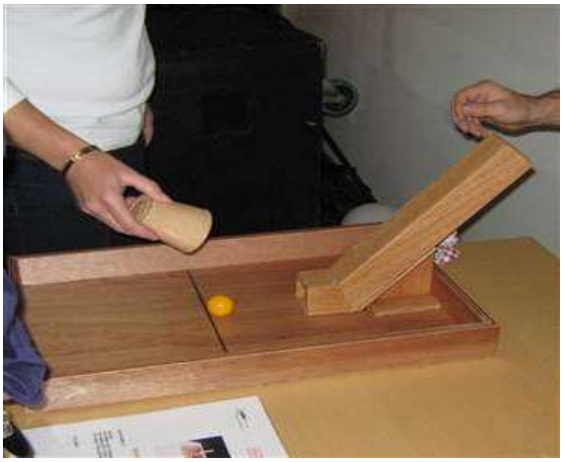
The complete description of all perception processes within elite tennis and cricket players in relationship to their adaptorial behaviour towards time pressured game situations



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Within the motoric movement action *cat and mouse game* the mouse represents each and every sub- or object within the environment which the animal will have to catch every consecutive time frame and conversely the cat indeed represents the movement of the animal towards the environment that accordingly can be characterized as a throwing action. Hence the clarification of the action shows that the mouse or the movements of the mouse will always remain a part of the environment and therefor can only and always need to be perceived out of the perspective of the mouse. Therefor a ball in for example tennis and cricket must always be considered as an autonomous environmental object each and every time frame. If an egocentric formulated will links this environmental object to a certain task and if we want to influence it accordingly then we are only capable to actually influence it during one touching-phase c.q. during one touching-moment. In which we are only capable to actually link the two completely autonomous tasks of the aforementioned catching and throwing of the autonomous environmental object.
Precisely the motoric movement action *cat and mouse game* illustrates convincingly that the catching as well as the throwing both encompass optimization processes in which the throwing needs to be optimized out of the catching. In which it also shows clearly that we will never be able to hit a ball to any target within the environment but that we are *solely* (!) capable of creating an initial phase of an outgoing ball trajectory shape[9]. Beyond that encounter the ball will again be a complete autonomous part within the environment. Ergo will not be a part of the animal. This provides the revolutionary consequence that scientists and sport coaches have to develop the belief that even a perfect hit ball is able to land outside the court or is able to go a completely different way than planned and that a complete mishit is able to win a match for you. So although we are able to influence it the explanatory model shows that the game solely is executed by the ball c.q. the environmental object and the animal is *only* (!) capable of playing that fully autonomous game.
Also within the motoric movement action *cat and mouse game* the movement of the mouse can best be compared with a marble within a marble run. Each moving environmental object will provide a perceptual image of a manifest action trajectory shape with the actual position of the object as the front position. In which the latter each time frame provides the actual moment of action within any motoric movement action. But besides this aspect the explanatory model introduces the novum that simultaneously we will always create a perceptual image of a latent action trajectory shape out of that manifest line segment shape. With the latter the explanatory model finalizes all theories considering the perception-action coupling and shows how also within the motoric movement action *cat and mouse game* the mouse reveals the latent part of the perceptual image of the action trajectory shape out of the manifest part of that shape. Which forms the basis for the explanation that due to the filling of a latent

[9] This looks like a word game but in fact is the exact wording of what actual functional perception processes need to occur and shows the basis of all basal misconceptions within science and the world of practical coaching within lots of sports.

line segment shape by a manifest action trajectory a leading *tau*-value can be acquired which always will become zero.
Besides the autonomy of the mouse the motoric movement action *cat and mouse game* elucidates that the movement of the cat must be perceived out of the perspective of the cat but that we aren't capable of motorically executing that movement along an action trajectory shape directly. Within the functional *tau*-coupling we will have to align the leading *tau*-value of the mouse with the movement of for example a tennis racket head or the hitting surface of a cricket bat. They also produce a *tau*-value within their own autonomous movement by filling an exact same perceptual image like the mouse fills its autonomous action trajectory shape. The only difference is that we are capable to fully perceive the movement of the mouse visually and the movement of the cat proprioceptively. The explanatory model provides the novum that even our own movements can't be executed directly and can only be achieved with the help of two foci. We are only capable to motorically influence the actual position of the tennis racket head or the hitting surface of a cricket bat within a catch/hit-movement, like a marble within a marble run, within a secondary autonomous focus. With which the explanatory model indicates that the final explanation is many times more complex than science ever assumed. So within the underlying batting sports we will have to visually perceive a *tau*-value of the ball within a catching action and will have to align this with the proprioceptive perception processes which are *simultaneously* (!) occupied with the determination of a *tau*-value of the movement of the tennis racket head or the hitting surface of a cricket bat as part of a throwing action. So this leads to the conclusion that within every motoric action always two marbles within two autonomous marble runs need to be perceived simultaneously and that the hitting movement of the tennis racket head within for example tennis as part of one of those marble runs can only be executed indirectly.
But although the explanatory model is absolute and crystal clear in regard to all motoric and perception processes involved the complexity of it all will form a too high hurdle even for renowned scientists. Therefor a scientific breakthrough will not be expected due to the present explanation. Scholars which conversely do want to discover the truth within this quest are able to get assistance from scientific research in relationship to the proprioceptive perception. The latter already discovered that during motoric actions two different kinds of proprioceptive perception processes can be distinguished. Namely the proprioceptive perception processes towards *movement* and towards *limb position*. Those two types can be noticed quite clearly within the aforementioned complexity of the explanatory model. Due to which it is capable to form the first and at the same time final functional clarification in which science wasn't able to even provide any part of any functional explanation.

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The complete description of all perception processes within elite tennis and cricket players in relationship to their adaptorial behaviour towards time pressured game situations

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Introduction

The present article hosts multiple objectives. At a microlevel it wants to reveal all functional c.q. all behavioural motoric and perception processes within the specific motoric movement action *cat and mouse game.* The explanatory model namely encompasses every imaginable motoric movement action and so the motoric movement action *cat and mouse game* can also be appointed in all its finesses and can be positioned exactly within the whole spectrum of all actions. In which the explanatory model shows that every imaginable action always beholds a compellingly linked catch and throwing task. Or more towards the quintessence of this article the motoric movement action *cat and mouse game* can precisely be positioned within the whole spectrum of linked catch and throwing tasks within ball sports.
The problem however encompasses that the final clarification within the explanatory model is situated at quite a remote distance of current scientific mindsets. Multiple significant mind steps are demanded which in a compelling way need to be regarded in their complex relations with each other before the final insight which the explanatory model provides us can be obtained. All readers at all levels will have to take this hurdle and although the specialists within this field of science already possess much knowledge about certain single components it is expected that especially they will have great trouble to obtain the quintessence of the explanatory model because they persevere c.q. are taken hostage within some dogmas/premises which pertinent will appear to be false. This perseverance on the one hand and on the other hand the aforementioned demand for multiple mind steps within a complex dynamics system almost shapes an impossible barrier to overcome and needs to be bridged in a very structural and meticulous manner.
If the choice was made to immediately start with the substantive treatise of the specific motoric movement action *cat and mouse game* right after the introduction than there was a substantial chance that you would get lost right after a few remarks and therefor the choice was made to approach this article in a more profound way. With the underlying ratio that by understanding bits and pieces of the presented chapters that hopefully will have the effect that you are capable of constructing the whole puzzle or at least that you will be capable of grasping parts of the explanatory model at short notice. Accordingly chapter 1 only discusses the whole spectrum of all motoric movement actions in the most broad sense and shows that every imaginable motoric action encompasses a combined c.q. a compellingly linked catch and throw task. Consecutively within chapter 2 slightly more specific the whole spectrum of linked catch and throw actions within ball sports will be discussed. The narrowing down process ends within chapter 3 which will finally provide all the specific motoric and perception processes which are demanded within the catch and throw action of the ball sport that can be described as the motoric movement action *cat and mouse game.*

The purpose of chapter 1 on the one hand is to provide insight into the fact that our visual organ is an intrinsic active organ that in every vista/environment primarily is occupied to compare all places P with each other to sec reveal c.q. to sec discover *movement* (!). Due to which the conclusion is justified that within every vista we are continuously occupied with an ongoing latent catch action. With this finding the explanatory model discloses a very strong ecological argument by showing that we continuously need to record the whole environment because from the beginning of times we don't know *when* (!) something will be bound to threaten us. The fact that this catching often has the goal to avoid, to *not*-catch or to flee from it doesn't alter that mere conclusion and shows that this detection system must be standby every time frame.
Cognitive interpretation of one (visual) image c.q. one time frame, that constitutes the main subject within current scientific research, can only be ranked much farther within the evolution. Ergo will not ever be able to clarify the very first selection processes in which, conform Darwin, the fittest organisms could survive. The explanatory model certainly doesn't deny the influence of those

posterior cognitive developments but shows that ecologically they must be ranked second or further[10]. On logical grounds it can't be otherwise than that the perception in relationship to our visual organ authentically aimed at comparing the environment with the only goal to just reveal mere movement[11]. However the explanatory model gives both cognitive developments their final destination and shows where they come together within the motoric movement actions presented within this article. It shows that the term line segment shape as part of an action trajectory (line segment) shape, incoming ball trajectory (line segment) shape, outgoing ball trajectory (line segment) shape etc. contains two essential different components. The (one-dimensional) observation of a line which solely encompasses the comparing of all positions P of an environmental object provides the basal factor of sec the *movement* (!) involved. It clarifies that we don't need to know what is coming towards our position but that *something* (!) is coming towards us[12] which will cause an intersection point with our position or with our movement. This autonomous basal phenomenon explains for example why toddlers are very well capable of hitting incoming tennis balls with a tennis racket[13] without knowing anything about the game of tennis. So even though the observations at that basal level, stemming from the earliest developments, are very primitive and one-dimensional it provides the possibility that a *tau*-value can be perceived c.q. that a *tau*-value can be perceived approaching zero. Later cognitive developments of being capable of positioning the shape of the line or what exact object is moving towards us provides the *further* (!) possibility to determine the related *tau*-value c.q. to determine the related *tau*-value more *accurately* (!). With which the explanatory model shows that it saves a lot of energy if the wildebeest sees that a zebra is coming towards his position instead of a lion or that the lion prefers that little springbok that is also in your neighborhood or that the zebra for whatever natural reason is actually pissed at you. Most of the time even the first impulse of fleeing or maybe even an attack can be ceased when that kind of information comes available and this also clarifies precisely why toddlers are capable to *touch* (!) tennis balls but on average are ten years away from comprehending the shapes of all incoming and outgoing tennis ball trajectories with all their specific intersection points which they also have to be able to execute with an optimal shape of a *hitting*[14]-technique.

So on basis of an intrinsically active visual organ the conclusion can also be drawn that within any environment we will never perceive any environmental object to be motionless[15] because each time frame, again and again, that organ actually creates a *new* (!) image of the same surroundings. In which our perception processes often determine that many pixels within that image will indeed *not* (!) show a change in position. We observe this as standing still or a standstill of an environmental object but our visual perception processes experience this as a *zero*-movement within a *zero*-line segment shape[16].

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[10] In which you are able to notice that the explanatory model hardly contradicts or disputes already discovered phenomena within the movement sciences but again and again completes and finalizes existing views.

[11] Within the triad of 1. hearing, 2. peripheral vision and 3. direct vision one is able to uncover a wide range *detection* (!) system. A system that regardless of being able to cognitively recognize what is moving only is concerned that *something* (!) is moving. Within your own empirical experiences you are able to discover that all the components of this triad can be observed within sliding scales which enable us to check a major part of the environment in relationship to movement in maybe the most parsimonious manner.

[12] Which also can be remarked in relationship to sound due to which the explanatory model is able to elucidate the complete ecological plan in relationship to movement. First and foremost we want to perceive movement directed towards us in the broadest way. So in order to fulfil that task we are able to change from 1. hearing to 2. peripheral vision to 3. direct vision which enables us to more and more obtain precise information about the shape of the movement. And again this has the sole goal to determine that something is moving towards us and stands completely apart from the process of knowing what is moving towards us.

[13] The explanatory model shows with the motoric movement action *catching*/*not-catching*/*avoiding*/*fleeing* that our evolutionary development is grounded within the fact that soon in our lives we need to be capable of at least push/hit/avoid environmental objects if they are not welcome.

[14] The general public regards tennis as a hitting sport. The explanatory model conversely shows that the game of tennis encompasses a compellingly linked catch and throw task in which most often the catching task is much more difficult.

[15] Also see: **How do we visually perceive the standstill of a coffee cup?** Zero-movement within zero-movement line segment shapes – N.J. Mol - The_visual_perception_organ_is_ecologically_a_comparing_organ

[16] The cyclist observes a static bike. The pedestrian observes an obvious moving bicycle.

Besides this revolutionary new insight the explanatory model demonstrates within chapter 1 that all motoric actions which conversely to the aforementioned actions are executed from the animal towards the environment must be considered as throwing actions. Although the many novae are hard to grasp it is more easy to understand that not only the (let go) throwing of a basketball encompasses a throwing task but also the (hold on) throwing of a tip of the pen within a letter, word or word part within the motoric movement action *writing* or the (hold on) throwing of the fingertips within an action trajectory shape towards a coffee cup within the motoric movement action *grasping.* However within those tasks it is most difficult to comprehend that we are not able to directly execute the movement of the movement action object (MA) within an action trajectory shape motorically. This is due to the fact that every motoric action from the animal towards the environment which we execute ourselves encompasses two complex subsystems in which the *movement* (!) of the movement action object (MA) within an action trajectory shape must be observed within one of those complex subsystems and the *execution* (!) of that movement[17] is part of the other complex subsystem. With other words the quintessence of those facts brings forward that we also visually perceive movement of the outside of our own body parts as a part of the environment c.q. our visual organ absolutely doesn't see that it is our hand that is moving. Although the main difference with the real environment beholds the fact that we are capable of proprioceptively perceiving that our body parts are ours it doesn't alter the mere and weird conclusion that the eyes as *just a dumb recording organ* (!) are totally separated from the fingertips.

[17] This encompasses the novel distinction between the perception processes involved with the movement (of the movement action object) versus the perception processes involved with the execution of the movement (of the movement action object).

Chapter 1

The motoric movement action *cat and mouse game*[18] within the whole spectrum of motoric movement actions

1. Every imaginable motoric movement action encompasses a linked catch and throw action
2. Catch actions
   a. Catch actions within the animal-environment relationship in which the environment doesn't encompass a part of our own body
   b. Catch actions within the animal-environment relationship in which the environment does encompass a part of our own body
3. Throw actions

The explanatory model provides the final clarification of all motoric and perception processes within any imaginable motoric movement action at the functional c.q. the behavioural level. The problem however encompasses the fact that the final clarification is situated at quite a remote distance of the current leading scientific mindsets. If one wants to obtain the final insights within the explanatory model multiple significant mind steps are demanded which in a compelling way need to be regarded in their complex relationships with each other. This demands a meticulous approach. So although only the clarification of the motoric movement action *cat and mouse game* beholds the central essence of this article the ultimate goal remains to implement the complete explanatory model within science. With that idea in mind there will be created many mutual relationships within this article. Clarification of the whole spectrum at a macro level hopefully has the effect that the explanation of the motoric movement action *cat and mouse game* at micro level obtains a broader context and mutually reinforce each other.
Chapter 1 approaches the motoric movement action *cat and mouse game* at the broadest level and demonstrates that really every imaginable motoric movement action hosts the same universal components. Although it is in great conflict with current mindsets the explanatory model shows that all motoric movement actions must be characterized as compellingly linked catch and throw actions. Consecutive to the underlying idea chapter 2 more specifically elaborates on linked catch and throw actions within ball sports which conversely are treated as such in general. It clearly demonstrates that those actions exactly comply to the universal motoric and perception processes as mentioned within chapter 1 and in the same coherent and conform way within the motoric movement action *cat and mouse game.* In that way chapter 2 forms a perfect liaison for chapter 3 in which finally the motoric movement action *cat and mouse game* as a whole is assessed at the micro level and in which it becomes crystal clear how one should approach this motoric movement action tactically. Which elite players within for example tennis and cricket already have found implicitly and which can be viewed within their adaptorial behaviour which is already underpinned due to an abundant supply of acquired data within the relevant scientific research.

1. Every imaginable motoric movement action encompasses a linked catch and throw action

The explanatory model demands many new and complicated mind steps. One of them encompasses the fact that science considers catching actions c.q. interceptive actions as very special and rare motoric movement actions. Conversely the explanatory model elucidates that within every vista/environment we are always latently catching all present environmental objects due to the

[18] https://www.youtube.com/watch?v=arsBG_QvPm8&t=8s

continuous intrinsic activity of the visual organ. When the visual organ is turned on c.q. when the eyes are open it namely creates a static still picture/image of the environment each consecutive time frame and subsequently visual perception processes will primarily compare all those static time frames. Which will always lead to a *relative* (!) conclusion that either an environmental object is moving or is not moving in relationship to our[19] perception processes but that the important finding within there remains that we visually perceive apparent standstill of an environmental object as active as we visually perceive movement of the same environmental object.
So the coffee cup, which within our feeling is standing still, is *continuously* (!) perceived by us at the exact same spot and uninterrupted *new* (!) visual time frames will be manufactured which in comparison will not expose differences in places P. We perceive this phenomenon as *zero*-movement within a *zero*-line segment shape and the corresponding *tau*-value within our perception processes remains to be zero[20]. Visual time frames of environmental objects which conversely do show movement in relationship to our perception processes are also produced continuously anew and those images indeed will reveal differences in places P when they are compared. The latter we perceive as actual movement within a line segment shape and if this becomes a part of a motoric action, which must be based on a egocentric formulated will, then a corresponding *tau*-value can be observed. Within a motoric action, in which the environmental object within our perception processes moves, we will have to observe this *tau*-value approaching zero and this is certainly the case within ball sports. So in short the explanatory model clarifies that we always are latently catching all pixels within a vista/environment and shows accordingly that the catching task within ball sport definitely doesn't encompasses a rare and exclusive task and wants to extra emphasize this phenomenon within this chapter.

Images: The flashing alarm clock stands still at the bedside table and the beach ball and the lion are lying still. Our perception processes namely experience that all consecutive places P of all time frames of all those environmental objects definitely don't show any difference in position. That they all actively move within the visual perception can best be observed within the *moving* (!) zeros of the alarm clock. There you will notice that your visual organ continuously produces brand new visual images of the same status quo because the first image of the zeros has absolutely nothing to do with the last picture showing zeros. The visual organ continuously needs to record the vista within time images because from the earliest times we don't know *when* (!) something is going to move c.q. is going to threaten us. A coffee cup probably will remain at its position but a beach ball sometimes leaves its static spot due to a coastal breeze. The lion already seems to fancy you and will definitely start to move at a sudden moment. Fortunately our eyes will then register this process within *time*-images and accordingly the visual perception then will definitely notice differences in places P.

So the next paragraphs and chapters will underline that from the environment in the direction of the animal always a *tau*-value within a catch action will occur which must be leading towards our own

[19] For the cyclist the bike doesn't show any movement but we perceive an obvious moving bike.
[20] So even though a *zero*-movement is involved conform the theory of relativity objects always move within a *time*-line (!).

throwing action because we will never be capable to influence any matter within any environment. The throw action, vice versa initiated from the animal in the direction of the environment, also provides a *tau*-value which we conversely are capable to influence. Due to the latter this needs to become the dependent *tau*-value which must be pointed at the aforementioned catch action.
The major new insight which the explanatory model provides in here is the revelation that the movement of environmental objects in a vista will always remain something belonging to the object and solely can and needs to be perceived out of the perspective of that object. That becomes clear and will generally be accepted if we want to change the direction of an incoming lion but within ball sports every coach and scientist fully presumes that for example within tennis we are capable of influencing the position of the tennis ball from the beginning to the end. Conversely the tennis ball needs to be regarded exactly like the incoming lion. It leads its own autonomous life with all its own autonomous positions P and just like the lion we are only capable to influence the autonomy of the tennis ball during one contact point c.q. one contact phase within one motoric movement action. Only then an opportunity will arise to link an incoming ball trajectory shape to an outgoing ball trajectory shape and only then we will be able to create an initial phase of an outgoing ball trajectory shape which will have to take care of the fact that the intended end of that ball trajectory shape will *automatically* (!) sprout from that first beginning.
Hence the explanatory model reduces all imaginable motoric movement actions and especially the motoric actions in ball sports to a minimal moment in which the environmental object actually will come in touch c.q. will provide an intersection point with the throwing action which is initiated by the animal. The appointing of this enormous puny/fragile moment shows on the one hand that it indeed needs to take care of the essence of the task formulated within the egocentric will but that on the other hand a motoric action mainly encompasses autonomous movements. So within for example tennis this comprises the incoming ball trajectory shape but also the tennis racket. The tennis racket will finally have to take care that this very important moment will occur and the explanatory model elucidates that we also will have to perceive all positions P of the tennis racket within a perceptual image of a latent hitting technique action trajectory shape out of the perspective of the tennis racket head. In which the actual position of the tennis racket head then also will mark the exact division between the manifest and latent part. Due to which we will also be able to observe a *tau*-value approaching zero within the action trajectory shape of the tennis racket head.
So in summary the explanatory model shows that the environmental object is an autonomous phenomenon within a catch action, within for example tennis needs to be perceived out of the perspective of the ball and always provides a leading *tau*-value. In addition it shows that our own throwing action also encompasses an autonomous motoric action, within for example tennis needs to be perceived out of the perspective of the sweetspot of the tennis racket head and always provides a dependent *tau*-value. Within the functional *tau*-coupling those two *tau*-values need to be aligned.
Hence the explanatory model shows that the final clarification of all motoric and perception processes at the functional level is many times more complex than science ever assumed but also shows that all motoric actions share many more commonalities c.q. show many more overlaps than science assumed and elucidates that they can be reduced to very simple to be perceived units.
In the continuation of this chapter the individual catch and throwing actions will be addressed more in depth.

2. Catch actions

a. Catch actions within the animal-environment relationship in which the environment doesn't encompass a part of our own body

Within this paragraph all catch actions will be assessed within the animal-environment relationship in which the environment doesn't behold a part of our own body. The explanatory model indicates that all motoric actions from the environment towards the animal initiate catch actions. In which the explanatory model shows crystal clear that even parts of our own body within some of our observations are considered as a part of the environment. Our eyes are situated at quite a distance from

those body parts and although they are miracles of nature they just remain to be a part of a *dumb*[21] (!) recording organ which every time frame only captures the present environment and that only facilitates that the visual perception within the comparison of those separate images will be able to signal movement. The difference of course is situated in the fact that we are able to feel c.q. perceive our own body parts c.q. the movement of our own body parts within an action trajectory shape in a complete proprioceptive way. This leads to the conclusion that we are definitely not able to see that our hand is ours which is already underpinned within scientific research[22]. On the basis of empirical experiences and proprioceptive perception processes we cognitively know that those two rather large tentacles on both sides of our body with each harbouring five smaller tentacles at the end which very often show up within our field of vision belong to us as our arms and fingers.

With *The Affordances Theory* J.J. Gibson presents lots of new angles in relationship to the visual perception. It inter alia shows that visual perception must be regarded as direct and besides the classical theories that motoric actions are solely driven from the animal towards the environment Gibson shows that conversely the environment offers the possibilities c.q. *affords the affordances* (!) to give birth to an egocentric formulated will as well. Within the animal-environment relationship Gibson shows that a second complete separate entity must be acknowledged within this complex relationship. Although Gibson's theory still experiences a lot of resonance within the scientific world and although current students obligatory need to study its finesses the theory remained insignificant[23] at the functional c.q. the behavioural level. However one will characterize Gibson's theory historically as a huge step forward in which again the explanatory model doesn't deny or renounce a lot but once more mainly adds and finalizes. Ergo the explanatory model is completely in sync with Gibson's ideas but now positions his thoughts in one complete model in which it mainly fills in the blanks c.q. the omissions.
Just like a lot of current scientific research Gibson assessed all present objects and subjects in every vista/environment mainly out of the cognitive knowledge with regard to the specific nature of those things. He came to the conclusion that the cognitive ability to appoint *what* (!) the object intrinsically meant to us encompassed the main argument underlying the *affordances*. With which he completely overlooked the fact that *possibilities* are also handed due to *the sole movement* (!) of all objects and subjects present within an environment. In which the explanatory model shows that we definitely do not have to possess any cognitive knowledge in regard to the recognition of an object or subject to be able to detect whether that matter is moving or not. Due to the fact that within our worldly dimensions all consecutive future, *latent*, positions P(+x) of an object will have to sprout from the past, *manifest*, positions P(-x) it can't be otherwise than that our visual perception processes within every imaginable vista will always experience and record all objects and subjects in line segment shapes. The explanatory model shows within there that our visual perception organ in the first place beholds a comparing organ which in regard to movement compares the positions P of all present matters each time frame[24]. On logical grounds and on the basis of empirical experiences one is able to derive from there that an animal always c.q. every time frame needs to be as actively aware of the relative to him moving objects or subjects as to the matters which he experiences as standing still. From the beginning of times we never knew *when* (!) something was going to threaten us and therefore a system had to be developed which as soon and direct as possible c.q. every ongoing time frame was able to notice when the lion finished his afternoon nap and in which direction he arose when he was about to obtain an

[21] Conform Gibson the explanatory model beholds the visual perception as direct with the underlying idea that the sole projections within the visual organ only function as a (dumb) serving hatch. The brain will add the brilliant stuff later on.
[22] **Is this my finger?** Proprioceptive illusions of body ownership and representation – M. Heroux et al.
[23] Even decades after Gibson scientists like Goodale/Milner/Proske/Gandevia/D.N. Lee/Gramann state that physiologically many things have been established but that they don't know nothing (!) how it all relates at the behavioural level.
[24] With this remark the explanatory model underpins the most ecological approach and shows crystal clear within there that our visual perception organ first of all must have been a comparing organ and *besides* (!) that, only second, that many evolutions later it has also developed to a cognitive recognition organ.

afternoon snack[25]. In which the explanatory model subsequently clarifies that all environmental objects within a vista must be observed in the same active way and that it definitely doesn't matter if within our perception processes objects are showing actual differences in places P or not showing differences in positions P. Which also can lead to no other conclusion that like aforementioned the within our perception processes moving environmental objects are imprisoned c.q. trapped within line segment shapes and that the within our perception processes static environmental objects are as actively observed within line segment shapes. The cup of coffee standing still in front of you will every time frame *anew* (!) be perceived by you at the exact same location or to phrase it different the image you saw three seconds ago is gone forever and will never return[26]. With this to the relativity theory linked observation the explanatory model shows that also every static c.q. still standing environmental object is shaping a line segment shape within our perception processes which conversely to actual moving environmental objects can be characterized as a *zero*-movement within a *zero*-line segment shape[27]. The explanatory model extensively clarifies within the motoric movement action *catching* that we are always latently catching in every vista c.q. that that in fact encompasses the primary implicit goal of our active visual perception organ and that this allotted fact will only become a motoric action[28] if we actually want to flee from c.q. *not*-catch[29] or actually want to catch[30] the environmental object moving in our direction. Only then an egocentric formulated will arises and only then an actual throwing process needs to occur from the animal towards the environment because only then a motoric movement action appears.

Images: With the explanatory model even the most classic questions can be answered of why we (are able to) see and why we (are able to) move. The answer is stunningly simple and has as opposed to what one would expect and what nowadays scientists are looking for nothing to do with any substantive purpose. Conform Gibson's *affordances* our worldly dimensions just allowed c.q. afforded the possibility and that's why it was unstoppable. Out of the factual reality that light and moving space just are present within our environments the factual conclusion arises that organisms develop along those possibilities. And the same can be applied to the factual reality that within our worldly dimensions every place P of every environmental object will be attached to each other c.q. needs to

[25] https://www.youtube.com/watch?v=Poo7Q-6GQj0. Of course it is nice to know that in this case a lion is approaching you. Still we much earlier knew and rather preferred to know that *something* (!) was heading towards us and especially in what line segment shape it was heading towards us than what exactly came towards us.

[26] Every time frame you construct a new image of a coffee cup and so you are able to suppose that you see a new cup each time frame.

[27] In which conform the relativity theory one can argue that every object or subject within a vista is always caught within a *time*-line segment shape just due to the simple passing of time.

[28] Even if we observe an environmental object moving towards our head and we just decide to let that happen then still the rudimentary action of closing the eyelids will occur to protect the eyeballs.

[29] Actual fleeing c.q. avoiding as a *not*-catch action actually happens a lot within our movements within our daily traffic and due to that will become a lot of the time the goal within our egocentric formulated will.

[30] Besides some pouring actions like tapping water or pouring drinks we actually don't catch a lot of things within daily life. Most of those experiences can be found within ball sports, juggling etc..

sprout from earlier manifest positions every executive time frame. Due to which every place P(0) of every pixel within a vista/environment factually always is linked to the places P(-1) and P(+1) and with which you are able to conclude that the actual position of an environmental object will always be positioned at the front of the manifest line segment shape but also will have a previous history in relationship to the manifest action trajectory shape c.q. will have to follow that manifest line segment shape[31]. With the next examples the explanatory model shows that our ecological carefully developed visual perception organ hardly is able to cope with the rather modern sensations we nowadays are able to experience in which the position P(0) suddenly is not linked anymore to the positions P(-1) and P(+1) and shows that our visual perception processes are trying their best to at least brew something. Image left – The flashing alarm clock which needs to be set again after a power failure shows unambiguously that the visual organ encompasses an intrinsic active organ and how we perceive *zero*-line segment shapes and *zero*-movements. Then the numbers, by coincidence also zeros, are there and then they are not there. The perception processes aren't able to discover any displacement although one is definitely able to determine that the observation of the first picture of the present zeros has nothing to do with the observation of the last image of those numbers. The *zero*-line segment shape of the zeros is obviously interrupted in time[32]. Image right – On the internet many visual illusions with dots can be found which seem to suggest that within our perception processes movement c.q. lines are constructed. The explanatory model of the motoric movement action shows convincingly within the functional clarification that the dots at a computer screen are solely visible at that position of the screen in an on and off sequence and that our perception processes within the *comparison* (!) of those isolated and exclusive *time*-frames want to connect them to line segment shapes. How this phenomenon within this process is able to evoke left and right turning circles is a question at the physiological level and the explanatory model provides no answers in there.

So within every vista we observe the whole environment within action trajectory shapes each consecutive time frame. In which we are able to identify that most environmental objects relatively to us provide the outcome that they are standing still c.q. are part of a *zero*-action trajectory shape in which the *tau*-value persistently[33] can be supposed to be zero and if environmental objects conversely do show a relative *displacement*-movement within our observations a corresponding *tau*-value can be determined. The motoric movement action *catching* and as such every motoric action encompasses an optimization process in which it is evident that the processing processes of the visual perception perform an all-embracing task. In here it goes too far right now to provide an exhaustive clarification of the compelling cooperation of the cortical streams in regard to the aforementioned optimization process. It is exhaustively explained within the specific assessment of the motoric movement action *catching*. However it is of major importance that one realises that the environment is imposing c.q. is handing c.q. is *affording* (!) this *tau*-value to us. In which the explanatory model clarifies that we mainly perceive this *tau*-value visually. The visual perception is by far superior because it allows us to reduce the observation of the relevant *tau*-value from the environment towards the animal to the most simple, one-dimensional, phenomenon. Within a perceptual image of a latent action trajectory shape that enables us to perceive the filling of sec the line within the shape in the most basal sense[34]. D.N. Lee has already appointed this filling process as the bridging of a *gap* which can be found within his long jump research in relationship to the approach towards the take-off board. How basal the disappearing of a gap can be perceived can very well be explained within for example the filling of a glass in which the actual liquid level will fill the *empty* (!) gap towards the rim of the glass.
There needs to be emphasized that we are able to catch many things, like the aforementioned lion, the coffee cup, the ball etc., in which maybe a change of direction of these environmental objects is intended. However it needs to be stressed within there that the movement of the environmental object will forever belong to that object and will never ever become a part of us. We just are capable of influencing an object within the environment with at the very most a touch and push movement during

[31] Or is *Caught In A Line*.
[32] Conform the relative time within the relativity theory.
[33] Of course until the moment that the perfectly static lion starts to move.
[34] The filling of the line within a *line* segment shape stands completely apart from the line filling a shape within a line segment *shape*.

just one contact moment c.q. one contact phase within one motoric movement action. And that is all. Accordingly the explanatory model shows within "Watch The Ball Trajectory!" that the game idea within ball sports only can and must be observed out of the perspective of the ball[35] and within tennis this leads to the fact that the game idea encompasses to lengthen a chain of ball trajectory shapes with one more legitimate outgoing ball trajectory shape and that out of the game dualism, due to an obvious present and active opponent, there must be added in there that the previous goal of lengthening the chain must be made as hard as possible for the opponent.

Images: If the leading *tau*-value within the motoric movement action *pouring*[36] can be observed with visual perception processes then it becomes crystal clear why this encompasses the most superior kind of perception. Then it not only allows us to experience the *tau*-value *at a distance* (!) but much more important it then allows us to reduce the perceiving of this value in the simplest way. Then we only need to behold how two horizontal lines, respectively the line of the liquid level and the line of the rim of the glass[37], relate to each other. The sole observation that the space present between those lines becomes smaller c.q. that the gap between those line approaches zero will have the consequence that the motoric movement (MM) will be slowed down c.q. will stop pouring c.q. will reverse the tilt of the bottle. On the basis of cognitive knowledge that is accumulated due to normal *plain* pouring one is also capable of pouring in pitch black darkness. By just putting a finger into the glass one is able to feel when the liquid level reaches the rim c.q. when the *tau*-value of the action trajectory shape approaches zero. Besides that one is also capable of filling glasses only on basis of the cognitive knowledge that a pouring action requires a certain time span. If one just accepts to drink out of half-full glasses and stops pouring ample time before one usually stops with the pouring action then one just needs to construct a very limited perceptual image of the *tau*-value. However in time the latter will definitely improve due to the fact that increasing experience will train our auditory perception processes more accurately.

Within the aforementioned animal-environment relationship one is now able to infer a third entity which finally will take care that Gibson's theory will be completed. Gibson and conform his idea the whole scientific family were never able to discover that affordances to initiate a motoric action not only flow from the nature of the environmental object itself but that the possibilities definitely also are compellingly afforded by the actual space/room *between* (!) the animal and the environment. The

[35] For laymen this leads to very confusing statements. The *game* (!) of tennis is only executed by the ball. Players are only capable of executing that autonomous game c.q. are only capable of *playing* (!) the game.
[36] Within these images a transparent glass is used due to which we are capable of perceiving a *tau*-value on the outside of the glass. Imagine however that we also are capable of observing the same *tau*-value on the inside of a non-transparent solid coffee mug. (Therefore you are very well capable of precisely filling glasses at a high shelf and not very well capable of filling mugs at that same shelf.) Although a different perspective is involved we experience the same rising of the liquid level but this example shows that we are capable of cognitively establishing the *tau*-value in multiple ways. We could only observe the rising of the manifest part and solely construct a perceptual image of the latent part or we do what we actually need to do when a coffee mug is involved and solely look at the filling of the latent part.
[37] Within which emphatically needs to be noted that the velocity of the rising of the *tau*-value explicitly belongs to the shape within which the action trajectory fills the latent part. The slower or the faster this process will unfold will have imminent consequences for the perceptual image that we will construct about the future time span in relationship to the stopping of the pouring.

explanatory model demonstrates with the scientific evidence[38] that we construct perceptual images of latent action trajectory shapes prior to a motoric action that our visual perception processes specifically are occupied with the examination if action space between the two other entities is available. The explanatory model shows that within that process we deliberately are looking for the *nothing* (!) c.q. actively are observing all *free* (!) places P between the animal and the environment because only that conclusion will take care for a undisturbed c.q. a successful course of the later still to be appointed throwing action from the animal towards the environment. In which the explanatory model additionally explains that science, even with the most exclusive eye-tracking-gear, was never able to signal anything concerning this phenomenon. In the nothing of the compellingly needed *free* action space nothing is there to be seen and so it remained invisible c.q. hidden even for eye-tracking-gear. On the other hand one could in retrospect say that the free action space has always been there in a very obvious way.

b. Catch actions within the animal-environment relationship in which the environment does encompass a part of our own body

Within this paragraph all catch actions will be assessed within the animal-environment relationship in which the environment does behold a part of our own body. The explanatory model indicates that all motoric actions from the environment towards the animal initiate catch actions. In which the explanatory model shows crystal clear that even parts of our own body within some of our observations are considered as a part of the environment. Our eyes are situated at quite a distance from those body parts and although they are miracles of nature they just remain to be a part of a *dumb*[39] (!) recording organ which every time frame only captures the present environment and that only facilitates that the visual perception within the comparison of those separate images will be able to signal movement. The difference of course is situated in the fact that we are able to feel c.q. perceive our own body parts c.q. the movement of our own body parts within an action trajectory shape in a complete proprioceptive way. This leads to the conclusion that we are definitely not able to see that our hand is ours which is already underpinned within scientific research[40]. On the basis of empirical experiences and proprioceptive perception processes we cognitively know that those two rather large tentacles on both sides of our body with each harbouring five smaller tentacles at the end which very often show up within our field of vision as our arms and fingers belong to us.
The animal-environment relationship is crystal clear within ball sports and within the grasping of a coffee cup. The ball and the cup are the objects which obviously belong to the environment and according the aforementioned they will always become part of an obvious latent catch action. If we want to influence the ball or the cup in any way we definitely need to develop a throwing action with our own body which first and foremost needs to take care that we at least will touch the ball or the cup. However we execute many motoric movement actions in which the animal-environment relationship is less clear and those are for example all those motoric actions in which our own body encompasses the destination in relationship to the egocentric formulated will. Just think about an itching sensation at the sole of your left foot or think about a nightly mosquito which uses your head as a landing platform but also think about the motoric movement action *eating* which we daily execute multiple times. The explanatory model also shows in here that the intended target also needs to be perceived as an environmental object c.q. becomes a part of a catch action and that a part of the body will not form an exception to this universal rule. In which the explanatory model illustrates the novum that we are capable of perceiving this (bodily) environment in a full proprioceptive way and in which the explanatory model additionally reveals the novum that due to proprioceptive perception we are also capable of shaping perceptual images of latent action trajectories[41].

[38] See: The scientific evidence in relationship to the constructing of perceptual images prior to the actual execution of a motoric movement action.
[39] Conform Gibson the explanatory model beholds the visual perception as direct with the underlying idea that the sole projections within the visual organ only function as a (dumb) serving hatch. Later on the brain will add the brilliant stuff.
[40] Is this my finger? Proprioceptive illusions of body ownership and representation – M. Heroux et al.
[41] Within the proprioceptive perception nowadays two phenomena are acknowledged: 1. the *limb-position* and 2. the *movement* which are also supported and substantiated by the explanatory model. With the novum that solely

With which the explanatory model now fully makes transparent how and why we are capable of lifting a foot c.q. are capable of determining a *tau*-value of the displacement of the *environment* (!) and are able to synchronise it with the throw action of the hand[42], in which also a *tau*-value approaches zero, towards the moving foot in order to get rid of the itching sensation. Of course this also explains exactly how we are able to clap two hands behind our back. Out of the throw action of one hand the other hand now shapes the environment which needs to be caught. Within which one now is able to conclude that the hands, at least when they are equally active, both belong to the entity of the animal within the throwing process as well as they belong to the entity of the environment within the catching process.

3. Throw actions

The explanatory model illustrates that our visual perception organ encompasses an intrinsic active organ that each time frame mainly is occupied to compare the places P of the whole vista/environment. Which leads to the conclusion that we always will observe every environmental object within a vista within a line segment shape in which it is ecologically/evolutionary in our interest that each time frame we are capable of determining whether if something is approaching us and 1. will threaten us and we accordingly want to flee from it c.q. avoid it or 2. if we conversely seek an actual encounter in case that we do want to eat it or mate with it. The perception processes involved can only produce relative observations. For the cyclist the bike remains static but we experience an obvious moving bicycle within an action trajectory shape. This relativity leads to the conclusion within the explanatory model that we always perceive everything in the same active way with the outcome that we either experience an obvious displacement movement which we are able to connect to a certain *tau*-value approaching zero or we experience an obvious *zero*-movement which we are able to connect to a corresponding zero *tau*-value. So the static coffee cup standing (*still*?!) at that table is also actively perceived within an obvious *zero*-movement within a (time) line. With this clarification the explanatory model shows that we always and everywhere are executing a latent catch action and that we dependently will have to cope with it because we aren't able to influence it in any way[43].
Conversely to the aforementioned catch actions the explanatory model shows that all motoric actions from the animal towards the environment must be considered as throw actions c.q. that all motoric action we ourselves initiate must be qualified as throw actions. The whole spectrum of throw actions is extensively assessed within the motoric movement action *throwing*. It discerns three kinds of throwing actions: 1. (*hold on*-) throwing actions with the whole body[44], 2. (*hold on*-) throwing actions with a part of the body or a flexible motoric movement object (cutlery, pen, tennis racket) and (*let go*-) throwing actions[45]. In spite of the seemingly big differences the explanatory model conversely provides one universal description within all throw actions in which it much more emphasizes the commonalities than the occurring differences. Due to which it is implicitly capable to elucidate the whole spectrum and that has the consequence that all aforementioned throwing actions can be classified on basis of their complexity[46].
With the appointing of the whole spectrum the explanatory model of all motoric movement actions provides the revolutionary insight that every throw action must be approached as an optimization

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proprioceptive perception processes are also capable to construct perceptual images of latent action trajectory shapes a third very important and never acknowledged phenomenon is added.

[42] Also think for example to all folkloristic dances in which dancers throw their hands to for example their boots, legs or other body parts.

[43] Even if you yourself initiate an outgoing ball trajectory shape within juggling you are only capable of influencing the initial phase. After that phase the ball returns to its own autonomous life. We will never be able to get a grip at the deviation process of a juggling ball within its action trajectory shape.

[44] This encompasses for example walking, swimming, car driving, sailing, biking etc. etc. which is summarized within the collective term motoric movement action *moving A-B*.

[45] (*Let go*-) throwing actions which we consider as real throwing actions and in which the movement action object is actually released upon a primary initial phase.

[46] It for example shows that all throwing actions as opposed to all catch actions can fully be perceived in a proprioceptive way and for that matter they all can be executed in pitch black darkness.

process. In short it comes down to the fact in there that we even aren't capable of directly constructing the line segment shape which we ourselves intend with our own initiated throw action[47].

[47] If you finally will understand the complete quintessence of the explanatory model you will be able to understand that we indeed are able to construct the strangest kinds of throwing action trajectory shapes because they indeed belong to two autonomous complex subsystems.

Chapter 2

The motoric movement action *cat and mouse game*[48] within the whole spectrum of ball sports in which an incoming ball trajectory shape is involved

1. Introduction
2. The movement of the ball c.q. the mouse versus the movement of the racket, hitting bat c.q. the cat
3. The *tau*-value of the ball c.q. the mouse versus the *tau*-value of the racket, hitting bat c.q. the cat
4. The contact point c.q. the contact moment c.q. the contact phase between the mouse and the cat
5. The egocentric formulated will within the ball sport tennis
6. The misconceptions c.q. omissions within the egocentric formulated will
7. Flow in relationship to the egocentric formulated will

The explanatory model provides the final clarification of all motoric and perception processes within any imaginable motoric movement action at the functional c.q. the behavioural level. The problem however encompasses the fact that the final clarification is situated at quite a remote distance of the current leading scientific mindsets. If one wants to obtain the final insights within the explanatory model multiple significant mind steps are demanded which in a compelling way need to be regarded in their complex relationships with each other. This demands a meticulous approach. So although only the clarification of the motoric movement action *cat and mouse game* beholds the central essence of this article the ultimate higher goal remains to implement the complete explanatory model within science. With that idea in mind there will be created many mutual relationships within this article. Clarification of the whole spectrum at a macro level has the effect that the explanation of the motoric movement action *cat and mouse game* at micro level obtains a wider context which hopefully will take care of a mutual reinforcing process.
Chapter 1 approaches the motoric movement action *cat and mouse game* at the broadest level and demonstrates that every imaginable motoric movement action hosts the same universal components. Although it is in great conflict with current mindsets the explanatory model shows that all motoric movement actions must be characterized as compellingly linked catch and throw actions. Consecutive to the underlying idea chapter 2 more specifically elaborates on linked catch and throw actions within ball sports which conversely are treated as such in general. It clearly demonstrates that those latter actions exactly comply to the universal motoric and perception processes as mentioned within chapter 1 and in the same coherent and conform way can be experienced within the motoric movement action *cat and mouse game.* In that way chapter 2 forms a perfect liaison for chapter 3 in which finally the complete motoric movement action *cat and mouse game* at micro level is assessed and in which it becomes crystal clear how one should approach this motoric movement action tactically. Which are the same tactical adaptations which elite players within for example tennis and cricket already have found implicitly. They can already be viewed within their adaptorial behaviour and they are underpinned by an abundant supply of acquired data within corresponding scientific research.

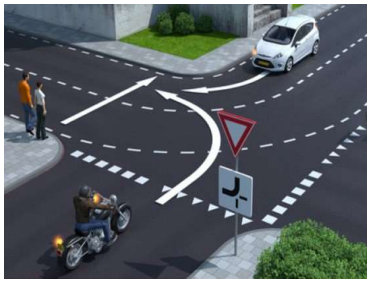
1. Introduction

Within chapter 1 the explanatory model clarifies that out of the environment towards the animal always a catch action occurs due to the intrinsic activity of the visual organ itself. The latter is primarily occupied with comparing all consecutive visual images in relationship to the perception processes towards the specific phenomenon of movement. Vice versa the explanatory model shows that out of the animal towards the environment always a throwing action will occur. Within there the

[48] https://www.youtube.com/watch?v=arsBG_QvPm8&t=8s

explanatory model demonstrates that within the catch action as well as the throw action a separate perception-action coupling[49] needs to be executed. Ergo within both those couplings two totally different marbles need to be observed within two totally different marble runs which both demand a totally different set of perception processes.
In the next paragraphs you will be able to read how Roger Federer needs to perceive the actual position of a tennis ball within a perceptual image of an incoming ball trajectory shape and needs to construct a perceptual image of an intersection point with the line segment shape within which the actual position of the tennis racket head is also filling a perceptual image within a hitting/catching movement. It needs to be remarked at this moment that both kinds of actions will always provide two separate perceptual images of manifest and latent action trajectory shapes which always will have to lead to a perceptual image of an intersection point of those two line segment shapes because within current ball sports[50] prior to the pushing action always a touch action[51] can be appointed c.q. will need to occur. It will have to occur because without touching nothing ever can be pushed. The explanatory model demonstrates that the filling process of latent perceptual images in which for example a tennis ball or a tennis racket head is involved can only be the work of the processing processes of the perception. On logical grounds the cortical streams must be responsible for the disappearing of the gap in which a manifest line segment shape is filling a latent action trajectory and shows unequivocally that they encompass optimization processes. With the construction of perceptual images organisms are very quickly capable of *precisely* predicting what *globally* needs to happen c.q. what will happen. With which the explanatory model provides the strongest ecological argument towards parsimony and implicitly indicates that the whole execution of a motoric action will remain open in such a way that till the last moment unforeseen deviations can be implemented[52].





Images: Within daily traffic we execute (*hold on*-)throwing actions with our own means of transportation. Within here the direction from the animal towards the environment becomes apparent. During that action we *simultaneously* (!) catch all other traffic participants which we conversely perceive from the direction of the environment towards the animal. The catching within daily traffic obviously has the intent that we actually do *not* (!) create any touching moment c.q. any touching phase with the other environmental objects which conversely is the intention when you enter a bumper car at a fair. This *not*-catching, that ecologically can be associated with fleeing c.q. avoiding, has much more in common with actual *hold on*-catching than current scientific mindsets assume. Most of the

[49] The explanatory model doesn't only terminate the perception-action dichotomy by showing that they both compellingly need to be coupled within an overarching phenomenon but makes it much worse c.q. much more complex by showing that Federer (but also each tennis playing toddler) needs to perceive two of those overarching phenomena and even needs to align them.
[50] Except for dodge ball in which you deliberately need to prevent that any action trajectory shape of the body creates a contact point with the incoming ball trajectory shape.
[51] Even if we want to blow away a balloon within an incoming balloon trajectory shape then one will need to construct a perceptual image of an intersection point with the line segment shape in relationship to our exhaled air. Then the air will have to be pointed at that specific intersection point of the two relevant line segment shapes. Also see: The motoric movement action *blowing* within *Caught In A Line*.
[52] Within here the explanatory model comes forward with the term *precise global*. A latent perceptual image of an action trajectory shape will provide substantial guidance to where it will lead. In which the explanatory model shows that without a perceptual image of a *precise global* action trajectory shape nothing even can be initiated. On the other hand it additionally demonstrates that a finishing optimization process will need to occur because the aforementioned perceptual image will remain to be a little bit too global.

perception processes are actually the same. Or to put it differently the perception processes which are needed within both catch actions of the other traffic participants are identical. The only difference encompasses the fact that within the throw action during daily traffic we don't want to construct an actual intersection point between our own action trajectory shape and the line segment shapes of the other environmental objects. In bumper cars we conversely do want to create actual intersection points. But although we indeed are able to appoint an apparent difference within the latter example it must be stressed in here that in spite of this seemingly big difference the motoric and perception processes encompass much more commonalities.

Within daily life we execute many (*hold on*) throwing actions and also *not*-catching c.q. avoiding occurs a lot. That happens a lot within for example daily road traffic[53]. Within the latter we determine all relevant *tau*-values of all other traffic participants, like marbles within their respective marble runs[54], and within there we plan our own latent action trajectory shape. Actual (*hold on*) catch actions of moving environmental objects or (*let go*) throwing actions don't happen often within our common daily life but conversely are executed a lot within ball sports[55]. In relationship to those sports the explanatory model appoints multiple new and complex mind steps which probably will cause you a lot of agony.

2. The movement of the ball c.q. the mouse versus the movement of the racket, hitting bat c.q. the cat within the whole spectrum of ball sports in which an incoming ball trajectory shape is involved

Within this paragraph the novum must be elucidated that a ball is and always remains an autonomous environmental object c.q. that only the ball shapes the game and due to these facts demands that our perception processes needs to observe the movement of the ball out of the perspective of the ball. This will already form a huge obstacle for most of the readers of this article and yet they still have to understand more. It is even much more complex. The ball not only needs to be perceived out of the perspective of the ball but within that perspective it is situated within an incoming and outgoing ball trajectory shape which is exactly divided by a touching moment c.q. a touching phase. That touching moment c.q. touching phase is the only moment where the animal and the environment make contact c.q. it is the only phase where the animal is capable of actually influencing the environmental object. Ergo the perception processes which exclusively need to be occupied with the autonomous movement of the mouse also need to be perceived in a differentiated c.q. much more sophisticated way. Completely apart from those perception processes one also needs to understand that the movement of the cat requires a complete other set of autonomous perception processes.

"Within ball sports the game is only shaped by the ball c.q. by all the positions of the ball which in an autonomous way will keep on moving within incoming ball trajectory shapes which compellingly need to be linked to outgoing ball trajectory shapes. We are just (!) capable of influencing that autonomous game if with the help of a throw action, vice versa from the animal towards the environment, we succeed in at least creating a contact moment c.q. a contact phase between the animal and the environment. Only if we succeed within this first quest we maybe are capable to push the autonomous ball into such a direction that we even are capable of having expectations about the outcome of the pushing action c.q. that we even are capable of having expectations about the end of that direction of the outgoing ball trajectory shape in relationship to the opponent."

So in here the major novum is revealed that we think that we play and particularly *control* (!) the whole game but that the explanatory model demonstrates that the game belongs to the environment and that it just can be executed[56] by the environment and preceding the conclusion of this all you will have to develop the understanding that for example within tennis the moving tennis ball encompasses an autonomous entity which will never become a part of us. We are only capable *of changing its*

[53] See: The motoric movement action *traffic*.
[54] See: The marble run.
[55] Also think about juggling.
[56] We are *just* (!) capable of playing the game.

direction (!) due to just a single contact point c.q. within just a brief contact phase with the help of a respective touch and push action. Only with the acceptance of this revelation you will be able to comprehend that this single contact phase moment marks the exact border between two totally different phenomena with two totally different sets of perception processes. Where laymen still appoint an action as one and undivided the explanatory model shows within a large part of the spectrum of all motoric movement actions, although they compellingly need to be linked, that they must be regarded as separate autonomous touch and push actions and that this must be applied within ball sports as well. The motoric movement action *touching* of a tennis ball exclusively encompasses all motoric and perception processes in relationship to the incoming ball trajectory shape *just prior to the moment* (!) of the very first haptic sensation of the collision between the tennis ball and the tennis racket head will occur.
Conversely the motoric movement action *pushing* exclusively encompasses all motoric and perception processes which need to occur *following* (!) the aforementioned first haptic sensation[57]. Opposite to current mindsets the explanatory model shows crystal clear that the touching and the pushing encompass detached separated phenomena[58]. Due to this insight it becomes apparent that they need to be optimized independent of each other and also that they only can be optimized independent of each other.
The touching of for example a tennis ball within a *catch*-movement will be maximally optimized by aligning the line segment shape of the tennis racket head as much as possible to the line segment shape of the incoming ball trajectory. Which most often encompasses a line segment shape that is completely opposite to the direction of the incoming tennis ball. In which additionally needs to be remarked that the optimal catching of an incoming ball trajectory shape benefits mostly when the tennis racket head will be kept as motionless as possible and in which the underlying principle beholds the fact to let the tennis ball come towards the tennis racket head and not the other way around[59]. It is easily for you to determine that the static holding of a tennis racket within groundstrokes in the era of power tennis will not lead to lots of successes[60] and besides that it is also easy to comprehend that often a different shape of an outgoing ball trajectory is required within the present game situation.
The pushing of the tennis ball within a *throw*-movement will be maximally optimized by aligning the line segment shape of the tennis racket head as much as possible to the line segment shape of the outgoing ball trajectory c.q. needs to take care that the outgoing ball trajectory will be supported as much as possible. Which most often encompasses a line segment shape of a throw movement of the tennis racket head that is completely opposite to the desired direction of the outgoing ball trajectory shape. In which as previously indicated we are able to notice within current power tennis that the push action aims at transferring as much kinetic energy as possible during the contact phase.
You are easily able to determine that this factual distinction is in great contrast with the current leading mindsets which behold a motoric action as one and undivided. The explanatory model conversely shows that in fact two autonomous parts are present although they compellingly need to be

[57] For laymen this is very hard to understand because the compelling coupling of those actions entail that before the touching the consecutive autonomous pushing will have to be considered tactically. For more detailed information read therefor the motoric movement action *grasping*. Within there it becomes crystal clear that the following push process of the relevant fingertips will have to be considered tactically before the actual touching process starts but that during the first actual *grasp*-action one only perceives the touching process.
[58] For example playing the piano is extensively assessed within the motoric movement action *grasping* in which also a compelling touch action prior to the push action becomes apparent. Within there it becomes crystal clear that the pushing has absolutely nothing to do with the earlier touching. The touching process only encompasses movement of the relevant fingertips through the nothing which lots of people are able to execute and only the quality of the pushing will decide whether you will become a concert pianist or not.
[59] Although this obviously can never be an option within groundstrokes executed around the baseline because players need to develop vigorous *push* actions within current power tennis this principle can and must be practised within tennis volleys.
[60] Professional tennis is familiar with *block* returns as a tactical answer to powerful flat first tennis services in which a static still tennis racket head returns the tennis ball deep into the opponents court. This strategy is based upon the philosophy that the tempo in the rally will be lost completely and the player universally hopes to still achieve a success percentage of a minor 15-25%. The exact same strategy can be noticed within the bunt within baseball. Then one knows that the batter has a major chance of at least *touching* (!) the ball but faces a huge chance to be taken out of the game. That is why the bunt is considered a sacrifice hit.

linked. Due to which it becomes very comprehensible that the *catch-throw* (!) technique is always a compromise of two autonomous optimization processes. Which also can be noticed within the term *catch-throw* technique itself. The aforementioned optimization processes show that the movements of the environmental object needs to be the leading phenomenon within a motoric action because it will satisfy the essence of the task in relationship to the egocentric formulated will but that it *only* (!) can be executed by a movement of the tennis racket, hitting bat etc. c.q. the cat. The latter also needs to move along a perceptual image of an action trajectory shape. So also the hitting is definitely an essential part which *simultaneously* (!) needs to be perceived but now it becomes crystal clear that it doesn't encompass the primary goal within our perception processes. Hopefully you will now start to see that the hitting within ball sports must be pulled down from its pedestal, its unrighteous supposed/claimed pedestal, and finally needs to end at the (secondary) position where it always should have been.

3. The *tau*-value of the ball c.q. the mouse versus the *tau*-value of the racket, hitting bat c.q. the cat within the whole spectrum of ball sports in which an incoming ball trajectory shape is involved

Within the present ball sports the ball within our perception processes will always move within an autonomous line segment shape and besides that within for example tennis the sweetspot of a tennis racket head will always move within a completely different autonomous line segment shape. When for argument's sake we once reverse the burden of proof one could also reason that we are only capable of creating an intersection point of the aforementioned specified line segment shapes if we are capable of constructing actual perceptual images of how the ball and the tennis racket head will fill the remaining latent parts of respectively the incoming ball trajectory shape and the line segment shape of the hitting technique. Because in no other way anybody is able to come to the conclusion that for example within tennis we start to initiate the execution of motoric actions when the opponent just hit the tennis ball. If no perceptual images were involved then what other information is leading us within the decision in either a spurt to the forehand or the backhand corner? In which the explanatory model demonstrates that the sole answer to that question obligatory needs to acknowledge that we indeed create perceptual images of latent action trajectory shapes in which with the help of the cortical streams we are capable of observing how the manifest part fills the latent part of that line segment shape. If we then have determined a latent intersection point of the environmental object with the tennis racket head and consequently have constructed an ending point of the line segment shapes within both perceptual images then we are consecutively capable of observing the latent part of the action trajectory shape approach to zero. In which the observation of the autonomous environmental object within its line segment shape needs to be leading because we aren't capable of actually influencing it anywhere. The movement of the tennis racket head will have to be aligned towards this leading phenomenon because we conversely are able to control this movement with proprioceptive perception processes within at least an autonomous complex subsystem of our own throwing action.
This leads to the conclusion that if we observe that the *tau*-value of the movement of the ball within an incoming ball trajectory shape approaches zero the *tau*-value of the movement of the cat will also have to approach zero. Ergo the latter conclusion indicates that proprioceptive perception processes need to enforce the *tau*-value of the hitting bat, the tennis racket head etc. to at least ensure that the two autonomous *tau*-values can be coupled c.q. will at least lead to a collision of the mouse and the cat. Which in essence displays the complete phenomenon of the functional *tau*-coupling. In which however needs to be understood that the *tau*-coupling must be perceived out of those parts of the involved objects which actually will collide with each other[61]. In which preliminary to what will come needs to be remarked that players within badminton want to touch one specific outside of the shuttle

[61] Within tennis you take a spurt to the backhand or the forehand corner. In which need to be remarked that only the whole action will take care that in the end a successful *tau*-coupling will occur but that the only essential contact encompasses that the outside of the strings of a sweetspot of a tennis racket head will touch the outside of a tennis ball.

and that within tennis that doesn't form a demand because a smooth round ball is involved which affords a similar outcome independently from where you exactly touch it[62].
Besides the aforementioned the explanatory model additionally clarifies why within for example tennis toddlers and absolute beginners are capable of hitting an easy incoming ball trajectory shape with almost a 100% success percentage. Or to put it in other words it explains why they are capable of successfully executing such a very complex functional *tau*-coupling so early on. In relationship to this phenomenon the explanatory model shows that the term line segment shape encompasses two essential different components. The line and the shape. The line constitutes the basal, the one-dimensional, component which ecologically can be attributed to the earliest defence mechanisms and which already can be noticed within 6 month old babies. Within interceptive tasks they are capable of guiding a part of their own body to a moving environmental object and in that same way toddlers are capable of bringing a tennis racket to a moving tennis ball and cause a collision. However that collision has nothing to do with the game of tennis. Any cognitive knowledge about the shapes of incoming ball trajectories with any intersection points in relationship to outgoing ball trajectory shapes as well as any cognitive knowledge concerning the associated hitting techniques is not present yet. It will approximately take 10.000 hours of hard practice before that phase will be established. Toddlers only *hit* (!) balls and that has no link whatsoever with playing the game of tennis.

4. The contact point c.q. the contact moment c.q. the contact phase between the mouse and the cat

Due to the explanatory model all stages within a motoric movement action can be appointed now out of many ground-breaking perspectives. Which this article exactly aims to do and which maybe also entails that we develop better athletes but far and foremost encompasses the goal that one finally starts to acknowledge which perception processes actually do play a role within the functional execution of a motoric action. Which will at least need to have the effect that scientists and sport coaches will start to approach situations in sports out of the exact factual verities.
Of course it will become and is already clear that the only very precise moment of contact within a sport like tennis encompasses the moment where *the specific part of the outside* (!) of the tennis ball will collide with *the specific part of the outside* (!) of the strings of the tennis racket head. This very meticulous description, in which the two perspectives within the animal-environment relationship are so obviously present, even shows that we much more precisely need to approach that essential and critical phase in which a successful *tau*-coupling actually needs to occur. So due to the fact that we are capable of precisely narrowing down that critical point we are also capable of appointing the rest of the motoric action out of this notion. Because now you are able to identify that athletes before that critical phase need to undertake lots of things motorically but at the same time you are able to determine that prior to the first haptic sensation of the touching of the ball really actually nothing is happening what can be related to a touching process between the animal and the environment. So before Federer is actually touching the ball he took a sprint to the backhand corner in which he brought his tennis racket backwards as a part of a preparation phase and that backhand stroke even will already be situated far within the main phase of the forward swing of his hitting technique. Ergo that all needs to happen before he finally will touch something c.q. before something actually will occur. If you look at it from this perspective than the touching becomes a much more isolated moment if one compares it to the other much longer time requiring phases in which the animal and the environmental object lead their own autonomous lives in which they are mainly moving through *nothing* (!).
On the other hand you can't propose that Roger then doesn't have to sprint to that backhand corner on basis of the conclusion that he is not actually executing anything c.q. that he is solely occupied with movement from the animal through the nothing? No, of course not. But it provides insight in the exact elements which, within this example for tennis, need to be perceived. Federer needs to make that first running action to be able to secure a successful posterior *tau*-coupling. If he will not execute that action the tennis racket head will never in time arrive at the possible location where an intersection

[62] The latter distinction can also be noticed within juggling in which the catching of a ball or ring provides the same differentiation as when it is compared to catching a cone.

point can be created[63]. Or with other words the first strides of a sprint are as essential for a successful *tau*-coupling as the future actual touching process is. Although it isn't involved with touching anything. The running can only be linked to the fact that the possibility is created that *the specific part of the outside* (!) of the strings of the tennis racket head will be capable to execute the future *tau*-value successfully. Or more precise the future dependent *tau*-value.
As a closing remark it must become clear that the underlying touching phase c.q. the contact point can be approached out of two really different perspectives. The functional *tau*-coupling will mainly have to be approached out of the simultaneous observation of the two perspectives but for other purposes one can study them separately. If for example sport coaches are confronted with a practical problem they are capable of isolating both perspectives. The touching moment c.q. the actual manipulation point can be isolated out of the specific outside part of the ball towards the tennis racket head or hitting bat or vice versa the action can specifically be approached out of the specific hitting zone of the tennis racket head or hitting bat towards the outside of the ball.

5. The egocentric formulated will within the ball sport tennis

"Top players seem to experience the game at a sub-verbal level. They use images and feelings to communicate information to their bodies, make split second decisions, and execute under pressure. They imagine what they want to do, and their tennis follows their imagination. Once again, something McEnroe told me in 1984 gives an insight into how this actually happens. We were talking about how the Winning Edge video was designed to give players clear visual models of himself and Lendl. Suddenly John stopped and said something surprising--as if he were realizing it himself for the first time. "Sometimes I'll see the shot flash across my mind's eye just before I hit it!" I had the chance to interview Billie Jean King for my book and she told me that once she figured out she was doing this unconsciously, she ritualized it and used it methodically on virtually every point."[64]

Within this paragraph all motoric and perception processes within the specific ball sport tennis will be appointed to illustrate all aforementioned novae even further. Tennis can be regarded as one of the most complex sports in which also linked catch and throw actions need to be executed. The goal is now to explain crystal clear within one specific sport that the common formulated egocentric will which we seemingly intend has nothing to do with the motoric and perception processes which we actually need c.q. which actually will have to be executed to achieve the goal sprouting from that egocentric formulated will. In which the explanatory model really aspires that you will start to understand that the reinforcing of that *apparent*/*seemingly* (!) egocentric formulated will c.q. the classical *incorrect* (!) reasoning concerning the action conversely will be detrimental to the execution of a motoric movement action or in other words does *in no way* (!) contribute anything substantial to improve any tennis performance. Conform the fact that we will never be capable of grasping a coffee cup[65] and that we will never be capable of throwing a basketball in a basket or kick a football in a goal during a penalty[66] we will never be capable to hit a tennis ball to a predestined area.
Like it has been explained within the previous paragraphs the environmental object, i.c. the tennis ball, is and will remain an object belonging to the environment and we are only capable of influencing it during one contact moment c.q. during one contact phase if the environmental object is at our side of

[63] Also within the motoric movement action *letter posting* it becomes crystal clear that the walking with the letter towards the mailbox and the standing still in front of the mailbox share much more commonalities than science presumes right now. The sole walking action and the sole arm action have the exact same goal of bringing a lifeless environmental object closer to the slit. Or with other words they have the only goal to diminish the latent places P between the letter and the slit of the mailbox.
[64] John Yandell; Visual Tennis; ISBN 13: 9780385264228
[65] We are only capable of moving our fingertips towards a coffee cup.
[66] We are only capable of constructing a perceptual image of an action trajectory shape between the ball and the basket and to throw the ball in the beginning of that shape. A shape that later on hopefully will be successful. Soccer exactly follows basketball.

the baseline c.q. if it became so close[67] that we indeed are capable of touching[68] it. It will have to become absolutely clear that a tennis ball within all stages of the game of tennis remains autonomous but that we surely aren't capable of influencing it anymore posterior to the touching phase. Sport coaches and the relevant scientists will finally have to accept that in spite of 1. the perfect throwing of a basketball in a perfect initial phase of a perfect perceptual image of a latent action trajectory shape between the ball and the basket, 2. the perfect hitting of a golf ball in a perfect initial phase of a perfect perceptual image of a latent action trajectory shape between the ball and the hole, 3. also a perfect execution of a perfect initial phase of a perfect perceptual image of a latent action trajectory shape between the tennis ball and the scoring part of the opponents court, that the ball due to whatever reason can decide *itself* (!) to not go into the basket, the hole or to hit that exact area of an opponent's part of the tennis court. So even if you execute everything in a perfect way and the action should obligatory unfold successfully the result can be negative. In which the substantial novum is revealed that that negative result can't be blamed on the player but encompasses just *a mere fact* (!) that one just has to accept and within for example coaching just needs to be assessed as a factual consequence[69].
The goal within this and the next paragraph also encompasses to show that the scientific research which within sports tries to create a link to reward (*reward-based learning*) or anxiety (*anxiety based approaches*) in essence don't have anything in common with the actual motoric and perception processes which one needs to execute within a motoric movement action. Anxiety or reward are possible factors which are capable to establish an emotional state but are in no way capable of changing the required and the to be executed motoric and perception processes. The explanatory model clearly elucidates that they belong to different worlds and ergo are not reconcilable c.q. can't be directly related to each other.

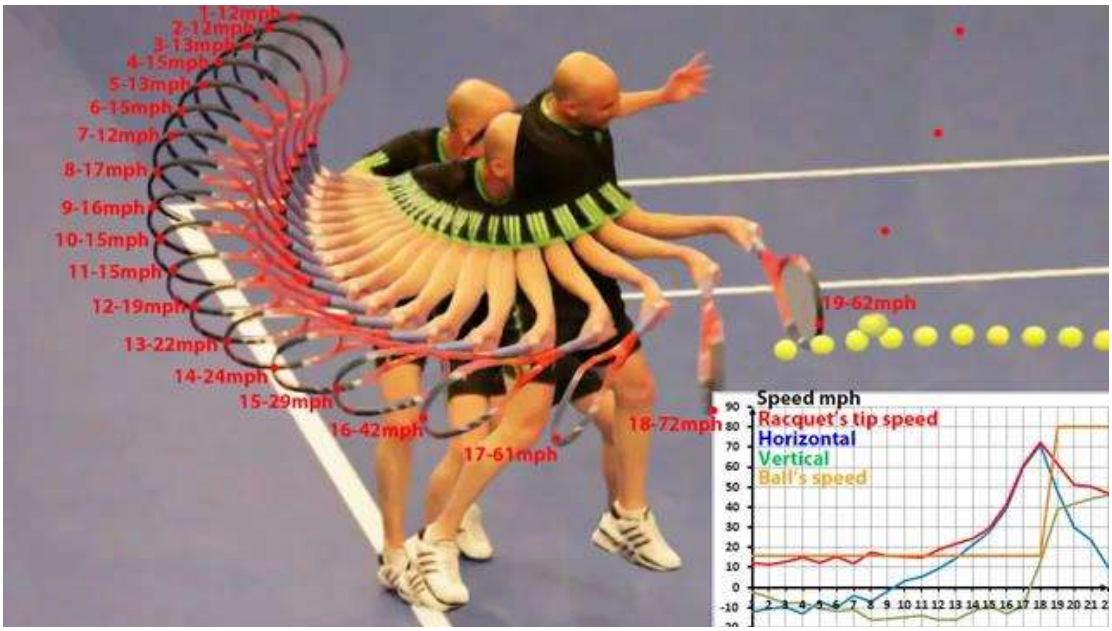


Image: Within tennis an incoming ball trajectory shape immediately[70] needs to be linked to an outgoing ball trajectory shape. Although anyone considers every ball game as a *hitting*-sport (!) and as

[67] Regardless of what running action we had to undertake within our part of the court.
[68] In relationship to the nature of touching also take in mind the motoric movement action *blowing*. In which needs to be remarked that the blown air will also be able to *touch* and *push* an incoming balloon *at a distance* (!) like a tennis racket also hits a tennis ball at a distance.
[69] Due to the lack of this sense of reality conversely coaches will even more reinforce the classical line of thinking in relationship to the egocentric formulated will and accordingly players will even more focus on exact those parts that will be detrimental to their performance and in that way create a vicious cycle downwards.
[70] The complexity of a sport is mainly determined due to this fact. Consider for example volleyball where you are allowed to execute two outgoing ball trajectory shapes to a player of your own team prior to the lengthening

such also approaches the action in tennis as one and undivided the explanatory model of the motoric movement action demonstrates clearly that the linking of an incoming ball trajectory shape to an outgoing ball trajectory shape encompasses two separate autonomous phenomena which each demand an autonomous set of perception processes. Within the *catching*-process in relationship to the incoming ball trajectory shape Andre Agassi's tennis racket head will have to create such a line segment shape that at least one contact point c.q. one intersection point[71] between the line segment shape of the tennis racket head and the line segment shape of the incoming ball trajectory will be constructed[72]. On top of that he subsequently wants *to push* (!) c.q. hit the tennis ball into the initial phase of the desired outgoing ball trajectory shape[73]. In which can be concluded that both components can separately be optimized by respectively aligning the catch or the push line segment shape as optimal as possible to respectively the incoming ball trajectory shape and the outgoing ball trajectory shape. However due to the fact that the outgoing ball trajectory shape needs to sprout directly from the incoming ball trajectory shape players will not be able to separate those components and they will have to look for a compromise[74] regarding the catch/push line segment shape of the sweetspot of the tennis racket head[75]. Within the specific description of the motoric movement action *cat and mouse*

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of the chain of ball trajectories by the opponent and also think about soccer in which this constraint doesn't exist. Although it is demanded within current *tiki-taka* soccer. On basis of this sole aspect tennis and volleyball a far more complex than soccer. Conversely soccer is much more complex because in that sport a net is missing which demands the back and forth playing of the ball. This *length* aspect (!) in *net*-sports namely causes such a huge reduction within possible ball trajectory shapes that in the end the total complexity of the task within soccer must be considered as far more complex in spite of the earlier mentioned counterargument.

[71] Although this touching process within a hitting sport like tennis most often will occur the execution within the motoric movement action *cat and mouse game* conversely shows that the sole touching is a rather rare occurring fact. In which immediately the link can be created towards baseball in which the sole touching is also a far more difficult task than within tennis or cricket. Which also automatically elucidates the tactical solution of the *bunt*-hit (!) within baseball. The bunt is typically such a tactical solution in which the action trajectory shape of the hitting bat is maximally optimized towards the incoming ball trajectory shape and which automatically shows the dramatical tactical consequences towards the outgoing ball trajectory shape. With the choice for the bunt a player makes huge concessions in relationship to the pressure he will be allowed to create with an outgoing ball trajectory shape. Therefor the bunt can be compared best with a *block*-return to a first flat service in tennis.

[72] Because tennis encompasses an elongated shaped court and due to the fact that the tennis ball can only be touched once the ball trajectory shapes within tennis host an obvious y-axis component. Therefor the line segment shape of the incoming ball trajectory shape will often be replied with a nearly exact opposite line segment shape of an outgoing ball trajectory. Which also causes the same characteristic within the line segment shape of the *catching*/*hitting* technique. Although the hitting technique within current professional tennis seemingly looks rather simple it conversely comprises a sophisticated evolved set of involved shapes. The *technical* solution which elite players within tennis discovered shows a perfect compromise in which the catching as well as the throwing/pushing process is optimized in the most maximal way.

[73] Within the clarification of the motoric movement action *throwing* the whole spectrum of all our actions towards the environment are included. The *let go*-throwing action, which we know from many sports, is characterized by the fact that we often aim to achieve something tactically with *the end* (!) of a ball trajectory shape but which we are solely capable of factually influencing at the beginning (!) c.q. during the initial phase of that shape. Within the tennis book "Watch The Ball Trajectory!" it is extensively explained how within the lengthening of each chain of ball trajectory shapes the tactical movement action (MA) always have to precede the actual movement action (MA). However due to the fact that tennis doesn't encompass just one linked incoming and outgoing ball trajectory shape, like within baseball and cricket, those phases intermingle continuously. In which need to be remarked that professional players again and again don't have to assess every incoming ball trajectory shape completely anew but that they execute chains within universal patterns of building (B) to scoring (S) respectively to preventing to score (PtS).

[74] The catching of an incoming ball trajectory shape will be optimized by the as static holding as possible of a tennis racket behind the ball and foremost (!) by letting the tennis ball come towards the racket. Within the current era of power tennis the sending is optimized by letting the tennis racket head transfer as much kinetic energy as possible to the tennis ball. So apart from inter alia the involved shapes this aforementioned fact will always have to lead to a compromise.

[75] Within Andre's forehand this doesn't become apparent that much but within the motoric movement action *cat and mouse game* the incoming *melon*-trajectory shape makes a perpendicular angle to the desired outgoing ball trajectory shape c.q. the line segment shape of the hitting technique. Which is also the case in tennis when a lob is coming down dead straight out of the sky and needs to be smashed horizontally.

game within chapter 3 it will become clear that the compromise should be weighed conform the way the catch and throw process differ as in regard to their underlying complexity if one wants to optimize the situation as a whole[76]. - Currently research is going on in which one is comparing all relative velocities of the tennis racket in relationship to the speed of the ball. It provides graphics like shown within this image. In this picture the red line shows a clear inflexion point between the numbers 14-18. An inflexion point which is exemplary within the graphics of each professional tennis player. According the explanatory model this inflexion point must definitely be linked to the transition phase from mainly 1. the catch process in relationship to the incoming ball trajectory shape *towards* (!) the intersection point of the outgoing ball trajectory shape to mainly 2. the push process in relationship to the outgoing ball trajectory shape onwards *from* (!) the intersection point of the incoming ball trajectory shape.

Like it is elucidated within the previous paragraphs the tennis ball is an autonomous environmental object. Due to the fact that all places P(0) of any environmental object are always linked to the places P(-1) and P(+1) our visual perception will always observe a moving tennis ball within a line segment shape with, conform a marble within a marble run, a manifest and latent part within the perceptual image of the possible line segment shape of the tennis ball trajectory. How the ball fills the perceptual image of the ball trajectory from very global to very precise c.q. how one can observe that the latent part of the gap narrows down to zero[77] determines the leading *tau*-value. It needs to be leading because we aren't capable of influencing the tennis ball at any point. The throwing motion of the tennis racket head[78], like the incoming tennis ball trajectory shape, also occurs within a marble run shape[79]. Within their specific hitting technique elite players first construct a perceptual image of a latent very specific catch/hit-action trajectory shape[80] of the relevant stroke until at least the contact moment c.q. the hitting phase of the tennis ball and also fill this perceptual image with the manifest part of the stroke. You are easily able to understand that the *tau*-value also needs to approach zero within that perceptual image of the tennis stroke when the leading *tau*-value of the tennis ball within the incoming ball trajectory shape approaches zero but far and foremost that both *tau*-values c.q. both marble runs have absolutely nothing in common and that they both encompass optimization processes. The latter needs to be emphasized because a huge number of coaches and still a few scientists maintain to believe that the execution of a sport encompasses a set c.q. a set repeatable process. Conversely the explanatory model shows that nothing set is present and explains that one *just* (!) can try to aim to optimize both *tau*-values[81]. The explanatory model even shows that we can only optimize the *tau*-value of the movement

[76] If a balloon within an incoming *balloon* trajectory shape approaches us very slowly we are capable of paying most of our attention to the hitting of the balloon. However within most sports this is the other way around. Often an activity will only become a genuine sport if indeed that catch process of the incoming ball trajectory shape needs to be emphasized much more than the sending of the outgoing ball trajectory shape. Therefor the term hitting sports should actually be changed in the term catching sports.

[77] For example think about the approach within the long jump towards the take-off board.

[78] Or to be more precise the relevant sweetspot because multiple of those optimal areas are present within one tennis racket head.

[79] So within every motoric movement action two autonomous marble runs are present in which two completely different marbles fill a different run. In here the explanatory model goes ways beyond any current scientific line of reasoning. First of all science was never able to discover the compelling relationship between the perception and the action. Like the marble shows within its relationship with the marble run. In which they show that they only become worthwhile when the overarching phenomenon is observed. And to make things worse the explanatory model clarifies that not one but even two of those overarching phenomena need to be observed within every motoric action.

[80] Mainly *catch*-shape.

[81] The explanatory model elucidates this crystal clear within addendum 1 and 2 of Caught In A Line and shows that you really never have grasped a handle of a coffee cup in the exact same constellation of your fingertips. Which by the way is not of any concern within the functional behaviour of ecologically parsimonious operating organisms as long as the fluctuation borders of the *autonomous* (!) push-process of all separate fingertips, which within the motoric movement action *grasping* just (!) aim to achieve a (vector) end-resultant of zero, stay within certain values. Also within the motoric movement action *writing* the explanatory model shows that you have never constructed one letter, word or word part in the exact same way due to the very same aforementioned

of the tennis racket head within its marble run just with the help of another complex subsystem and not within the observation of the movement of the tennis racket head within the hitting movement itself.

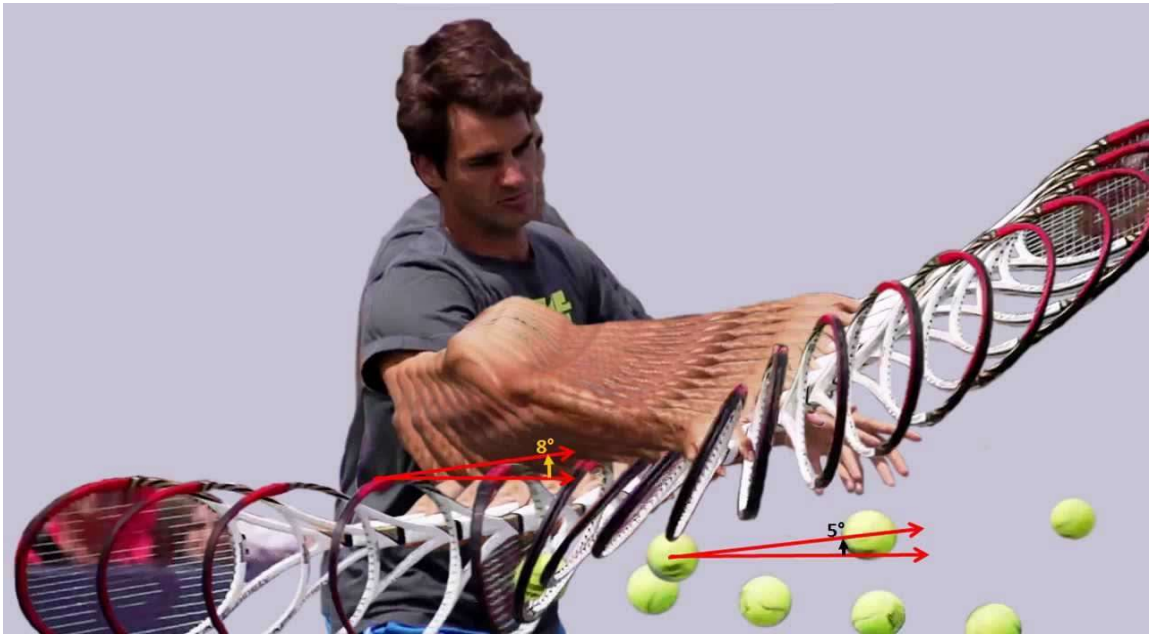

Image: Within tennis Roger Federer represents an unprecedented phenomenon and therefor logically his specific *outer* (!) characteristics are a source for many speculations and research from the lowest to the highest level. However also at the highest scientific level one mainly persists to study only the outer characteristics of elite players. The TQE-fallacy[82] still meets much support among renowned scientists and is even subject of study within current c.q. upcoming articles. It predominantly focusses at the sole phenomenon that Roger *seemingly* (!) shows a quieting of his gaze (on the outside of his body) in relationship to the contact moment c.q. the contact phase that has been addressed so extensively and finally within this article. TQE beholds this mysterious *quietening* (!) as the ultimate source of Federer's excellence and therefore, although they wouldn't be capable of providing any clarification, doesn't need to substantially explain it. The explanatory model conversely shows that the phenomenon of TQE definitely occurs but solely as a consequence of the very many active motoric and perception processes which it accordingly fully reveals[83]. This image clearly shows the last part of the main phase of a forehand groundstroke. Within this phase Roger is mainly occupied with *inner* (!) perceptual images of the relevant ball trajectory shape and relevant tennis racket head action trajectory shape and within there he needs to observe two autonomous perception-action couplings simultaneously. If he *actually* (!) observed, with direct vision, that the tennis ball filled most of the perceptual image of the latent action trajectory shape he cognitively knows that within the last meter of the shape the ball will hardly deviate from the still latent action trajectory. Then he knows that he is able to amply correct the eventual occurring deviations, within the last part of the incoming ball trajectory shape, within the size of his tennis racket head. Besides the fact that the explanatory model exactly appoints why and where TQE is present it also shows within Federer's tweener[84] and Federer's tennis service[85] that elite players don't require any actual vision within the last phases of their strokes. Not at the ball and not at a goal target c.q. the environment.

reasons. If the constructed ink lines as in regard to their shape remain within certain values then we are capable of deciphering any scribbling within the same cognitive way.

[82] The Quiet Eye (TQE) – J. Vickers et al..

[83] Within addendum 1 of *Caught In A Line* an explanation is offered that indeed acknowledges that the mysterious clarification within TQE was able to attract so much attention.

[84] Appendix C

[85] Appendix B

This all leads to the factual conclusion that the line segment shapes of two marble runs need to be aligned with each other even if your sole goal encompassed just any random collision between the ball and the racket. So this solely regards the single aspect of the touching of a ball with a racket and that absolutely doesn't include the aspect of where you want the tennis ball to go. In which the explanatory model shows that the human skills required within this task are stretched to the very limit of what mere mortals are able to execute. The two marble runs with their corresponding *tau*-values can be perceived simultaneously because the incoming ball trajectory shape can solely be observed with visual perception and the movement of the tennis racket head within the perceptual image of the catch/hit-technique can solely be observed with proprioceptive perception processes. From which also the novum stems that the catching encompasses an autonomous phenomenon and in fact doesn't share any commonality whatsoever with the subsequent pushing then that they compellingly need to be linked. On logical grounds it then becomes crystal clear within that phenomenon that a dualism occurs in which one can only solve this situation with a compromise in which the autonomous catching as well as the autonomous sending/pushing show an optimal equilibrium.

6. The misconceptions c.q. omissions within the egocentric formulated will

Considering all the aforementioned the explanatory model now brings forward an elementary necessity to renew c.q. to redefine the egocentric formulated will at this moment. Universally the egocentric formulated will is acknowledged as the ultimate premise within the birth of a motoric action and so it constitutes a crucial element but in spite of that fact it was swiftly formulated within science without much thought and without lengthy deliberations till now. Wasn't it all so *linear* (!) clear? If you want to grasp a coffee cup then the egocentric formulated will is based upon that fact, isn't it? The explanatory model of the motoric movement action provides a much more subtler *complex* (!) answer. Like a lot in science the answer to the aforementioned questions is yes but at the same time no. In the end we indeed want to drink out of the steaming hot cup of coffee and ergo we want to get it into our hands but the explanatory model shows that there are a few autonomous phases within that process which have absolutely nothing to do with the actual drinking. However the difficult thing within convincing you has to do with the fact that those stages rapidly pass due to which it seemingly looks as if a, one and undivided, *linear* (!) motoric action is involved. The explanatory model shows convincingly that the opposite is true. After we decided to drink coffee we first plan which body part will be involved[86] and if that encompasses the fingertips then we decide whether that will be the right or the left hand[87]. If we use the fingertips then within a completely autonomous phase we first construct a perceptual image of a latent action trajectory shape out of the relevant fingertips towards the handle of the coffee cup. The explanatory model specifies this as the tactical movement action (MA) and within there you need to consider how posterior *to the first touching* (!) of the ear of the cup a successful *pressing*/*pushing*-process (!) will be able to occur. However it needs to be emphasized in here that within this tactical phase, generally[88], still absolutely nothing is executed and that logically is not possible because without a perceptual image of a latent action trajectory shape we

[86] For example very hot coffee in a mug without a handle will most often first be approached by a motoric action with the mouth.

[87] Which *precise global* (!) shape of an action trajectory you will construct within there is inter alia dependent on the location of where the ear of the mug is situated or if you for example first want to grasp the spoon to stir the coffee.

[88] Within very safe environments it looks like you are initiating movements even before the tactical movement action (MA) occurs. Scientific research (e.g. Hayhoe, Land) already supports this abundantly. Within the action trajectory shape often a relative big space, in which *nothing* (!) is present, needs to be crossed and that provides us a *safe* (!) time frame. So when you cross a deserted road you start crossing before you actually will activate your visual perception organ to see if the road remains safe. However within rooms where working chainsaws are involved you will certainly not rely on this kind of tactics.- But even if we postpone the activation of our visual perception organ it must be remarked that we must have constructed a perceptual image of a latent action trajectory shape. Even in very safe environments. When you compare it to the "dangerous" situation the latter perceptual image can be much more global but still there must be an image.

just are not capable of executing anything[89] within the actual movement action (MA). Within the actual movement action (MA) the actual execution of the motoric action is the key issue and it's just a mere fact that our motoric and perception processes within grasping a coffee cup can solely (!) execute this out of the perspective of the fingertips. In here again a few novae come forward due to which you probably will lose track.
So factually the position of the handgrip of a coffee cup, as very important, is perceived tactically in a very early phase to determine an optimal shape of the action trajectory but that during the actual movement action (MA) that *final point* (!) is just observed as one of the countless positions of the chosen line segment shape which during the actual execution will not be reconsidered tactically.
During the actual movement action (MA) the explanatory model shows that we primarily are occupied with the execution of the motoric movement action *touching* which compellingly needs to be linked to the subsequent motoric movement action *pushing* but that during the actual touching process our motoric and perception processes aren't occupied at all with this future pushing. Ergo then we are absolutely not occupied with the grasping of the cup but we are just occupied with *bringing our fingertips closer* (!) to the coffee cup with the help of the processing processes of the perception.
Which scientifically leads to the novum that grasping actually doesn't exist but conversely encompasses two compellingly linked autonomous motoric actions. The autonomous motoric movement action *touching* and the autonomous motoric movement action *pushing* which shows crystal clear that we will never be able to grasp a cup but that we are only capable of moving our fingertips towards a cup.
Of course the aforementioned provides a lot of difficulties within designating the egocentric formulated will and indeed depends on what level you behold the motoric action. However we are capable to notice that what we vernacularly/colloquially try to achieve crucially differs from the motoric and perception processes we need when we actually execute a motoric action. So the very important conclusion which we are able to transfer to the egocentric formulated will within obligatory linked catch and throw actions within ball sports is that we indeed want a flat fast tennis service to touch the utter corner area of the service box or that we want to hit a baseball out of the stadium but that we definitely will never be capable to get a grip on the final destination of an outgoing ball trajectory shape[90]. An autonomous environmental object will remain to be autonomous always and anywhere and if we want to influence this autonomous movement of the environmental object at any point then we will only be able to do that if we first of all will be able to get in contact with it c.q. if we first of all succeed in touching it (!). How many times did well-prepared batsmen at the plate with a horrifying and incredible perfect homerun blow indeed totally missed the incoming baseball? Well, very often and the same experience can be acknowledged within the motoric movement action *cat and mouse game.* Before we will be able to crush/squash the melon c.q. *push the melon to pieces* (!) we first need to make a touching process happen and that is why most of the ball games became genuine sports because the catch/touching process within the catch/hit movement of the hitting bat is multiple times more difficult than the hit/push process within that same catch/hit movement of the hitting bat.
In which one easily is able to determine that the scientific and coaching community didn't or hardly paid any attention to this phenomenon and which one is also easily able to determine that the reinforcing of the logical but indeed so wrong instructions conversely leads players further astray from the correct motoric and perception processes which the player actually needs to execute.
In retrospective one will be able to identify that the definition of the egocentric formulated will within motoric movement actions was the cause of so many wrong assumptions and conclusions in relationship to where the motoric and perception processes actually should be pointed at. Now the

[89] The explanatory model argues unequivocally that a perceptual image of a latent action trajectory shape is of utter importance. It doesn't matter how global it is. As long as it is there. Only then we are capable to start an actual mutual process with the help of the cortical streams.
[90] The same can be applied to golf and the penalty in soccer although in those examples no incoming ball trajectory shape can be noticed. We are just incapable of hitting a ball into a hole or to shoot a football into a goal. Ergo we are not capable of *wanting* this. We are just capable to actually construct a perceptual image of a successful latent action trajectory shape and to reduce that to an initial phase c.q. a *linked touch and push phase* (!). Only within that phase we are able to actually influence the autonomous environmental object (the ball) which hopefully has the consequence that only later on the enduring autonomous environmental object will be successful.

explanatory model shows a universal, uniform, coherent etc. etc. clarification in which all the aforementioned novae find their rightful place but you yourself also could have been able to determine facets of it all within your own empirical experiences. Within tennis you mainly have to look at the tennis ball according to the many coaches and within the penalty in soccer the same number of coaches tell you to look at the goal. With the theory of The Quiet Eye (TQE) the still much appraised J. Vickers on the one hand let you focus on the ball/puck within scientific research in relationship to ice hockey and golf and on the other hand your focus needs to be aimed at the basket within a free throw in basketball. You could already have come to the understanding that current interpretations host a very inconsistent story line and that within there TQE remained a hazy and mysterious phenomenon.
Finally the explanatory model comes to the conclusion that the definition of the egocentric formulated will should much more harbour the aforementioned elements of the essential actual motoric and perception processes. Within there the explanatory model is willing to move along within a certain bandwidth depending on the particular focus but it must become crystal clear that the egocentric formulated will is never able to contain the goal of hitting a ball to a specified designated area. That is factual impossible.

7. Flow in relationship to the egocentric formulated will

In relationship to the egocentric formulated will a final remark is devoted to the phenomenon of flow. The comprehending of flow within sports is a persistent topic with an accompanying persistent debate. The representatives of this debate disagree on lots of elements with the exception that they all agree within the idea that flow encompasses a rare and unique occurrence that is only predestined to very unique talented athletes. Conversely the explanatory model shows that everyone executes many daily motoric actions in complete flow. You make tea in flow, you ride your bike in flow and if you want to kick that soccer ball over eleven meters at a remote soccer pitch to a team mate you also experience complete flow. Only if the distance of those eleven meters is transferred to the last all-decisive penalty within the most prestigious championships than suddenly it becomes a hard and difficult task. The cause of this all is rooted within the fact that the player doesn't know what one actually executes c.q. needs to execute and/or what to focus on. In which all previous paragraphs indeed show that if the soccer player is going to focus on (wrong/false) coaching instruction based upon an erroneous formulated egocentric will and ergo will not focus on the actual required perception processes that a definite negative outcome will become a part of the story. The latter must be linked to scientific research that because of this observed negative outcome is occupied with *anxiety* and *reward* in relationship to performance in sports. The explanatory model shows crystal clear that the execution of a tea making task or whatever sport performance has absolutely nothing to do with the emotional state of the athlete. Again the essence of the misconception within there is rooted within an erroneous formulated egocentric will which indeed is detrimental to the actual required motoric and perception processes. In which the explanatory model shows within for example tennis that if you indeed know what you actually need to perceive and need to execute that your mind is so occupied with the *proper* (!) motoric and perception processes c.q. is distracted in such a way that as a matter of fact no room is left to develop improper and/or distracting thoughts. So with a proper formulated egocentric will the knife cuts both ways.

Chapter 3

The motoric movement action *cat and mouse game*[91]

1. The small version versus the big version of the motoric movement action *cat and mouse game*
2. The mouse c.q. the movements of the mouse
   a. The egocentric formulated will in relationship to the melon
   b. The primary focus in relationship to the movements of the melon
   c. The *tau*-value in relationship to the movements of the melon
   d. The visual perception of the *tau*-value of the melon
   e. Adaptorial behaviour of elite players within tennis, cricket and golf in relationship to the visual perception of the *tau*-value of the melon
3. The cat c.q. the movements of the cat
   a. Introduction
   b. The egocentric formulated will in relationship to the movements of the hitting bat
   c. Optimization of the shape of the action trajectory of the hitting bat
   d. The *tau*-value in relationship to the movements of the hitting bat
   e. The proprioceptive perception of the *tau*-value of the hitting bat
4. Optimal tactical strategy
5. Motoric movement actions encompass optimization processes and therefor always comprise an error rate

The explanatory model provides the final clarification of all motoric and perception processes within any imaginable motoric movement action at the functional c.q. the behavioural level. The problem however encompasses the fact that the final clarification is situated at quite a remote distance of the current leading scientific mindsets. If one wants to obtain the final insights within the explanatory model multiple significant mind steps are demanded which in a compelling way need to be regarded in their complex relationships with each other. This demands a meticulous approach. So although only the clarification of the motoric movement action *cat and mouse game* beholds the central essence of this article the ultimate goal remains to implement the complete explanatory model within science. With that idea in mind there will be created many mutual relationships within this article. Clarification of the whole spectrum at a macro level hopefully has the effect that the explanation of the motoric movement action *cat and mouse game* at micro level obtains a broader context and reinforces each other in a mutual way.
Chapter 1 approaches the motoric movement action *cat and mouse game* at the broadest level and demonstrates that every imaginable motoric movement action hosts the same universal components. Although it is in great conflict with current mindsets the explanatory model shows that all motoric movement actions must be characterized as compellingly linked catch and throw actions. Consecutive to the underlying idea chapter 2 more specifically elaborates on linked catch and throw actions within ball sports which conversely are treated as such in general. It clearly demonstrates that those actions exactly comply to the universal motoric and perception processes as mentioned within chapter 1 and in the same coherent and conform way within the motoric movement action *cat and mouse game.* In that way chapter 2 forms a perfect liaison for chapter 3 in which finally the motoric movement action *cat and mouse game* as a whole is assessed at the micro level and in which it becomes crystal clear how one should approach this motoric movement action tactically. Which elite players within for example tennis and cricket already have found implicitly and which can be viewed within their adaptorial behaviour which is already underpinned due to an abundant supply of acquired data within the relevant scientific research.

[91] https://www.youtube.com/watch?v=arsBG_QvPm8&t=8s

1. The small version versus the big version of the motoric movement action *cat and mouse game*

Within the description of the motoric movement action *cat and mouse game* the old-Dutch cat and mouse game is appointed as a motoric action. It has been chosen 1. because it actually represents the most complex motoric actions on basis of the motoric and perception processes involved but as such can be reckoned as one of the simplest actions within that spectrum, 2. because an actual visible marble run is present in which, conform its affiliated clarification[92], the *tau*-value within the incoming ball trajectory shape c.q. the action trajectory shape is so plastically illustrated and 3. because the present marble run, conversely to most other incoming ball trajectory shapes within ball sports, is not transparent. Which latter qualification exactly reveals why this motoric action is so complex although it seemingly ought to be a very simple catch and throw action.

Image: The small version of the original old-Dutch cat and mouse game. The involved tube c.q. the hole of the mouse shows obvious commonalities with a set classic marble run.

The underlying specific clarification serves as a general illustration of every imaginable motoric movement action because every motoric action requires a universal consequent set of motoric and perception processes at the primary c.q. the functional/behaviour level. Due to the fact that now every aspect of all those functional processes becomes clear provides the possibility to also appoint the complexity of all components within one motoric movement action which also shapes the basis that the complexity of every single motoric movement action can be positioned within the whole spectrum of comparable motoric actions. Which now also provides the possibility to formulate optimal tactical strategies in relationship to the execution of any action. So within every motoric movement action, ergo also within the motoric movement action *cat and mouse game*, this leads to the fact that a well-defined ending motoric learning progression can be determined and this subsequently *automatically* leads to the most optimal motoric learning model.
The game idea of the original motoric movement action *cat and mouse* game encompasses the catching of a rolling ball. A ball which approaches a player within a non-transparent (!) and diagonal assembled tube and with the help of a small cup the incoming ball needs to be caught before or on a set marked line. Although this encompasses the original old-Dutch game and although it provides the name to this motoric movement action *the bigger version*[93] of this game will be addressed in this article. Within the bigger version a PVC tube, melons and a baseball are involved but all the principles

[92] See: The Marble Run – Appendix A.
[93] The complexity of a motoric movement action is also based upon the fact if and how the ball fits into the fluctuation possibilities of the catching device with which we have to catch the ball. You are able to clearly understand the decrease of the complexity if we were allowed to catch the ball with a big *moving box* instead of a small cup. Then all deviations within the action trajectory would easily be covered by the wide borders this specific catching device would provide. For more information see: the motoric movement action *needle and thread* and the motoric movement action *key and lock* within addendum 2 of *Caught In A Line.*

stay the same[94]. However the only difference encompasses the fact that within the last phase of this game the hitting bat doesn't need to catch the melon but needs to smash it to pieces[95]. Due to the latter this motoric action has been purposefully chosen because then the liaison to all ball sports becomes apparent and subsequently to the understanding of all functional processes within this game this will have to lead to the grasping of the far more complex processes within for example the motoric movement actions within cricket or tennis.
The traditional design, *the smaller version*, of the cat and mouse game can only be related to the motoric movement action *catching*. The bigger version also tends to that action but also tends to combined catch and throw actions which are far more complex. Catch and throw actions which are familiar to us due to sports like tennis, cricket, baseball, table tennis, badminton etc.. The melon not only needs to be stopped but also needs to be smashed to pieces. That doesn't lead to many tactical deliberations but in the end phase of this action it must lead to the fact that the bat will have to provide such a pressure on the melon that the melon will collapse due to that pressure or in combination with the counter-pressure of the table. If one would regard this as a combined catch and throw action then one could say that an incoming *horizontal* (!) *melon* trajectory needs to be caught optimally and directly linked to a *vertical* (!) outgoing melon trajectory shape into the table. Or with other words the melon needs to be hit dead straight through the table[96].

Image: *The bigger version* of the cat and mouse game. The melon must be smashed to pieces between the two blue lines[97].

So the difference with the small version beholds the fact that the hitting bat needs to remain at quite a substantial distance[98] from the melon within the hitting process and needs to be accelerated to gain sufficient kinetic energy to successfully execute the task sprouting from the egocentric formulated will. Just the catching with a small cup can conversely be executed much more evenly and therefor encompasses a much simpler task. Still it needs to be emphasized again that even the bigger version will remain to be one of the simplest actions within the whole spectrum of compellingly linked catch

[94] The diameter ratio cup-ball within the original small cat and mouse game is around 3:2. Within the big version everything must be magnified with approximately a factor ±30. See the illustrations. The tube within the large version encompasses a diameter of around 30-40 centimetres and is around 4-5 metres in length.
[95] In Holland the bigger version of this game can be spotted at fairs and flea markets and it became well-known due to a popular television program for children called: "*My father is the best!*".
[96] The fact that the incoming melon trajectory and the outgoing melon trajectory make a square angle is a complicating factor. This complicating factor could equal the horizontal grabbing action with the hand of the vertical falling sticks in the old-Dutch *stick catching game* (See appendix B: The motoric movement action *catching*). Within tennis it equals the game situation when a player wants to smash a lob which is falling dead straight out of the sky.
[97] Belonging to this YouTube video clip: https://www.youtube.com/watch?v=arsBG_QvPm8&t=8s.
[98] The distance should allow a progressive progression of kinetic energy which in the end will have to take care that the melon will collapse. This component needs to be optimized as well because honeydew melons are sturdy pieces of fruit and don't collapse easily.

and throw actions. The shape of the incoming melon trajectory and the shape of the outgoing melon trajectory will always demand a similar shape of the action trajectory of the hitting bat.

2. The mouse c.q. the movements of the mouse

a. The egocentric formulated will in relationship to the melon

So within the bigger version of the motoric movement action *cat and mouse game* the essence of the task in relationship to the egocentric formulated will encompasses the catching of an approaching melon which directly need to be smashed to pieces. Once more that essence will only be fulfilled by all places P of the melon and clearly revolves around an environmental object which we will only be capable to influence if we ourselves execute a motoric movement action. An action that only will be able to provide the possibility that the *direction* (!) of that autonomous movement of the environmental object within the original incoming line segment shape can be influenced to a desired future outgoing line segment shape. We are capable to change the direction of an incoming ball trajectory shape with all kinds of body parts (kicking, hitting, heading etc.) due to which we are capable to influence the course of a game but the game remains to be something exclusive belonging to the ball c.q. remains something belonging to the environment.
So only at certain occasional set moments the autonomous game can be influenced by bringing (parts of) our body in contact with the ball. In which the explanatory model clarifies crystal clear that primarily our motoric and perception processes factually are occupied with the touching[99] of the ball and secondarily want to push it which initialises[100] the initial phase of an outgoing ball trajectory shape.
Due to the fact that the explanatory model provides the notion of incoming and outgoing ball trajectory shapes and in there indicates that a separate touching and pushing/pressing action needs to occur the novum is revealed that a catching process needs to be perceived and executed and especially the motoric movement action *cat and mouse game* shows crystal clear that the sole touching of the melon is an art in itself c.q. requires exceptional skills. Within there the explanatory model shows that the catching of an incoming ball trajectory shape and the throwing of the melon within an outgoing ball trajectory shape in fact behold two autonomous actions. In which on the one hand it encompasses the task that movements of the hitting bat will be capable to optimally take care of at least the catching c.q. the *touching* (!) of the movement action object (MA) and simultaneously encompasses the task on the other hand that movements of the hitting bat will be capable to optimally throw the ball into an initial phase of an outgoing ball trajectory shape. Within there the explanatory model clearly illustrates a dualism in relationship to the linked catching and sending process and clarifies that within most actions only a catch/hit technique compromise will be able to lead to an optimization. A compromise which will have to sprout from the fact if either the catching or the hitting needs to be emphasized.
If we zoom in on this aspect some more then it can be noticed that the line segment shapes of the incoming ball trajectory shape and the outgoing ball trajectory shape need to be linked to a chain of ball trajectories. Within the autonomous game, which we are only able to perceive at a distance, the end of the incoming ball trajectory shape within the catching will obligatory have to provide the beginning of the outgoing ball trajectory shape within the sending of the ball. So the role of our own throwing action with which we are just incidentally able to influence this process encompasses a very complex task and will have to consider the catching as well as the throwing of the ball. The catching and the throwing are optimized in a very different way and encompass many contradicting movements of the hitting bat. The catching is optimized by a stable and relative still standing movement of the

[99] However the hard thing to understand encompasses the fact that we need to tactically consider the future initial phase of the outgoing ball trajectory shape before we start the touching action but that during the actual execution of the touching that goal remains on the background.
[100] Within the motoric movement action *grasping* the explanatory model shows that scientifically grasping doesn't exist. They actually encompass the linked motoric movement actions of touching and pressing/pushing. Only if you approach it in that way you will be able to rank the grasping of a coffee cup within the whole spectrum of motoric movement actions and only due to that approach you will be able to appoint the precise overlaps within for example playing the piano, soccer etc. in which also a pushing/pressing action is always preceded by a touching action.

hitting bat with which a player is capable to fulfill the crucial essence of letting the ball come towards the hitting bat. Conversely the sending/hitting is optimized by the transition of as much energy as possible[101]. Within technique training sessions players and coaches will have to look for an optimization of those two concerns because they compellingly need to be linked. Within practice this will normally lead to the compromise that in the first reception phase the catching task will have to be emphasized and that later on, when the chance to deviations of the ball within the incoming ball trajectory shape becomes minimal, within the last part of the reception phase a player will be capable to switch to the pushing/hitting task[102]. So it is very important to conclude that within the catching/throwing dualism of the game the optimization of one process is detrimental to the other process and that there becomes a need to find the best possible compromise.

b. The primary focus in relationship to the melon

All the aforementioned clearly illustrates that the essence of the task solely will be determined by all positions P of the melon c.q. the mouse and that accordingly we need to primarily perceive the action out of the perspective of the melon. Because we indeed want to influence the trajectory of the *melon* (!) in such a way that it will be pushed/pressed against the hitting surface which will cause the *melon* (!) to collapse. Therefor it needs to be observed within the primary focus and this will also include the perceiving of the *tau*-value of the incoming melon trajectory shape because we absolutely never will be able to actually influence the environmental object. Which means that our own throwing action will be completely dependent on the movement of the melon.
However the explanatory model doesn't stop with this finding and thereupon shows that the primary focus needs to be linked to two autonomous optimization processes which in the present ball sports indeed will have to show a compelling relationship. However the explanatory model already introduces so many novae that it becomes even harder to explain the finer details of this part more precise. But it needs to become clear that the motoric and perception processes within the autonomous catch process of the incoming ball trajectory shape will always have to be continued until the very first moment of the haptic sensation of the touching of the ball. This essence will always remain but will never prevent that for example tennis players will be allowed to start to focus, *also* (!), on the pushing/hitting process a short time span before that haptic sensation of the touching occurs. Within tennis that obviously is related to the fact that at that last moment the occurring deviations within the incoming ball trajectory shape can be amply absorbed within the size of the tennis racket head[103]. By the way how eventual deviations can be absorbed with the relevant motoric movement object (MM) explains a big part of the complexity within the whole spectrum of ball sports and inter alia clarifies why we definitely aren't capable of absorbing the deviations within incoming *billiard ball* or *golf ball* trajectory shapes within the size of the billiard cue tip or the hitting surface of a golf club. Which definitely demonstrates that we only will be capable to execute those sports when the ball remains static at its place.
Besides the aforementioned it needs to become crystal clear that the motoric and perception processes within the autonomous pushing/pressing/hitting in relationship to the creation of the outgoing ball trajectory shape must have been weighed tactically *even before* (!) the actual execution of the catching/touching process. So one is able to determine that the pushing factually just starts after the aforementioned first haptic sensation of the touching of the ball and that the pushing process will always be influenced by the previous catching phase.

c. The *tau*-value of the melon

The aforementioned shows crystal clear that the *tau*-value within the primary focus is mainly determined by how the actual position of the mouse/ball/melon will fill the perceptual image of the

[101] For example within the current era of power tennis.
[102] See the graphics within the picture of Andre Agassi within paragraphs ?? of this article. An obvious inflexion point can be noticed within tennis racket head speed in relationship to the x-axis.
[103] Also see the clarifications of the tweener and the tennis service in relationship to Roger Federer within the appendices of this article.

latent incoming ball trajectory shape till the intersection point with the perceptual image of the outgoing ball trajectory shape. Within the previous chapters it is extensively explained that the *tau*-value is the effect of the compelling coupling of the perception and the action within an overarching phenomenon. Also within the present set marble run the melon will be situated at the front of the manifest action trajectory shape but will also have to follow the perceptual image of the still latent part of the action trajectory shape that actually sprouts from the manifest part. Accordingly the explanatory model introduces the novum that the actual position of the mouse shapes the precise division in a never acknowledged phenomenon that shows that the perception is glued to the action. So the tip of the pen also marks the exact border between the manifest and the latent part of the action trajectory shape i.c. the letter, word or word part and so the actual position of the marble also marks the exact border within a marble run.
Within those examples you are also clearly able to disguise that a perceptual image of a latent line segment shape will gradually be completed and becomes manifest till the last latent part has vanished c.q. until the latent gap (conform D.N. Lee) approached zero. So the leading *tau*-value of the environmental object within the specific motoric movement action *cat and mouse game* is determined by the linking of the actual position of the melon to a perceptual image of the latent and manifest action trajectory shape belonging to the incoming melon trajectory shape.

d. The visual perception processes in relationship to the *tau*-value of the melon

The explanatory model of the motoric movement action clearly illustrates that we are capable to determine the *tau*-value of an action trajectory shape with various kinds of perception processes. It (again) acknowledges what current science already had discovered in relationship to the visual and auditory perceiving of action trajectory shapes but also in here extends the current theories with a final explanation. Which in this case encompasses the fact that we are not only capable of proprioceptively constructing perceptual images but that we even are capable of experiencing the *tau*-value approaching zero with the help of proprioceptive perception processes. For example within pitch black darkness we are capable to open a lock with a key by first bringing the *not*-key hand to the lock due to which we will be able to construct a perceptual image of a latent action trajectory shape between the tip of the key and that *not*-key hand. Within that perceptual image of an action trajectory we subsequently are capable to move the tip of the key along that shape and proprioceptively perceive how the *tau*-value subsides to zero. You are capable to dispel a nightly mosquito which choose your head as a landing platform by raising your hitting hand first due to which we will be able to construct a perceptual image of a latent action trajectory shape between the hitting hand and the landing spot. Within that perceptual image of an action trajectory we subsequently are capable to move the hitting hand along that shape and also proprioceptively perceive how the *tau*-value subsides to zero. In which, with the help of empiric experiences, you will be able to determine that you even are capable to accelerate the hitting hand first and decelerate it once it approaches the head. Which has the consequence that we actually are capable of dispelling mosquitos due to indeed that accelerating and decelerating capability but maybe even more important that we don't have to hit through our head each time a bug is annoying us. Proprioceptive perception processes allow us to just hit until the outside of our head.
However we are only capable of using proprioceptive perception processes within motoric actions from the animal into the direction of the environment and so not vice versa from a melon within an incoming ball trajectory shape which conversely encompasses a movement of an autonomous environmental object. So the observation of the movement of the mouse within the motoric movement action *cat and mouse game* can definitely not rely on proprioceptive perception processes and can solely be used within perceiving the movement of the cat c.q. the hitting bat within an action trajectory shape of the catch/hitting-technique.
So the only possibilities to observe the movement of the mouse that remain will have to rely on the visual and auditory perception processes. In which, upon empirical knowledge, you are swiftly able to determine that they both could be used within the perceiving of the movement of the melon. However the auditory perception of the *tau*-value provides a much more inferior representation than if the *tau*-value is observed with visual perception processes. In which we also are able to discern that we just have so much more experience in relationship to the latter. You are capable to just auditorily determine a *tau*-value of the melon rolling within the tube but it will provide such a gross perceptual

image of a *tau*-value of the melon that amateur cat and mouse game players just have to rely more on a unsafe guess c.q. a lucky hit.
Under normal circumstances we rather prefer to perceive the *tau*-value visually because that is the most parsimonious, as well most efficient as most effective, way. However within the motoric movement action *cat and mouse game* the melon disappears c.q. leaves our (direct) eyesight for quite some time after the insertion into the tube. The non-transparent tube will prevent the visual organ to register the melon each consecutive time frame and therefor will not enable that visual perception will be able to compare the actual positions P of the melon.
At the end of the tube, very close to the hitting spot, the melon just reappears within our eyesight. Then we will be able to do what we as creatures of habit always want to do. Namely that we want to determine a *tau*-value of the movement of the melon with *direct* (!) vision. In spite of the very clear fact that now very little time is left to determine that *tau*-value. Just a small distance from the end of the tube to the catching/hitting-spot is involved and within the time span (Δt) which the melon will stay within that short distance a player wants to construct a *tau*-value as usual with direct eyesight in an *easy relaxed* (!) manner and in the same manner subsequently want to transfer that direct vision c.q. the attention to the catching/hitting-spot. From where one wants to execute the last part of the catching process of the incoming ball trajectory shape with peripheral vision like we usually do within all catch actions. Or with other words when the direct vision is transferred to the catching/hitting-spot it awaits the last phase of the incoming ball trajectory shape with peripheral vision.
In the upcoming paragraphs it will become clear that the movement of the cat, the hitting with a racket or hitting bat, will also take a certain time span. Due to which one can simply determine that especially in the underlying situations those time spans are at odds with each other and in which it is just simple to understand that if the time span of the mouse remaining in the area from the end of the tube till the hitting area is shorter than the time span it will take the hitting bat to move along its technique trajectory shape then it will become just impossible to hit the mouse ($\Delta t_{mouse} < \Delta t_{cat}$).

e. Adaptorial behaviour of elite players within tennis, cricket and golf in relationship to the visual perception of the *tau*-value of the melon

Within this part of chapter 3 only the movements of the mouse c.q. the melon will be assessed, then within the next part the sole movements of the cat c.q. the hitting bat will be discussed and only at the end of this chapter the tactical adaptorial possibilities in relationship to the motoric movement action *cat and mouse game* as a whole will be explained extensively. However within this paragraph the specific tactical adaptation will yet be clarified which you in general can experience within cricket elite players and more specific be able to experience within elite male tennis players when they have to return a first flat and fast tennis service and in which you are able to remark that those players discovered those adaptations implicitly. This will have to increase the aforementioned novel insights concerning the present perception processes in relationship to the *tau*-value even more.
Within the aforementioned sports and game situations professional players will experience the same time pressure c.q. time constraints which are appointed within the previous paragraph. If they would accompany the incoming ball trajectory shape with direct vision *until the actual* (!) bounce point and only then transfer their direct vision towards the upcoming catch/hitting area then little time would remain to, more or less, accurately determine the *tau*-value of the last part of the incoming ball trajectory shape with peripheral vision. They optimize the essential components within the game situation by the very early anticipation of the direct vision c.q. by keeping the direct vision in front of the action which is already profoundly supported by many scientific data. Elite players indeed want to establish the *precise global* (!) zone in which the ball will bounce with direct vision but if they determined that area they will transfer their direct vision to the *precise global* zone where the hitting phase will have to occur and await there the incoming ball trajectory shape with peripheral vision. In which explicitly must be remarked that the *precise global* bounce point can be established a considerable time span before the actual bounce will occur. In that way they don't actually erase the time span needed for the transfer of the direct vision from the process but by bringing it forward they gain crucial time which is so essential later on. This tactical adaptation will be obligatory to future professional cat and mouse game players as well because this part of the process will always be constrained by the time span involved.

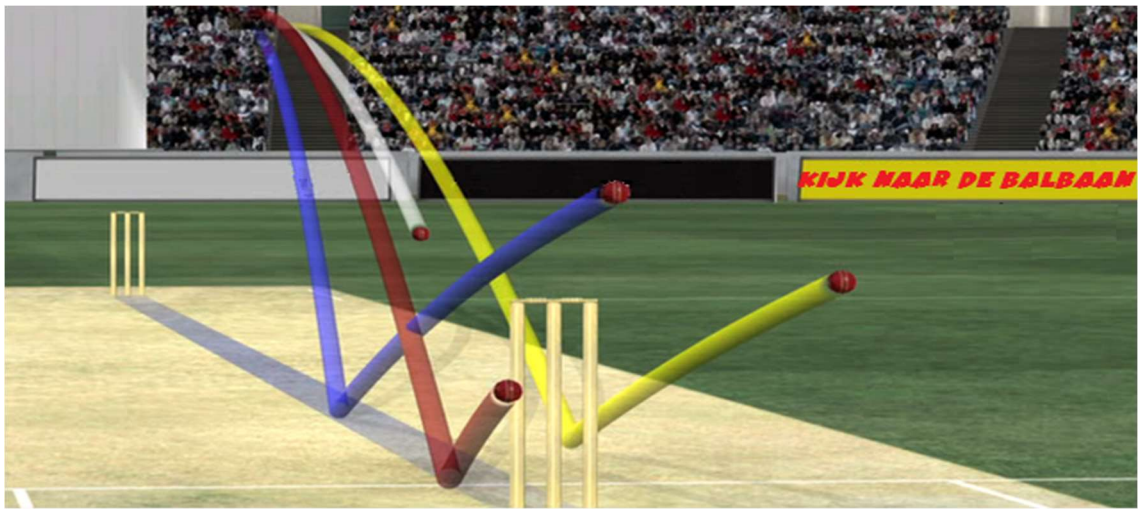

Image: During the initial phase of the incoming ball trajectory a batsman within cricket makes a *precise* perceptual image of the *global* zone where the ball will bounce with the help of direct vision. When the cricket ball within the white ball trajectory shape is at around that actual position an elite player will have gathered sufficient information to establish that *precise global* area. Which is afforded by the fact that at that moment the perceptual image of the manifest part of the ball trajectory shape will only allow a set percentage of deviations in relationship to the perceptual image of that still latent part of the ball trajectory shape and this provides the opportunity to accurately estimate a limited area in which in the near future the ball will touch the ground. The batsman uses this strategy because he wants to gain time within this time pressured game situation. He needs that time to shift his direct vision towards the contact zone of his hitting bat and to point his peripheral vision to the *precise global* zone out of which the incoming cricket ball trajectory shape will (a)rise c.q. to the limited global bouncing zone he just did establish. When the shifts are executed the batsman awaits the ball coming to his hitting bat in which must be emphasized that he is mainly catching and definitely not hitting the ball. The game situation indeed needs that an outgoing ball trajectory shape will be executed but the complexity of the catching within cricket outweighs the throwing process by far and so the compromise within that dualism should shift towards the catching in which it is crucial that you let the ball come to the hitting bat and definitely not the other way around.

As opposed to this very common tactical adaptation within lots of professional players one elite player within golf shows a revolutionary new tactical approach which stuns[104] the complete scientific family till this very moment and which they are not capable to explain at all. To the explanatory model it is all perfectly clear and shows that the observed phenomenon exactly belongs within the current description of this paragraph. Within golf Jordan Spieth remains to keep his direct vision at the hole during the actual execution of the putting[105]. In which science assumes that he then doesn't look at the ball at all. But as aforementioned there also exists something like peripheral vision. Otherwise Jordan will definitely not be capable to putt any ball. So you are able to identify that he executes it different than most players but in short you could say that he monitors the opposite. Most pro players will point their direct vision at the ball and the initial phase of the outgoing ball trajectory shape and they will point their peripheral vision at the hole. Spieth will aim his direct vision at the hole and he will point his peripheral vision at the ball and the initial phase of the outgoing ball trajectory shape. So after all it is not that earth-shattering phenomenon like it is introduced within the movement sciences at this moment. It just opens a new tactical approach within the motoric movement action *cat and mouse*

[104] Especially see the reports concerning *ball focussed aiming* (BFA) and *target focussed aiming* (TFA).
[105] Within the motoric movement action *golf putting* the explanatory model clarifies that every professional golf player must have perceived and tactically weighed lots of possible action trajectory shapes right before the actual execution starts. Or within other words the actual putting is only finalizing previous perception processes.

game. So until the melon will be hit a player could maintain to keep his direct vision at the end of the tube and could maintain to constantly point his peripheral vision at the catch/hitting area[106].

3. The cat c.q. the movements of the cat

a. Introduction

Out of the fact that within the previous paragraphs and chapters the focus first of all encompasses the movements of the mouse and within there are elaborated so extensively you might get the idea that the movements of the cat c.q. the hitting bat are less important. This must be refuted and contradicted in the harshest way possible. The movements of the mouse are so prominently discussed within the previous paragraphs and chapters to just move all misconceptions out of the way in relationship to the fact that hitting sports are conversely mainly assessed out of the movements of the cat due to the fact that nobody was ever able to grasp the autonomy of the movements of the mouse. The awareness needs to arise that an environmental object at all times remains autonomous, that we are only capable of actually influencing it during one sole touching moment c.q. one single touching phase and that all perception processes in relationship to the movement of the mouse need to be perceived out of the perspective of the mouse. However the movements of the cat are essential as well and that is fully absorbed within the explanatory model. Hence the explanatory model acknowledges the movements of the cat as a full-fledged autonomous motoric movement action.
Within the previous texts it is extensively illustrated that all pixels within every vista/environment will always at least provide a latent catch action. Our intrinsic always active visual organ will always compare the places P of each pixel with each other within our visual perception and thereupon will experience that either a pixel remains c.q. *moves* (!) at the same position or that it shows actual movement c.q. is caught within a line segment shape. In any way it always provides an autonomous perception-action coupling of the environmental object towards the animal which is characterized by the fact that it predominantly can be visually perceived. As opposed to the latter the explanatory model considers all motoric actions which conversely are executed from the animal towards the environment as throwing actions and those actions are related to a completely different perception-action coupling which conversely to the movements of the mouse can be perceived proprioceptively. Within this article the movements of the mouse are just emphasized that much because they are so significantly present within ball sports. Within most motoric movement actions the environmental object doesn't move within our perception processes and that can experienced within for example the grasping of a coffee cup, eating, writing or the free throw in basketball. Because the environment doesn't move within those motoric actions c.q. because our perception processes don't perceive movement as such within those actions it is logical that we focus much more on the throwing process as related to the animal. This throwing indeed is already complex enough but it needs to become clear in here that the catching process is also a necessary and complex process but doesn't take away any of the complexity of the throwing. The movement of a hitting bat along an action trajectory shape is in itself already a very complex task. In this article it will be partly addressed because it has been assessed more extensively within other articles[107]. In here only the most important novae within the explanatory model will be appointed that perfectly clear shows we are only capable of visually perceiving the movement of a hitting bat along an action trajectory shape within one complex subsystem and just are capable to proprioceptively perceive the execution of that movement within another complex subsystem. Like we are capable of visually processing c.q. adjusting the movements of the mouse within the catch action due to the help of the cortical streams we also will have to process c.q. adjust the movements of the cat with the help of the same cortical streams. The only major difference in here encompasses the fact that the latter can entirely be processed in a proprioceptive way which current

[106] Till now this possible tactical adaptation seems rather trivial but maybe some players could enormously benefit from it. In any case it needs to become crystal clear in here that this game situation will always be constrained in time and that the transfer of the focus of the direct vision will have the consequence that it will take some crucial time to again observe the *tau*-value in a proper way.
[107] More extensive descriptions can be found within for example the solitary motoric movement actions *writing*, *grasping*, *letter posting* etc..

scientific research already indicates. Ergo the conclusion of the explanatory model encompasses within for example tennis that we aren't capable of directly influencing the line segment shape of the outgoing ball trajectory but much more important that we even aren't capable of directly influencing the line segment shape of the movement of the tennis racket head either. Which leads to the logical conclusion that the observation of the two aforementioned line segment shapes can only be perceived as optimization processes. In which the essence of the task sprouting from the egocentric formulated will in the end revolve around the establishing of one physical intersection point of the two aforementioned line segment shapes that will have to take care of the fact that finally one touching moment c.q. one touching phase will actually occur.
If one would assess the complete catching/hitting technique in relationship to the motoric movement action *cat and mouse game* then the present explanation would become much longer. Therefor within this article it will be addressed briefly[108]. Conform baseball, cricket, softball etc. the practitioners of the motoric movement action *cat and mouse game* show a similar basic feet position in which they either prefer to position their right or left shoulder towards the tube. Although it is completely neglected within current science the explanatory model shows within for example the motoric movement action *letter posting* that the determining of the feet position encompasses much more a transfer in between two phases. Namely between the phase of moving the lifeless letter with mainly leg action and the phase of moving the lifeless letter with mainly arm action. In which becomes clear that we *beforehand* (!) will have to possess cognitive knowledge concerning the required distance we will have to bridge between the letter and the slit and this combined with cognitive knowledge in relationship to the fact that we beforehand must be aware of the fact within which fluctuation borders of our arm action c.q. length we are able to comfortably post the letter. So cognitive knowledge must be present in order that we are easily capable of maneuvering the letter to the slit of the mailbox from a set feet position. So the latter needs also be considered within the determination of the position of the feet within the motoric movement action *cat and mouse game.* Which will have to lead to the only possible conclusion that we possess cognitive knowledge that a certain feet position will provide the possibility to amply cover the hitting zone within the movements of the hitting bat.

Image: It is very obvious that we mainly approach the motoric movement action *cat and mouse game* out of the hitting, the notably visible action, and not out of the catching c.q. the touching process. As long as you are not aware of the upcoming optimal strategies everybody will mainly miss (!) the melon completely when they try to move the hitting bat in an exact perpendicular way downwards. Which will lead to the conclusion that pictures like this one can only be produced when the melon lies perfectly still at a scaffold.

b. <u>The egocentric formulated will in relationship to the movements of the hitting bat</u>

[108] Conform for example a complete tennis service the explanatory model illustrates that also within the motoric movement action *cat and mouse game* the whole technique of the hitting needs to be addressed as *one whole structure* (!) c.q. *one whole constellation of movements* (!) towards *one* (!) outgoing ball trajectory shape. With that observation the explanatory model introduces the term *unity model*. Besides this observation the explanatory model shows that in general the technique is based upon three autonomous complex subsystems. Longer descriptions and approaches in relationship to the technique can be found within "Watch The Ball Trajectory!" and addendum 1 and 2 of *Caught In A Line*.

Within chapter 2 the misconceptions concerning the egocentric formulated will in relationship to ball sports in general are elucidated and it explains that this term has been addressed just marginally till now. Science solely regards the motoric movement action *cat and mouse game* as a hitting sport. One still isn't capable or incapable to recognize that the leading *tau*-value within a motoric movement action will be produced by the movement of the environmental object within its action trajectory shape. Which accordingly cause their mindsets to remain at such a remote distance that they also are not capable to understand that the shape of the incoming ball trajectory and the shape of the outgoing ball trajectory are strictly divided by one exact actual touching moment c.q. touching phase. Or with other words you are only capable of influencing the direction of an environmental object if you actually secure that primarily a (haptic) touching moment and subsequently a pushing moment will occur.
Ergo the leading *tau*-value is not produced by the movements of the hitting bat but by the movements of the melon. Which is also very logical because that is the environmental object we want to smash to pieces. Just like within tennis you won't get jury marks (e.g. figure skating, gymnastics etc.) for the execution of the strokes within the motoric movement action *cat and mouse game.* Conversely the goal within tennis encompasses that the tennis ball ends at a certain spot in the court of the opponent and the goal within the motoric movement action *cat and mouse game* encompasses that the melon collapses due to a forcing pushing action against the subsurface within the hitting area. So it is not important at all how fancy you hit but how effective and efficient you hit and that encompasses that you first try to touch the melon and subsequently push it to pulp/squash.
So within the egocentric formulated will a player will indeed move a hitting bat along an action trajectory shape but only as a following c.q. dependent consequence of another completely autonomous leading phenomenon. Which latter we are solely capable to observe with visual perception processes and within that phenomenon we have to optimize the catch/hitting shape of the hitting bat if either the catching or the hitting/pushing dominates.

c. Optimization of the shape of the action trajectory of the hitting bat

If one would start to understand that the egocentric formulated will should much more contain the aforementioned aspects then very soon one would be able to grasp that the common approach of batters in relationship to the motoric movement action *cat and mouse game* don't show any notion of those aspects at all. So if again we prematurely discuss possible tactical adaptations which elite players show within for example cricket or tennis than on empirical grounds one will simply be able to identify that every batter within the motoric movement action *cat and mouse game* lifts up the hitting bat straight up vertically and subsequently brings it down perpendicularly c.q. in the exact way it moved upwards. Within which easily can be determined that this approach solely optimizes the pressing/pushing process and which absolutely denies the fact that you will have to touch the melon first in order to subsequently push it later on. Due to the fact that within the latter the line segment shape of the incoming melon trajectory and the line segment shape of the hitting bat will only provide one exact perpendicular intersection point you will very easily be capable to draw the conclusion that the obligatory touching process will have to occur at one very specific point[109]. Due to which empirically can be witnessed that lots of practitioners of the cat and mouse game indeed are capable of executing massive hits but *completely miss* (!) the melon by miles c.q. are not capable to create any touching moment within indeed the most optimal pushing process. In relationship to the egocentric formulated will it would tactically be much smarter if a shape of an action trajectory of the hitting bat was suggested that would be able to provide many more intersection points between the line segment shape of the incoming melon and the line segment shape of the hitting bat. That would implicitly be harmful to the pushing/pressing process but the chance of touching, as a consequence of the compelling previous catch process, will be increased accordingly. Like it is extensively explained within chapter 2 the catching of any moving object is optimized maximally by a catching movement

[109] Notice that this phenomenon also occurs when a tennis player needs to smash a lob which falls high out of the sky. Then the line segment shapes of the incoming ball trajectory and the tennis racket head also provide just one very specific intersection point. Even Roger Federer regularly mishits within to those game situations.

that is exactly in the opposite direction and so the horizontal incoming melon trajectory would be best approached with a horizontal catching movement of the hitting bat if the only goal encompassed the touching of the melon. But besides the touching of the melon it also needs to be pressed against the table and so a compromise needs to be found within the touching and the pressing process and if we would respect this catch dualism then one need to look for a technique in which both processes are optimized. It is possible that more catching/pushing techniques of the hitting bat would lead to optimization. Only one of those techniques will be explained in here.

Image: A new moon shows its characteristic shape. If we suppose that the opening of the tube is situated at the left side of this picture it resembles the shape how the hitting bat should move within the execution of the motoric movement action *cat and mouse game* if a player wants to optimize the catching as well as the pressing/pushing action.

If we suppose that the hitting bat was obliged to start right above the hitting area then players shouldn't bring it perpendicularly straight down but they must bring it down in a shape of approximately one third of a circle[110] (a new moon shape) with the open side of the circle towards the opening of the tube. The longer line within the *line* segment shape would be able to produce more kinetic energy but especially the shape of the end of that line of the movement of the cat will much more horizontally approach the hitting area due to which many more intersection points in relationship to the line segment shape of the mouse will become available c.q. be generated. So within the last part of the hitting phase a player should endeavour to create an as horizontal as possible action trajectory shape of the hitting bat while it still must be able to, vertically, crush the melon between the bat and the table.

d. The *tau-value* of the hitting bat

Just like within the aforementioned paragraphs concerning the movements of the mouse the relevant part of the hitting bat, that actually will come in contact with the melon, also fills a perceptual image of a catch/hit action trajectory shape and within our perception processes that part of the hitting bat also marks the exact division between the manifest and latent part of that perceptual image. Within the previous chapter it is extensively elucidated that Federer, like Andre Agassi, hits tennis balls out of a set basis of relevant tennis hitting techniques which he practiced for many long years. Those specific techniques all host set shapes and those anchored/ingrained perceptual images allow him to exactly guide the tennis racket head within the relevant action trajectory shape dependent on the forever deviating factor of how the tennis ball will fill its own autonomous ball trajectory shape c.q. the incoming ball trajectory shape.
So due to this understanding the novum is revealed that within one action two separate autonomous perception-action couplings need to occur. In which additionally the novum is disclosed that they compellingly need to be linked. Which again shows that it all is many times more complex than anyone ever assumed and at first notice it all seems too complex. Which would lead to the premature

[110] A shape like this:)

conclusion that mere mortals would absolutely not be capable of executing this all. However the explanatory model stringently refutes this seemingly correct observation. It shows that indeed it is all very complex but clarifies that it can stay within the borders of our human capabilities due to the fact that those two autonomous phenomena can be reduced to two very simple to be observed entities.
The previous chapters and paragraphs show crystal clear that the *tau*-value within the primary focus is determined by how the mouse c.q. the ball/melon fills the perceptual image of the latent incoming mouse trajectory shape until the intersection point of the perceptual image of the outgoing mouse trajectory shape. Conform this fact the *tau*-value within the secondary focus is determined by how the cat c.q. the hitting bat/tennis racket head fills the perceptual image of the latent catch/hit action trajectory shape of the cat until the intersection point with the perceptual image of the latent incoming mouse trajectory shape. In the previous paragraphs it is extensively explained that the *tau*-value is the consequence of the compelling coupling of the action to the perception within an overarching phenomenon. Also within the current set marble run the actual place P of the hitting bat will be the very front of the manifest part of the perceptual image of the action trajectory shape c.q. the place P(0) but is also obligatory to follow the perceptual image of the still latent part of that action trajectory shape. Hence the explanatory model provides the novum that the actual position of the cat marks the *exact division* (!) within a not ever acknowledged phenomenon that shows that the action *is always* (!) compellingly coupled to the perception. Conform this fact a tip of a pen always marks the exact division between the manifest and latent part of an action trajectory shape i.c. a letter, word or word part and so also the actual position of the marble always marks the exact division within a marble run. Within those examples it is obvious that a perceptual image of a latent line segment shape is filled and becomes manifest until the latent part has disappeared completely c.q. until the latent gap (conform D.N. Lee) has actually become zero. So the leading *tau*-value of the environmental object within the specific motoric movement action *cat and mouse game* is determined how the actual place of the melon is coupled to the manifest and latent action trajectory shape in relationship to the incoming melon trajectory shape and the dependent *tau*-value of the hitting bat is determined how the actual place of the hitting bat is coupled to the manifest and latent action trajectory shape in relationship to the action trajectory shape belonging to the hitting technique.

e. <u>The proprioceptive perception of the *tau*-value of the hitting bat</u>

The huge difficulty within this paragraph encompasses the fact that science still fully presumes that everyone is executing a motoric action in the exact same way with an identical set of perception processes. Conversely the explanatory model shows that several kinds of different strategies are at our disposal. It for example shows that within pitch black darkness we are also very well capable of posting letters with the sole help of proprioceptive perception processes and that the patient D.F. uses a comparing method[111] due to which she will never have to cognitively know beforehand in which direction the slit of the mailbox is pointing. When she executes the final phase of the letter posting action and with direct vision observes the letter and the slit within one visual image she just simply aligns the shapes of the letter and the slit. She only needs to possess cognitive knowledge that letters and slits need to be aligned c.q. that transverse inserted letters don't reach their destination properly. In spite of the fact that the explanatory model within there elucidates that you are capable to distinguish more superior or more inferior strategies the novum is revealed that not one single road leads to Rome but even many roads. Within common practice one is able to discover a huge number of hybrid forms of perception processes and that forms a huge obstacle for the clarification of the explanatory model together with the explanation within this paragraph.
So within lots of daily motoric actions in which no actual moving environmental object is present c.q. in which the environmental object remains static in relationship to our own position we are *also* (!) able to visually perceive the *tau*-value of our own *throwing*-action. So if we want to grasp a still standing coffee cup we could also visually perceive how the *tau*-value between the relevant fingertips and the cup narrows down to zero. In which need to become crystal clear that we could do that but that we are not obliged to do that. However within the present action that is absolutely no option. The

[111] See: <u>How does the patient D.F. post a letter? -The motoric movement action letter posting - The explanatory model of all motoric movement actions</u>

visual perception within the motoric movement action *cat and mouse game* has to be exclusively occupied with the determination of the *tau*-value of the *moving* (!) mouse. So in those kind of actions the movement of the cat can solely be determined with proprioceptive perception processes.
The scientific research in relationship to the proprioceptive perception already discovered that it can be divided in two main groups. It can be split up in proprioceptive perception in relationship to 1. *movement* and proprioceptive perception in relationship to 2. *limb position*. A very important discovered classification within science. However the related researchers are absolutely not competent to come forward with any cogently functional explanation[112]. Conversely the explanatory model does. It exactly shows how the two kinds of proprioceptive perception processes find refuge within the two complex subsystems which both simultaneously are crucial within an overarching phenomenon.
Within the proprioceptive perception c.q. within your hitting technique you will have to observe two matters simultaneously. First you will have to perceive the *movement* (!) of the specific part of the hitting bat that will touch the melon within the whole action trajectory shape of the catch/hit action because this movement will provide the actual *tau*-value of the hitting bat. However due to the fact that the latter movement can only be observed indirectly and only indirectly can be executed motorically the attention will also have to be pointed at the hitting technique which you only are able to deliver with your whole body c.q. the hitting technique which you are solely capable to provide due to other body parts than the specific aforementioned part of the hitting bat. Hence this latter part provides the explication that proprioceptive perception processes need to be pointed at the limb position which you obligatory need within your catching/hitting technique to actually move the specific part or the hitting bat that will touch the melon. So during the *movement* of the hitting bat the proprioceptive perception in relationship to *limb position* will have to point its focus towards the proprioceptive perception towards the *movement*. Now you are capable to understand that a triad of perception processes occurs. The perception processes in relationship to the movements of the mouse are dominant c.q. leading and need to be followed with perception processes belonging to the *movement* of the hitting bat within the hitting shape and the latter will on its own have to be leading towards the perception processes in relationship to the *limb position*.
So completely aside from the movements of the mouse only with the clarification of the movements of the cat the explanatory model provides a pretty complex phenomenon in which already multiple different observations are demanded and so within an ecological approach this complexity of the perception processes in relationship to the cat already shapes a very weak argument. Which normally would have led to the rejection of the explanatory model because seemingly it is all a little bit too complex. Conversely the explanatory model shows that it all, as well the perception processes in relationship to the movements of the mouse as the perception processes in relationship to the movements of the cat, can be validated because all required complex perception processes can be cut down to phenomena which can be perceived in the simplest way possible.
On logical ground the explanatory model elucidates that the cortical streams will have to process the movements of the melon within an incoming ball trajectory shape with the help of a double and mutual system. Within science the cortical streams are considered to play a crucial role and the explanatory model mainly connects the ventral stream to the processing of all perceptions in relationship to the incoming melon trajectory shape but with the clear distinction that the actual position of the melon is also observed and vice versa the explanatory model mainly connects the dorsal stream to the processing of all perceptions in relationship to the actual position of the melon but with the clear distinction that the incoming melon trajectory shape is also observed. With this clarification the perception-action coupling becomes crystal clear as well and it provides the possibility to cut the movements of the mouse down to the simplest to be perceived one-dimensional shape. Then you solely need to observe how within the *line* (!) of the (action trajectory) line segment shape the movements of the mouse fill in the latent part of that line and within there you only need to perceive how the gap, between the manifest and the latent part within the perceptual image, within that line approaches zero without ever having to consider the involved shape. In the exact same way the movements of the hitting bat need to be perceived. In which on the same logical grounds you will

[112] Also in retrospective it will become apparent that no matter how many physiological data you will acquire you will never be able to arrive at any functional c.q. behavioural explanation. There are just too many complex elements involved.

come to the same conclusion that solely due to the processing processes of the perception the same perception-action coupling will be able to occur. Which then also will lead to the fact that also the movements of the cat can be observed in the simplest to be perceived one-dimensional shape. Only then you are able to come to the conclusion that due to the same double and mutual system we are also able to cut the movement of the hitting bat down to the same one-dimensional form like we execute in relationship to the mouse. Because only with the help of *two simple lines* (!) we are capable to construct a perceptual image of a *successful* (!) intersection point between the mouse and the cat.

4. Optimal tactical strategy

Within this article the motoric movement action *cat and mouse game* is elucidated. It serves as illustration of all motoric movement actions because in regard to the involved motoric and perception processes really all imaginable motoric actions have to follow the complete explanatory model in a consequent universal manner. This provides the possibility to fully reveal the complexity of the motoric action as a whole and to fully classify all various elements/components in relationship to their relative complexity. Due to the latter every motoric movement action can be ranked in relationship to their complexity within the whole spectrum of comparable motoric actions and due to this complete insight within all actions the most optimal tactical strategy[113] can be determined as well.
The motoric movement action *cat and mouse game* comprehends a clear catch action as part of a clear marble run[114]. It serves as basic model for all catch and throw tasks which we are capable to execute and provides an ending description of all required functional motoric and perception processes. Within the whole spectrum of marble runs you are very well capable of determining yourself that the line segment shape of the incoming ball trajectory within the motoric movement action *cat and mouse game* encompasses one of the simplest marble runs and if in addition the tube or the marble run would have been open or transparent then it probably wouldn't have obtained an individual commentary. But the essence of this all is exactly situated in there. While it just encompasses one of the simplest straight marble runs the tube belonging to the runway is indeed not-transparent c.q. closed and when you compare this characteristic to a plain *open* marble run it becomes crystal clear that we prefer to determine a *tau*-value of the incoming ball trajectory shape with mainly visual perception processes c.q. shows why the visual perception is superior in determining a *tau*-value within the catch process. If the tube would have been open then we immediately are capable of visually observing the actual position of the melon within (the perceptual image of) the whole latent melon trajectory shape which *almost precisely* is shown by the plain fact that a compelling marble run is so plastically present which the melon unequivocally needs to follow. Then the part of the tube is lengthy enough that we are capable of comfortably determining a *tau*-value of the present gap c.q. that we are capable of comfortably perceiving the closing of the latent melon trajectory shape by the manifest action trajectory and align this with the closing of an action trajectory shape within a throw action of the hitting bat. Within the latter also a *tau*-value will have to approach zero which will have to take care that the melon will be crushed. Due to the fact that the time span involved within the gap of the melon trajectory shape within the catch action is significant larger than the time span required for the closing of the gap of the hitting bat within the throw action the latter will not be pressurized. So if the tube would have been open the throw action of the hitting bat will not be constrained in time. Conversely when a closed tube is involved exactly this process will experience lots of time constraints. A player will be able to auditorily construct a perceptual image of how the melon approaches within the marble run but this is such an inferior tactical strategy that mere mortals will wait to determine a *tau*-value when the melon will become visible the moment it exits the tube. Which now leads to a completely changed situation. The future actual positions P of the melon will hardly differ from the perceptual image of the latent action trajectory shape but the line segment between the end of the tube to the hitting zone, in which a player will have to determine the leading *tau*-value, will appear to be too small. A player will only be able to establish a very inaccurate image of a *tau*-value or will not be able

[113] Due to the aforementioned also a well-defined ending description of a learning progression can be formulated that *automatically* will lead to the most optimal motoric learning model.
[114] The marble run has yet been assessed extensively within the explanatory model and the clarification can be found at many sites.

to establish a *tau*-value at all. Although it is even more important to remark that the time span in which the melon fills the perceptual image of the small distance within the incoming melon trajectory shape is much smaller than the time span a player needs to move the hitting bat from a starting position to the hitting zone. In which the time span related to the transfer of the direct vision from the end of the tube towards the hitting zone is even left out of the equation. This all leads to the conclusion that this task stretches the human capacities to the limit and shows that this task can only be executed with a very low success percentage.
With the aforementioned the motoric movement action *cat and mouse game* reveals the *tau*-coupling within every imaginable motoric action and due to this uncovers many details. One of the novae encompasses the fact that conversely to common thinking the catch process is pressured within linked catch/throw actions[115]. The leading *tau*-value namely comprises perception processes in relationship to the incoming ball trajectory shape. So this reveals a hardly recognized and hardly acknowledged novum within science and the explanatory model shows with the aforementioned clarification that within combined catch/throw actions one even needs to catch until the moment when the first haptic feedback occurs of the touching of in this case the melon. In which it of course also clarifies that within the catching process attention must be paid to the compellingly linked throwing.
In line with the aforementioned the description of the motoric movement action *cat and mouse game* shows that the direct linked catching and throwing of for example balls within many ball sports actually encompasses two autonomous parts. In which the catch process in relationship to the incoming ball trajectory shape will be optimized with a movement trajectory shape of for example a tennis racket head within tennis, a hitting bat within cricket/baseball etc. that is exactly opposite towards the line of the incoming ball trajectory shape and in which the throwing process in relationship to the construction of the outgoing ball trajectory shape will be optimized with a movement trajectory shape of for example a tennis racket head within tennis, a hitting bat within cricket/baseball etc. that is exactly opposite towards the line of the (initial phase of the[116]) desired outgoing ball trajectory shape. In which the explanatory model accordingly shows that if the line segment shapes within the catching and throwing are not exactly opposite to each other that always a compromise must be perused in order to optimize the complete process. So if we need to hit an approaching (air) balloon we mainly can point our attention to the execution of an outgoing *balloon* trajectory shape but the motoric movement action *cat and mouse game* elucidates quite clearly that within many ball sports hosting a direct game dualism that the catching process needs to prevail because if we are not capable of catching the ball in any way c.q. if we are not capable of touching the ball in any way we certainly will never be able to send/throw it. The motoric movement action *cat and mouse game* is in fact very complex due to the fact that the incoming melon trajectory shape is perpendicular to the outgoing melon trajectory shape. At least that is the common approach in relationship to this specific motoric action and the explanatory model shows that much more superior tactical strategies can be formulated.
Within this chapter two clear visible tactical considerations in relationship to an optimal strategy are appointed which you are able to examine right away within your own empirical experiences. Those considerations will cause a significant higher success percentage within the motoric movement action *cat and mouse game.* One consideration has previously been explained within the visual perception processes in relationship to the movements of the mouse and the adaptorial behaviour of elite players[117] in for example cricket or tennis. Besides the very logic explanation of it all this behaviour can be verified right away with hard data which affiliated scientific research already provided. The other consideration compels the movement of the cat. This can't be checked yet within the behaviour of elite players but the provided explanation[118] in relationship to the adaptation of the shape of the action trajectory of the hitting bat will probably lead to a quick acceptance because you can right away understand that it must be superior by far and will lead to ditto results.

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[115] Sometimes ball sports are called hitting sports. The explanatory model shows that that is a major mistake. Baseball, cricket, tennis etc. are predominantly *catching sports*.
[116] See: The motoric movement action *throwing*.
[117] See: Chapter 3 – paragraph 2.e; Adaptorial behaviour of elite players within tennis, cricket and golf in relationship to the visual perception of the *tau*-value of the melon.
[118] See: Chapter 3 – paragraph 3.c; Optimization of the shape of the action trajectory of the hitting bat.

Besides the two aforementioned considerations the explanatory model of the motoric movement action provides further research possibilities within the task of optimizing tactical strategies. It suggests that the roles of the peripheral and direct vision within the visual perception processes can be reversed. Due to which the explanatory model is able to provide the final clarification in relationship to all the yet found data within the affiliated scientific articles concerning viewing behaviour and subsequently fully elucidates the recent debated phenomenon of *target focussed aiming* (TFA) versus *ball focussed aiming* (BFA).
The explanatory model also indicates that strategies could be optimized by zooming in on the actual contact moment c.q. the contact phase between the mouse and the cat. The movement of for example a tennis racket can be perceived out of the sweetspot of the tennis racket head but can also be observed out of the much more specific *frontside* (!) of that sweetspot which actually will come in touch with the specific outside of the tennis ball.

5. Motoric movement actions encompass optimization processes and therefor always comprise an error rate

The explanatory model of the motoric movement action clarifies that within any imaginable motoric action at least one marble will have to move within one marble run in which the actual position of the marble each time frame will mark the exact division between the manifest and latent part of the present action trajectory shape. The noticing of this phenomenon shows that the actual position of the marble c.q. *the action* (!) can be linked to a perceptual image of an action trajectory shape. In which it accordingly elucidates that solely within the coupling both components acquire a meaning. Or to phrase it much stronger, without each other they don't have any meaning at all. The explanatory model clarifies within there that the movement of the environmental object along its action trajectory shape, the marble within the marble run, is going to fulfil the essence of the task formulated within the egocentric will when the *tau*-value of the latent action trajectory shape will approach zero. The explanatory model as well as current scientific research now assume that this latter process is so essential that a double and mutual set of perception processes is required to observe this *tau*-value approaching zero. On the one hand that set of perception processes needs to observe the actual place of the marble but in close relationship to the action trajectory shape and on the other hand that set of perception processes needs to observe the action trajectory shape but in close relationship to the actual place of the marble. On logical grounds you are not capable to arrive at any other conclusion in here that the processing processes of the perception exactly evolved to this double and mutual task. So the ventral stream mainly processes all perception processes in relationship to the action trajectory shape and the dorsal stream mainly processes all perception processes in relationship to the actual position of the marble. In which they will definitely have to keep a relationship because the very essence of the execution of the task is at stake. The allocation of this task to the cortical streams encompasses a revolutionary insight and encompasses the first functional explanation which in itself is so forcing that any other commentary will become obsolete. It is so forcing because this explanation brings the most ecological arguments to the table. A system in which we are capable to very quickly start with the execution of a motoric action with just a very global perceptual image as a necessity and then are capable to work towards a very precise perceptual image of the action trajectory shape, in which till the last moment deviations can be implemented, can't be beaten on parsimonious grounds. A more efficient or a more effective system can definitely not be devised.
However now the huge problem arises to explain what adverse consequences sprout from the aforementioned conclusions. That is a very difficult challenge because the explanation deviates considerably from current mindsets and one will first need to fathom the essences of this article at the deepest level. So prior to the following clarification the quintessence is provided that you will have to begin to realize that our body has found a system that absolutely has nothing to do with set and/or exactly repeatable processes[119].

[119] Just the mere thought that a body would opt out of this rationale would be a sign of poor realism. The idea to provide all possible actions with separate set processes would be a delusive one. The term *set* is a human interpretation and just doesn't exist within a body.

The system that our body discovered is a system in which only the boundaries of possible deviations is restricted c.q. is narrowed in such a way that motoric actions unfold *equally* (!). That is the *one and only* (!) goal of the body. It is absolutely not parsimonious to post a letter in one exact set way. Conversely it is most parsimonious to first *reduce* (!) the number of places P between the letter and the slit of the mailbox, *in whatever way* (!), and then as an autonomous process to align the two shapes, of the letter and the slit, in the second place. So subsequently it also doesn't matter at all in what exact constellation you remove the *letter*-fingers from the letter during the insertion into the mailbox. The *only* (!) thing important within there is that common appearing deviations are kept between certain fluctuation boundaries and then the action will unfold successful. So for the sake of clarity. You never ever have executed any part of letter posting in the exact same way and besides that you will never ever be able to do it and fortunately that is absolutely not the intent of our body. For years you posted letters and grasped coffee cups successfully. The latter you executed exactly like letter posting. First you reduced the number of places P between the relevant fingertips and the grip of the cup within the motoric movement action *touching* and as soon as those fingertips experienced the first haptic sensation of the grip you immediately transferred to the second compellingly linked motoric movement action *pushing*. Due to the fact that the processing processes of the perception elicited that fewer and fewer places P were present between the fingertips and the grip you were capable of getting closer to the grip in spite of the fact that within each individual grasp action multiple erratic deviations need to be corrected. And you were also never capable of executing the push action of the relevant fingertips within the grasping in the exact same constellation. It is most parsimonious if indeed deviations are allowed but that they are kept between certain values. Then it just doesn't need to be exact c.q. then it never *has* (!) to be exact. Conform the aforementioned basic idea one will have to approach the motoric movement action *cat and mouse game* similarly. The perceiving of the movements of the mouse and the movements of the cat also encompass to control occurring deviations within fluctuation boundaries c.q. to constrain the always occurring deviations within the respective action trajectory shapes. A player will be able to reduce the deviations within the movements of the incoming melon within a rather precise perceptual image of the incoming melon trajectory shape but it won't be 100% precise and a player will also be able to reduce the deviations within the movements of the hitting bat to a rather precise perceptual image of an action trajectory shape of a *hitting technique* but that won't be 100% precise either. So in short if you would implement the proposed tactical adaptations[120] than you will definitely make a lot of progress in relationship to success rates but the error rate will not ever become zero[121].

Of course one could transform the motoric movement action *cat and mouse game* in such a way that the error rate will approach zero. Within the YouTube clip[122] that serves as the main example for this article one could adjust the inclination angle of the tube in order to slow down the velocity of the incoming melon. One could enlarge the distance between the end of the tube and the hitting area. One could use a watermelon in stead of a honeydew melon due to which the diameter ration melon-tube would be reduced. This will cause a huge reduction within the occurring deviations. Subsequently the almost two times bigger watermelon will also significantly increase the chance that it would be hit and the same would occur if you would change the *slim* hitting (baseball) bat into a thicker caveman's club. However what you always will have to understand is that we then probably always will touch the melon but that this unique touching process will never become an identical copy of any previous hit. Which always will have its influence within the compellingly linked pushing process and that as a consequence in some cases the melon will not be crushed or at least that the melons always get crushed differently.

Out of the aforementioned facts that motoric movement actions always encompass optimization processes probably you yourself are now capable to understand that on basis of logical reasoning some

[120] See: Chapter 3-2.e and chapter 3-3.c.

[121] If without tactical adaptations a player will execute the motoric movement action *cat and mouse game* like shown within the YouTube clip the estimated error rate will rise above 70%. Upon implementation of those tactics the error rate will definitely drop below 40%. However within the motoric movement action *cat and mouse game* always an error rate will be a part of reality because the execution of this motoric action stretches our human capacities to the limit. Even an elite *cat and mouse game* player will approximately miss 10% of the incoming melons.

[122] https://www.youtube.com/watch?v=arsBG_QvPm8&t=8s

consequences automatically flow from the term *optimization*. First this means that you will need to perceive a whole action from the beginning to the very last end. Which absolutely doesn't deny the fact that vision within a tea making task can be transferred to a next script-item moments before the previous item has fully been executed. Like it already has been established within scientific research (Hayhoe, Land et al.) and which is easily clarified within the explanatory model. Vision is able to transfer because it isn't needed anymore within the previous item. Within the latter one only needs to finalise the motoric action in which proprioceptive perception processes are suffice because eventual occurring deviations within the action trajectory shape can amply be absorbed within the size of your hand palm. So due to the fact that two foci and two kinds of perception processes are simultaneously involved within the execution of one motoric action one of the two is prematurely capable to transfer to a next script-item but the remaining one, often the proprioceptive perception processes, will definitely have to perceive the action till the final moment. Only then one will be able to completely transfer all perception processes to the next script-item.
Besides the aforementioned within every motoric movement action one will have to peruse the complete process over and over again because deviations will always, *randomly*, be different. Which doesn't mean that for example pro tennis players at some point know everything about the relevant shape of an incoming ball trajectory and as such are very well capable to estimate the relevant fluctuation borders of that actual incoming tennis ball but that player will again and again need to observe that process anew because the process of the ball in relationship to a perceptual image of a latent action trajectory shape will every time be unique.

Appendix A - The Marble Run

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

N.J. Mol
September 2019 ©

The explanatory model of the motoric movement action hosts one universal clarification within all imaginable actions in which with the help of movements *from within the body* a movement of an (movement) action object within an action trajectory shape *on the outside of the body* must be executed. In which already two perspectives within one motoric action can be acknowledged.
Just seldomly those action trajectory shapes become visible. Conversely within the motoric movement actions *writing* and *nerve spiral* a visible action trajectory shape can be perceived and although the marble within the marble run only shows it's actual positions P, ergo doesn't become visible at any other place, an actual shape is present which shows the contours within which the movement of the marble will definitely occur. Due to these contours the marble run is able to show very plastically that within the perception-action coupling one overarching phenomenon will arise c.q. will have to occur in which our perception processes observe the actual position of the marble solely in a compelling relationship with the perceptual image of the whole latent action trajectory shape. Within this phenomenon the actual position of the marble at every place P marks the exact division between the manifest and latent part within the perceptual image of that line segment shape and due to this one is inter alia able to perceive at the most basal level, as one-dimensional as possible, that a manifest line is filling c.q. is closing a latent line. In which the explanatory model shows that any cognitive recognition of any part of the shape of that line can be ignored completely and clarifies that one is able to very simply perceive the *tau*-value becoming zero, as one-dimensional as possible, by just observing the linear closing of the aforementioned gap. Which also presents a very solid ecological argument because it can be linked to the earliest organisms.
Hence the explanatory model shows that two foci are demanded within every motoric movement action which already could be concluded out of the aforementioned opening sentence. The novum in here encompasses the fact that one focus always must be pointed to the (movement) action object i.c. the marble but in which it is even more important to notice that this part solely can and must be perceived out of the perspective of the marble and that the other part solely can and must be perceived out of the perspective of the body (towards the marble). Which within the movement sciences logically should have led to the conclusion that one action always encompasses two foci because the two perspectives, which belong to two irreconcilable worlds, can never be combined. In which the shocking character of this revelation is based within the fact that science was never capable to acknowledge that the successful execution of one motoric movement action demands the execution of two separate autonomous parts out of two completely different perspectives.

1. Introduction to the marble run

a. The explanatory model in relationship to the marble run

At a microlevel the clarification within this epistle has the sole goal to reveal all functional perception and motoric processes in relationship to the marble run. However at a macrolevel the main goal remains to communicate the complete explanatory model of all motoric movement actions. The explanatory model namely encompasses the complete and final description of all functional perception and motoric processes within all imaginable motoric actions. The problem however is situated in the fact that the final explanation of the explanatory model is situated at quite a remote distance from the current mindset within the movement sciences. Multiple significant mind steps are demanded which in a compelling way need to be regarded in their complex relations with each other before the final insight which the explanatory model provides us can be obtained. All readers at all levels will have to take this barrier and although the specialists within this field of science already possess much knowledge about certain single components it is expected that especially they will have great trouble to obtain the quintessence of the explanatory model because they persevere c.q. are taken hostage within some dogmas/premises which pertinent will appear to be false. This perseverance on the one hand and on the other hand the aforementioned demand for multiple mind steps within a complex dynamics system almost shapes an impossible barrier to overcome and needs to be bridged in a very structural and meticulous manner.

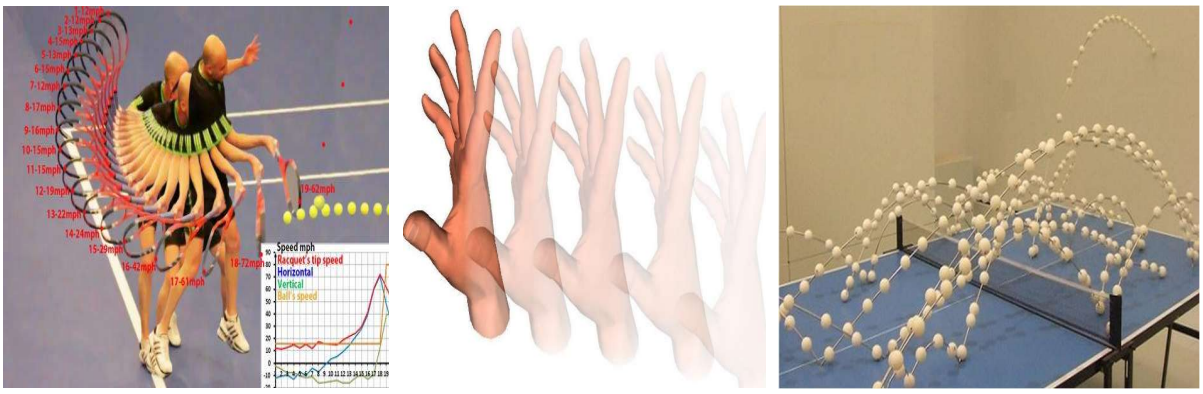
Images: A marble run seems to encompass a rather unique phenomenon. However within every imaginable motoric movement action a marble run is hidden. Daily you execute many actions in which one is able to more or less acknowledge a marble run.

One of the many complex mind twists encompasses the breakthrough within the perception-action coupling theory. Till now science became more and more aware that perception and action are linked but never were able to understand the exact origin of this relationship because they were never able to acknowledge the fact that we construct perceptual images of action trajectory shapes. The marble run plastically demonstrates how the marble-marble run relationship expresses the perception-action coupling within all imaginable motoric movement actions.

b. The motoric movement action *marble run* versus the marble run

Within this article the marble run is outlined and not the motoric movement action *marble run*. If one wants to execute the motoric movement action *marble run* one first needs to throw a marble in the entry position of the marble run which beholds such a simple action which besides that completely precedes the journey of the marble. Therefor it has been decided to leave this part out which also provides extra attention towards the autonomous process of the movement of the marble. Now it will become crystal clear that this part solely encompasses the marble in which only the marble will complete the essence of the task within the egocentric formulated will, that ergo all perception processes within this part of the action must be observed out of the perspective of the marble and that it beholds a complete autonomous process within a complete autonomous complex subsystem.

If the motoric movement action *marble run* was appointed in here one would also be restrained by the fact that this action shows an obvious throwing action and although this is also the exact goal because the marble run stands model for all throwing actions it much more than that wants to emphasize that it also stands model for all catch actions because with sec the marble run one is able to envision every incoming object trajectory which we at a predetermined position deliberately want to catch or deliberately want to (not-)catch c.q. avoid (fleeing)[123]. This will be clarified within this article within for example the commonalities between the marble run and an incoming tennis ball trajectory shape.



Images: Within most actions the filling of a latent action trajectory shape by a manifest line segment shape doesn't become visible at all. Then the only thing which can be perceived visually is the actual position of the (movement) action object. Still all consecutive places P of the sweetspot of a tennis racket always become part of an action trajectory shape within the motoric movement action *hitting/touching etc.*, all consecutive places P of the relevant fingertips always become part of an action trajectory shape within the motoric movement action *grasping* and all consecutive places P of a ping pong ball always become part of an action trajectory shape within the motoric movement action *catching*. Hence always a marble-marble run (line segment shape) relationship will become manifest in which the perception-action coupling will take place.

c. <u>The marble run represents the movement action (MA) within every imaginable motoric movement action</u>

It is likely that you are aware of the existence of marble runs and are familiar with how they operate. However it is also very likely that in relationship to the marble run you will remark that it encompasses a rather exclusive and specific phenomenon which therefor isn't capable to lead to general scientific conclusions. With this article the explanatory model will demonstrate the opposite and will conclude that a marble-marble run relationship is present within every imaginable motoric movement action.

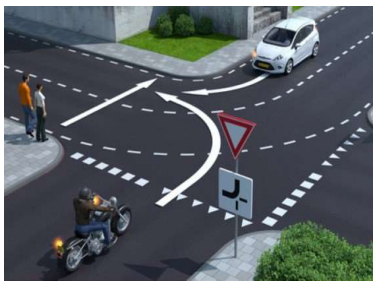
Images: Action trajectory shapes hardly ever become visible. Within the motoric movement action *writing* the tip of the pen represents the marble and the marble run is represented by the line segment

[123] See: The motoric movement action *catching/not-catching/avoiding/fleeing etc.*.

shape of a whole letter, word or word part. Within the motoric movement action *flying*, an obvious example of the motoric movement action *moving A-B*, the pilot will hopefully always overlook how especially the latent part of the action trajectory shape will be constructed. By the way within any motoric movement action *moving A-B* it is characteristic that the movement of the marble within the marble run will be perceived from within the marble.

Within the marble-marble run relationship the explanatory model shows that the single, the sole, components hardly have any meaning by themselves but that conversely the two together within an overarching phenomenon show how within every motoric action the perception needs to be linked to the action. With which 1. the explanatory model ends the whole perception-action dichotomy, 2. shows that one part of any action solely must be observed out of the perspective of the action object, 3. that solely this part executes the essence of the task formulated within the egocentric will, 4. that it definitely encompasses an optimization process and 5. that this part solely can be achieved due to the double c.q. mutual cooperation of the ventral and dorsal stream.
The explanatory model has already been assessed within many specific motoric movement actions which already have been published. In the exact same universal way you will be confronted with the marble-marble run coupling within all those explanations and that is why it will not be discussed in here any further. However due to the fact that the motoric movement action *traffic* isn't appointed thoroughly yet and due to the fact that a single driving lane shows such a striking similarity with a marble run it is shortly addressed within this article. Within daily road traffic we are confronted with the sole two main kinds of motoric movement actions. I.c. the motoric movement action *catching* and the motoric movement action *throwing*. The throwing of ourselves within our own action trajectory shape and the catching (read: *not*-catching (!)) of the other traffic participants within their own autonomous action trajectory shapes containing their own perception-action coupling perception processes.





The motoric movement action *traffic*

We don't really execute actual catch actions a lot. However the motoric movement action *not-catching* we conversely do experience and execute countless times within for example daily road traffic[124]. Within there you will have to determine all, *relevant* (?!)[125], action trajectory shapes of all traffic participants and within there all linked *tau*-values. In no other way you will be able to plan the void of your own latent action trajectory shape as opposed to the voids within the action trajectory shapes of the other traffic participants. Ergo you create a perceptual image of the latent action trajectory shape of every traffic participant and fill that with a perceptual image of the

[124] As a bycatch I want to remark in here that if you are willing to study the motoric movement action *catching* and especially the overlap within the not-catching you are able to conclude that very hopeful entries/solutions become available towards the latent parts within the *Neuron Mirror Imaging* research.
[125] In the following parts of this discourse it will appear to be that you will have to include all traffic participants within the tactical movement action (MA) because only then it will become apparent which latent parts of which latent action trajectory shapes will become relevant for you.

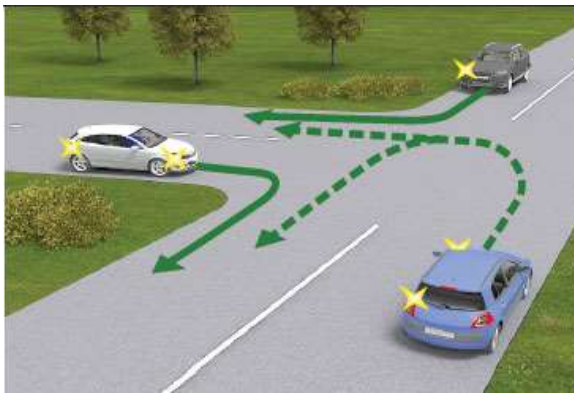
manifest part of it[126]. With your cognitive knowledge as the basis that will enable you to construct *tau*-values which provides you the possibility to construct intersection points between your and their action trajectory shapes and that within gross margins will allow you, in case you are a secure traffic participant and hardly take any risk, to cognitively determine if you will be able to create your own planned action trajectory shape in time[127].
If you want to cross a street as a pedestrian and you approach a cross road in which you have to give the right of way to the other traffic participants then you will handle the situation like this. If you notice a power wheelchair at a considerable distance of the crossing then you probably perceive at that moment that this participant is filling its latent action trajectory shape out of a perceptual image of the manifest shape in such a slow way that you will be able to very easily create the *tau*-value within your own action trajectory shape long before the wheelchair even will come close to the crossing. For the sake of correctness I have to remark in here that you don't determine any time frame in this situation but you perceive that the *tau*-value within the action trajectory of the wheelchair is approaching zero in such a slow tempo that you know for sure, based on your cognitive knowledge, that you are able to let your own *tau*-value approach zero much faster. Of course that is different when a Ferrari is involved. Although it is located at the exact same remote distance as the power wheelchair was positioned you as the secure traffic participant will now not be able to establish with certainty how the Ferrari will shape its *tau*-value[128]. Just like with the wheelchair you shape a latent action trajectory shape out of the actual place of the Ferrari till the intersection point with your own latent action trajectory shape and you now also want to establish the relevant *tau*-values. Or in fact you now also perceive with which speed the *empty* (!) space within a latent line segment shape will be filled and you judge with a security margin if you will be able to fill the empty space of your own line segment shape before the Ferrari will complete its action trajectory shape. If you (cognitively) judge that both *tau*-values show a definite intersection point in the form of a collision point then you decide to let the Ferrari pass first.

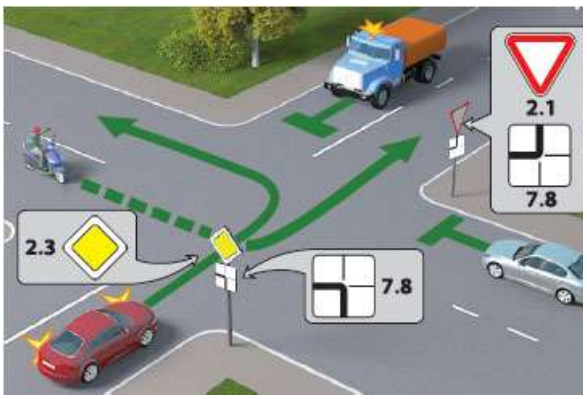
1. <u>The *tau*-coupling within the motoric movement action *traffic*</u>[129]

Within ordinary daily motoric actions at home we consider action trajectory shapes of moving objects/subjects like we assess action trajectories in daily road traffic[130] outdoors. Within there it is important to understand that the functional *tau*-coupling within the timing of a motoric movement action within traffic is based within a whole motoric action of one traffic participant itself[131]. Each

[126] Just like we logically aren't able to actually perceive the latent part of the action trajectory shape we also aren't able to actually see the manifest part of the action trajectory shape. Within there we will also have to rely on a perceptual image out of the actual place of the (movement) action object (MA) in relationship to previous places P (P(-1), P(-2), P(-3) etc.).
[127] Time is actually the very wrong word. We perceive this traffic situation in relative space.
[128] Besides the universal differences between a Ferrari and a powered wheelchair I also need to remark in here that we possess cognitive knowledge concerning the fluctuation boarders of lots of (movement) action objects (MA). The velocity of an action object is definitely a part of the action trajectory shape and so the much wider acceleration possibilities within the Ferrari cause that we have to reckon with much wider fluctuation boarders within the creation of the relevant *tau*-value.
[129] Excerpt from *Caught In A Line*; addendum 2; p.26.
[130] Remark the commonalities between the marble within the marble run (opening addendum 2 of *Caught In A Line*) and the car within its lane. Although the choice for an example like the marble run at first looks *weird* as well it is exactly this phenomenon which we experience in every motoric movement action and definitely within how we arranged to move from A to B.
[131] Within short notice I definitely will have to reappoint this more profoundly. Your own action trajectory shape relates to a *throwing*-action with an autonomous *tau*-coupling. The action trajectory shapes of the other traffic participants conversely need to be caught with the intention to actually not get them into your hands. Hence the *tau*-values of those participants must definitely be determined but they are not allowed to provide intersection points with our own *throwing*-action just like is the case within tennis for example. Traffic must be regarded much more as juggling a x-number of balls in a cascade. Within juggling one also needs to actively catch and specifically use the voids of the moving balls to launch the relevant ball in its ball trajectory shape once more.

vehicle in the accompanying images below is occupied with its own autonomous motoric movement action and within there with its own *tau*-coupling.
Each vehicle from bike to car is characterized by the fact that the action trajectory is created by its own (movement) action object (MA) which only can be influenced by a set intermediary constellation[132]. The transition point within for example driving a car out of the perspective of the legs is therefore situated between 1. the outside and the bottom of the sole of the shoe which will touch the relevant pedals and 2. the outside of the pedal that will be touched by the shoe.
The line segment over which, the transition point of, the specific pedal can be moved determines the *tau*-value of the motoric movement ($tau^{G}{}_{MM}$). Just like within most other motoric movement actions we don't have to perceive this *tau*-value with direct vision. Certainly within driving a car we perceive this in a proprioceptive way. Just like within most other motoric movement actions we do have to perceive the *tau*-value of our action trajectory ($tau^{G}{}_{MA}$) with direct vision. So if we suddenly have to queue behind another car the distance of the line segment shape between our car and the car in front of us determines, the gap or the latent action trajectory shape. When we observe the closing of this gap we are able to determine the leading *tau*-value of the movement action ($tau^{G}{}_{MA}$). The *tau*-value of the motoric movement ($tau^{G}{}_{MM}$) will have to follow the leading *tau*-value within the execution of one specific motoric movement action with one vehicle. Or with other words the brake pedal foot will need to put pressure in such a way to the pedal that it will correspond with the possibilities which the distance between the two cars provide ($tau^{G}{}_{MA} \approx tau^{G}{}_{MM}$).





Images: In daily road traffic we are continuously aware about the fact that other participants are *caught in a line*. Our perception processes in daily traffic especially observe the latent parts of the action trajectory shapes belonging to the present vehicles. This looking at *nothing* is an important function of the perception processes in all motoric movement actions because in there we visualize the latent action trajectory shape of our own motoric movement action *moving A-B*.

The other traffic participants produce their own action trajectories with their own *tau*-coupling like moving children in a kitchen. So they don't form a *tau*-value which has a direct consequence for the egocentric formulated task within your own motoric movement action. Fortunately we don't have to actually catch other participants in daily traffic but we only have to avoid them. That is why they will not become a part of the functional *tau*-coupling within the actual movement action. The *tau*-values of other participants only need to be judged marginally during the tactical movement

[132] In determining the transition point of a (motoric) movement object it is essential to know whether the object is flexible (f.e. spoon, tennis racket etc.) and adds an extra movement trajectory to the motoric movement (MM) or whether the object must be qualified as a set intermediary constellation (f.e. computer, car etc.) and that the object doesn't add an extra movement trajectory. See also *Caught In A Line*; Chapter 3-4 and 3-5.

action[133]. Therefore we only need to perceive the *tau*-value of the action trajectories of other road users (A, B. C etc.) and to take care of the fact that they don't collide with the timing of our own action trajectory ($tau^{G}{}_{\text{MA (own)}} \neq tau^{G}{}_{\text{MA (A, B, C etc.)}}$)[134].

2. The classic marble run [135]

"What is so fascinating about a marble run?[136] *You release the marble at the top and you know that a spherical object will roll down due to gravity. Is it because we let something move what can't move by itself? Is it because something is still moving while our effort stopped a long time ago? Or is it the fact that we impose our will to the marble to follow a defined path? Whatever the answer might be it will remain fascinating to stand in a mountain stream in summer and influence the water stream by just changing a few rocks. We are not able to control matter but we are able to control the direction of the matter."*[137]

Image: A classic marble run. Before you release the marble at the top you know exactly which shape the marble will have to follow[138]. Within a set classic marble run one can only see the actual place of the marble within a further invisible action trajectory[139]. Within almost all motoric actions the action

[133] In actual catching the timing but also the shape within the movement action (MA) must be aligned with the timing and the shape within the motoric movement (MM). That is a far more complex task. See appendix B; The motoric movement action *catching/not-catching*.

[134] You are able to distil in here that a conscious act to bump into another car, which is the task within for example the bumper cars at a fair, is a more complex task than to avoid a car in normal daily traffic.

[135] https://www.youtube.com/watch?v=_vg9J_4-kd8; https://www.youtube.com/watch?v=QQ9gs-5lRKc; https://www.youtube.com/watch?v=BfeHg0Zu1WQ;

[136] I still remember my childhood being intrigued by the rolling marbles. It was the same feeling I later felt with the tumbling of domino stones. The explanatory model creates a clear link between the motoric movement action *catching* and the motoric movement action *not-catching/fleeing/avoiding*. The movement actions (MA) of both actions are in fact identical. In that way the visual perception in motoric movement actions gains a more general context and does it provide a clear link to the recently developed insights within *neuron mirror imaging* research. That could probably lead to the conclusion that the aforementioned fascination within my childhood has a clear physiological origin.

[137] Cover text within the book *Caught In A Line*; http://watchtheballtrajectory.jouwweb.nl/downloads-1.

[138] It is important that you start to see that you create the shape out of the perspective of the marble.

[139] So although the marble doesn't leave any actual footprints of manifest places P of the marble one will be able to visibly perceive the casing/enclosure of the shape very well.

trajectory shape remains invisible however within the motoric movement action *writing*, *pouring* and *nerve spiral* the whole action trajectory shape conversely becomes visible.

A classic marble run has one *whole* set shape (!) in which the starting and ending point represent just a minor part of the innumerable points P of that shape[140]. The whole marble run exactly determines which complete line segment shape the marble will have to follow. Within there it is important to notice that the shape also includes the involved time frame[141] and the involved length of the marble run. Equal marbles will pass the same route in an equal time. Each time frame one is able to make a statement about the actual place of the marble and the manifest and the latent part of the marble trajectory shape. Within the marble run an obvious mutual relationship can be noticed.
With the aforementioned revelation the perception-action dichotomy can be finalized at once because the explanatory model shows crystal clear that they both are obligatory needed in a compelling relationship within an overarching phenomenon and the latter shows that they hardly have any meaning without each other. The perception of the actual position of the marble at the front of the manifest action trajectory shape is obligatory to be able to actualise the perceptual image of the latent part, which the manifest part implicitly shapes, in an optimal way because also a marble will be able to deviate at any random point P (for example in time) within a marble run shape. This actualisation process then needs to be followed within the creation of the latent part of the action trajectory shape because at that moment it is *the best* (!) representation c.q. the best presumption how the future action trajectory shape will look like which the marble most likely is going to follow/fill. Just like it is formulated within the ball trajectory shape within tennis. The tennis ball is situated at the front of the ball trajectory shape but is also destined to follow the perceptual image of the latent part which implicitly arises from the manifest part. So in other words within every motoric movement action the (movement) action object is caught within a line which is unequivocally present within the marble run.

Image: Within every imaginable marble run the actual position of every imaginable marble, as the *front* (!) and leading part of the manifest action trajectory shape, needs to be perceived permanently to optimally update the perceptual image of the still latent part that implicitly arises out of the manifest shape.

So the marble will create the actual ball trajectory shape but it is also destined to follow the preset shape. If we want to make statements about the state of the marble run process than we need to compare the manifest line with the latent part of that line segment shape out of the perspective of the marble. The explanatory model will show that this state of the action trajectory, the closing of a line segment, also provides the leading *tau*-value ($tau^{Gap}{}_{MA}$) or ($tau^{G}{}_{MA}$) for the timing within the

[140] Read: *Caught In A Line - The ball trajectory shape.*
[141] The time frame in which an action trajectory is created also belongs to the shape of the action trajectory. So the fluctuation borders of these time frames can also be predicted in a *precise global* way.

movement action (MA) [142]. The closing of this gap will lead the *dependent* motoric movement (MM) and by doing so it will lead the timing, the *tau*-value ($tau^{Gap}{}_{MM}$) or ($tau^{G}{}_{MM}$) , of the relevant movement trajectories. Together they determine the *functional tau*-coupling[143].
In comparison to most motoric movement actions one is not only able to assess a *precise* image of a *global* ball trajectory shape within a set, classic, marble run before the action starts but even a *precise* image[144] of a *precise* ball trajectory shape[145]. The fluctuation margins of possible deviations within the perceptual perception processes of future places of the marble will be very limited or nihil[146].

3. <u>The marble run versus the action trajectory/marble run shape within a motoric movement action</u>

Within every motoric movement action we first construct a perceptual image of a latent marble run over which the movement action (MA) will be executed[147]. This perceptual image encompasses a complete, a whole line segment shape (!) of a, (invisible) *marble run*. It is constructed out of the perspective of the relevant (movement) action object c.q. the marble and the ending point encompasses the location where the action object will finally complete the egocentric formulated will. The main difference with a real marble run comprises the fact that a perceptual image within most other motoric actions can only behold a *precise* image of a *global* marble run shape[148].
That has pros and cons. The major advantage is the fact that one is not bound to a set trajectory within the execution of an exact same motoric movement action. Within the exact same action one is allowed to perceptually shape any preferable marble run and adapt it at any given time. This forms a guarantee for maximal creativity and by doing so for 1. an undisturbed progression of the (movement) action

[142] To better understand the autonomy of the movement action (MA) it is important to realize that we are able to interrupt the marble within the marble run at any place but that we are also able to decide to not interrupt it. For the movement action (MA) that makes no difference at all. Also study the motoric movement action *catching* versus the motoric movement action *not-catching*.
[143] If at any moment you would decide to grab the rolling marble out of the marble run then you will also have to create a trajectory shape out of your fingertips to a set interception point of the two line segment shapes. With the movement of the fingertips along this trajectory shape towards that point you will also create a *tau*-value. If you want to intercept the marble just at the moment when the marble appears into the intersection point of these two line shapes then you will have to align both *tau*-values within a strict *tau*-coupling process.
[144] It is essential that you start to see that the shape of a classic marble run allows us to create a *precise* perceptual image of all future places P of the marble in a very early phase but that the *tau*-value can only be determined in a *precise global* way at that very early moment. Although the marble will hardly have any chance to deviate at any random point P when it comes to the *width* of the shape, it will be able to deviate in a *normal* way in *time* c.q. in the *length* of the shape.
[145] With the description of the motoric movement actions *bobsleighing/luging etc*., *car racing*, *free diving* the explanatory model will show however that also in very fixed/set marble runs, like for example a bobsleigh run, small deviations will occur. They become relevant in the aforementioned sports because there is hardly any time to correct these deviations due to the high speeds involved.
[146]Within the motoric movement action *cat and mouse game* a *very simple* marble run shape is used. But although it comprises a simple shape the action becomes extremely complex because the marble run is in fact a *non-transparent* tube. That is the crucial reason why this motoric movement action is so hard to execute and the explanation of that complexity shows/*proves* the need for a deliberate cooperation between a perceptual latent image and actual perception processes. To establish a *tau*-value one really needs to experience this relationship (!). It is the relationship that counts. So it appears that the independent phenomena do not possess a lot of (*tau*-) value themselves.
[147] Conform Gibson the explanatory model posits that the moment we enter a vista/environment an *abundance of* (action) *possibilities* are revealed. The explanatory model even surpasses that statement and says that within every motoric movement action one of those possibilities/*affordances* actually becomes manifest.
[148] Of course the difference with a physical present marble run is the fact that now you will not be able to perceive something that looks like a guide rail of the (movement) action object. Within most actions the marble run is invisible and so you need to construct a physical present marble run each time you are going to execute an action if you want to be convinced of the explanatory model. This marble run needs to be created within the void, *the nothing* (!), located *between* (!) the animal and the environment in which you will have to become aware that the *nothing* is an important part within every motoric movement action, that conform Gibson the *nothing* contains many invisible marble run trajectory shapes and that the *nothing* contains many advantages.

object and 2. a successful fulfilment of the egocentric formulated goal and due to this one is able to anticipate maximally to unforeseen circumstances and suddenly occurring obstacles[149].

Image: Within a return of a tennis service the incoming ball trajectory shape can be assessed as a marble run. The actual marble run shape also never becomes visible, also the marble must always be connected to the places P(+1) and P(-1) at any place P and the actual position of the marble outlines the exact division between the perceptual image of the manifest action trajectory and the latent action trajectory shape and that is what this image shows in all actual consecutive places of the tennis ball. However the main difference between almost all motoric actions and the marble run encompasses the fact that the marble run enforces lesser deviation possibilities within the action trajectory shape by constraining the marble within a strict guiding rail c.q. a straitjacket. Also the tennis ball is caught within a line and like aforementioned is certainly glued to the previous position P(-1) but the still latent places P(+x) are much more prone to deviations. Tennis is mainly an outdoor sport and the player who doesn't learn to cope with particularly the wind will never become successful. Besides that the net and the bounce of the tennis ball (f.e. gravel/lines) are a prominent source of huge deviations.

However due to the fact that the *marble*, in comparison to the classic marble run, will then be able to deviate and will deviate from the perceptual image at any place P there needs to be a (extra) control system that will monitor and implement possible deviations at any moment in time. That is the major disadvantage of such an open perceptual image. The explanatory model grants this assignment to the processing processes of the perception, the dorsal and ventral stream. The ventral stream will mainly have to observe the, manifest and latent part of the, marble run but in a set relationship to the actual place of the marble. The dorsal stream will mainly have to observe the actual place of the marble (and by doing so also provides the actual action moments) but in a set relationship to the whole marble run shape. The explanatory model shows that both streams are part of a continuous mutual relationship till the very end of a motoric movement action. If the marble deviates from its *action path* than at once another new *precise global* perceptual image of a latent part of the marble run must be constructed which the marble will then have to follow again[150].

[149] See for example the assignments belonging to the motoric movement action *grabbing/taking/touching* within the clarification of the action trajectory shape (chapter 3.b).

[150] In general the marble run is presented as a *precise global* action trajectory shape. Although it must be understood that when the marble run progresses the perceptual image changes from *precise global* to *very precise*. With every point P less within the latent line segment shape the chance to deviations diminishes exponentially. If our hand really comes close to the apple or an espresso cup then the perceptual image of the still latent part of the action trajectory shape will hardly be able to deviate from the actual action trajectory. This exponentially *narrowing down* process is one of the essences of the parsimonious character of the explanatory model. The fact that the perceptual image of the last part of the latent action trajectory will hardly deviate from

4. The not-transparent marble run within the motoric movement action *cat and mouse game*

Within the final part of this article the motoric movement action *cat and mouse game* is briefly addressed. It has already been appointed extensively in relationship to the explanatory model and is available at the internet at several locations.

Images: The motoric movement action *cat and mouse game* is known within two sizes. A small, room size, version (images left) and a big, game show and event size, version (images right).

This motoric movement action encompasses a very special marble run because the run is not-transparent and that exactly shows how by far the visual perception is superior within the accurate determination of the closing of the gap within the action trajectory shape. It shows that we crucially need an actual image of the position of the (movement) action object within the perceptual image of the whole marble run because only then we are capable of reducing that image to a simply to be perceived phenomenon. Then (within a catch action) we will perceive at a very basal, one-dimensional, level that a line segment will disappear c.q. will become zero like we for example also perceive when we observe the rising of the fluid level within a glass when we poor a liquid. We align this observation of the *tau*-value becoming zero with the basal, one-dimensional, disappearing of a line segment within the movement of the catch action from the cat. However within plain open marble runs this can be fulfilled but within a closed, not-transparent, marble run this simple phenomenon cannot be achieved and within there we will have to rely on c.q. regress to auditory perception processes to establish the actual position of the mouse within the perceptual image of its action trajectory shape and that is much more inferior.
The motoric movement action *cat and mouse game* also shows within for example tennis or cricket which are characterized by obligatory linked catch-throw actions how elite players adapted themselves to game situations in which a player doesn't get sufficient time to link the actual position of the incoming ball to a perceptual image of a whole marble run c.q. hardly is able to establish the *tau*-value, not even in a one-dimensional way, visually.

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the actual action trajectory leads to the practical consequence that within a lot of motoric movement actions one can take away direct vision (but not the attention) in a phase before the action is completed. But that is only able to occur within these actions in which the fluctuation of the then still occurring deviations within the action trajectory shape can be covered widely within the fluctuation boundaries of the motoric movement (MM). For example the motoric movement actions *thread a needle*, *opening a front door lock with a key* or *(hold-)catching* are not able to fulfil that requirement (because within those actions the motoric movement (MM) needs to align to the movement action (MA) almost 1:1) and so within the end phase of these actions, when the perceptual image of the latent action trajectory shape will already be very precise, there still needs to be direct vision. For more information see for example the actual movement action within the motoric movement action *catching*.

Appendix B - Nadal and Federer don't gaze at the ball and don't gaze at the target during the tennis service

Caught In A Line
The explanatory model of the motoric movement action

N.J. Mol

The tennis service of Nadal and Federer[151]

The service follows the game action like all other strokes and the *tweener*. In comparison to The Quiet Eye the appointed Game Action will remain to be one consequent universal explanation of the reality within every motoric movement action.
Conversely to common thinking within the tennis service an incoming ball trajectory shape must be linked to an outgoing ball trajectory shape as well. The main difference of course beholds the fact that within a tennis service the player creates his own incoming ball trajectory in which the commonalities with a juggler comes to mind. That makes the service from just being difficult a very difficult and complex stroke. The shape of the incoming ball trajectory must be timed within a strict *tau*-coupling process as well. Although similar a toss will never have the same outcome and in the long run *just* (!) a rhythm service will not work. Roger's serve must be timed as well and he executes all the actions which were described in the previous paragraph within the tweener.

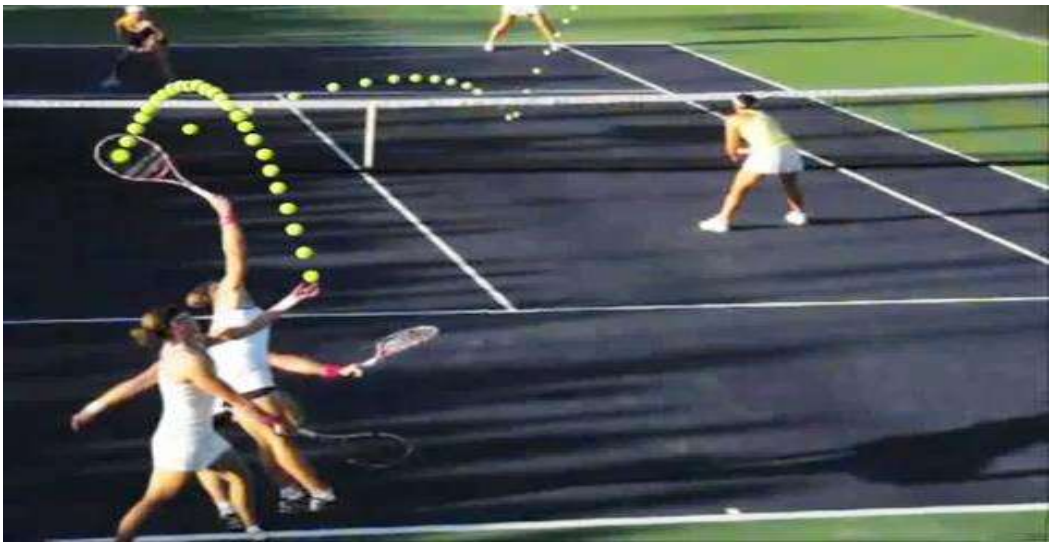

Image: The service is also experiencing an incoming ball trajectory shape.

At American internet forums I was reminded that Federer sometimes serves with his eyes closed. That means that at moment of the actual hit his eyes are closed. There are several video clips which shows this quite clearly. From these clips I took two stills of the earliest moment of the closing of the eyes. The racket is in the main phase of the swing but still a significant distance from the contact point. When Federer closes his eyes he gathered all the actual necessary information he needs. From that moment he is only occupied with the execution of the initial phase of the outgoing ball trajectory shape. He is only capable of influencing influence an outgoing ball trajectory during that phase. He isn't aiming over the net. He isn't aiming at a goal area within the opponent's court. He isn't gazing at the ball. He isn't gazing at the opponent's court. His perception processes are occupied with the perceptual image, *at the inside of his head* (!), visualizing the intersection point of the two ball trajectory shapes of the incoming toss and the required tactical outgoing ball trajectory shape. In which needs to be emphasized that the intersection point is the starting point of the outgoing ball trajectory. Within it is crucial to get the right angle of inclination from the racket towards the position of the ball. That angle is mainly determining the shape of the outgoing ball trajectory. Like in all game situations Federer is only capable to add a desired tactical outcome of any outgoing ball trajectory shape within the beginning of that shape c.q. within the initial phase. Or with other words Roger hits the ball within a perceptual image of a still latent outgoing ball trajectory shape during the initial phase. He practiced

[151] Excerpt from "Watch The Ball Trajectory!"

the initial phase of the desired service ball trajectory shape for many years. It contains the premises that automatically will take care that the outcome of that ball trajectory will be successful. Within those last moments there is no need for him anymore to maintain direct vision at the ball because the shape of the incoming ball trajectory will not deviate drastically anymore and/or actual deviations from the ball within the incoming ball trajectory shape c.q. the toss will be obviated within the size of his tennis racket head. From experience Roger now knows, within exact fluctuation boarders, exactly how the *tau*-value of the incoming ball trajectory shape develops c.q. knows when the ball within a perceptual image will arrive at aforementioned intersection point.

"Directing.
Many actions begin with a movement of the hand to contact an object. These are nearly always preceded by a fixation on the object (there were one or two cases where an object was contacted while the eyes were looking elsewhere; presumably this was done from memory). Typically only a single fixation is involved, and the eye usually moves away from the object just before the hand reaches it. Thus the grasp itself is often not executed under visual feedback.[152]"


Images: The first moment of closing the eyes; the racket head is still a significant distance from the intersection point.

By the way Federer doesn't hit all his serves with his eyes closed. He could do it because we can determine that he doesn't need them for actual vision during this last brief moment. Nadal is showing the same at the image below. The actual perception processes gathered the information required. The perceptual image doesn't need more input at that time.

[152] Michael F. Land, Mary Hayhoe; In what ways do eye movements contribute to everyday activities? http://ac.els-cdn.com/S004269890100102X/1-s2.0-S004269890100102X-main.pdf?_tid=f270a256-99c8-11e5-adbf-00000aab0f02&acdnat=1449152584_01e6d4abbe3f4f3cb29ef26d8717f6ec

Image: The first moment of taking away the eyes of the ball. Notice the similarities with Federer's pictures.

On YouTube there are several clips[153] of Michael Jordan performing free throws with his eyes closed. The execution follows the game action exactly like in Roger's serve. At the actual moment of shooting the ball you don't anymore need direct vision. However, due to the fact that a free throw only encompasses the motoric movement action *throwing,* a player is able to actually accompany the ball much longer during the initial phase. The initial phase in a free throw is approximately 0,5 meter and due to this aspect a basketball player is capable of starting to create a perceptual image of a desired outgoing ball trajectory shape even moments after he initiated the initial phase. But he will definitely have to complete that process before the end of the initial phase is reached.

[153] https://www.youtube.com/watch?v=_JUjbpL9X7I

Appendix C - Roger Federer doesn't gaze at the ball and doesn't gaze at the target within the tweener

Caught In A Line
The explanatory model of the motoric movement action

N.J. Mol
March 2020 ©

Roger Federer's Tweener[154]

The tweener[155] is the ball played between the legs. The tweener is *the* trick shot for talented boys between the age of 10-16 years. If you can't perform this shot you are a complete loser. Besides this aspect the tweener can regularly but mainly be seen within the highest levels of male matches[156]. In which can be noticed that most pro's surrender once they make the decision to perform this shot. They know they will most likely lose the point and execute this shot mainly to please themselves and the audience. Just a few players grab this opportunity to win the point. There are a lot of clips on YouTube[157] of Federer but also Nadal and Dimitrov.
The tweener will mainly arise in the game situation in which a very good drop shot just didn't have the right outcome[158]. After a magnificent sprint the opponent was able to just play/touch the ball upwards in the last part of the 2nd tempo of a ball trajectory shape far below the net chord. The player who played the drop shot moved forward to a place around the service line. There he encounters an easy rising ball which he can volley around shoulder height over the opponent who is now close to the net and now knows that he must execute a second sprint to retrieve the lob.
The characteristic of that lob is that there is little ball speed involved, that the ball has a lot of potential energy because of the high contact point and that it will relatively take a long time to land in the court. If the ball speed exceeds a certain value in the x-axis[159] than the lobbed player will not be able to reach it in time. So the balls in ball trajectories which can be retrieved will drop down vertically in the last phase before the second bounce. The tweener is than actually hit in that last phase between the legs. The problem is not the shape of the ball trajectory or the ball trajectory defining factors (BTDF). The problem is to overrun the ball in a well-timed manner.

Image: Federer hits a *tweener* while the opponent is positioned halfway between the service line and the net.

[154] Excerpt from "Watch The Ball Trajectory!"
[155] https://en.wikipedia.org/wiki/Tweener
[156] There are no women who perform the tweener in a structural way.
[157] https://www.youtube.com/results?search_query=tweener+tennis
[158] Chapter 10.11; Not completely perfect ball trajectories
[159] Chapter 10.1

So if the tweener can be hit than the incoming ball trajectory beholds a rather easy ball trajectory shape. The advantage of this is that it is an easy ball to hit but the disadvantage however is that you are only capable to create a flat outgoing ball trajectory shape which limits your options to a flat lob or a flat passing shot. This last shot must contain a marginal angle of departure and a lot of ball speed. And you have the opponent at the net. The odds are against you in a very serious way. However the aforementioned players manage to succeed far more than one can expect if you look at the universal success rates. Especially Federer takes this game situation to another level. Not successful clips are hardly presented at the internet but if I saw him doing it live I only remember one occasion he didn't succeed. So the tweeners I saw succeeded for at least 90%. Of course every point is only one point but with this shot you give a real mental blow to the opponent as well.
In this paragraph I will appoint a tweener by Federer and mainly the Game Action in there[160]. I start at the moment when Roger recognises the game situation just after the lob has been played. His cognitive basis possesses all the possible action possibilities in this game situation. He knows when and where to execute all the actions. Even in a comfortable chair at home he can visualize all the ball trajectories and actions involved. In short you can say the cognitive basis will act as a blue print for this actual game situation.

Image 1: Tweener (picture 1, 2, and 3); *the main phase of the swing*

At first Roger must visualize if the lob can be smashed. From the Initial Phase of the incoming ball trajectory he will soon experience that a smash is not possible. The moment he realizes that he turns around and makes a first assessment of the shape of the incoming ball trajectory. There the Tactical Tennis Action makes the first global perception of an intersection point of an outgoing ball trajectory. This is more important here than in an usual stroke because the tweener must be hit at a certain height. There is not a lot of room to maneuver. At the same time Roger takes a gamble that his opponent will occupy an universal position at the net. Even Federer doesn't have eyes in the back of his head. At the professional level players don't retreat in this game situation. (What maybe would be better if they play against Roger). From the gathered information he decides whether to make a lob or to make a low passing shot and especially which direction he will give either one of them. This shot also limits the direction you can make.

[160] I use this video clip: https://www.youtube.com/watch?v=pMJ0-1GGf5k

The perception processes keep on following the ball trajectory and guide the perception from global to specific. The footwork is adjusted to this perception because he has to overrun the ball trajectory far in the 2nd tempo after the bounce. The easy part is that the incoming ball trajectory is pretty simple in that phase. The ball is coming down in a straight line without a lot of ball speed.
Like the Tactical Tennis Action explains Roger will have to progress from a global to a specific intersection point of the outgoing ball trajectory. He has to do that but is also able to do that because deviations of a ball trajectory will exponentially diminish the more of the ball trajectory is actually created.

If you look to the tweener clip once more you notice the following in this phase. He is running behind and towards the ball if the ball descends. He must keep the right distance and adjust his timing. When the ball is at shoulder height he comes closer and his eyes will make the saccade towards the intersection point of the outgoing ball trajectory. The eyes will remain there waiting and see the ball coming from there peripheral vision. When the ball is still a little above his knee the main phase of his racket swing starts. That is during or right after the saccade when there is no concrete vision. The perception again picks up its role very soon and checks if the latent ball trajectory, a really short distance now, will become the actual path of the ball. The ventral and dorsal stream take their roles again. Deviations will be adjusted by new perceptions and new checks in an ongoing mutual way. But if everything goes to plan real deviations will hardly occur.

Image 2: Tweener (picture 4, 5, and 6); *at the moment of hitting the ball (picture 4) Federer's head is always in the middle of the turn towards the net.*

When the ball descends to just under his knee Federer always starts turning his head. And if he hits the ball just above the height of his sock his head is always in the middle of that turn. The turn is completed way after he hit the ball. Actual perception with a turning head gives a lot of disturbed information. Federer doesn't look at the ball and I am convinced he doesn't use peripheral vision at the moment of hitting because of the movements of the head. This shows that he doesn't have to actually see the ball during the hit.
The Game Action says the same thing. He visualizes an intersection point and an outgoing ball trajectory from that point. He only needs actual information about the intersection point. The rest depends on perception processes in his mind and not on actual vision. The fact he scores so many

points in this game situation can't be explained out of coincidence. He knows how to pass his opponent with the right ball trajectory.

"In tennis, maintaining the head on a vertical axis and keeping the upper body stabilised is recognised as one of the characteristics of high-level players (Elliot, 1989; Groppel, 1986). In particular, keeping the head still during the preparation phase and at impact helps insure better balance and a consistent hit on the center of the strings (Braden and Bruns, 1977; Saviano 2003)."[161]

So Lafont's conclusion isn't right in this game situation. At the moment Federer turns his head his upper body also starts to turn in a strange way. Of course there is a dynamic balance in Roger's movement but that is not meant with *stable upper body*. The head *and* the upper body are turning at the moment of the hit.

This game situation is also a blow for Joan Vickers. There is no gazing at any point. Not at the contact point and not at the goal. Nowhere. It is even worse. The head is actively turning and the results remain excellent. The Game Action explains it all. The incoming ball trajectory is easy and the technique asked is limited but quite easy to perform. Those are the easy parts of that game situation. When there is enough actual information the actual perception can better be transferred to the tactical outcome of the outgoing ball trajectory. Roger wants to know what consequences the perception of the already hit latent outgoing ball trajectory will have in this game situation. One game situation consists of two independent combined Motoric Movement Actions. A catch and a throwing task. The throwing task only needs an intersection point. The rest is perception.
The incoming ball trajectory in this game situation is quite easy. In other game situations Roger will prefer to maintain eye contact at more demanding incoming ball trajectories.

[161] Six Good Reasons to Keep Your Eye Off the Ball - Damien Lafont