The motoric movement action *letter posting*

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"How does the patient D.F. post a letter?"

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

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"How does the patient D.F. post a letter?"

Index:

The big defect/flaw within letter posting encompasses the fact that current science assesses the *actual* (!) execution of a posting task mainly in relationship to the position and the shape of the slit of the mailbox as the primary and enduring point of attention. That is a huge misconception. Current science is not noticing that we mainly focus on the slit within a tactical consideration in which the single goal is to just create a perceptual image of a latent action trajectory shape between the letter and the slit which completely *precedes* (!) the actual execution. During the actual execution we then will perceive how mainly the letter will fulfil this line segment shape and that action starts by the letter bridging the first latent places P up to the last places P of the action trajectory shape which will ensure that a letter will automatically reach the slit.
Hence the big novum which the explanatory model reveals within there is that our attention during the actual/factual execution is mainly occupied with the letter to bring it closer to a goal which is connected to the egocentric formulated will and not with the slit which is just marginally judged in a previous phase *completely separated from the actual execution* (!). Then we are mainly occupied with the letter being part of an action trajectory with an obvious latent and manifest part. The explanatory model therefor appoints the letter as the (movement) action object (MA) and of course that always should have been the conclusion. We were never able to manipulate the slit in any way but we conversely were able to manipulate how a letter fills a line segment shape out of the perspective of the letter during the actual execution.

1. General – Flaws within current science

The next resume has the ultimate main goal to reveal the complete universal explanatory model towards all motoric movement actions. The explanatory model is developed by N.J. Mol and encompasses the full and ending explanation of all functional perception and motoric processes concerning all imaginable motoric actions which actually host a (*displacement*) movement. So although this resume hosts a full-fledged clarification of the motoric movement action *letter posting* it remains just one specific adaptation/application.
From this complete clarification of a letter posting task this description will work towards the specific answer to the question of how the patient D.F.[1] is capable of easily and successfully completing posting tasks within a scientific setup in which the slit of the mailbox can obtain all possible positions. By now the patient D.F. is a well-known phenomenon within science. Due to an illness/accident she is known for the fact that she is not able to rely anymore on a proper functioning of her dorsal and ventral stream, the two processing processes of all perceptions. Scientifically it was therefore assumed that she wouldn't be able to execute posting tasks at all because indeed it was previously observed that she wasn't capable of specifying the direction of the flexible slit of the mailbox when the letter was still at the writing desk. Still she is capable of executing every posting task successfully.
Scientists within this research don't possess any clue about the functional explanation of this phenomenon in particular and about the function of the ventral and dorsal stream in general and the essence of this omission is that the current standard of knowledge within science is still at an extremely remote distance from the complete explanation of all functional processes within every motoric action. How science exactly beholds it, if there is consensus at all, I am not able to precisely indicate anymore because for quite some time I am now exposed to the explanatory model and abandoned my old ideas too long ago. However within science mainly one focus is appointed and one is convinced that the attention at all times must be pointed at the slit of the mailbox *during* (!) the execution of the task. Conversely the explanatory model clearly indicates that 1. a tactical movement action (MA) needs to be present in which a latent action trajectory shape must be constructed between the starting position of the letter and the slit of the mailbox out of the perspective of the letter and 2. that this complete construction must fully precede the actual movement action (MA) in which the action is factually executed. Although one is able to remark in here that within the first mentioned task one can distinguish that the space between the letter and the slit is involved within the second precondition it is only of importance which processes are involved of getting the letter to the slit. In which must be emphasized that within the latter task we only observe the positions of the letter and nothing else. Within the tactical movement action (MA) we determine c.q. create a perceptual image of a *whole* (!) *precise global* latent line segment shape between the (movement) action object (MA), in this case the letter, and the slit in which the slit indeed is an important reference point but still just one single position within a line segment shape[2] which encompasses multiple points P.
Hence during the actual movement action (MA) we are mainly going to perceive how we execute this line segment shape starting from *the beginning* (!) to the end. In this process the explanatory model outlines a double *mutual* relationship between the actual position of the letter and the perceptual image

[1] You are able to find a lot of information on the internet about the patient D.F.. See for example: https://en.wikipedia.org/wiki/Patient_DF.

[2] The term line segment shape hosts the separate words *line* and *shape* and exactly these words express the two dimensions within an action trajectory shape. The line compels the basal element. We always perceive this element and this for example explains how we are capable of perceiving a *tau*-value within the movement action (MA). The shape is the cognitive element which can be enriched due to experience. Within addendum 2 of *Caught In A Line* it is extensively explained why according to this insight it can be observed that even toddlers are capable of hitting tennis balls with a tennis racket within an hour because they indeed are able to perceive a tennis ball caught in a line but that they are thousands of hours away from understanding and handling the relevant shapes. Inter alia the shape of the incoming ball trajectory, the outgoing ball trajectory and the shape of the stroke.

of a letter trajectory shape and clearly shows that in there the processing processes of the perception are involved. In which the actual position of the letter must be perceived within an action trajectory shape with a manifest and latent part which inter alia takes care of the fact that one is able to tangibly perceive a *tau*-value like D.N. Lee already mentions within his *tau*-coupling theory. The closing of the whole latent action trajectory with the manifest shape c.q. the *tau*-value approaching zero c.q. the disappearing of *the gap* can be perceived within every action trajectory shape.
So the explanatory model clearly shows that during the actual execution we are occupied with the letter and not with the slit of the mailbox and therefor the explanatory model appoints the letter as the (movement) action object (MA). Or with other words the actual execution of a motoric action, in this case a (*hold on*) throwing action, must exclusively be assessed out of the perspective of the animal towards the environment. The *affordances* conform Gibson's The Affordances Theory provided by the environment are assessed in a previous phase.

Just like within all other well-known phenomena within the movement sciences the explanatory model now provides the final clarification and answers all functional questions and that opens the way to definitely appoint all aspects within a motoric action. This will for example allow that we are capable of fully appointing the complexity of every specific action in particular but much more interesting enable us to comprehend the whole spectrum of all motoric actions in relationship to the complexity in general. If you are able to appoint all overlaps binding all motoric actions you are able to gain final insight in that spectrum in which current science failed till now.
The explanatory model encompasses an ending and full description. It provides many novae and due to this all scientific research regarding motoric actions can now be judged on their merits. Besides the aforementioned fact that a posting task must mainly be observed out of the letter more huge defects/flaws can be determined within that scientific research. In for example *grasping*-research[3] the same task was given to test persons in which science implicitly assumed that everybody executes the same task in the same way and that obvious doesn't happen that way because with the discovery of the tactical movement action (MA) and the actual movement action (MA) the explanatory model reveals multiple possible strategies within the exact same task. Unfortunately without that knowledge science threw all acquired data in the same category and one tried to draw general scientific conclusions out of this miscellaneous pile of data. Now I don't want to say that one isn't able to reasonably assume that the execution of the same motoric action by different test persons will host equivalent elements but a priori one isn't able to assume this and then no scientific conclusions can be drawn. Within your own empirical experiences you are already able to establish that within a letter posting task you probably align the shape of the letter with the shape of the slit of the mailbox in a very early phase within the *letter* trajectory shape. However within the grasping/grabbing of an object/coffee cup with the hand I prefer to adjust the hand in a much later phase. When reaching I indeed slightly adjust my hand towards the object in an early phase but I really open it or turn it in a much later phase then I do with the letter in the posting task. But although that might be the modus operandi within many people that doesn't exclude that different strategies are possible. In any way the explanatory model shows within this article that many different strategies are available and that current science never even considered this aspect.
The explanatory model that ecologically is able to defend its ground till the beginning of times clearly shows that on the basis of efficiency and effectivity, *parsimonious* (!), operating organisms it is very likely that a preferential strategy will exist but that it is also possible that less parsimonious alternatives can be seen because multiple components within a motoric action can be experienced in different ways. In that way this article inter alia clearly shows why and how we are able to very successfully execute many motoric actions in pitch black darkness although for example we rather

[3] Grasping/grabbing is a basal motoric action and gets a lot of scientific attention. The internet is packed with scientific articles.

prefer to visually perceive the action trajectory shape[4]. It will become clear that most often we very likely prefer to tactically construct a perceptual image of a whole *precise global* latent action trajectory shape within the movement action (MA) first before we at any rate are going to actually execute anything. It is just the most parsimonious solution to first (visually) perceive where the handgrip of the suitcase is situated at a conveyer belt before we are able to actually execute the consecutive motoric movement actions of *touching* respectively *pressing/pushing*[5] as successful as possible. The position of the handgrip is a very important reference point of a whole action trajectory shape within grasping but the simple novum that the explanatory model brings forward in here is that the perceiving of all places P of this shape within the *animal-environment* relationship are essential as well. All positions P of this action trajectory shape must be bridgeable and actually need to be bridged because otherwise an action doesn't succeed. We definitely have to perceive that *nothing* (!) is present within the whole latent action trajectory shape which could block the (movement) action object (MA) and of course eye tracking gear wasn't able to determine that because indeed nothing is there to be seen. Because this probably is never considered due to the simplicity of it all you yourself are able to easily conclude that if a working chainsaw or an obvious shopping window is present at any place P within the action trajectory shape that you even wouldn't consider to make an attempt to grasp the suitcase.



Images: Without knowing beforehand where and in which position a handgrip of a suitcase is situated a patient like D.F. is able to successfully grab a suitcase by its handle. Within an alternative method it is possible to first move the (movement) action object (MA), in casu those finger parts that will hold the handgrip of the suitcase, towards just any part of the suitcase and subsequently compare c.q. adjust those finger parts with all parts of the suitcase that can be enclosed. Within there it is very plausible to assume that we are only able to come up with such a strategy if we possess cognitive knowledge beforehand that a handgrip is always a feature of a suitcase and that is the minimum knowledge the patient D.F. at least should have available. By the way not-patients use the similar strategy in a pitch black dark hotel room. They possess cognitive knowledge that the handgrip is close c.q. belongs to any part of the suitcase.

Although I just mentioned that most often we shape a perceptual image of a whole latent *precise global* action trajectory before we are actually going to execute anything that in itself remains a true statement but that most often happens on basis of previous direct visual perception. However in very

[4] Within addendum 2 of *Caught In A Line* Andre Agassi shows that he is able to create a perceptual image of an incoming ball trajectory shape with the sole use of auditory perception processes but that that is by far more inferior as compared to the visual perception processes.

[5] The explanatory model provides many novae. Within every motoric action for example always two in cooperation working foci instead of one focus must be pointed at two separate autonomous parts. Besides the complete dismantling of this ancient till now prevailing idea the also ancient till now prevailing idea that a grasp/grab-action, golf put, piano key touch etc. only constitutes one motoric action is definitely dismantled as well. Grasping/grabbing, the golf put, a piano key touch etc. is indeed characterized by two strict linked motoric actions with two completely separated *tau*-couplings. In fact the touching will always precede the later pressing/pushing. For an extensive explanation of the motoric movement action *touching/grabbing/taking* see addendum 1 and 2 of *Caught In A Line*.

safe environments[6] in which at first a whole lot of *nothing* (!) needs to be bridged[7] within the action trajectory shape we most often execute an actual initiating movement solely on the basis of abstract cognitive knowledge just without any direct vision. This is completely in line with the observations of Hayhoe and Land in a tea making task. They already mentioned that test persons execute initiating hand movements to a next script item before actually focussing on that item with direct vision. This exactly underpins the explanatory model and within your own empirical experiences you are able to determine right away that within the crossing of a very deserted road as a pedestrian you execute the initial distance of the *crossing* trajectory shape at first without any direct vision upon which you indeed will check if coincidentally a Ferrari is entering the scene. In just *ordinary* (unsafe-)traffic situations you will definitely not execute the crossing trajectory shape like this. Conversely you will then shape a perceptual image of a latent action trajectory shape with direct vision (right-left-right) at first before you actually are going to initiate c.q. execute anything of your own action trajectory shape.

The aforementioned examples show that a variety of actual execution practices can be seen within *normal* situations. However far more extreme practices can be observed as well but before I come back to the latter I will summarize the aforementioned towards the explanatory model.
The explanatory model instructs that first within a tactical consideration belonging to the completely autonomous complex subsystem of the movement action (MA), out of a general cognitive basis, most of the time a parsimonious consideration leads to an optimal shape of an action trajectory but indicates that *after* (!) the completion of this tactical plan this shape is executed within an actual movement action (MA) *solely* (!) out of the perspective of the (movement) action object (MA) or within the motoric movement action *letter posting* the letter. So within the actual movement action (MA) no more tactical considerations will occur and solely a *precise global* shape of a latent action trajectory is executed out of the perspective of the animal towards the environment in which the perception processes are mainly occupied with the fact that every advancing place P of the (movement) action object (MA) will have the consequence that the *tau*-value within the action trajectory will approach zero. The *tau*-value will approach zero if the letter at the end of the action trajectory arrives at the slit of the mailbox and of course that is why the slit is an important reference point because it is the last point within the action trajectory shape but still it is just one position connected to many more places P between the letter and the slit within the whole latent action trajectory shape. Within the perception of this *tau*-value within the movement action (MA) of the letter posting it is very likely that we mainly perceive how the gap between the manifest part of the *letter* trajectory shape and the latent *letter* trajectory shape is completely closing and that we don't have to focus on the mailbox at all. It is very likely that on the basis of previous received cognitive knowledge within the tactical movement action (MA) we thrust that the slit of the mailbox will remain to be at the location where we just located it a few moments ago.

Images: The most parsimonious way is to construct a *crossing* action trajectory shape with the opening within *the fence* as the exact ending point/destination if you want to get to the other side but less

[6] In kitchens without working chain saws, very quiet roads etc..
[7] Then we indeed cognitively know that at first a lot of *nothing* (!) will show up within the action trajectory shape.

parsimonious ways are available as well. A patient like D.F. but also all other people with proper functioning processing processes of the perception are, for whatever reason, able to first move towards just any part of the obstacle/fence *completely* (!) before they subsequently could look for where the shape of the opening of the passage allows the shape of the body to pass. Within the tactical framework of this strategy you only need to know beforehand that the passage provides a crossing possibility or in Gibson's words provides the *affordance* of crossing and you only need to align the relevant shapes without ever having to appoint at a cognitive level what exact shapes are involved. Just like it is possible within letter posting. The patient D.F. is capable of only executing and will have to execute this strategy if she ever wants to cross somewhere successfully and you might very well compare this if you are only capable of using one hand, the *letter*-hand, in a posting task in pitch black darkness. In that task you will also look for (any part of) the slit first before you subsequently will try to align the shape of the letter to the shape of the slit on the basis of trial and error.

Within the execution of the action trajectory shape *parsimonious* (!) individuals will always encounter deviations of that shape which is so clearly shown within the description of the motoric movement action *nerve spiral*[8] and that of course has everything to do with the fact that we are only capable of motorically influencing the action trajectory shape indirectly within the complex system of the motoric movement action containing two complex subsystems. It is exactly due to these deviations that a motoric action can be executed in a very effective and efficient, parsimonious, way and exactly these deviations are controlled by the processing processes of the perception within the actual movement action (MA). Of course the novum within the movement sciences is the complete explanation of all motoric actions but especially the perspective out of the (movement) action object (MA) during the actual movement action (MA) has never been acknowledged in science.
This all shows that many strategies are available even just within situations in which we are capable of constructing a *precise global* action trajectory shape *beforehand* (!) with a proper functioning of the ventral and dorsal stream. But even that is not necessary. You are able to execute many motoric actions in a very different way mainly on the basis of abstractions of the task at hand present within your cognitive knowledge. It is very likely that you occasionally execute those kinds of actions just like me probably within very safe environments with this strategy. In pitch black darkness it is even a very common strategy. You then for example first look for a part, any part at all, of the wall, door, lamp etc. and only when you found a part you will continue to look for the light switch, lock etc. because you know that they must be part of the wall, door etc.. It is not very parsimonious but that is not the issue in here. The issue is that you are capable of successfully executing egocentric formulated tasks. In the same way you could choose a very parsimonious option or a less parsimonious option within the crossing of a street with a parallel hedge at the other side of the street which only hosts a very tiny hedge opening which allows only one person to pass. The most parsimonious way is to first spot/localize the hedge opening and to construct a straight as possible action trajectory shape between your current position and the opening. If a very crowded street is involved you are also able to decide to first cross the street in the shortest way out of safety reasons and then to move to the hedge opening. Within persons who aren't capable of constructing any perceptual image of the task at hand they definitely will have to rely on this last strategy if they want to execute these kinds of motoric movement actions. Although healthy people will already move towards the indeed tactically previous perceived hedge opening right after the crossing people without this possibility will then have to start to look for a shape within the hedge which allows the shape of the body to pass. From this example you are able to distil that the last group actually will have to possess cognitive knowledge beforehand that there must be a passage. Only in this very complicated, definitely not-parsimonious, way patients like D.F. are able to fulfil tasks like these. They aren't able to rely on any other alternative strategy.
It is not difficult to understand that this last strategy could also be used within posting a letter. In the first phase we will only have to perceive that the letter is coming closer to any part of the mailbox and so implicitly is coming closer to the slit. During the actual movement action (MA) our perception processes and motoric processes are only occupied with bringing the letter closer to the slit through the *empty* (!) manoeuvring space. Or with other words they are only occupied with reducing the number of latent places P between the letter and the slit and nothing else. Within a posting task you only need to

[8] See: Appendix C – The motoric movement action *nerve spiral*.

possess cognitive knowledge about the destination possibilities of a letter and you only need to be capable to perceive that the distance between the letter and the slit becomes smaller. So the patient D.F. definitely doesn't need a proper functioning of the cortical streams within the execution of this task. It is more than likely that she was able to properly execute this posting task for decades and that she acquired lots of abstract knowledge within her cognitive basis. If she can portray the letter and the slit within one visual image in the end phase of the posting she never will have to be able to recognize any specific shape but solely needs *to align* (!) the shapes of the slit and the letter also on the basis of stored cognitive knowledge. Just like healthy people are also able to complete a posting task. It could possibly convince you that at this moment you are able to execute a posting task in the classical way and that immediately after completion you are also able to execute a posting task successfully conform the *comparing*-method of the patient D.F.. This revelation hopefully leads to the clarification of the whole spectrum of execution possibilities in which posting tasks can be executed successfully and implicitly will lead to the understanding where science failed till now.

2. Introduction of the motoric movement action *letter posting*

The task within the motoric movement action *letter posting* is to get/throw a letter, and only the object of the letter, into a mailbox. So this part of the task is formulated out of an egocentric will but this specific part will in essence only be executed by the letter[9]. With all of its consecutive places P only the letter will construct the action trajectory shape. Just like a ball in every ball sport, the ink during the motoric movement action *writing*, the food during the motoric movement action *eating*, the outside of a fingertip[10] within the motoric movement action *grabbing/taking/touching* etc. the letter is a fully autonomous entity. We don't share anything with the letter, we are not the letter and we will never have something with it. We are going to post a letter due to an egocentric will but the movement action (MA) remains something of the (movement) action object and not of the ego. The movement action (MA), conform Gibson, expresses the relationship *between* (!) the animal and the environment and has nothing to do with the execution of the action by the animal itself.

We never posted a letter and we never will post a letter. The letter posts itself. We are only able to execute the letter posting.

However the letter will not do anything by itself. Without a letter we are not able to fulfil a posting task but if we don't pick up the letter nothing will ever disappear in a mailbox either. Just like within all motoric movement actions we will have to move the motionless, dead, letter outside our body with movement trajectories within our body which we conversely do control. Therefor letter posting can only be executed if we simultaneously keep the primary focus (exclusively linked to the visual perception within ordinary posting) on the essence of the task, of the movement of the letter within the letter trajectory shape, and keep the secondary focus (exclusively linked to the proprioceptive perception) on those movement trajectories that will execute the posting towards that primary focus. Probably you will find that hard to understand because we automated the posting process completely. The action trajectory of the letter is simple and we are able to control it every moment in time within the movement action (MA) because we hold on to the letter constantly till the moment we actually deliver the letter with a little throwing motion[11]. Besides that the motoric movement (MM) is very

[9] Like the water in a mountain stream the letter is a completely autonomous entity. Only by moving rocks we are able to influence the direction of the water. We will never be able to control matter. Nor the water. Nor the letter.
[10] See: addendum 2 - appendix D: The motoric movement actions *grabbing/taking/touching*. Of course the outside of our fingertip belongs to our body but we are only able to move that outside part over a line segment shape by the means of movement trajectories within our body.
[11] Within addendum 1 of *Caught In A Line* the whole spectrum of throwing actions is appointed. All actions can be divided into two groups. Everything what is thrown at us will be part of a catch action. Every action that we conversely control ourselves can be considered *self-paced* actions and are indeed throwing actions. Throwing actions can be divided in three groups. 1. (Hold on) throwing actions with the whole body, 2. (hold on) throwing actions with a part of the body or action object and 3. (let go) throwing actions. Within the latter one needs to remark that within this group also a hold on throwing action will occur before the actual letting go of an object.

simple as well. In letter posting we have combined the two foci to one, very familiar, complex focus image in such a way that it seems that we execute this task 1:1. But that is not so. We are only able to move the letter over a line segment shape c.q. action trajectory shape within the movement action (MA) outside of our body by creating very awkward movement trajectories within our body just until a place very close to the letter. The (movement) action trajectory shape within the movement action (MA) and the (motoric) movement trajectories within the motoric movement (MM) don't have anything in common[12]. They can't have anything in common because they belong to two irreconcilable worlds.

The script within the motoric movement action *letter posting* contains two parts. The first one relates to the motoric movement action *grabbing/taking*[13] etc. of the letter. I pick up a letter with the help of three fingertips and hold on to it by creating a counter-pressure between on the one side the thumb and on the other side the index and the middle finger[14]. So before I actually pick up the letter I create a perceptual image of a latent action trajectory shape out of the perspective of these fingertips towards the places of the letter that will be touched by these fingers. The moment I feel the letter into my hand c.q. experience the first haptic sensation of the outside of the letter the motoric movement action *grabbing etc.* is finished at once and the motoric movement action *letter posting* begins. Conversely this motoric movement action arises at the writing desk at home where I just grabbed the letter and not just in front of the mailbox.
So at a macro level all the places P of a letter from the writing desk to the slit of a mailbox create the action trajectory shape. However in general, at a micro level, one can divide the motoric movement action *letter posting* into three parts. 1. The movement towards the mailbox with in my case a lot of leg action, 2. the standing in front of the mailbox with in my case a lot of arm action and 3. the tiny (*letting go*) throw of the letter into the mailbox in the very last phase of the posting. However we don't consider the walking towards a mailbox as a part of the post action. The letter is hanging passively[15] to the side of the body and we are mainly occupied with the motoric movement action *moving A-B*. The cause of this is that we cognitively know that the letter[16] will automatically travel with us during our movement as long as we hold on to it. So when we arrive in B we know that the letter will be there as well. In our opinion the motoric movement action *letter posting* just starts when we arrive in front of the mailbox. Although the letter remains passive, like in all the three parts, in our opinion we now experience a *moving* letter. But the only difference now is that the letter is mainly moved by arm action instead of leg action. It is important to notice in here that the arm and leg action only have one common goal. Namely to move a motionless, dead, object over a line segment shape and that this action trajectory has the only goal to just bring the letter closer to the slit of the mailbox through the

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However ball sports for example are characterized by relatively short hold on phases as compared to the independent flight of the ball. Within letter posting right the opposite is at hand. Letter posting hosts a huge hold on throwing action and just a tiny letting go throwing action.

[12] If the body really would execute tasks 1:1 then it is almost impossible to philosophise about the consequences. Then the body must be equipped to create all the countless possibilities of action trajectory shapes separately. We then probably need to own hundreds of extra muscle groups. That is unworkable and it seems much more logic that the body chose for the cooperation of two autonomous, generic, systems. In which one system completely focusses on the (movement) action object (the letter) and monitors the consequences as well as the goal of the movement action (MA) and the other system completely focusses on the execution of that movement action (MA) with the help of just *a limited supply of general* muscle groups within the motoric movement (MM). In that way the body chose for a splendour of a solution. Due to the complex cooperation of both complex subsystems a multitude of egocentric formulated tasks can be executed. This complex cooperation is indeed complex and therefore harder to understand but the autonomous parts function in a relative simple way with the effect that they quickly achieve and efficient and effective optimization within the possibilities. It is exactly what one would expect within a sensible, *parsimonious*, developed body out of an ecological approach and it is completely in line with the development of other organ systems.

[13] See: *Caught In A Line* - addendum 2 - appendix D: The motoric movement actions *grabbing/taking/touching*.

[14] In addendum 2 - appendix D the grabbing of a little coffee cup is appointed out of the exact same (movement) action objects.

[15] The letter will be passive during the execution of all three parts.

[16] A letter is such a solid object (and not for example a liquid, a soft bread dough or Silly Putty) that we cognitively know that if we hold a part of the letter that the rest of the letter will come along.

nothing[17]. When the letter is secured into the slit of the mailbox the motoric movement action *letter posting* will be finalized with a very tiny throw. In throwing actions one is only able to influence the initial phase of an object trajectory shape[18]. One needs to construct the whole object trajectory during that very first beginning. However within the motoric movement action *letter posting* every spot in the receptacle of the mailbox will lead to a successful delivery and that is why every throw of a letter which is secured into the slit of the mailbox leads to a 100% success rate. Even in this phase the letter remains a motionless, dead, object. I establish the actual throw by transferring an impulse to the transition point with the help of a minor wrist action. The letter will be able to travel the last part of the action trajectory by itself because all the fingertips will be released from the letter at exactly the same moment due to a precise *tau*-coupling[19]. In this last phase of the letter posting task an impulse needs to be transferred from the body to the letter. Just like in for example darts. Therefore the (movement) action object, the letter or a dart, must be held over a precise action trajectory shape c.q. a precise distance A-B and must be released by *all fingertips simultaneously* (!) at an exact point when the letter approaches B to be able to execute an independent trajectory. So this seemingly very simple task is in reality a very complex process in which the *tau*-coupling plays a huge role.

When we are sitting in a comfortable chair we are able to create a cognitive image of the task in every motoric movement action. So we are also able to do that in a letter posting task. We are very familiar with the task and in our mind we are able to see ourselves execute it. We are able to visualize that at our *own* mailbox but we are also able to visualize it as a general action at every kind of mailbox. We are able to construct lots of abstract images within this task. You know that you will have to deliver something. That you will have to get the letter parallel to some kind of insertion possibility. That the insertion possibility must be situated at an elevated position in order to let a letter drop into a *lower situated* receptacle. That you will have to make a small throwing motion in the end. Etc. etc.[20].

If we are actually going to execute a posting task at a *new* mailbox then we first make a tactical plan with the aforementioned cognitive basis as a reference. The final goal of that tactical plan is to construct a perceptual image of a latent, *precise global*, line segment shape from the letter in the hand towards the slit of the specific mailbox before the actual execution will start.
During the actual execution we just execute the tactical plan. We bring our hand, or better, we bring the letter *in the beginning* (!) of the perceptually shaped latent action trajectory which will lead to a successful execution and just follow the plan. So we *throw* the letter in the beginning of the letter trajectory from which the letter is not able to escape. Within the actual execution of the movement action (MA) mainly visual perception processes are at work when we post in an ordinary way. They

[17] This is one of the essential abstract ideas we constructed within this task.
[18] See the motoric movement action *throwing*; *Caught In A Line*; p. 63.
[19] See the upcoming point 5.a.
[20] This is a very limited description of all the abstractions we gain during years of posting experience. More abstractions and abstractions about the *nothing* will be appointed later when the patient D.F. is discussed.

are processed in two streams. The ventral and the dorsal stream[21]. The ventral stream mainly processes all perceptions towards the action trajectory shape. The actual position of the letter is noticed but the emphasis is placed on the action trajectory. The dorsal stream mainly processes all perceptions towards the actual position of the letter. In here the action trajectory shape is noticed as well but the emphasis is now placed on the letter. These processing processes of the perception audit each other in a continuous mutual relationship in which the actual place of the letter will provide the actual action moments. If the letter deviates from its *action path* a new perceptual image of a latent action trajectory shape must and will be created right away. The letter will then have to follow this shape again and will then be audited again by the dorsal stream until the next deviation arises. This will continue till the letter reaches the slit of the mailbox.
Now most mailboxes are solidly attached to the ground and so most motoric *post* actions won't need a lot of corrections. But let's try to imagine that you are in another country and the mailbox is moving in a stable way horizontally side to side over a length of 50 centimetres. Than you will witness this mutual process much better. The cognitive basis has not changed. When you arrive at this mailbox you conduct a quick research and again you make a tactical plan based on the actual environment information. From your *feet position* you are able to reach the slit of the mailbox within your arm's length[22]. The difference with the stationary mailbox is that you now have constructed more perceptual images of possible action trajectories. Or to phrase it differently you now have constructed a global image of latent action trajectory shapes. Because you can't make a precise latent action trajectory yet and at this moment there is no need for such a shape. The *only* (!) need, and that is very important to understand in lots of motoric movement actions, is that the letter first will have to come closer to the slit[23] of the mailbox.
After you made a tactical plan you are really going to execute the actual *post* action. Now it would be nice if you would really join me in this action at this point. With the global image of latent action trajectories in mind you bring the letter up to the slit. The main goal in there remains to get the letter closer to the slit and nothing else. The two cortical streams are more active now. The ventral stream shows changing action trajectory shapes within all consecutive time frames which you still try to follow for a bit as a global leading guide. The dorsal stream is now correcting more actively.
Still you manage to get the letter closer to the slit. The perceptual image of the latent action trajectory has now become manifest for most of its part. There is just a little part of the latent action trajectory left. The more an action trajectory is actually completed the more the chance to deviations will diminish. It diminishes exponentially with every consecutive place P. So in this last phase the actual *post* action can therefore change the emphasis from bringing the letter closer to the slit to actually inserting the letter into the slit although the processing processes of the visual perception will maintain to do their job like aforementioned. They will keep processing till the task is fully completed.
In the mean time you brought the letter in your hand parallel to the slit. This will lead to the posting of this letter as well. Although you wonder if you will ever come back at such a mailbox again.

3. The movement action (MA) of the motoric movement action *letter posting* – The primary focus

So the explanatory model clearly reveals that in an universal way every motoric action can be divided in two autonomous complex subsystems. The movement action (MA) and the motoric movement (MM). The explanatory model of the motoric movement action appoints three parts within the

[21] https://en.wikipedia.org/wiki/Two-streams_hypothesis
[22] Or to put it stronger. You will have tactically assessed the situation in such a way that you are able to execute most *arm* (!) action trajectory shapes within that feet position. This is based on cognitive knowledge concerning the maximal length of action trajectory shapes which you are able to produce with the arm.
[23] So at a micro level the main goal in here has nothing to do with the later insertion but solely has to do with the bringing together of two items in which the crossing of the void between the animal and the environment is the essence and not the egocentric formulated goal. Within there it is very important to understand that this bringing together always is achieved by bridging a gap with *nothing*. Because a letter or any other item can only be *posted* if in the whole action trajectory *nothing* will block its way. That is why our visual perception processes actively look to create a path where there is *nothing*. This goal is never noticed because, indeed, *nothing* is there to be seen.

movement action (MA). The cognitive basis, the tactical movement action and the actual movement action.

In letter posting we possess a huge base of general knowledge concerning action trajectory shapes which we are able to create with the arm. We experience all motoric movement actions we execute in line segment shapes[24] and so all these shapes become references for all future actions. They will form the future blueprints for all other action trajectory shapes. As aforementioned we possess a lot of abstract images within the posting task. For example we do possess *precise global* images encompassing the length of the action trajectory and also we do possess *precise global* images encompassing the involved execution time of an action trajectory[25]. However within letter posting we are able to influence the time of execution at any point because we are able to hold on to the letter in the first two phases of the posting process. So the timing is not relevant during the usual execution of a posting task but even so we do create a *precise global* time frame within this execution. This timing process becomes transparent if we conversely are going to post a letter while riding on a bike. Then only a short distance A-B in front of the mailbox will be available in which successful action trajectories can be created towards the mailbox. That distance A-B will then provide the fluctuation borders of the time span (Δt) in which the action trajectory must be created. If the time, in which the cyclist is between A and B, is shorter than the timeframe an action trajectory requires to be executed then the action trajectory can never be executed successfully ($\Delta t_{(A-B)} < \Delta t_{(action\ trajectory)}$). So if you want to post a letter riding on a bike you will have to slow down your velocity in such a way that you are able to create one whole action trajectory within the time fluctuations of your presence in front of the mailbox ($\Delta t_{(A-B)} > \Delta t_{(action\ trajectory)}$).
The appointing of the fluctuations in the previous description are an important step to the next example of the *feet position* determination in front of the mailbox[26]. I will appoint this determination now but I want to stress in here that this description will later be the stepping stone for the upcoming appointing of the functioning of the *visuo*-motoric processes within the movement action (MA).
The description/explanation of the feet position determination[27] in letter posting is a crucial indication of the existence of perceptual images of latent action trajectory shapes and besides that it finally shows how it all really works at the functional level for a major part.

Images: The fluctuation borders of the length of the arm action are an important part of our cognitive knowledge concerning an action. We are able to increase the maximum length with the help of special[28] techniques (photo left) but above a certain value we just know that we are not able to bridge the gap. Even if there is hardly no room to manoeuvre, because of safety reasons or crowdedness, then we still are able to use that minimal distance to execute the necessary actions (photo right). But also

[24] All motoric movement actions are *Caught In A Line*.
[25] A time image and a specific length are all part of the action trajectory defining factors. Also see "Watch The Ball Trajectory!"; The ball trajectory defining factors (BTDF); p. 27.
[26] This feet position determination can be applied to many motoric movement actions.
[27] The feet position determination marks the transition between the leg action in the first phase to the stand still and the arm action in the second phase of the motoric movement action *letter posting*.
[28] The so called *finger walking*.

when this value drops below a certain value then there will be no manoeuvring room left. So if you get squeezed against the door of the fridge then there is just no room to reach the hand grip.

The explanatory model very clearly shows that we determine a feet position in front of the mailbox based on cognitive knowledge about the *precise global* (fluctuation) borders of the possible lengths of all action trajectories we are able to execute with an arm. If we were only able to execute this with the help of online perception processes then a feet position could only be determined *during* the execution of the actual *post* action. That is obvious not the case. We very well know the global borders of the *length* (!) of an action trajectory shape with the arm before we are going to actually execute the posting task. This knowledge about the fluctuation borders of the length of these action trajectories is an important part of our cognitive basis.
The explanatory model of the motoric movement action provides a clear, logical and uniform explanation for all feet position determinations. In all the decades I posted letters nothing ever inhibited the action and I was able to use the whole spectrum of action trajectory shapes and I think that is your main experience as well. If we are able to post *freely* then the explanatory model assumes that we quickly choose a position about halfway the fluctuation borders of the arm concerning the length of the action trajectory shape. So we don't stand too close to the mailbox and we don't take a position at our maximum's arm length either. We choose a comfortable, *easy*, position which doesn't require any extreme arm action. But as aforementioned we occupy the first available *easy* position very quickly and don't have a lot of extensive considerations in this process. We then know that this position will comfortably cover any possible, *sudden*, deviations/disturbances quite easily and we leave the actual execution to the online perception processes when the arm becomes active which will have to finish the actual post action. This all points to an efficient and effective, *parsimonious*, system that in the preliminary phases only tries to come to a strong, *precise global*, reduction of all possible action trajectory shapes within a very limited amount of time.
Out of the aforementioned you are also able to deduce that the perception processes in a posting task not just start after the feet position determination. The explanation of this determination involves the leg action much more into the posting task and shows that it is just the transition phase of the movement of the motionless, *dead*, letter by mainly leg action to movement by mainly arm action.

At a specific mailbox location the general cognitive image of an action will have to lead to a very restricted action trajectory shape due to the tactical movement action. This shape will serve as the basis for the actual movement action which in fact contains a perceptual image of a latent action trajectory shape. An action trajectory shape which can be compared with an invisible marble run[29]. The advantage of this *open* marble run is the fact that the letter is not compelled to follow one set pathway but that it is able to adjust itself to any possible, *sudden*, obstruction/deviation which could hamper a successful delivery. However the downside of this *open* action trajectory is the fact that possible deviations need to be monitored continuously. As aforementioned this monitoring process is attributed to the processing processes of the perception, the ventral and dorsal stream. The ventral stream is mainly occupied with the action trajectory shape but in a set relationship to the actual position of the letter. The dorsal stream is mainly occupied with the actual position of the letter but also in a set relationship with the action trajectory shape. This definitely ends the *perception-action* dichotomy and leads to the conclusion that the actual posting action can only be executed by a very clear and essential cooperation of *cognitive-perceptual* shaped images and *actual online* perception processes. The actual perception of the position of the letter shows the demarcation between the manifest and latent part of the perceptual image of the action trajectory shape. Because the (movement) action object (MA) is always able to deviate at any point within the action trajectory shape every time you execute the same posting process you will always need actual information to actually perceive the *tau*-value becoming zero within the next post action and the *tau*-value can only be perceived due to the filling of a latent action trajectory shape with a manifest part.

a. The *tau*-value within the movement action ($tau^{G}{}_{MA}$)

[29] You are able to find an extensive description of the marble run within the opening of addendum 2 of *Caught In A Line*.

Only if one will realize that both types of perception processes are simultaneously needed in the motoric movement action *letter posting* only then one will be able to gain insight in how the *tau*-value of the movement action ($tau^{G}{}_{MA}$) can be specified. The *tau*-value of the action trajectory within the movement action ($tau^{G}{}_{MA}$) can only be determined by observing how the manifest part of the *letter* trajectory/line segment shape closes the perceptual image of the latent part of that *letter* trajectory/line segment shape. The term line segment shape hosts the word *line* and *shape* which are exactly the two phenomena which must be appointed within a sound ecological explanation. Ecological explanations need to cover the evolution of the earliest organisms but also need to explain the apparent differences within higher/later ranked organisms. For the *tau*-value towards the timing in there one only needs to observe one-dimensionally, at the most basal level, how the (alleged) line segments relate to each other and so one doesn't have to exactly observe what *shape* of the letter trajectory is involved. This basal functioning of our perception processes can ecologically be linked to the earliest organisms. Evolution of cognitive knowledge about *the shape of the line* (!) can be observed within higher and later ranked organisms which will provide them a more secure determination of the *tau*-value. So conform D.N. Lee you could suppose that for the construction of the *tau*-value one only needs to observe how the gap between the letter and the slit approaches zero within the motoric movement action *letter posting*. This gap becomes very transparent within the motoric movement action *pouring*. When you fill a glass with a liquid you only one dimensionally observe how the actual surface is rising towards the rim of the glass.

4. The motoric movement (MM) of the motoric movement action *letter posting* – The secondary focus

So the explanatory model clearly reveals that in an universal way every motoric action can be divided in two autonomous complex subsystems. The movement action (MA) and the motoric movement (MM). The motoric movement (MM) in the motoric movement action *letter posting* is very simple. If, like aforementioned, one divides the letter posting into three parts then it concerns a simple walking action, a simple arm action and a simple throwing action. Because it is so simple I will not appoint it any further in this section. In this section I want to explain how the secondary focus is involved and appoint its connection with the *tau*-value of the motoric movement ($tau^{G}{}_{MM}$) which is of importance in the functional *tau*-coupling within the complete motoric movement action.

In general the secondary focus in every motoric movement action must be pointed at the biomechanical main action within the motoric movement (MM) towards the transition point in the direction of the action trajectory shape. This is formulated like this because in very complex movements, like a tennis service or a long distance golf swing, one is not able to avoid paying attention to aspects of the motoric movement (MM). In simple actions like letter posting that is not necessary. We don't have to pay any attention to a specific posting technique. However the rest of the general description concerning the secondary focus will stay. Within letter posting we always focus on the transition point, so not out of a not relevant technique, towards the letter trajectory. The transition point is the point where the movement action (MA) and the motoric movement (MM) come together or to put it in other words it is the point where they *transition* which the transition point literally indicates.
In letter posting these two complex subsystems transition in the point *between* the outside parts of the fingertips which touch the letter and the outside parts of the letter that are touched by these fingertips. So although the transition point is situated extremely close to the position of the letter, which forms the essence within the movement action (MA), it doesn't have any overlap with the letter at all. They belong to two irreconcilable worlds. The letter is part of a line segment shape, outside the body, between a random starting point and the slit of a mailbox within the movement action (MA) and this line segment shape can only be executed by the motoric movement (MM) which is only able to create movement trajectories, within the body, just *until* (!) that transition point and definitely not beyond that transition point. So even if the technique within the motoric movement (MM) is very simple, the secondary focus will always be pointed at, intentional or not intentional, movements within the body

towards the transition point directed to the action trajectory shape. While at the same time the primary focus must be pointed at the completing of the action trajectory shape within the movement action (MA) outside of the body.

We are able to fully perceive all movement trajectories proprioceptively within the motoric movement (MM)[30] like within the aforementioned complex techniques like the service in tennis or the golf swing. However the explanatory model notices a few different phenomena within the proprioceptive perception. I will appoint those phenomena now.
Without direct vision we are able to clap behind our backs and to scratch an itching occiput and in pitch black darkness we are able to open a front door lock and in the same way we would be able to post a letter without any vision. Although alternative strategies exist the last two actions will then mainly be executed by bringing the non-key/letter hand to the lock/slit[31]. When two of our own body parts[32] are involved, so when we are able to feel where they both are situated, we are able to construct a perceptual, *precise global*, image of a latent action trajectory shape solely on the basis of proprioceptive perception[33]. However this proprioceptive perception solely belongs to the movement action (MA) and has nothing to do with the proprioceptive perception within the motoric movement (MM) which I will address in a moment. This proprioceptive perception is solely occupied with perceiving the action trajectory shape and within there is perfectly capable of constructing a *tau*-value within the movement action ($tau^{G}{}_{MA}$) and to perceive the closing of the gap. So when for example a nightly mosquito picks a landing spot on our head we are capable of even creating an acceleration phase first and later a deceleration phase within the action trajectory shape from the palm of our hand to the head of the mosquito. This takes care of the fact that we will be able to close the relevant gap quickly but that we don't have to hit through our head but only *just until the outside* (!) of our head. This can only be done with the help of a strict and perfect *tau*-coupling in which the *tau*-value of the movement action ($tau^{G}{}_{MA}$) must be aligned precisely with the *tau*-value within the motoric movement ($tau^{G}{}_{MM}$). And so it can happen that within letter posting in pitch black darkness we are

[30] When we clap behind our back, without any vision, we construct two latent, *precise global*, action trajectory shapes within the movement action (MA) out of the two palms of our hands which have an intersection point at around the middle of our back. When we execute one clap we construct a perceptual image of the gap between the palms of our hands and we know exactly (from precise global to more and more precise) when the *tau*-value of that gap approaches zero. The transition point within this motoric movement action is situated between (!) the outside of the palms of the hands that will produce the clap and the end of the relevant muscles within the body that manipulate the outside of the palms of the hands. Our clapping technique is so simple that we are able to execute this action by primarily focusing on the leading gap within the movement action (MA) and by just secondarily focusing towards the transition point in the direction of the action trajectory shape from within the inside of the body. If we perceive that the leading gap of the action trajectory shape within the movement action (MA) approaches zero then we are able to command the motoric movement (MM) in such a way that it even can add a crescendo to the clap. We are able to achieve this by proprioceptively accelerating the transition point within the motoric movement (MM) in the last phase of the action trajectory shape and by decelerating it suddenly in the very last part.
[31] Within the use of an ignition switch within a strange car you prefer to create an action trajectory shape with actual vision most of the time. In your own car you are so accustomed with the desired action trajectory shape out of your fixed seat position that you won't need any vision anymore. Still you will regularly experience proprioceptively that the tip of the ignition key is not situated at the exact right spot. However on the basis of this wrong *proprioceptive* touching (trial and error) you soon create the right action trajectory shape.
[32] Or when flexible (motoric) movement objects are involved.
[33] Visual handicapped persons who use a blind man's cane do exactly the same. Now the fingertips are extended within the tip of the cane because the cane is a flexible (motoric) movement object. A user of the cane will now be able to construct a latent action trajectory shape between the tip of the cane and the feet (the transition point is actually that part of the shoe that will touch the pavement) within the motoric movement action *walking* based on proprioceptive perception. I intentionally mention this specific example because it also shows that we not only proprioceptively perceive the tip of the cane but that we also *feel* if *nothing* is blocking the *whole* action trajectory shape by swinging the whole arm and stick. That is namely also the implicit goal when we probe the door looking for the key hole with the non-key hand in pitch black darkness. Also then we are *proprioceptively* feeling what obstacles we have to avoid within the *whole* (!) shape. But because most of the time nothing will hamper us in that task this part is never acknowledged.

simultaneously occupied with two different kinds of proprioceptive perception within the action trajectory shape and in the motoric movement (MM) which will be discussed later on.
However like aforementioned the proprioceptive perception within the movement action (MA) has nothing to do with the proprioceptive perception within the motoric movement (MM). In which of course we have to remark that the proprioceptive perception within the movement action (MA) could scientifically never have been noticed before because no one ever acknowledged the action trajectory shape within the explanatory model.
Current scientific research only links the proprioceptive perception to the motoric movement (MM) and has divided it in two groups. The proprioceptive perception in relationship to *movement* and the proprioceptive perception in relationship to *limb position*[34]. Although this scientific research *again* clearly tends towards the explanatory model it *again* is not capable of definitively explaining the found phenomena without a strict framework of that explanatory model.

"While we have learned a lot in recent years about the peripheral signals responsible for the senses of limb position and movement, the picture continues to evolve. We are beginning to recognize that the source of the signals can change, depending on the task undertaken. Yet we still know relatively little about the central processing of the incoming information. How do we derive the metrics of body parts, for example, or process constantly changing spatial signals during ongoing body movements? This is an area where we should focus future research efforts."[35]

Besides the novelty of the explanation of the proprioceptive perception within the movement action (MA), the explanatory model of the motoric movement action also takes the found phenomena within this part of science one final step further. The explanatory model differentiates when it comes down to the complexity of the motoric movement action and tells exactly when, how and where a secondary focus is needed out of the perspective of the *limb position*. It also shows that, regardless of the complexity of the action, the secondary focus must always be pointed at the transition point out of the perspective of the motoric movement (MM) because that is the *very last point* (!) which we are able to manipulate directly within the motoric movement (MM) towards that action trajectory shape. With the transition point the explanatory model translates the signalled phenomenon of the proprioceptive perception in relationship to *movement*. Till now current scientific research only came to the conclusion that proprioceptive perception *somehow* (!) has a relationship with movement within a motoric action. The explanatory model shows exactly that this phenomenon is explicitly related to the transition point and that the proprioceptive perception in there is strictly related to the motoric movement (MM). But it also shows that the transition point is often situated very close to the, movement of the, (movement) action object that it is able to cause confusion. Only the places P of the letter will construct the action trajectory shape within the movement action (MA) and the transition point, *between* (!) the places of the letter that will be touched by the fingertips and the places of the fingertips that will touch the letter, within the motoric movement (MM) from inside the body will only be able to take care that this action trajectory shape will be executed.
So the explanatory model shows that within a simple *self-paced* motoric movement action like letter posting we mainly need to be occupied with the perception of the action trajectory shape within the movement action (MA). Because we hold on to the letter most of the time we are able to let the motoric movement (MM) just follow the perceiving of that action trajectory shape within the primary focus. Due to this we only need to observe the transition point out of *a* motoric movement (MM) within the secondary focus within letter posting.

a. The *tau*-value within the motoric movement ($tau^{G}{}_{MM}$)

Now within *self-paced* motoric movement actions like letter posting the next phenomenon occurs. The action trajectory and the according *tau*-value of the movement action ($tau^{G}{}_{MA}$) is created by all consecutive places P of the letter. It is very important to stress in here that the movement action (MA)

[34] See for example: U. Proske & S. Gandevia; The proprioceptive senses: Their roles in signalling body shape, body position and movement, and muscle force (2012).
[35] See the previous footnote.

is only concerned with the letter and so only the letter shapes the action trajectory and determines the *tau*-value. Or in other words it has nothing to do with the transition point. Conversely the *tau*-value of the motoric movement ($tau^{G}{}_{MM}$) is created by all consecutive places P' of the transition point within the secondary focus[36]. Because we continuously hold the letter these points, P and P', will maintain to be close to each other[37] although in essence they fulfil two completely different goals. So they relate to different gaps but their *tau*-values can be observed as one because they fill in the relevant line segments in almost the exact same way. Or within other words the perception of the gap of the movement action (MA) automatically provides information about the gap of the motoric movement (MM). So in these kinds of (*static*) motoric movement actions one is able to say that there is an equalization of gaps. This implies that you are able to pause the action trajectory at any moment when you for example need to sneeze. The pausing of the gap of the action trajectory will automatically pause the gap within the motoric movement (MM). If you resume the movement action (MA) then the perception of the gap within the motoric movement (MM) will be resumed simultaneously and will continue with the movement of the letter till the leading *tau*-value ($tau^{G}{}_{MA}$) will approach zero. Although in common language this isn't called timing you are now able to understand that self-paced actions are timed as well. This phenomenon can be regarded as *self-paced* timing. If the visual perception processes observe that the *tau*-value of the movement action ($tau^{G}{}_{MA}$) approaches zero then the *tau*-value within the motoric movement ($tau^{G}{}_{MM}$) is guided in such a way that it also approaches zero. In static actions like within the first two phases of the motoric movement action *letter posting* this is hard to grasp. However within the upcoming explanation of the *tau*-coupling within the throw of the letter within the non-static last phase of the motoric movement action *letter posting* the *tau*-coupling within static actions become crystal clear as well. We need to close the relevant fingertips during the holding on to the letter in the first two phases of this action as active as we need to open them simultaneously within the last phase.

5. The complete motoric movement action *letter posting*

The description of the two only organs of the motoric movement action can leave the suggestion that they are linear or otherwise separated processes. That is a misconception. Both organs are part of one undivided complex system. The explanatory model explains the motoric movement action as a complex system. The description of the motoric movement (MM) and the movement action (MA) only concerns the explanation of the two complex subsystems. During the execution of a motoric movement action they need to be executed simultaneously. The explanatory model explains which perception processes in both parts are needed and out of which perspective they need to be perceived. The explanatory model is connecting the processing processes of the perception to the movement action (MA) and proprioceptive perception to the motoric movement (MM) but it doesn't exclude that some perception processes show overlaps. So in letter posting the primary focus must be pointed at the actual position of the letter within a letter trajectory shape and at the same time the secondary focus must be pointed at the biomechanical main action towards the transition point which will *execute* (!) the movement action (MA).

a. The *tau*-coupling within the complete motoric movement action *letter posting*

Both foci arise out of the obligatory simultaneous cooperation of bottom-up and top-down perception processes. That insight definitely ends the perception-action dichotomy within scientific debates. One can only get convinced of the *tau*-values within the movement action ($tau^{G}{}_{MA}$) and the motoric

[36] In for example the motoric movement action *catching*, appendix B, this transition point trajectory is a really different line shape than the action trajectory.

[37] So for all clarity our primary focus during letter posting is only observing the movement of the letter. That includes the *tau*-value of the letter trajectory. At the same moment our secondary focus is observing the transition point where we hold the letter. As aforementioned we do that out of a certain technique but that doesn't need special attention. But it does need attention though. So during posting you visually observe all points P of the letter towards the slit of the mailbox and at the same time you proprioceptively observe all points P' of the transition point out of the movements within your body.

movement ($tau^{G}{}_{MM}$) if one will understand the exact origin. You are only able to depict a gap when you try to visualize a perceptual image of a latent line segment shape as sound as possible and take away the manifest part of the actual positions of the (movement) action object or the transition point within that perceptual image. The gaps follow each other as aforementioned. The leading gap is always created by the movement action ($tau^{G}{}_{MA}$). It is leading because the letter is the (movement) action object and forms the essence of the action because the letter only will take care that our egocentric formulated will be satisfied. But we are not able to directly influence the position of the letter within a *letter* trajectory shape. Therefor the *tau*-value of the motoric movement ($tau^{G}{}_{MM}$) will have to follow the primary focus because it executes the movement action (MA) and because we conversely are able to directly influence it in a proprioceptive way. The *tau*-coupling occurs during the whole action within the letter posting and also shows that and how both processes must be executed simultaneously.
However as aforementioned the timing is not really relevant in the first two phases of the motoric movement action *letter posting* because within there we hold on to the letter constantly. In the final phase of the letter posting when the letter is actually inserted into the slit of the mailbox the *tau*-coupling becomes more significant c.q. transparent. Even this tiny throw needs a *tau*-coupling[38]. Although a very small distance A-B is involved in here a small energy transfer is needed and therefore a small initial phase needs to take place. The *tau*-value of the movement action ($tau^{G}{}_{MA}$) is now determined by how the letter fills the small line segment A-B of that initial phase. The *tau*-value of the transition point towards that action trajectory within the motoric movement ($tau^{G}{}_{MM}$) will have to follow this leading gap and will have to provide the message to the motoric movement (MM) to completely release the letter from all the relevant fingertips once the letter reaches the end of the perceptual image of that latent letter action trajectory shape in B. So with other words if we perceive that the *tau*-value of the movement action ($tau^{G}{}_{MA\ A\text{-}B}$) approaches zero then the *tau*-value of the motoric movement ($tau^{G}{}_{MM\ A\text{-}B}$) also has to approach zero and gives the order to take all fingers of the letter at the exact same moment at all transition points.
In that way the *tau*-coupling can be brought back to the primary and secondary focus. The primary focus in a throwing task must be pointed at the initial phase of the action trajectory shape and especially at the previous determined end point of that initial phase. The secondary focus in a throwing task must be pointed at the transition point towards the action trajectory shape out of the perspective of the throwing technique belonging to the motoric movement (MM).

6. The letter posting task and the patient D.F.

The explanatory model of the motoric movement action provides insight in all processes at the functional level and because of this we are able to arrange all motoric movement actions concerning their complexity. The explanatory model also shows in there that we often use one standard procedure to execute an action but that we are able to complete tasks in various other ways[39]. This latter insight also provides a link to the aforementioned fact that we are able to implement abstract cognitive knowledge about all kinds of action trajectory shapes in a maximal creative way. Therefor I always wonder how I would execute the same motoric movement action in pitch black darkness and split that question in two parts concerning a *known* and an *unknown* environment.
If we are going to post a letter in pitch black darkness in a *normal* way then you probably will raise your not-letter hand to the slit of the mailbox first to create a perceptual image of a latent action trajectory shape. So now we don't perceive this visually but we visualize a latent action trajectory out

[38] The essence of a throwing task is that the (movement) action object (the letter) must pertinently be held over a certain (very tiny) line segment A-B in which the initial phase of the object trajectory will be shaped. That initial phase is essential for the upcoming or near future shape of the action trajectory and for the transfer of energy. When the action object approaches B the body parts which hold the object will have to receive the message to release from the object at the exact same time.
[39] The explanatory model clearly shows in there that if visual perception is involved that it belongs to the movement action (MA). But visual perception is not necessary for a motoric movement action as long as a perceptual image of a latent action trajectory shape is created. Conversely the proprioceptive perception is always involved in the motoric movement (MM).

of non-visual perception[40]. If the direction of the slit, for example in a scientific setting, could be varied then we perceive the specific direction of the slit in the exact same way with the not-letter hand and we accordingly adjust the letter position in our letter hand.
However if you were only allowed to use the letter hand within pitch black darkness you also will be able to successfully execute this task. So now you are not able to execute this task *as normal as* you are used to execute it but you are going to execute it within the abstract possibilities which remain within the task. Now with the letter hand you are going to probe the surroundings with the only goal to just find the slit which can be compared to the main formulated goal within this task that says that in the beginning of a posting action it is the only goal to reduce the places P between a letter and a slit of a mailbox. This execution is also based on the fact that we cognitively know that in a letter posting task the letter only needs to cross empty space, *nothing*/*the void*, first just in order to get close(-r) to the slit[41]. We cognitively know that we don't need to achieve anything more in this phase of the execution of this task. Once you found the slit with the letter hand, as aforementioned out of proprioceptive perception, you then start to compare the letter direction in your hand with the direction of the slit of the mailbox because cognitive knowledge instructs you that a letter will not enter a slit transversely. Then you try to align the two directions with the help of trial and error. You repeatedly will take the letter a little distance from the slit and place it back in a slightly altered way. The proprioceptive/haptic feedback which you will receive from this process will finally lead to successful alignment of both directions and a successful delivery.
Now we come to the patient D.F.[42]. Out of the aforementioned the explanatory model of the motoric movement action is able to formulate a clear explanation to the question why the patient D.F. is able to execute a posting task, in normal day light, successfully although she doesn't own a properly functioning ventral stream anymore. The patient D.F. is for example not able to cognitively tell in which direction the slit of the mailbox is shaped in any phase of the task. The aforementioned explanation in pitch black darkness tells exactly why this ventral stream is not essential at all and that we are able to execute tasks in different ways. D.F. is just able to bring the letter closer to the slit out of the aforementioned abstract idea that a letter first needs to come closer to a slit. Or maybe out of an even more abstract idea that the gap between two items just needs to be closed first for most of its part. Then like in pitch black darkness she could use the trial and error method but even that is not necessary in here. Because once she will see both items, the letter and the slit, within one visual image she will be able to just align the two without ever having to cognitively appoint any shape or any direction. So with this *comparing*-method the patient D.F. will be able to successfully execute this task as well as many grasping tasks.

[40] In a scientific setting the area between the letter and the slit will not be occupied. Just like what you will experience during your daily posting tasks. But however the space between the letter and the slit is empty one of the main goals of the perception processes is to determine one free action trajectory shape through the *nothing*. Only *nothing* will guarantee a successful action trajectory shape *between* the animal and the environment.
[41] At a micro level the first task is just to bridge the space in an environment. The explanatory model, conform Gibson, defines the animal-environment relationship crucial and states that the relationship is shaped by the space between the animal and the environment. But because this space is invisible we were not able to see that it is an existing entity.
[42] https://en.wikipedia.org/wiki/Patient_DF; http://psychsciencenotes.blogspot.nl/2012/04/patient-df-uses-haptics-not-intact.html.

The explanatory model of the motoric movement action
-
Definitions

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

N.J. Mol

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"This is the essence of the explanatory model c.q. the phenomenon in which a huge mind step is required within current scientific thinking. One will namely have to realize that within every motoric action *two* (!) foci must *simultaneously* (!) be pointed at two autonomous movements which both need their exclusive set of perception processes. With proprioceptive perception processes we need to pay attention to movements *within* (!) the body as a part of the motoric movement (MM)[43] which we are able to control directly and simultaneously we need to focus on the movement of the (movement) action object within an action trajectory shape with a wide variety of perception processes[44] as a part of the the movement action (MA) *outside* (!) of the body which we conversely are not able to control directly but which only is capable of fulfilling the essence within the egocentric formulated will. So the movement action (MA) is *only* (!) capable of executing the essence of the task within an egocentric formulated will and the motoric movement (MM) is *only* (!) capable of executing the movement action (MA). Or in other words the motoric movement (MM) is absolutely not able to directly execute the essence of the task[45] and the movement action (MA) can't execute anything by itself. Only the movement within the motoric movement (MM) is able to evoke movement within the movement action (MA).
The separated perception processes within both autonomous movements will in both aforementioned complex subsystems each have to lead to the construction of a perceptual image in which a latent line segment shape is filled with a manifest line segment shape. This filling process c.q. the closing of a *gap* (!) is already appointed as *tau*-value within D.N. Lee's *tau*-coupling theory and both *tau*-values need to approach zero as part of an optimization process. In this optimization process the leading *tau*-value of the the movement action ($tau^{G}{}_{MA}$) always needs to be followed by c.q. aligned with the dependent *tau*-value of the motoric movement ($tau^{G}{}_{MM}$). This functional *tau*-coupling needs to occur within every motoric movement action."

[43] In that way it will become clear that the term *visuo*-motoric processes is not correct due to the fact that occurring visual perception processes will always belong to the complex subsystem of the movement action (MA) and never will be a part of the other complex subsystem of the motoric movement (MM). They are linked to each other due to their separate *tau*-values within the functional *tau*-coupling but in no other way. Due to this last explanation one can immediately see that the term *sensori*-motoric processes indeed is correct because the movement within the complex subsystem of the motoric movement (MM) can only be perceived in a proprioceptive way. Within addendum 2 of *Caught In A Line* the explanatory model fully appoints the already within science discovered essentially different phenomena of the *movement* and *limb position* in relationship to the proprioceptive perception.

[44] With the explanatory model it will become crystal clear that we are able to perceive the movement action (MA) within a motoric movement action with a wide variety of perception processes. In here the explanatory model definitely confirms the use of visual and auditory perception processes but introduces the novum that the movement of a (movement) action object (MA) within an action trajectory shape can also be perceived with proprioceptive perception processes. So although we often prefer to execute an action with the help of *superior* (!) visual perception processes this explains that the same action can successfully be executed as well in for example pitch black darkness.

[45] Within for example the motoric movement action *letter posting* it is explained that only the letter will complete the post action and for example within "Watch The Ball Trajectory!" it is explained that only the tennis ball executes the game of tennis. We will never be able to control matter. We are only capable to manipulate the direction of matter indirectly.

The explanatory model of the motoric movement action – Definitions

1. Introduction

The explanatory model of the motoric movement action is developed by N.J. Mol and encompasses a full, ending and final description of all functional perception and motoric processes within all motoric actions in which a movement[46] or a *zero*-movement[47] is being executed. The explanatory model has been discovered within actions in which an obvious *displacement*-movement could be perceived within the movement action (MA) by the (movement) action object (MA). Due to this discovery the explanatory model was later on capable of assessing also those actions in which an obvious *zero*-

[46] This is the essence of the explanatory model and also the phenomenon where a huge mind step needs to occur within scientific thinking. Within every action *two* (!) foci on two autonomous movements should be recognized which both need their own set of perception processes. With proprioceptive perception we need to pay attention to movements *within* (!) the body as a part of the motoric movement (MM) which we are able to directly control and simultaneously we need to focus on the movement of the (movement) action object within an action trajectory shape as a part of the Movement Action (MA) *outside* (!) of the body which we are not able to control directly[46]. The Movement Action (MA) *only* (!) executes the essence of the task within an egocentric formulated will and the motoric movement (MM) is *only* (!) capable of executing the Movement Action (MA). So the motoric movement (MM) is absolutely not able to execute the essence of the task[46].The separated perceptions within both autonomous movements need to construct separate perceptual images in which a latent line segment shape is filled with a manifest line segment shape. This filling process c.q. the closing of a *gap* (!) is already appointed as *tau*-value within D.N. Lee's *tau*-coupling theory and both *tau*-values need to approach zero as part of an optimization process. In this optimization process the leading *tau*-value of the Movement Action ($tau^{G}{}_{MA}$) always needs to be followed by the dependent *tau*-value of the motoric movement ($tau^{G}{}_{MM}$).

[47] For his visual organ it doesn't matter if Federer is about to hit a normal incoming tennis ball or a tennis ball fixated on a static pole/pillar because that organ will create just as many time frame images of the ball. However within his visual perception Federer perceives an obvious ball trajectory shape within the first situation by comparing all places P of the ball and within the latter situation he will not notice any difference in places P of the ball. Within his perception this ball is not moving but in fact is actually moving all the time at the same spot as in relationship to his visual organ.

movement occurs. With the explanatory model as the starting point already a number of essential documents have been published[48] and many more will follow.
Unfortunately current scientific thinking is situated at quite a remote distance from the explanatory model and that is why the conversion to the new insights will be a real struggle because multiple complex mind steps are demanded. Before a final understanding can be obtained all those mind steps together are necessary and to make that possible this document has the main goal that at least the definitions will not be a disturbing factor because it is possible that confusion could arise within the new definitions because the explanatory model had to appoint the many new discovered phenomena. Within this appointing process the explanatory model had the assignment to stay as close as possible to the current/old terminology but the new terms needed to cover the load as much as possible. Although the new terms are carefully chosen they are not carved in stone. If better definitions occur c.q. are proposed then they need to be implemented as soon as possible. Science is paramount.

2. Definitions

a. Complex system

Out of the complex dynamical systems thinking approach the explanatory model unequivocally encompasses a complex system. Complex systems are systems whose behaviour is intrinsically difficult to model due to the dependencies, competitions, relationships, or other types of interactions between their parts or between a given system and its environment[49]. Every imaginable motoric action hosts the exact same complex system and the explanatory model clarifies each one of them in the exact same universal way. Within an ecological approach this is a very convincing factor because combined with the fact that a *simple* complex system is involved it can be linked to the development of the earliest organisms.
The idea that the explanatory model encompasses a complex system is diametrically situated opposite to explanations with for example a linear character. The mindset within current science and for example also the mindset within the training programs of the International Tennis Federation do obviously still represent that linear philosophy. This linear assumption probably stems from the idea that for example the grabbing of a coffee cup cannot be anything else than a very simple happening which only needs a simple linear explanation. Unfortunately that appears to be the biggest misconception within science. Even within the simple grabbing of a coffee cup a complex system is involved in which there should be remarked that accordingly each motoric action must be explained as much more complex but in there it should be noticed that the parts are conversely much and much simpler than how current science now explains one motoric action as a whole.

b. Two complex subsystems

The essence of the clarification within the explanatory model encompasses the fact that the execution of one and every motoric movement action can be divided in autonomous parts. The complex system of the motoric movement action only hosts two autonomous complex subsystems. The motoric movement (MM) and the movement action (MA). Within there the major scientific breakthrough is situated in the fact that the essence of the task formulated within the egocentric will can only be executed by the (movement) action object (MA)[50] moving within an (movement) action trajectory shape within the movement action (MA). This remains and will remain to be only a matter of the (movement) action object and the explanatory model instructs that we are only capable of perceiving

[48] For example see: https://watchtheballtrajectory.jouwweb.nl/.
[49] https://en.wikipedia.org/wiki/Complex_system
[50] The letter, the tennis ball, the water in a mountain stream, the outside of the fingertips etc. can never be manipulated directly over a line segment shape outside of the body but those are the objects that in essence fulfil the task at hand.

this part out of the perspective of the (movement) action object (MA) and that we are not capable of directly manipulating the movement of the (movement) action object (MA) in relationship to the action trajectory shape[51].
We are only capable of and have to passively (!) perceive the (line segment shape of the) movement of the (movement) action object (MA) and are only able to influence this movement directly with complete other perception processes within the other complex subsystem of the motoric movement (MM)[52]. The latter is conversely able to directly execute something c.q. we are capable to manipulate directly but that definitely doesn't encompass the essence of the task which can be formulated out of the egocentric will. The motoric movement (MM) is *solely* (!) capable of executing the movement action (MA) and we are only capable of perceiving the movement action (MA) *passively*[53].

c. Complex focus image

The aforementioned novae within science shed a completely other light on the dilemma of attention within a motoric action. Current scientific thinking still maintains the assumption of one undivided action, considers an action to be a simple and linear occurrence and therefor expects just one focus to be involved within the whole action. Conversely the explanatory model shows that simultaneously separate autonomous attention must be pointed on two completely different parts within every motoric movement action. I.e. within every motoric action two foci are involved in which the primary focus encompasses autonomous perception processes within the movement action (MA) and *simultaneously* (!) this will have to be aligned with the secondary focus which encompasses autonomous perception processes as part of the motoric movement (MM).
On logical grounds it can be assumed that parsimonious organisms construct one complex focus image out of the two separate foci because they have to be executed simultaneously as part of one complex system that only succeeds when both parts are fully executed. Besides logic you are also capable of convincingly determining this within your own empirical observations and it is additionally possible, although it feels very weird, to disconnect c.q. to separately perceive the two foci when we for example grab a coffee cup. You are able to visually perceive the fingertips closing a gap within the action trajectory shape outside of the body and at the same moment you are able to proprioceptively perceive how muscles within your body are working during that task. Within letter posting we are only capable of perceiving the line segment shape of the letter, i.e. the movement containing all positions P of the letter, outside of the body within the movement action (MA) and we are only capable of aligning this movement of the letter over an action trajectory shape indirectly with movements until only the last point within the body that is closest to the actual position of the letter[54]. Within this point the movement action (MA) and the motoric movement (MM) transition and that is why the explanatory model defines this as the transition point.
So in regard to current science one can in retrospect state that within scientific research one indeed noticed that the more the attention came to the outside of the body the better learning achievements could be expected but that scientific research was never able to go so far away from the body that the action trajectory shape could be discovered which definitely needs the primary focus. They were only able to appoint a focus in relationship to a body part and by emphasizing that they faultily reinforced

[51] Within the cover text of *Caught In A Line* and all related addenda it is explained that we indeed are able to influence the direction of the water in a mountain stream but never in a direct way. With mainly visual perception processes we need to focus on the direction of the stream and we are only able to (directly) move rocks within the stream.
[52] Within here an aforementioned footnote returns in which is explained that the term *visuo*-motoric shapes the false impression that there is a direct relationship between visual perception and the motoric execution. Only an indirect relationship is involved because they dont belong to the same complex subsystem.
[53] Within "Watch The Ball Trajectory!" that leads to the following wordplay. Only (all positions/places of) the tennis ball executes the game and we are only able to play/execute that *autonomous* (!) game.
[54] Within letter posting the transition point is exactly situated *between* (!) the outsides of the fingertips which touch the letter and the outsides of the letter which are touched by the fingertips.

the secondary focus[55] and the biggest mistake within there of course encompasses the fact that a second focus and the connection between the two foci within one complex system has been missed.

d. The term *motoric movement action*

So within every motoric action we have to passively pay attention to a movement as part of the movement action (MA) and we are only able to manipulate this movement with completely other movements within the body which also need autonomous attention. Both sort of movements belong to irreconcilable worlds and because this novum exactly hosts the essence of the functional explanation there was a need to look for a new linguistical term in which this phenomenon could be expressed in a maximal way. The term motoric movement action (MMA) was found as an alternative to the terms motoric action or action. The new term shows that in the end every action encompasses just one *undivided* (!) phenomenon in which simultaneously the two foci both need to be established but that it can be split in two autonomous parts. The term motoric movement action clearly shows this by using the word movement only one time but shows the possibility to either connect it to the word motoric and creates the term motoric movement (MM) or the word action and creates the term movement action (MA). In that way the word movement shows that it is a crucial and intermediary part within the term motoric movement action which connects both complex subsystems.
Besides the fact that the phenomenon of double movements is appointed within this term in a subtle way it instantly forms a nice contrast to the term motoric action. Due to the fact that the whole motoric movement action can now be appointed static actions like standing still, balancing[56] etc. can now be fully appointed as well[57]. Motoric *movement* actions are characterized by a definite *displacement*-movement c.q. an action trajectory shape in which all the consecutive places P of the (movement) action object indeed show differences in those places P and a motoric (*non-movement*) action is conversely characterized by a *zero*-movement c.q. a *zero*-line segment shape in which our perception processes definitely will not perceive any changes in places P of anything.

e. The formula of the motoric movement action

The formula of the motoric movement action can be depicted like this: MMA = MM x (MA). The formula clearly shows one complex system in which one motoric movement action can only be executed by the compelling cooperation of two completely autonomous parts. The brackets around the movement action (MA) show that this part is the leading phenomenon and needs the primary focus and shows that the motoric movement (MM) is the dependent phenomenon which needs to follow the movement action (MA) with the secondary focus. Within here the explanatory model shows the big breakthrough that within every action always two foci must be pointed at two autonomous parts as opposed to current scientific belief that only one focus is involved[58].
Furthermore the formula shows that an action only compels two autonomous complex subsystems which *simultaneously* (!) need to occur and need to be perceived. From the fact that two autonomous complex subsystems simultaneous need to occur for one action to be successful the conclusion can be drawn that every execution of any motoric movement action can only be considered as an optimization

[55] Within "Watch The Ball Trajectory!" you are able to discover that the reinforcing c.q. the emphasizing of the secondary focus had a detrimental effect within the education of tennis. Within tennis the primary focus should always be pointed at the (movement) action object (MA) and that is the tennis ball which is caught in a line c.q. which has a set relationship with a ball trajectory shape.
[56] For example within standing on a balance beam but also think about balancing a stick on one of your fingertips.
[57] In here the scientific research about standing still and moving walls must be mentioned. This research clearly shows that within static actions we definitely want to maintain the same distance within the perceptual image of the line segment shape we construct between the animal and the environment and it shows that if our perception processes detect a change within the distance of that line segment shape that we compensate the static action in a set way.
[58] Within addendum 1 of *Caught In A Line* an extensive explanation is revealed why this belief remains to be so strong within science.

process. This expresses another novum and forms a great contrast with current scientific thinking which mainly considers motoric actions as set standard processes[59]. Conversely you are only capable of optimizing both complex subsystems because there can never be a set relationship established between movements which belong to two irreconcilable worlds. Each time, again and again, within every motoric action anew one will have to execute a brand new optimization process.
So therefor for example it is explained within the motoric movement action *letter posting* that within the last part of the posting we will have to release all relevant fingertips from the letter[60] with a precise *tau*-coupling but never, and I repeat never, will be able to achieve this in the exact same way. How we in what *constellation* (!) will remove the relevant fingertips from the letter will never ever be the same and the novum is that it really doesn't matter. It is only of importance that the always occurring deviations within that constellation will be kept within certain fluctuation boarders because then every letter will *precise globally* follow the same path, the same first initial phase c.q. will be released in a similar way and that is the only goal within parsimonious operating organisms. If a letter could only be posted due to an initial phase which exactly have to fit one set specific line segment shape then far too much attention and/or energy would be needed and ergo will cost too much time. Or in other words organisms who had to depend on such a system wouldn't have been able to compete/survive in a competitive evolutionary playing field.
Within complex systems the present complex subsystems do not show set relationships but of course do influence each other. Only the complex subsystem itself can be optimised and by doing so play a role within the optimization process of the other present complex subsystems. As aforementioned the complex subsystem of the movement action (MA) is leading and the optimization process within that subsystem is the leading guide for the optimization process which needs to occur within the motoric movement (MM).
So although the processes within the two autonomous complex subsystems can't be linked to set relationships the aforementioned optimization processes are always coupled c.q. do transition in one exact point. The explanatory model defines that as the transition point. Although the formula is not very clear in regard to this transition point the product sign within the formula could be linked to this point in which you are also able to assess the product sign as the spot where two mathematical collections only touch each other in one point.

f. <u>The transition point</u>

The explanatory model of the motoric movement action shows that the two autonomous complex subsystems need to be linked c.q. that they do have to transition somewhere. The action trajectory shape as part of the movement action (MA) is always situated outside of our body[61] and we are only capable to directly influence the motoric movement (MM) till a point that always will remain inside our body even though the transition point can be situated far outside the body if one is using a flexible

[59] The explanatory model supports most already discovered phenomena and their related data within the movement sciences and doesn't deny them at all. Within most of those phenomena the explanatory model is just able to add the final and ending explanation. However the phenomena within current scientific thinking about vector coding, position coding, parameter coding etc. is fully rejected by the explanatory model because the explanatory model shows that after the tactical shaping of a perceptual image of a latent action trajectory between for example the starting point of a letter and the slit of the mailbox we mainly perceive the actual execution during the actual movement action (MA) out of the perspective of the letter. Within there we only execute an optimization process in which parsimonious organisms are only taking care of the fact that every consecutive place P brings the letter closer to the slit. Or within other words if the letter is positioned at place P(0) we are only interested and occupied with the process to bring it to the place P(+1) and so *at that moment* (!) we are definitely not interested to bring it to the slit at all.
So the novum within the movement sciences concerning this matter encompasses the fact that the actual execution within letter posting definitely must not be considered out of the perspective of the slit but out of the perspective c.q. the actual position of the letter.
[60] Which can obviously also be noticed within the game of darts.
[61] Within the words of J.J. Gibson; *Between* (!) the animal and the environment.

(motoric) movement object (MM) like for example a tennis racket (pen, cutlery etc.)[62]. Within the use of this object we are only capable of manipulating the outside, the *sweet spot*, of the racket head with completely different movement trajectories till about the point within the body where the relevant fingertips touch the outside of the handgrip of the racket. But in spite of the fact that there are a lot of muscles within the fingertips and therefor the manipulating within the motoric movement (MM) will indeed come very close to the outside of the fingertips it will never actually come on the outside. It will always stay within the body. Or with other words we are only able to achieve movement on the outside of the body if we move something on the inside of the body.
The need to name the part of the motoric action in which the two autonomous complex subsystems show an overlap only became evident due to the discovery that a motoric action can only be executed by two autonomous foci. Within philosophies which only consider one focus there was of course never a need to do so. The term transition point has been chosen because it exactly expresses the transitioning of the motoric movement (MM) towards the movement action (MA).

g. The complex subsystem of the movement action (MA)

The movement action (MA) is a completely autonomous complex subsystem in which the (movement) action object (MA) *solely* (!) executes the essence of the task within a motoric action sprouting from the egocentric formulated will. The (movement) action object will let the whole motoric action succeed if it fills c.q. executes the whole action trajectory shape completely. So a letter posting task for example approaches the end phase of the movement action (MA) if the letter, at the beginning situated at the writing desk, will finally get trapped within the slit of the mailbox. Although one will have to realise that the (movement) action object isn't capable of executing anything on its own. The (movement) action object like the letter or a tennis ball will fulfil the essence of the task but are lifeless entities which will never be able to move themselves.
The (movement) action object is glued to its action trajectory shape c.q. a line segment shape. The term line segment shape encompasses two phenomena in which one has to do with the one-dimensional basal filling of the *line* and the other with the cognitive element i.e. the *shape* of the action trajectory. The basal filling of the line within a perceptual image of a latent action trajectory shape with a perceptual image of the manifest line of that action trajectory shape can be considered as the disappearing of *the gap* (!) of the latent part of that *line* (!) segment shape. Ergo one is able to perceive this as the distance/gap within that line segment shape approaching zero and within the explanatory model this phenomenon is associated with what D.N. Lee appoints as a *tau*-value within his *tau*-coupling theory. Within for example the long jump Lee appoints a *tau*-value within the run up to the takeoff board. He defines this as "*the state where you are in*" and "*the state where you want to be in*". This definition remains rather hazy because Lee isn't capable of appointing the specific and definitely present line within the action trajectory shape. Conversely the explanatory model finalizes this initial thought and specifically shows where and how the *tau*-value is exactly produced[63].

h. The components within the complex subsystem of the movement action (MA)

The explanatory model shows a set universal build-up in really every imaginable motoric movement action concerning the construction of a *tau*-value c.q. the perceiving of the movement within the movement action (MA). This is based on logical grounds and empirical observations. The explanatory model appoints exactly three parts which show a set linear progression within the build-up. They are: 1. the cognitive basis, 2. the tactical movement action (MA) and 3. the actual movement action (MA).

[62] But also think about heading a football. To put it simply within there we are only able to influence the transition point, the point *between* (!) the outside of the head that will touch the ball and the outside of the ball that will be touched by the head, only *far* away from there by moving the muscles in the neck because there are hardly any muscles within the head who are able to functionally contribute to this task.
[63] Due to the lack of this insight Lee appoints multiple *tau*-values and mixes them randomly. The explanatory model shows in an universal way that the movement action (MA) and the motoric movement (MM) both produce only one *tau*-value and that those *tau*-values always are part of the essential *tau*-coupling within the always occurring optimization process.

On logical grounds you are able to determine that we must possess a huge general cognitive basis of action trajectory shapes which also includes related tactical considerations due to the fact that we are only capable to execute any action with the help of such a shape[64]. This general cognitive basis must be available to us at all times and definitely encompasses more than just the action trajectory shapes within one specific motoric action. Within for example the motoric movement action *grasping/grabbing* the cognitive basis obviously do provide us many specific *grab*-action trajectory shapes but also all other action trajectory shapes belonging to all other motoric actions. So the cognitive basis serves as a complete/exhaustive but very gross/general blueprint in regard to the actual circumstances of the first upcoming action. Then first an enormous reduction process needs to occur at the location at hand where the next actual motoric action will have to be executed and that process will finally have to lead to the shaping of a perceptual image of just *one* (!) latent *precise global* action trajectory shape within the next consecutive phase of the movement action (MA). Within the explanatory model the consecutive progression within the movement action (MA) where the motoric movement action has to be adapted to the actual specific situation at hand is called the tactical movement action (MA) and contrarily to the cognitive basis this compels an active part which out of a multiple supply of possible action trajectory shapes needs and is only able to come forward with the choice for one latent action trajectory shape[65]. The term tactical movement action (MA) has been chosen because it pins the attention to the specific actual motoric action at hand. In which needs to be remarked that there first was some doubt to call the cognitive basis the *general* tactical movement action (MA) and the tactical movement action (MA) the *specific* tactical movement action (MA). Finally these more different terms were chosen because the term cognitive basis much more underpins the general character of that part and due to the more different terms intrinsically binds the tactical movement action (MA) much more to the actual movement action (MA) and the specific action at hand.
The explanatory model shows that the tactical movement action (MA) builds upon c.q. is refining the cognitive basis and so together they form the tactical department in which the only goal is to *beforehand* (!) come forward with one perceptual image of a *latent* (!) action trajectory shape which will lead to a successful execution within a motoric movement action. These tactical considerations always need to be finalized beforehand because it will have to lead c.q. will have to be a guide within the factual execution within the actual movement action (MA) because it isn't able to execute anything without that guiding perceptual image. The processing processes of the perception, the ventral and dorsal stream, definitely need a perceptual image of an action trajectory shape because they need to construct a mutual relationship between the (movement) action object and the action trajectory shape which is the only way to realize the aforementioned optimization process within a motoric action. In which need to be remarked that it doesn't matter if the perceptual image remains very global as long as it is present.
The cognitive basis and the tactical movement action (MA), the tactical department, finally need to come forward with the choice of one action trajectory shape but definitely don't execute anything. In that way the department is a servant towards the actual movement action (MA). On the other hand the actual movement action (MA) simply accepts the choice for that one action trajectory shape, isn't tactically reconsidering anything and just executes that choice. But although a linear build-up can be noticed they don't disappear from the scene in that way. If suddenly a big change occurs then the tactical department needs to be present to immediately come forward with a new perceptual image of a latent action trajectory shape and that is for example the case when a tennis ball within an incoming ball trajectory shape decides to touch the cord of the net and deviates in such a way from that shape that a completely new end of that ball trajectory shape will arise.

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[64] With the cognitive basis the explanatory model provides the element that can be enlarged by gaining more cognitive knowledge. This is also explained within the two essential phenomena within the term line segment shape which is present within the action trajectory. The *line* is the basal element within that term and for example shows why absolute tennis laymen are able to hit tennis balls because they will perceive the tennis ball filling *a* (!) line at the lowest level. The *shape* forms the cognitive aspect and shows that elite tennis players used all those years of practice/training to increase the knowledge about those shapes.
[65] The explanatory model shows crystal clear that within the execution of one motoric movement action only one action trajectory shape will be constructed. So it doesn't matter how awkward you one day decide to construct an action trajectory shape towards the light switch. One action will always and can only be executed by one shape.

With the acknowledging of a tactical and an actual movement action (MA) the explanatory model appoints another novum and that is that we perceive the actual execution of an action solely out of the movement of the (movement) action object[66]. So within the tactical movement action (MA) when we post a letter for example we indeed construct a latent line segment shape between the letter and the slit of a mailbox *beforehand* (!) but during the actual execution of the posting of the letter our perception processes are solely occupied with the realisation of that action trajectory shape out of the perspective of the letter and nothing else. It seems as if we continuously perceive the slit of the mailbox in the exact same way but we solely have to do that because the slit is an important benchmark within the chosen action trajectory shape. However the explanatory model shows that the slit is just one of the many points P within an action trajectory shape which as a whole has the main goal to show that the *tau*-value out of the perspective of the letter is approaching zero. During the actual execution we are only interested in noticing that the next position of the letter is a position of the letter closer to the slit and in principle that has nothing to do with the final actual posting of the letter.
The fact that the movement action (MA) hosts these three elements has never been acknowledged within science and in retrospective that was an essential omission. Current scientific thinking still beholds that during the actual execution of a motoric action we keep on assessing the situation tactically and that the slit of a mailbox remains to keep the similar attention even during the whole actual execution of the action. Conversely by appointing the actual movement action (MA) the explanatory model shows that the tactical decision completely precedes the actual execution[67].

i. The actual movement action (MA) within the complex subsystem of the movement action (MA) and the processing processes of the perception

The actual movement action (MA) actually executes the movement action (MA) and as aforementioned that encompasses the essence of the task formulated within the egocentric will. The essence of letter posting is that a letter moves over an action trajectory shape towards the slit of a mailbox and definitely doesn't compel the fact which random movement trajectories (MM) within the body are involved within the execution of that task. On logical grounds the processing processes of the perception are being related to the optimization process within the actual movement action (MA) because at first the (movement) action object will have to follow the perceptual image of the latent action trajectory shape which was provided by the tactical movement action (MA). However due to the fact that we are only able to motorically execute action trajectory shapes indirectly the (movement) action object will always deviate from the latent perceptual image of an action trajectory shape and so a crucial system is required which will pick up those deviations and right away will create a new latent part of the action trajectory shape which the (movement) action object then will have to follow again. So for those occurring deviations within there the explanatory model suggests that a double/mutual process would be the ultimate solution that 1. would be capable to mainly perceive the (movement) action object but in a definite relationship to the action trajectory shape and that 2. would be capable to mainly perceive the action trajectory shape but in a definite relationship to the (movement) action object. Based on all current scientific research concerning the processing processes of the perception the explanatory model relates that required mutual system to the primary function of the ventral and dorsal stream as in regard to the movement within motoric movement actions. So the explanatory model relates the ventral stream to all perceptions concerning the movement of a (movement) action object within an action trajectory shape but mainly out of the perspective of the action trajectory shape and the dorsal stream to all perceptions concerning the movement of a (movement) action object within an action trajectory shape but mainly out of the perspective of the (movement) action object. So

[66] Addendum 2 of *Caught In A Line* extensively clarifies that elite professionals within the golf put and the free throw in basketball first construct a perceptual image of a latent ball trajectory shape between the ball and the basket/hole during the tactical movement action (MA) but that within the actual movement action (MA) they just throw/hit the ball in the beginning (initial phase) of that chosen ball trajectory shape because that is the only part which they are able to control directly. But it must be remarked that these phases were hard to discover within scientific research because they follow each other in just fractions of seconds.
[67] This novum also leads to the fact that the *open* versus *closed skill* dichotomy can be ended as well. This is extensively discussed within addendum 1 and 2 of *Caught In A Line*.

in "Watch The Ball Trajectory!" it is explained that a tennis ball within an incoming ball trajectory shape is *caught in a line*. Out of the manifest part of that shape we are able to construct a perceptual image of the latent part of that shape but this will only tell us where the ball will end in a *precise global* way. A tennis ball will always randomly deviate within the ball trajectory shape. We will not be able to ever change that because we will never be able to control matter but as long as we possess a system that can handle these deviations that is not a problem at all.
So in summary the explanatory model shows that a functional system within an optimization process must be present within every motoric action which links the (movement) action object to an action trajectory shape which is chosen within the tactical movement action (MA). The explanatory model links this system to the processing processes of the perception, the ventral and the dorsal stream, because the conclusions within that affiliated scientific research exactly seem to point at what the explanatory model describes. Although that scientific research is mainly of physiological nature it also tries to find a functional explanation and however one is able to conclude that according to the explanatory model that scientific research still remains at a remote distance from the full functional explanation one can judge that it keeps on approaching the explanatory model in its ideas step by step. The explanatory model on the other hand is able to perfectly use the implications which the aforementioned scientific research is suggesting for the mutual relationship which needs to be there between the (movement) action object and the latent action trajectory shape as a part of a parsimonious optimization process within every motoric action. It is assumed that a (movement) action object is caught within an action trajectory shape from which it can deviate at any place P within that shape. If it does deviate, and it will deviate, than there must be a system that creates a new perceptual image of the latent part of the action trajectory shape which the (movement) action object than have to follow again.
Both the explanatory model as well as the relevant scientific research suggest that the processing processes of the perception play a crucial role within a mutual process and on logical grounds one at least will be able to conclude that the explanatory model is looking in the right direction.

j. The complex subsystem of the motoric movement (MM)

The many novae within the explanatory model are mainly sprouting from the movement action (MA) in which they finally reveal how the essence of a motoric action is executed but also a few important things can be remarked about the other complex subsystem of the motoric movement (MM) as well. The motoric movement (MM) is a separate complex subsystem within the whole complex system of the motoric movement action and is only occupied with the *execution* (!) of the movement action (MA). It hosts c.q. is built upon three complete autonomous complex subsystems: 1. the individual conditions (IC) or the physical ability, 2. the body movements (BM) and 3. the body processes (BP). In a formula MM = (IC) x (BM) x (BP). Unlike the movement action (MA) the three complex subsystems show no linear relationship whatsoever and also no transition points can be noticed. Like within the movement action (MA) this again shows that only an optimization process can be the ultimate aim within those complex subsystems. If one wants to reach an optimum within the motoric movement (MM) in for example an elite sport there needs to be investigated in which constellation those three complex subsystems provide a maximal value.
The individual conditions (IC) inter alia show that every motoric learning instruction, each motoric activity, must be adapted towards the individual/subject. This *subjective* process is extensively appointed within "Watch The Ball Trajectory!" and *Caught In A Line* and within there completely acknowledges/confirms the scientific research of Wolfgang Schöllhorn concerning differential learning. The body movements (BM) encompass the used technique model as can be appointed in for example the tennis service technique[68] and the body processes (BP) are pointing to those processes within the body with which we often address the endurance/stamina of an athlete. No critique against

[68] Out of the philosophy of the unity model the explanatory model pleas to regard the autonomous complex subsystem of the motoric movement (MM) as a whole as technique in the wide/broad sense and the body movements (BM) as technique in the specific sense.

biking or rowing but they just require a simple technique. So within the optimization process in regard to those sports the body movements (BM) play an insignificant role but the autonomous complex subsystem of the body processes (BP) are of major/decisive importance as it might be the case with the individual conditions (IC). Conversely within a tennis service the used technique is so much more important than for example the endurance which you need within the execution of one service.
At a macro-level biomechanical research will be able to highly benefit from the strict framework of the explanatory model. Although biomechanical research maybe forms the largest part within scientific research within the movements sciences it also isn't capable to present results within a final functional model. The explanatory model now provides such a strict model in which it is important that one starts to realize that one motoric movement action can only be finalised due to the execution of only one action trajectory shape and that the motoric movement (MM) always encompasses multiple (motoric) movement trajectories (MM). Of course within the biomechanical study of the technique one needs to inventory all those separate movement trajectories but all those movements finally need to be concentrated at that one (movement) action trajectory shape (MA) within the movement action (MA) and therefor the explanatory model pleas for a *unity* (!) model. Within for example the tennis service the egocentric formulated goal is to finally construct one specific outgoing ball trajectory shape in which the tennis ball will have to follow the planned perceptual image of that latent shape but which can only be executed by other completely different movements which also show obvious time span differences. Till now biomechanical research showed the tendency to mainly assess all those movements in a linear way because one was missing the action trajectory shape c.q. the clarification of the explanatory model. In for example "Watch The Ball Trajectory!" the explanatory model conversely shows that within the tennis service your left pinkie toe and the racket head *and all other body parts between those two positions* (!) are continuously moving from *the beginning to the end* (!) of the execution of a service and in that way shows that all the movements as a whole c.q. only all those combined movements produce that one action trajectory shape despite the fact that linear phenomena can be noticed. So the explanatory model pleas within for example a tennis service to much more assess the serve technique as a unity of movements that needs to lead to *one* (!) eruption of energy within the construction of *one* (!) action trajectory shape.

Appendix B – The Marble Run

1. The marble run [69]

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[70]. 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[71] 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 at once come to an end because the explanatory model shows crystal clear that they are obligatory needed in a compelling relationship within an overarching phenomenon. They hardly have any meaning without each other. The actual position of the marble must always be perceived with on-line c.q. bottom-up perception processes because the marble is always subject to certain fluctuation boundaries within the action trajectory shape but this definitely needs to be perceived within a previous constructed perceptual image of a latent action trajectory shape with the help of top-down perception processes.

"What is so fascinating about a marble run?[72] *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*

[69] https://www.youtube.com/watch?v=_vg9J_4-kd8; https://www.youtube.com/watch?v=QQ9gs-5lRKc; https://www.youtube.com/watch?v=BfeHg0Zu1WQ;
[70] Read: *Caught In A Line - The ball trajectory shape.*
[71] 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.
[72] 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

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. "[73]

Image: A set marble run. Before you release the marble at the top you know exactly which shape the marble will have to follow[74]. Within a set classic marble run one can only see the actual place of the marble within a further invisible action trajectory[75]. Within almost all motoric actions the action trajectory shape remains invisible however within the motoric movement action *writing*, *pouring* and *nerve spiral* the whole action trajectory shape conversely becomes visible.

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 movement action (MA). 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[76]. Together they determine the *functional tau*-coupling[77].

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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.

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

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

[75] 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.

[76] 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*.

[77] 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

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[78] of a *precise* ball trajectory shape[79]. The fluctuation margins of possible deviations within the perceptual perception of future places of the marble will be very limited or nihil[80].

2. The marble run versus the action trajectory/marble run shape within a motoric movement action

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[81]. 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[82].
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 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[83].
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

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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.

[78] 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.

[79] 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.

[80] 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.

[81] 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.

[82] 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.

[83] 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).

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[84].

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.

[84] 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 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 C

The motoric movement action *nerve spiral*

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The functional explanation within the explanatory model of the motoric movement action concerning the functioning of the ventral and dorsal stream

Caught In A Line
The explanatory model of all motoric movement actions
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1. The explanatory model in relationship to the motoric movement action *nerve spiral*

At a microlevel the clarification within this epistle has the sole goal to reveal all functional perception and motoric processes within the motoric movement action *nerve spiral*. 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.
In this quest I implicitly tried to reveal major parts of the explanatory model by appointing very specific motoric movement actions. That is why I started to explain the motoric movement action *marble run* in addendum 2 of *Caught In A Line*. Although the trajectory of the marble not becomes visible at any moment one is able to perceive the whole latent action trajectory shape of the marble beforehand and within more modern flexible marble runs one is able to adjust that latent action trajectory in any preferred shape. Within this action it becomes perfectly clear that the (movement) action object (MA) i.c. the marble indeed reveals the actual position of the marble but much more than that it shows the exact border between the manifest and latent action trajectory shape. This insight clearly reveals that a manifest action trajectory shape fills its latent part c.q. reveals that the vanishing of the latent action trajectory shape provides the *tau*-value, which will become zero, within the movement action ($tau^{G}{}_{MA}$). This implicitly provides us the insight of how we are capable of executing all interceptive c.q. catch actions because we are capable of determining the leading *tau*-value within an incoming *ball* trajectory shape to a previous cognitively determined (latent) catch point[85].

Besides the marble run the very specific motoric movement actions *pouring* and *writing* are explained as well. Conversely to most other motoric actions within the latter motoric movement action the action trajectory shape becomes completely visible. Or to phrase it in a different way, within writing the manifest part of the action trajectory shape remains visible while it disappears c.q. never becomes visible within most other actions. Of course the latter is the obvious main goal within writing and also in here the actual position of the tip of the pen marks the partition between the manifest and the latent part of the action trajectory shape. When the tip of the pen approaches the end of the (cognitively determined) perceptual image of (the line segment shape of) a letter, word or word part the writer will also perceive that the gap of the latent line segment shape will disappear c.q. will experience that the *tau*-value within the movement action ($tau^{G}{}_{MA}$) becomes zero and will align this with the following c.q. depending *tau*-value within the motoric movement ($tau^{G}{}_{MM}$) which will give the order from the *inside of the body* (!) just until the (*inside of the outside* (!) of the) tip of the pen to slow down till it finally has to come to a standstill at the end of the letter, word or word part.

[85] Within catching a ball with the hand the catch point is the intersection point of two line segment shapes which definitely need to be constructed beforehand as latent perceptual images. Otherwise one wouldn't be able to catch anything. The line segment shapes involved are 1. the line segment shape in which your hand is thrown and 2. the line segment shape in which the ball approaches.

The aforementioned motoric movement actions already present lots of novae and some complex mind steps. They for example clearly show that a perceptual image of a latent action trajectory needs to be shaped before any actual action is able to occur and that the actual position of the (movement) action object (MA) during the action fills that perceptual image with a manifest action trajectory shape. Of course this immediately ends the perception-action dichotomy within science by showing that it was never the question which of the two was more important within an action but that they compellingly need to be linked within an overarching phenomenon which shows that the final explanation is much bigger and much more complex than was ever assumed within science.

Images: Action trajectory shapes hardly ever become visible. Within writing that is obvious the underlying reason but it is definitely wrong to state that that is the primary object within the egocentric formulated will. That goal must be formulated at a far more basal level by solely connecting that will to the actual construction of letters, words or word parts. - Within your own empirical experiences you will be able to conclude that within writing with five pencils you probably will point your attention to just one and definitely not at five writing lines. Mere mortals are just not capable of doing so.

However how a (movement) action object (MA) fills a chosen action trajectory shape as part of an optimization process and that within there a crucial system, like the ventral and dorsal stream present us, needs to be located is still not becoming clear within the aforementioned motoric movement actions. So in the previous descriptions it doesn't become clear how for example the tip of the pen precisely reaches the end of the letter, word or word part during the actual writing. Maybe it occurred to you, at least if you still use pen and paper, that never one letter, word or word part was ever an exact copy of the other. First of all this has never been an issue as long as the letter, word or word part shows an *equal* shape within certain fluctuation boundaries and second it is just not possible to ever create the exact same shape because an optimization process is involved in which every time anew an action trajectory shape can only be adjusted indirectly with the *direct* (!) help of the other autonomous complex subsystem of the motoric movement (MM) because the explanatory model also provides the final insight that one motoric movement action can only succeed with the help of two foci. Maybe it sounds very awkward to you, although it reveals one of the very difficult needed mind steps, we aren't able to directly control the outside of the tip of the pen *as part of* (!) the action trajectory shape motorically. The movement on the outside of the tip of the pen within a letter, word or word part encompasses a completely autonomous complex subsystem within the successful execution of one motoric movement action. We are only capable of directly moving *the inside of* (!) the tip of the pen[86] from within the body with in fact very awkward and very weird body movements. It must be emphasized in here that those movements have nothing at all in common with the movements of the outside of the tip of the pen. This reveals the novum that we are only capable to visually perceive how the outside of the tip of the pen on the outside of the body moves within an action trajectory shape

[86] This is possible because a pen encompasses a flexible (movement) movement object (MM). Just like a tennis racket or a spoon/fork/knife.

within the primary focus and that *simultaneously* (!) the secondary focus must be pointed at the proprioceptive perception[87] towards the required motoric movements within the body. In which accordingly the novum is revealed that aforementioned visual and proprioceptive perception processes encompass completely different phenomena within one action and that the assumption/premise was wrong/false that they were part of one undivided motoric action.
Due to the fact that the movement action (MA) in which the actual production of the letter, word or word part in essence completes the task within an egocentric formulated will but can actually only indirectly be executed with the help of another autonomous complex subsystem i.c. the motoric movement (MM) the body of ecologically parsimonious developed organisms will need to host an important system that will take care that actions can be executed in an efficient and effective way. Because the (movement) action object (MA) can and will deviate from the perceptual image of the latent action trajectory shape it is preferable that the body hosts a double c.q. mutual system in which those deviations will be corrected.

"Although we have emphasized the separation of the dorsal and ventral streams, there are of course multiple connections between them, and indeed adaptive goal-directed behavior in humans and other primates must depend on a successful integration of their complementary contributions. Thus, the execution of a goal-directed action might depend on dedicated control systems in the dorsal stream, but the selection of appropriate goal objects and the action to be performed depends on the perceptual machinery of the ventral stream. One of the important questions that remains to be answered is how the two streams interact both with each other and with other brain regions in the production of purposive behavior[88]*."*

"Much of our work to date has focused on the differences between the two visual streams – establishing where they go, why they are there, and how they work. This side of the story has depended crucially on evidence from patients who have suffered damage to one or the other stream. But even though studying the visual deficits and spared visual abilities in these patients has told us a great deal about the systems working in isolation, it has told us nothing about how the two systems interact. The big unanswered question for the future is how the two streams work together in all aspects of our visual life.[89]*"*

The explanatory model links this double c.q. mutual system to the scientific observations within research concerning the processing processes of the perception. The latter mainly encompasses revolutionary/ground breaking physiological scientific research in which again and again at the end the question rises how on earth it all works together at the functional level. Finally the explanatory model which introduces the existence of (perceptual images of latent and manifest) action trajectory shapes now provides the possibility to link the (movement) action object (MA) to a phenomenon which directly is capable of relating it what all physiological findings already suggest towards the function of it all. The explanatory model is even able to universally situate all those findings in a set and final way. So within the motoric movement action *writing* one is now able to mainly connect the ventral stream to (the processing of all perceptions concerning) the perceptual image of the whole (latent) action trajectory shape of a letter, word or word part and to connect the dorsal stream to (the

[87] The explanatory model also reveals the novum that we are capable of creating an action trajectory shape within the movement action (MA) and experience a *tau*-value just on basis of sole proprioceptive perception processes. We are for example capable of successfully executing many motoric movement actions in pitch black darkness. We are able to detect a keylock with the help of our two hands and to experience the closing of *the gap* between the tip of a key and the lock just on basis of those proprioceptive perception processes. So besides the already discovered phenomena of *limb position* and *movement* in regard to the proprioceptive perception processes the explanatory model adds a third important discovery.
[88] A. David Milner, Melvyn A. Goodale; School of Psychology University of St Andrews Fife, KY16 9JU Scotland, U.K; http://www.theassc.org/files/assc/2367.pdf
[89] Goodale & Milner - The British Psychological Society - https://thepsychologist.bps.org.uk/volume-19/edition-11/one-brain-two-visual-systems.

processing of all perceptions concerning) the actual position of the tip of the pen within a letter, word or word part. However the explanatory model ranks the function of these cortical streams at such an important level because they only will have and are able to take care of the successful execution of the essence of the egocentric formulated will that the explanatory model hypothesizes that the two streams function within a double c.q. mutual system which over the years is more and more underpinned c.q. is in definite coherence with aforementioned physiological scientific research. So the explanatory model links the ventral stream mainly to the perceptual image of an action trajectory shape but in a definite relationship to the perception or the processing of the perceptions concerning the actual position of the (movement) action object (MA) and vice versa the dorsal stream will mainly perceive the actual position of the (movement) action object (MA) but in a definite relationship to the perception or the processing of the perceptions concerning the action trajectory shape.
The understanding of this mutual process can only lead to the conclusion that the filling of a latent action trajectory shape with a manifest action trajectory must be regarded as an optimization process. So within the motoric movement action *writing* of a letter, word or word part first a perceptual image of a latent action trajectory is cognitively shaped which the perceptions towards the dorsal stream than just will have to follow[90]. Deviations caused by the manifest action trajectory shape within the perceptual image of the latent action trajectory which will always occur will immediately have to be corrected within the ventral stream providing a new perceptual image of the shape of the remaining latent action trajectory and this will instantly have to be the next compelling guide for the dorsal stream until the next deviation occurs. This mutual process will only end when the (movement) action object (MA) reaches the very last part of the action trajectory shape when the *tau*-value approaches zero c.q. when it actually will fulfil the egocentric formulated will and within there reveals the universal optimization process within all imaginable motoric movement actions.

"It takes about one-tenth of a second for information about the visual scene to reach the back of the brain or the occipital lobes. During the next tenth of a second, the visual information is analysed in two separate ways. Figure 2 shows the two pathways of the dorsal stream and the ventral stream. The dorsal stream runs from the occipital lobes to three locations, the back of the brain at the top (called the posterior parietal lobes), a vertical strip of brain in the centre (called the motor cortex) and the front of the brain (called the frontal cortex). The ventral stream runs from the occipital lobes to the back of the brain at the bottom (called the temporal lobes)[91].

So within writing the tip of the pen "*jerkingly*" arrives at the end of a letter, word or word part. Again 1. because the letter, word or word part is indirectly created within the autonomous complex subsystem of the movement action (MA) that solely can (directly) be executed within the autonomous complex subsystem of the motoric movement (MM) which both only in a compelling relationship can lead to a successful execution of the whole motoric movement action and 2. because the dorsal and ventral stream have to cope with the *processing* (!) of the perceptions concerning the (movement) action object (MA) in relationship to the (movement) action trajectory shape (MA). The processing of those perceptions take some time and so before they can and will be corrected the chance is considerable that a deviation will occur within the action trajectory shape because at any point P the (movement) action object (MA) will be able to vary from the planned (latent) perceptual image P(+1) in numerous ways. In which again is stressed that this is not a problem at all as long as strict fluctuation boundaries of those deviations are involved. Which for example within the motoric movement action *writing* will have to take care of the *equal* (!) shaping of symbols which will need to host the opportunity that cognitively the same value will be attached to those equal shaped symbols which than only will make it possible that a written text can be understood. So within for example

[90] If one for example wants to grasp a coffee cup than at the start of the actual movement action (MA) one will have to throw the relevant fingertips in the beginning of the perceptual image of the latent action trajectory shape without any tactical considerations thrusting that the tactical movement action (MA) beforehand assessed that the end of that shape will reach the handle of the cup.
[91] Cerebral Visual Impairment - Working Within and Around the Limitations of Vision; Gordon N Dutton; http://www.liv.ac.uk/~pcknox/Publications/trimble/CVI%20chapter%20for_hers-Dutton.pdf.

writing the execution of the exact same symbols has never been a goal at all. Within most *normal* motoric movement actions the main goal within ecological successfully evolved organisms indeed is that they are enabled to act quickly yet parsimoniously and so within for example the motoric movement action *grasping/grabbing* it is not important at all that the fingertips reach the handle of a coffee cup in an exact precise way but that the essence clearly beholds that our perception processes are only occupied with the goal to diminish c.q. reduce the number of places P between the fingertips and the handle as parsimonious as possible. In which process only at the end of the action trajectory shape the possibility needs to arise that the manifest action trajectory shape will hardly deviate from the perceptual image of the still latent part of that shape and this process from *precise global* to more and more *precise* is afforded because the chance to deviations will exponentially diminish with every advancing place P within the action trajectory shape. Or with other words during the actual c.q. factual execution of a motoric movement action we are *Caught In A Line*[92] which we only are capable of crossing with the help of the processing processes of the perception. So within your own empirical findings you are now able to verify why you never were able to construct an exact equal copy of one letter, word or word part and are now also able to examine that we walk or bring our fingertips to a light switch or a coffee cup in a "*jerking*" way. However in spite of the fact that we are able to verify this *shocking* execution within the affiliated action trajectory shapes within our own empirical experiences it subconsciously feels that we create straight line segment shapes and that is probably the cause that even scientific research pays attention to this subjective feeling. Conversely the explanatory model shows us that this can never be the case and therefor diligently looked for such a specific motoric movement action which implicitly would clarify the aforementioned jerking optimization process. Till now the best answer to this assignment was presented within the motoric movement action *nerve spiral*. This action shows an overlap with writing due to an obvious clear visible action trajectory shape. At first you think it is a very rare kind of action but when you observe it closer it just encompasses the motoric movement action *touching/taking/grabbing/grasping etc.* which without any doubt we execute most in our lives. For example the motoric movement action *eating* comprises such an action and will convince you right away that we often execute it and besides that it shows the immediate overlap with the motoric movement action *nerve spiral* because within eating we also use a flexible (movement) action object (MA). Just like the ring within the motoric movement action *nerve spiral* the bowl of the spoon, the prongs of the fork and/or the cutting face of the knife can be manipulated freely (flexible) along an action trajectory shape at around the same distance from the fingertips.

Of course the main difference is situated in the fact that the nerve spiral demands the execution of one precise set action trajectory shape which has the consequence that the tactical movement action (MA) can only come forward with almost the exact same perceptual image of the latent action trajectory shape which we always need beforehand before it will be executed during the actual movement action (MA). At the same time you are able to witness that within the game which goes along with the motoric movement action *nerve spiral* a challenging diameter ring-spiral ratio is used that allows players to successfully cope with the deviations within the actual manifest action trajectory shape in comparison to the actual spiral c.q. that those deviations will not lead to the ring touching the spiral. Therefor it is recommended that within scientific research a completely straight nerve spiral will be used but that the diameter ring-spiral ratio is minimized as much as possible. Than it will appear that no mere mortal will be able to move the ring from A to B without letting the bell ring. Even when one moves the ring as slow as one is able to do. With a *usual*/*normal* velocity (like within writing, taking, eating etc.) and a distance A-B present within the above shown nerve spiral one will touch the spiral even multiple times. It can't be otherwise because this is the *natural* way. We are only able to indirectly correct the movement of the ring within a line segment shape with the help of the processing processes of the perception.

[92] Within the description of the ball trajectory shape within for example the book "Watch The Ball Trajectory!" the final conclusion is formulated that the tennis ball indeed creates the actual c.q. manifest ball trajectory shape but conversely also is bound to follow the perceptual image of the latent shape that stems from the manifest part. So like the tip of the pen also actually creates the letter they are both caught in that line.

2. Introduction to the motoric movement action *nerve spiral*

The motoric movement action *nerve spiral* can be categorized under sports or games. The small version of the game which can be obtained in toy stores can be executed in the living room. Large versions used to be a familiar phenomenon in earlier Dutch televised game shows. The game idea of the motoric movement action *nerve spiral* dictates a player the task to guide the eye of a metal ring over a trajectory of a metal spiral from A to the endpoint B without letting the ring touch the spiral. The ring is situated at the end of an elongated metal bar from which the handle is isolated and the eye of the ring is linked to the spiral in such a way that it can't be removed c.q. that it will always touch the spiral if you want to separate the ring from it. The of course metal substances of the ring and the spiral are connected with a power supply in such a way that an electrical current will occur if they touch each other which in order will trigger a loud ringing bell. So with other words the goal of the game is to guide a ring from A to B without triggering the bell c.q. without letting the ring touch the spiral and so if one decides to play the game one develops the egocentric formulated will to achieve that goal.

The revolutionary essence of the explanatory model encompasses the fact that the execution of one motoric movement action, any motoric movement action, allows a strict division in two completely autonomous parts. However the obligatory conclusion arising from this affirmation comprises that any motoric action needs to be assessed as a complex system and only can be executed due to an obligatory cooperation of those two autonomous complex subsystems. Although science regards this observation bizarre, they still behold one undivided action in relationship to just one existing focus, the explanatory model conversely shows that final insights can be achieved because any motoric action allows this strict and universal division into two autonomous components each demanding a separate focus.
Accordingly the explanatory model shows that the essence of the task within the motoric movement action *nerve spiral* beholds the fact that a ring, and only the ring[93], needs to be transported from A to B (along an action trajectory shape i.c. the very visible spiral). So although this task is formulated out of an egocentric formulated will this one part of the action is in essence only executed by the ring[94]. The ring alone will shape its action trajectory line segment shape with all its consecutive positions P. Just like a ball within every ball game, the ink during the motoric movement action *writing*, the food during the motoric movement action *eating*, the outside of a fingertip[95] within the motoric movement action *grasping/touching etc.* the ring is regarded as a fully autonomous entity within our perception processes. We don't share anything with the ring, we are not the ring and we don't have or will ever have anything in common with the ring. We are going to move the ring as a consequence of an egocentric formulated will but the movement action (MA) must be linked to the (movement) action object (MA) and not to any phenomenon belonging to the ego. Conform J.J. Gibson the (movement)

[93] This demands a complex mind step. Finally a letter trajectory shape needs to be executed by a mailman but if you want to get a grip at the two involved autonomous complex subsystems you will have to start to understand that within one action one part of our perception processes is solely pointed at the position of the actual letter and that the another part of our perception processes is solely pointed at the physical manipulation towards all those places P of the letter.
[94] It is like the flow of the water within a mountain stream. Only due to moving rocks we are able to manipulate the direction of the water. We just never will be able to manipulate *autonomous* matter in any other way. The very complex next mind step that stems from that idea is the fact that even the outsides of our body need to be considered as such. We for example are only able to manipulate the *outside* (!) of our fingertips within an action trajectory shape on the outside of our body with inner body movements just till a very close point of the outside of those fingertips. But they will always remain within our body/fingertips.
[95] See *Caught In A Line* – Addendum 2: The motoric movement action grabbing/grasping/touching etc.. The outside of our fingertips indeed belongs to our body. It is made from living tissue but we are not able to consciously direct it as a part within an action. We are only capable of manipulating the outside of a fingertip just from the inside of the body until close to the outside of that fingertip. Ergo the outside of a fingertip can only be manipulated within an action trajectory shape on the outside of the body with movement trajectories on the inside of our body.

action object (MA) expresses the relationship *between* (!) the animal and the environment[96] and nothing belonging to the animal or the environment itself.
However the ring doesn't do anything by itself. Without a ring you aren't able to play the game but if we don't pick up the ring nothing will arrive in B either. Just like in all other motoric movement actions we will have to move the lifeless, dead, ring outside of our body with movement trajectory shapes from within the body which we conversely are able to control directly. So the motoric movement action *nerve spiral* is only able to succeed if we point one focus (the primary focus) on the essence within the task, the *ring* line segment shape, and at the same time point a completely other focus (the secondary focus) on movement trajectory shapes within the body towards the execution of the movement action (MA) c.q. towards the primary focus. So in summary within any motoric movement action our perception processes within the movement action (MA) are solely engaged with the (movement) action object (MA) out of the perspective of that object and our perception processes within the motoric movement (MM) are solely engaged with the *execution* (!) of the movement action (MA) by and within (out of the perspective of) the body and not with the ring at all. Ergo the movement action (MA) is solely occupied with the (visual) perception of the movement of the ring along the spiral (outside of the body) and the motoric movement (MM) is solely occupied with (proprioceptive) perception of movements (within the body). So we are only capable to visually perceive the movement of the ring within an action trajectory shape and are only capable to manipulate that movement indirectly by producing rather awkward body movements which have no relationship whatsoever with the action trajectory of the ring. It is necessary that you start to see that the autonomous movement of the ring can only be influenced by a completely other autonomous moving process[97].

3. The movement action (MA) of the motoric movement action *nerve spiral* – The primary focus

So the explanatory model clearly reveals that in an universal way every motoric action can be divided in two autonomous complex subsystems. The movement action (MA) and the motoric movement (MM). Within the movement action (MA) itself which is only occupied with the movement of the (movement) action object (MA) within the (movement) action trajectory out of the perspective of the object the explanatory model appoints three components. They are: 1. the cognitive basis, 2. the tactical movement action and 3. the actual movement action. The first two parts encompass the tactical department and mainly have the goal to come forward with a perceptual image of one latent action trajectory shape out of multiple options before any actual execution will occur. Every day we execute many motoric movement actions in which we move our body, a body part or a (movement) action object (MA) from A to B. So we possess a huge cognitive basis of knowledge how to get from A to B. Ergo this knowledge comprises a huge arsenal of *shapes* (!) of reference action trajectories in which also a lot of abstract knowledge of inflexion points, timing, length, duration etc. is stored.
Within most *normal* motoric movement actions this department is very active but it obviously has little to construct within the motoric movement action *nerve spiral* because within that action a compelling action trajectory shape needs to be executed. So the difficulty of this motoric movement action has no relationship with these *tactical* components because we are able to construct a perceptual image of the latent action trajectory shape easily. However it must be noted that persons with a lot of experience concerning the motoric movement action *nerve spiral* within the tactical movement action (MA) translate their broad knowledge of spirals to the specific spiral now in front of them.
The difficulty within the motoric movement action *nerve spiral* must be linked to the actual movement action (MA) in which we actually move the ring along the action trajectory shape from A to B. Then

[96] With this third entity the explanatory model finalizes Gibson's *The Affordances Theory*. It shows that not only the environment affords the action but that it depends as much on the available movement space between those two phenomena.
[97] It is like the flow of the water within a mountain stream. Only due to moving rocks we are able to manipulate the direction of the water. We just never will be able to manipulate *autonomous* matter in any other way. The very complex next mind step that stems from that idea is the fact that even the outsides of our body needs to be considered as such. We for example are only able to manipulate the *outside* (!) of our fingertips within an action trajectory shape on the outside of our body with inner body movements just till a very close point of the outside of those fingertips. But they will always remain within our body/fingertips.

we are not able to quickly start to actually construct a *precise global* action trajectory shape which only needs to become more and more precise at the end of the action trajectory like we are allowed to do within almost all other actions but within the motoric movement action *nerve spiral* the action trajectory shape needs to be constructed very precise from the first beginning to the very end. The explanatory model of the motoric movement action indicates that we are only capable of following the movement) action object (MA) filling the action trajectory shape with the help of the processing processes of the perception[98] and only are capable of actually manipulating that process with the help of the other autonomous complex system of the motoric movement (MM). The explanatory model shows crystal clear that the filling of the action trajectory shape by the (movement) action object (MA) can only be considered an optimization process which we are only able to perceive and are only able to execute indirectly. The ventral stream will mainly have to process all perceptions towards a perceptual image of the whole (movement) action trajectory shape but definitely will have to keep a relationship with the actual position of the (movement) action object (MA). The dorsal stream will mainly have to process all perceptions towards the actual position of the (movement) action object (MA) but definitely will have to keep a relationship with the perceptual image of the whole (movement) action trajectory shape. With this mutual c.q. double process the explanatory model shows that the ventral stream needs to come up with *new* perceptual images of *new* latent parts of the action trajectory every time the dorsal stream signals a deviation within the latent perceptual image due to the manifest action trajectory shape and the dorsal stream will just have to follow this new perceptual image unequivocally just until the next deviation occurs. So the explanatory model concludes that if we didn't possess those processing processes of the perception we would never be able to execute actions successfully. So in the optimization process in which in other words a perceptual image of a latent action trajectory shape is *jerkingly* filled with a perceptual image of a manifest action trajectory shape the only outcome will be that mere mortals will touch the spiral with the ring numerous times within the motoric movement action *nerve spiral* and the conclusion can be that within all motoric movement actions perceptions of deviations are indeed processed due to an ingenious system but which will never show one exact copy of an action trajectory shape due to the processing time involved.

a. The *tau*-value within the movement action ($tau^{G}{}_{MA}$) of the motoric movement action *nerve spiral*

The actual spot of the (movement) action object (MA) like the ring within the motoric movement action *nerve spiral* shows the exact partition of the manifest and latent part of the action trajectory shape. Just like the marble shows within a marble run. Only if you will start to realize that the manifest part is filling a latent part of an action trajectory shape until the latent part disappeared completely and that our perception processes are mainly occupied with this phenomenon only then you will be able to gain insight in how the *tau*-value of the movement action ($tau^{G}{}_{MA}$) is perceived c.q. must be observed. The *tau*-value of the action trajectory within the movement action ($tau^{G}{}_{MA}$) can only be determined by observing how the manifest part of the *ring* trajectory/line segment shape closes the perceptual image of the latent part of that *ring* trajectory/line segment shape.
With the term line segment shape the explanatory model shows the two words *line* and *shape* which are exactly the two phenomena which must be appointed within a sound ecological explanation. Ecological explanations need to cover the evolution of the earliest organisms but also need to explain the apparent differences within higher/later ranked organisms. The explanatory model links the basal part to the word *line* and ongoing cognitive developments to the word *shape*.
For the *tau*-value towards the timing within the movement action (MA) one only needs to observe one-dimensionally[99] how the (alleged) line segments relate to each other and so one doesn't have to

[98] If you want to execute the motoric movement action *nerve spiral* successfully you will definitely have to rely on superior visual processing processes. However the explanatory model shows that the cortical streams are very well capable of processing auditory perceptions like scientific research already confirms. Besides that the explanatory model introduces the novum that the two processing processes of the perception can also be actuated proprioceptively.
[99] The explanatory model shows within *Caught In A Line* and the eponymous addenda that the term line segment shape hosts two essential components. The basal word *line* can ecologically be linked to the development of the earliest organisms and shows that the *tau*-value within the movement action ($tau^{G}{}_{MA}$) can be perceived one-

exactly observe what the *shape* of that line exactly beholds. This basal functioning of our perception processes can ecologically be linked to the earliest organisms. Evolution of cognitive knowledge about *the shape of the line* (!) can be observed within higher and later ranked organisms which will provide them a more secure determination of the *tau*-value. So conform D.N. Lee you could suppose that for the construction of the *tau*-value one only needs to observe how the gap between the ring and the end of the spiral approaches zero within the motoric movement action *nerve spiral*. This simple linear gap for example becomes very transparent within the motoric movement action *pouring*. When you fill a glass with a liquid you only one-dimensionally observe how the actual surface is rising towards the rim of the glass[100].

4. The motoric movement (MM) of the motoric movement action *nerve spiral* – The secondary focus

So the explanatory model clearly reveals that in an universal way every motoric action can be divided in two autonomous complex subsystems. The movement action (MA) and the motoric movement (MM). The description of the aforementioned movement action (MA) already shows that the final explanation is far more complex than ever was assumed within science. Accordingly it shows many complex elements with many perception processes but conversely also shows that one is able to simply execute them at the functional level. Now the whole explanation becomes even more complex because the explanatory model indicates that the movement action (MA) can only be perceived (indirect) and solely can be executed directly/motorically with the other autonomous complex subsystem which provides the novum within the movements sciences that a secondary focus must be present within every motoric movement action. Of course it could never have been regarded different and this encompasses one of the major flaws within science. Within the movement action (MA) one needs to perceive everything out of the perspective of the (movement) action object (MA) i.c. the ring within the motoric movement action *nerve spiral* and within the motoric movement (MM) one needs to perceive everything *within the body until the ring* out of the perspective of the acting organism. The explanatory model shows[101] that the motoric movement (MM) in principle hosts three complex subsystems. They are: 1. the body processes (BP), 2. the body movements (BM) and 3. the individual condition (IC). They are autonomous complex systems themselves and the product of the three needs to be optimized when you want to reach the highest outcome within the motoric movement (MM) towards the the movement action (MA) in for example sport performances. So they are also present within the motoric movement action *nerve spiral* but one can easily see that within there they do not become relevant at all. 1. You don't need any stamina/endurance (BP) to execute the motoric movement action *nerve spiral*, 2. you don't need or will have to consider a technique model (BM) within the motoric movement action *nerve spiral* and 3. the individual conditions (IC) don't need to be optimized as well within the motoric movement action *nerve spiral*.
So although the whole motoric movement action *nerve spiral* must be assessed as very complex the motoric movement (MM) remains very simple at the functional level. Just like the the movement action (MA) and that is why we are able to execute this motoric movement action in complete flow[102]. The motoric movement (MM) within the motoric movement action *nerve spiral* even remains very simple when you consider that the action becomes more complex due to the use of a flexible (motoric)

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dimensionally by the blunt observation that a line is filled without ever having to know any detail of the shape of that line. With the word *shape* the explanatory model appoints the cognitive element that conversely separates higher from lower ranked organisms. Due to this revelation the explanatory model is able to explain why even toddlers are able to hit tennis balls because they are already capable to perceive the one-dimensional filling of a line and to perceive the corresponding basal *tau*-value becoming zero. However it will take more than a decade of hard practice before they will be able to distinguish most of the relevant ball trajectory shapes in tennis and to tactically approach them in the right way.

[100] Within the motoric movement action *pouring* this *tau*-value can clearly be observed twice. The first time this happens when the arch of the liquid reaches the glass but the second time makes an even better example. When the liquid is filling the glass we only need to perceive the rising of the level of the liquid till the rim of the glass one-dimensionally. When we observe that the gap between the actual level and the desired level disappears then the motoric movement (MM) will receive the signal to slow down the pouring.

[101] Within *Caught In A Line* and within Addendum 1 and 2 of *Caught In A Line*.

[102] Read: *Caught In A Line*

movement object (MM)[103]. The ring attached to an elongated metal bar adds an extra movement trajectory to the motoric movement (MM). The ring/bar can be manipulated freely/flexible and therefor the movement trajectories within the body will have to create a unity with it. But in spite of this remark the movement technique remains simple and mainly concerns hand, wrist and arm movements.
Of course it is a little more complex than that but that is not relevant. The only thing important in here is that you start to understand that we are only able to manipulate the movement of the ring along an action trajectory shape with these, much different, motoric movements. The ring (the movement object) is a lifeless substance and is doing nothing and will never do anything. So the movement of the ring along an action trajectory shape will always have to be executed somewhere else. The movement trajectories are linked to the motoric movement (MM). The action trajectory is linked to the (movement) action object (MA) within the movement action (MA). They are not able to show any overlaps because their perspectives belong to two irreconcilable worlds.
So the technique isn't elaborated any further because it is all too simple within the motoric movement action *nerve spiral*. However two matters within the motoric movement (MM) need to be clarified because they will have to show how the secondary focus is present within the motoric movement action *nerve spiral* and which will have to show the link with the *tau*-value within the motoric movement ($tau^{G}{}_{MM}$) which is crucial within the functional *tau*-coupling of the whole action.

a. <u>The secondary focus in relationship to the transition point</u>

So with the novum of two simultaneous existing foci the explanatory model also reveals the novum that within every motoric movement action in general the secondary focus must be pointed at the biomechanical main action within the motoric movement (MM) towards the action trajectory shape c.q. the primary focus. This is formulated like this because in very complex movements, like a tennis service or a long distance golf swing, one is not able to avoid paying a profound part of attention to aspects of the motoric movement (MM). In simple actions like within the motoric movement action *letter posting* or *nerve spiral* that is completely needless. We don't have to pay any conscious attention to a specific letter or ring moving technique.
So within the motoric movement action *nerve spiral* we don't have to focus consciously at any motoric movement but at a subconscious level it must be linked to the primary focus. The explanatory model shows that this linking always occurs in one specific point. This is defined as the transition point. The transition point is the point where the movement action (MA) and the motoric movement (MM) come together or to put it in other words it is the point where they *transition* which the transition point literally indicates.
Within the motoric movement action *nerve spiral* the two complex subsystems transition within the point *between* (!) 1. *the metal* (!) of the ring at the end of the elongated metal bar and 2. *the air* (the void) (!) of what the metal of the ring encloses. So the ultimate spot we are able to manipulate directly within the motoric movement (MM) is situated immensely close to the transition point but will never show an overlap with that transition point. The inside (the void) of the ring is part of a line segment shape, outside of the body, between a random start and end point of a nerve spiral within the movement action (MA) and it can only be executed by the motoric movement (MM) which is only capable to manipulate movement trajectory shapes within the body *just until* (!) the transition point. So even though a technique c.q. the motoric movement (MM) must be considered as very simple within a motoric action the secondary focus, conscious or not, must always have to be pointed at movements within the body towards the transition point while simultaneously the primary focus must be pointed at the action trajectory shape within the the movement action (MA) outside of the body.

b. <u>The *tau*-value within the motoric movement ($tau^{G}{}_{MM}$) of the motoric movement action *nerve spiral*</u>

Now within *self-paced* motoric movement actions like the motoric movement action *nerve spiral* the next phenomenon occurs. The action trajectory shape and within there the *tau*-value concerning the

[103] See: *Caught In A Line*; p. 52.

timing of the movement action ($tau^{G}{}_{MA}$) is constructed by all consecutive places P of the *opening* (!) of the ring. It is very important to stress in here that the movement action (MA) is only concerned with this opening of the ring and so only the opening shapes the action trajectory and determines the *tau*-value within the movement action (MA) and it is important to understand that it has no relationship with the transition point. Conversely the *tau*-value within the motoric movement ($tau^{G}{}_{MM}$) is constructed by all consecutive places P' of the transition point within the secondary focus in which the place P' encompasses the metal part *around the opening* (!) of the ring[104]. Because the ring doesn't get separated from the elongated metal bar the places P and P' will maintain to be close to each other[105] during the complete action. They relate to different gaps within two completely different phenomena but their *tau*-values can be observed as one because they fill an exact similar gap within a line segment shape in an exact similar way. Or within other words the perception of the gap of the movement action (MA) automatically provides information about the gap of the motoric movement (MM). So in these kinds of (*static*) motoric movement actions one is able to say that there is an equalization of gaps. This implies that you are able to pause the action trajectory at any moment when you for example need to sneeze. The pausing of the gap of the action trajectory will automatically pause the gap within the motoric movement (MM). If you resume the movement action (MA) then the perception of the gap within the motoric movement (MM) will be resumed simultaneously and will continue with the movement of the ring till the leading *tau*-value ($tau^{G}{}_{MA}$) will approach zero. Although in common language this isn't called timing you are now able to understand that self-paced actions are timed as well. This phenomenon can be regarded as *self-paced* timing. If the visual perception processes observe that the *tau*-value of the movement action ($tau^{G}{}_{MA}$) approaches zero then the *tau*-value within the motoric movement ($tau^{G}{}_{MM}$) is guided in such a way that it also approaches zero.
However within this kind of static actions like within the motoric movement action *nerve spiral* or within the two first phases of the motoric movement action *letter posting* the *tau*-value of the motoric movement ($tau^{G}{}_{MM}$) is hard to grasp. However with the explanation of the *tau*-coupling within the (tiny) throw of the letter within the non-static last phase of the motoric movement action *letter posting* the *tau*-coupling within static actions become crystal clear as well. We need to close the relevant fingertips during the holding on to the letter in the first two phases of this action *as active as* (!) we need to open them simultaneously[106] within the throwing phase. Within our subjective feelings we only regard the opening of the fingers as a genuine motoric *movement* (!) action but the static holding must be considered as active within a zero-*movement* (!)[107].

"*However as aforementioned the timing is not really relevant in the first two phases of the motoric movement action letter posting because within there we hold on to the letter constantly. In the final phase of the letter posting when the letter is actually inserted into the slit of the mailbox the tau-coupling becomes more significant c.q. transparent. Even this tiny throw needs a tau-coupling[108]. Although in here a very small distance A-B is involved a small energy transfer is needed and therefore a small initial phase needs to take place. The tau-value of the movement action ($tau^{G}{}_{MA}$) is now*

[104] In for example the motoric movement action *catching* this transition point trajectory is a really different line segment shape than the action trajectory.
[105] So for all clarity our primary focus during letter posting is only observing the movement of the letter. That includes the *tau*-value of the letter trajectory. At the same moment our secondary focus is observing the transition point where we hold the letter. As aforementioned we do that out of a certain technique but that doesn't need special attention. But it does need attention though. So during posting you visually observe all points P of the letter towards the slit of the mailbox and at the same time you proprioceptively observe all points P' of the transition point out of the movements within your body.
[106] Read: "simultaneously within certain fluctuation boarders". Because you can't, never will be able or ever released your fingertips from the letter in the exact same constellation.
[107] Within the motoric movement action *grasping/grabbing etc*. the whole spectrum of obligatory linked *touch* and *push* actions are revealed.
[108] The essence of a throwing task is that the (movement) action object (the letter) must pertinently be held over a certain (very tiny) line segment A-B in which the initial phase of the object trajectory will be shaped. That initial phase is essential for the upcoming or near future shape of the action trajectory and for the transfer of energy. When the action object approaches B the body parts which hold the object will have to receive the message to release from the object at the exact same time.

determined by how the letter fills the small line segment A-B of that initial phase. The tau-value of the transition point towards that action trajectory within the motoric movement (tau^{G} $_{MM}$) will have to follow this leading gap and will have to provide the message to the motoric movement (MM) to completely (!) release the letter from all the relevant fingertips once the letter reaches the end of the perceptual image of that latent letter action trajectory shape in B. So with other words if we perceive that the tau-value of the movement action (tau^{G} $_{MA\ A\text{-}B}$) approaches zero then the tau-value of the motoric movement (tau^{G} $_{MM\ A\text{-}B}$) also has to approach zero and gives the order to take all fingers of the letter at the exact same moment at all transition points.
In that way the tau-coupling can be brought back to the primary and secondary focus. The primary focus in a throwing task must be pointed at the initial phase of the action trajectory shape and especially at the previous determined end point of that initial phase. The secondary focus in a throwing task must be pointed at the transition point towards that action trajectory shape out of the perspective of the throwing technique belonging to the motoric movement (MM).[109]"

So we continuously perceive the *tau*-value of the motoric movement (*tau*^{G} $_{MM}$) within the motoric movement action *nerve spiral* within all time frames of the whole action during the pushing of all relevant fingertips around the handgrip of the elongated metal bar. In the explanation of the motoric movement action *grasping/grabbing etc.* you are able to read the explanation that within holding with the hand the relevant fingertips need to create pushing-vectors in such a way that a zero resultant must be perceived within the flexible (motoric) movement object (MM). By the way every day you are able to witness this multiple times within your own empirical experiences during the motoric movement action *eating* within the use of a spoon, fork or knife.

5. The complete motoric movement action *nerve spiral*

Due to the comprehensive separate description of the two only organs of the motoric movement action the suggestion could arise that they are linear or otherwise separated processes. That is a complete misconception. Both organs are part of one undivided complex system. The explanatory model explains the motoric movement action as a complex system. The description of the motoric movement (MM) and the movement action (MA) only concerns the explanation of the two complex subsystems. During the execution of a motoric movement action they need to be executed and they need to be perceived simultaneously. The explanatory model explains which perception processes in both parts are required and out of which perspective they need to be observed.

The explanatory model is connecting the processing processes of the perception to the movement action (MA) and proprioceptive perception to the motoric movement (MM) but it doesn't exclude that some perception processes show overlaps. So within the motoric movement action *nerve spiral* the primary focus needs to be pointed at the movement of the ring within a kind of set marble run and at the same time the secondary focus must be pointed at the biomechanical main action towards the transition point within that action trajectory shape which will *execute* (!) the movement action (MA). Like aforementioned both foci produce a *tau*-value which is essential for the completion of the functional *tau*-coupling within the whole action.

[109] Excerpt from the motoric movement action *letter posting*.