

“Training is in the head – yours and also animal’s”

Translation of the last chapter where you can find also explanation to our concept of default behavior and the training evaluation system we introduced at the 4th Animal Training Conference in Twycross (2017)



This book has been published in Czech in 2016 by publisher Plot as an exercise book to my first book “Training is dialogue” (Plot 2014). This text is just a shortcut of the last chapter (not full), which is the most complicated chapter from whole the book.

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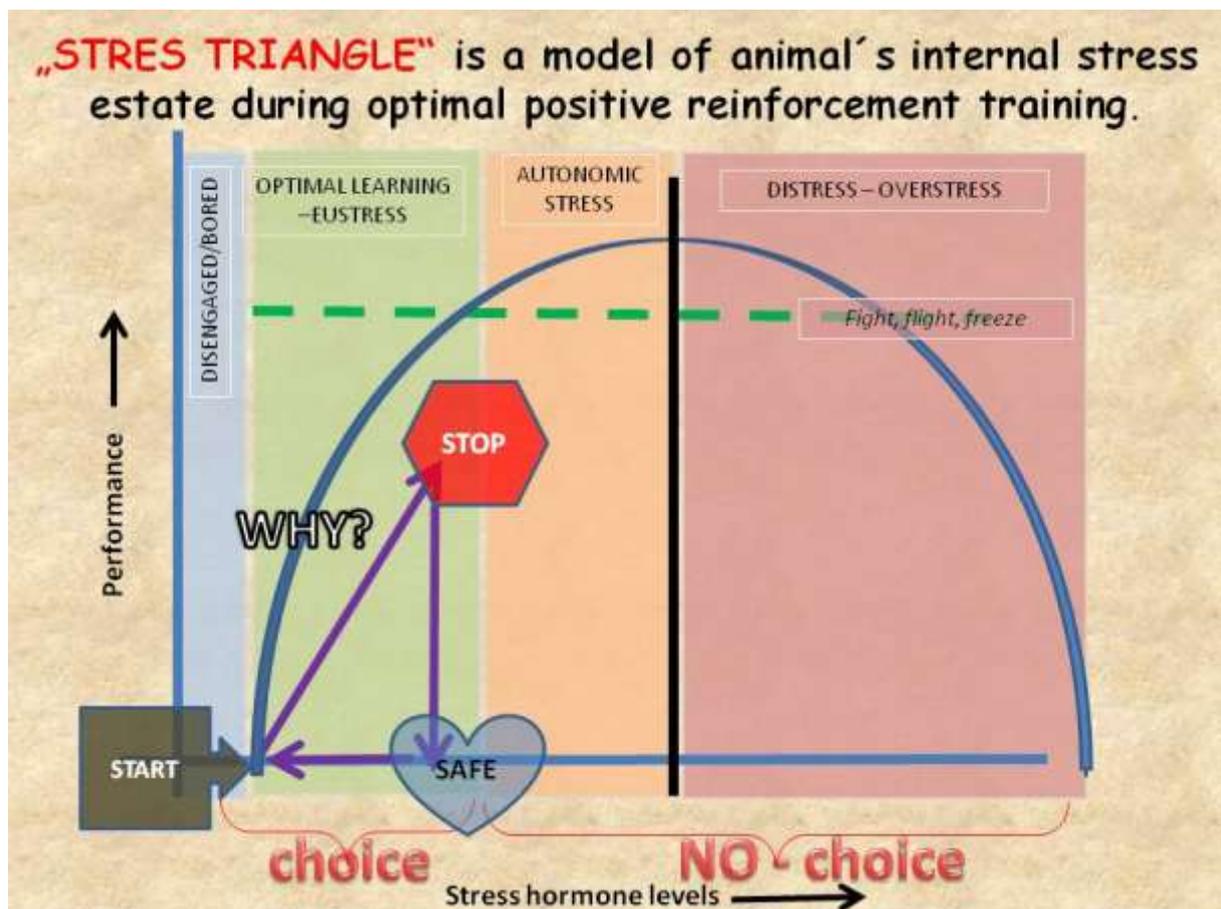
Explanation:

The graphs used in here are done in Czech (I did not have enough time to change them all to English). To understand them, look at English original in here. The symbols and colors remain the same. To understand the topic of “Stress triangle” you can read the basics in the translation of the previous book “Training is dialogue”, which you can find in here:

http://www.trainingisdialogue.com/data/training_is_dialogue_shortcut_of_thebooktxt15330.pdf

(From page 32).

The original picture in English with all the symbols looks like this.



So, now, enjoy the text☺

Chapter VI) Details that move the mountain

Does the following situation seem familiar to you? You are riding a bicycle. You promised to reach your destination in 20 minutes, which is 20 kilometres far from you at the moment. That's possible to make if things are going well. And they do so far. Well, the right pedal is a cracking a bit when you step on it with full power, but it's just a detail. The bicycle is still going, anyway. After five kilometres you get a feeling that chain is creaking a bit and worse, it is skipping, maybe because you are stepping on the cracking pedals in an asymmetric way... But that's nothing more than a little inconvenience, let the journey get finished. No time to deal with details, just focus on the urgencies. Okay, the saddle is wobbling more and more, but that's just another detail. Thanks God it's nothing urgent, not much time is left within an hour.... And now, the loose saddle falls off. Ouch! A painful experience that forces the person to lean forward and shift his weight on cracking pedals – and suddenly, the pedal falls off, the chain does the same and both the person and the bicycle fall into a ditch. So, finally we have a situation worth dealing with. Not only when riding bicycle, but as well in training, it's better to stop and tighten all the screws than to keep going in a creaking vehicle. Because when you drive a half-wrecked vehicle, one screw that falls off makes the other that were not tightened properly to do the same in a sudden. The same thing happens in training, when we keep driving and don't care about details.

Small and large stress triangles

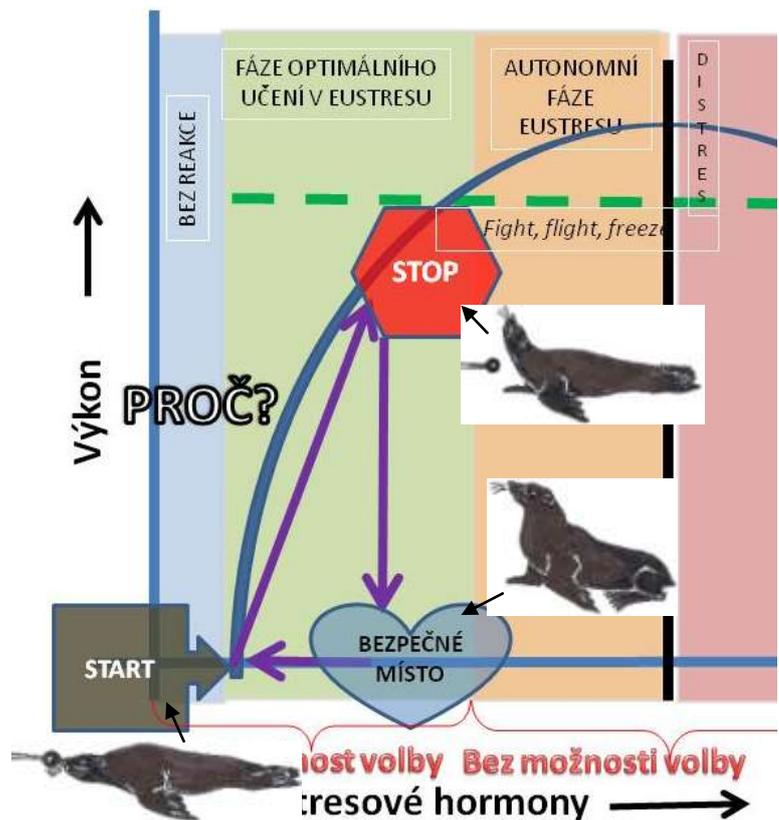
At the beginning of this chapter, it's necessary to mention that it's the most complicated part of the whole book. The content of this chapter is not about the topic as a whole and it doesn't describe general principles, it "digs in the details" instead and more, these details are being transformed into graphs and tables. If you don't feel like this, you can keep going and drive on. But maybe some loose screws will make your journey end in a ditch. But that's what happens every now and then. Try to remember about the examples from two previous chapters. In the solutions I offered to you, the training process wasn't as straightforward as you would perhaps imagine. What's the reason for interrupting Baryk's training with Lisa the cat by leaving and toy tugging pauses? Why would it be useful to interleave the nail clipping training with easy behaviors? Why did we apply the same rules in parrot training? Why in the case of bowl-aggressive bowl didn't we practice only bowl manners, but we also interleaved the training with different behaviors? And why did the dog have a small and big START during nail clipping? The reason for all of this is that in practice, small and big questions occur together with small and big stress triangles. And these are being applied according to current situation and urgency of these questions.

Let's start with the large triangle. It's the one that's the most visible and which allows us, together with our animal, to avoid the acute risk of passing over the animal's FFF threshold. And let's take a look at an example that is a bit far from the dog training world. Let's say that in a SeaWorld facility, the trainers train a sea lion for a voluntary fixation in a so-called squeeze cage. This is a useful behavior for complicated medical procedures that are accompanied with pain, because it is possible to immobilize the sea-lion in such cage. The way a squeeze-cage is being operated is that its ceiling is being released down slowly so it fixates the sea lion at the bottom of the cage. Naturally, the sea-lion will become nervous in such a tight space. And he can be so nervous that if he starts to convulse in such a tight space, it could lead to an injury. So it's necessary to train him for the lowering ceiling so that he doesn't lose his mind

when the action happens. He must get the answers for START, STOP, SAFE PLACE and WHY. Sea Lion's keeper might use a target during training. Target is a training aid that looks like a stick with a colorful ball at the end. Sea Lion's task is to keep nose at the ball until the whistle sounds (which signals properly done behavior) and a reward comes.

At this moment, the squeeze cage opens and can be passed-through from both sides and the ceiling is high up. The sea lion though doesn't have to be afraid to follow the target inside, so he goes. He passes through the cage several times, receives a whistle and a reward. As soon as he feels comfortable in the cage, second phase begins. In this phase, the target could be placed at one fixed point in front of the sea lion, so that our trainee is able to touch it with its nose when lying down. The Sea lion is eager, doesn't wait for the cue and puts its nose on the target. Because he receives bridge and reward, he keeps doing it without a cue and increases duration gradually. As soon as he's lying down with its nose at the target almost all the time, it's time to start lowering the cage's ceiling. The sea lion touches the target with its nose, which means the START signal for us now. Until he changes his position, we can slowly keep lowering the ceiling and perhaps reinforce him, if it doesn't break his lying position.

Now, it would be ideal if the ceiling lowers to a certain height, the sea lion keeps its position, the ceiling gets back up and the sea lion receives a big reward. This is a good plan, but the sea lion is more suspicious than we originally thought and he raises his head from the target and looks above himself. We can understand this movement as his STOP. And the ceiling doesn't move while he keeps looking up. The lying position in the cage with head heading anywhere else than on target becomes the sea lion's SAFE PLACE. He gets relaxed in it and when he finds out that he is in control of the ceiling's movement, he can return to previous work. The question WHY enters the process as well – the answer is the fish he gets. And because of the fish he puts his nose on the target, which means another START and the keeper, depending on his judgement, put the ceiling a bit more lower and the mechanism stops by itself. Or he may not lower it at and keep the current position a little bit longer. Anyway, in a couple of seconds this phase comes to an end, the ceiling goes up and the sea lion receives a big reward.



During this small episode, the sea lion gets answers to all the questions of our familiar large stress triangle. So we could continue according to the slogan "the wheel is turning, everything is

fine". But, even if the wheel keeps turning, maybe some of its parts got malformed. In fact, we have no idea whether we completely fixed the stress triangle or we got stuck somewhere around its center.

Maybe the sea lion wasn't completely relaxed, even though at the moment he is asking for START, he can be at the center of his stress hill instead of at the base as we assume. So the global crisis has been averted for a while, but now a bit of work on the details and "tightening the loose screws" is necessary. So right now, when the cage ceiling episode ended with a success, is the time to interrupt for a while and do some behaviors outside the cage just to make sure. Restart the brain and wash the stress away from the body, if it's there, so that we can go on with more confidence.

Ctrl+Alt+Del in the animal's head

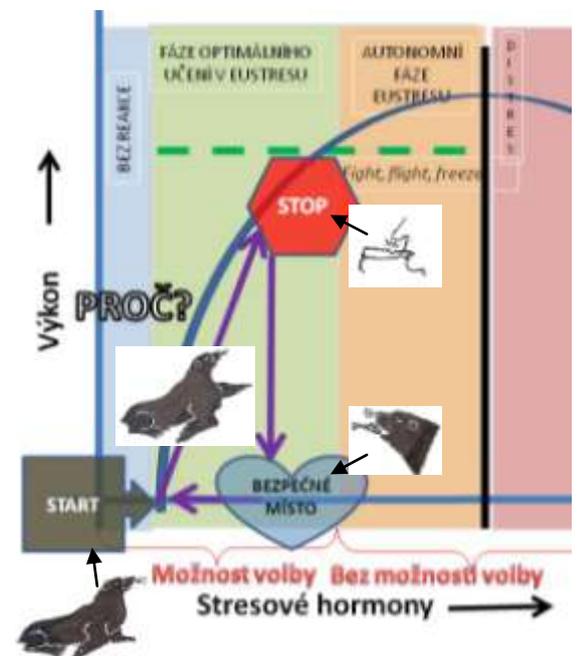
Why don't we continue the cage work with the sea lion now? Why did we so "cowardly run away" from work to be done? The sea lion just started to be successful. But in fact, we did not run away. Because it's possible that a while ago, we inadvertently stressed him too much. The easy get-a-couple-of-fish-more game, all of a sudden, turned into a situation where his very safety was put at risk. He was missing control, a primary reinforcer that has a greater importance than all the food in the world at the moment. And this could be a great load for the animal's "operating system". In order not to "jam the harddisk" (or at worse, become overheated), we need to "cool it down". And easy behaviors that calm the sea lion down serve this purpose. We can perceive these easy tasks as some form of "Ctrl+alt+del") of the sea lion's brain. In case of some marine mammal shows, these "brain restarts" are very cleverly incorporated into the show itself. For example, the Sea Lion Team of Prague Zoo uses the following trick in case that sea lion's brain "freezes": For some reason, the sea lion doesn't know what is expected during the show and starts getting confused. The more he gets confused, the less successful he is in completing even easy tasks. In such situation, it's necessary to give him a super-easy task so that we get ahead of this downward heading trend. Even the completely jammed sea lion's brain is able to successfully perform this super easy and almost automated behavior. The sea-lion shakes his head – and in that moment, his mind is back in a game. He was successful, receives his fish and just to make sure he gets another super-easy task – the keeper "threatens" him with his right hand, which he answers by covering his nose with a flipper. He receives another fish, which returns him into a completely relaxed and ready state and the show may go on smoothly. You say that you've never seen this in Prague Zoo? Of course you did, but the keeper doesn't explain to the audience what's going on at the moment. The situation may look similar: "Meloun, are you not gonna work today?" (the discriminative stimulus – keeper stands with his arms akimbo). "I won't", the sea lion answers by shaking his head and the keeper hands him a fish inconspicuously. "Shame on you" (discriminative stimulus – "threatening" right hand). "Shame on me", answers the sea-lion seemingly by covering his nose. He gets another fish and the show goes on. Similar restarts of animal's brain utilized through an easy behavior is a procedure each experienced trainer has in his repertoire, even though there is no special term for it in training terminology. Some trainers call these easy tasks "stress breaks", others call it "foundation behaviors". However, this technique is very useful and falls into a wider category of "training tricks" that has its name. In summary, we call them "behavior momentum". Such behavior momentum serves not only as a tool to "restart the crashed animal's operating system", but also to create the "right mood". It can both calm down the

animal when too excited or to excite an animal when it's bored and lacks enthusiasm. In my practice, I use the first version most often – to calm down an animal that feels insecure. In dog training world, nose touch serves this purpose exceptionally well. It is easy, most dogs perform it almost automatically, however it is performed on operant basis, so that we can suppose that performing it holds the animal under the FFF borderline. Moreover, we don't need to force the dog to turn away from alleged danger – the dog has both his problem and trainer's hand in his perimeter, so he's able to perform the behavior. In some cases, I ask for nose touch in a moment that we are starting to lose contact with the dog. Of course, it will work only when the dog is not far above the FFF borderline and he can indeed do nose touch automatically – otherwise he could bite trainer's hand instead.

But let's return to the sea lion and squeeze cage training. Behavior momentum is achieved by letting the sea lion out of the cage and letting him perform a couple of easy behaviors there. He waves his flipper, turns around, retrieves the ball from the ground. He didn't hesitate for a second, he does all the behaviors flawlessly and in fact without thinking. He receives a reward for each behavior, although perhaps not as big one as he receives in the squeeze cage for just touching the target. But anyway, he doesn't need to solve any complex problem or fight for survival at this moment. He's just doing easy behaviors and receives rewards – which is not only profitable, but also calming activity. With lots of easy, "guaranteed" behaviors, he gets where we need to have him – as close to the base of his stress hill as possible. How is it possible that series of easy and well-trained behaviors can calm down the animal and its stress level lowers as shown on the graph? Let's remind what was mentioned in the first book (Training is dialogue...) – Positive reinforcement based training actually is a dialogue between the trainer and the animal and this dialogue is always started by the animal. This so-called dialogue consists of five words: I WANT TO WORK (says the animal) – Cue (the trainer gives) – BEHAVIOR (the animal performs) – BRIDGE (ie. Sound of a clicker or any other marker signal – (the human gives) – REWARD (the human gives, the animal consumes). If we antropomorphize it a bit, both participants of the dialogue say: "I want to work" (animal) – "Here you go" (trainer) – "You've done it right" (trainer) – "And now, let's celebrate it" (both).

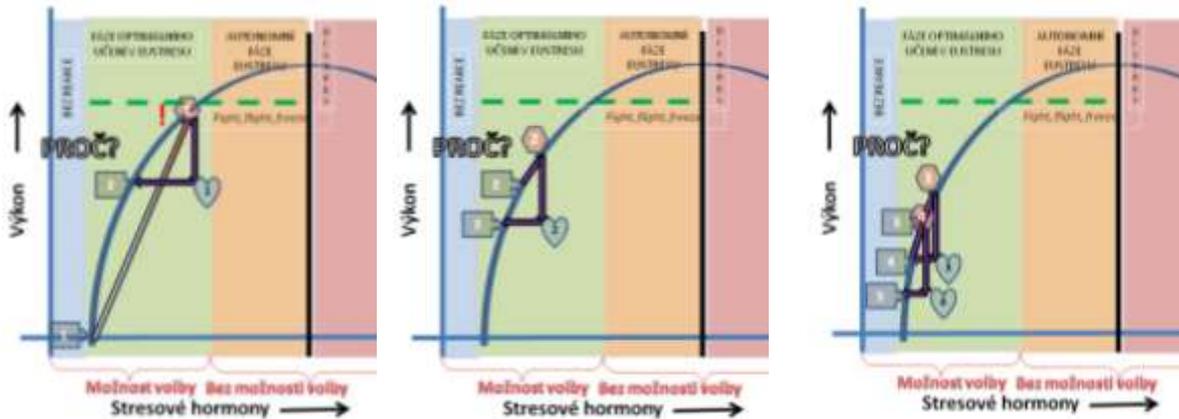
The way the animal says that it wants to work is in fact the START point at the stress triangle. An ideal way to ask for work is a pre-trained "default behavior" that will be covered further in this chapter. The animal gets the task and starts working, which moves him towards the FFF.

Finally, it finishes the job and hears the bridge, which informs him that the task was done properly and the animal stops rising up. So this bridge (clicker, whistle...), a terminant bridge, becomes a small STOP. Even though the animal didn't ask for it, the trainer gave it, but anyway it terminated the animal's effort and stopped its rising towards the FFF. That's why this stop doesn't need to come slightly under the FFF border line, but it can come anytime when the animal completed its task. Then he receives a reward which takes him some time to consume. And the time when the animal is consuming the reward is a safe place in terms of a short



training session, during which the animal doesn't receive another cue until it asks for it.

And the ratio between the effort the animal had to put into task completion and time period it spends by consuming the reward, determines whether it's calmer or more excited than it was at the time it finished the previous behavior. Simply put, If it goes higher during the work than it's able to fall during consumption of the reward, than it's getting more excited with each behavior that follows. But if the animal received easy tasks which didn't cost it much mental or physical effort, than the decrease during consuming is greater than previous rise when working. And so the animal gets calmer with each consecutive behavior as shown in the picture.



What's going in the graph: In this case, we will mark the point the animal's state is moving between with numbers that tell us which consecutive behavior we observe. So the START of the first behavior **1** , the animal starts in a relaxed state, but the unexpectedly difficult task or shock moved it up to the FFF borderline. It needs to stop **1** and during the consumption of the reward (SAFE PLACE, **1**) calms down a bit. When in this calmer state, it asks for another cue **2** which is easier, so after its completion and consumption of the reward his internal state gets even a bit more calmer. And so on, until after three easy tasks gets almost completely calm and asks for another cue as shown at the position **5**

First step for the animal or zero alternative of behavior (default behavior)

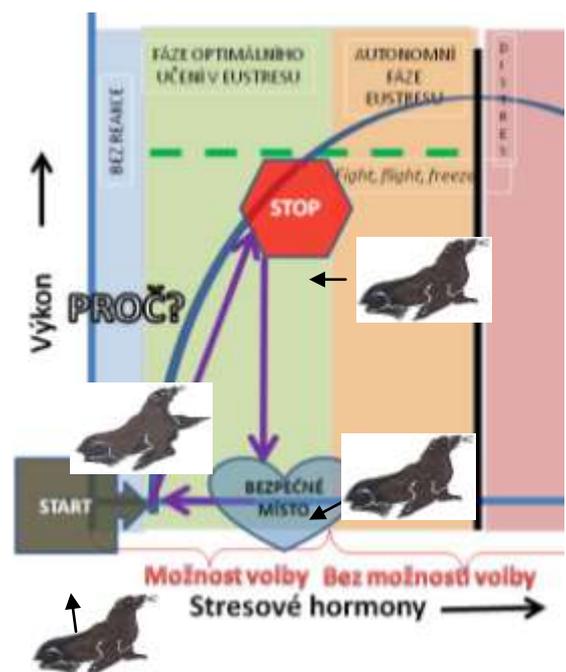
So now we have a sea lion outside the cage, he just finished a couple of easy behaviors as a part of “behavior momentum” and seems to be completely calm. He’s standing in a relaxed position heading towards the keeper and expecting what happens next. The keeper tried not to give any cue for a period of time... And the sea lion keeps sitting calmly and waiting for a cue. He just performed a “first step for the animal” (or we can say “zero alternative”) which is an important message for us. The sea lion is telling us that he’s relaxed and we can return to the cage. Why was the sea lion’s position towards the human so important? Because it informed what’s going on in his mind and body. Actually, he should not have received cue for any of the behaviors he performed a while ago until he asked for it by getting into this position.

But let’s return to our sea lion in front of the squeeze cage. At the moment, the sea lion stands in a relaxed posture heading towards the keeper and the relaxed posture is a sign that we are indeed at the base of the stress hill and not somewhere in its middle. Simply put, a sea lion sitting in this default position is a much more important sign of a good training than a sea lion throwing somersaults high above the surface. It’s a word he speaks to us and tells us how he feels and that he’s ready to work. It is his calm request for START.

“OK”, but what if I ask for a behavior, he tries but doesn’t do it and returns to this default position instead? Should I be happy for that? Isn’t he going to sit and do nothing all forever?”

Definitely not – in case that we understand what is the sea lion telling us at the moment and react accordingly. At this moment, the sea lion doesn’t understand the cue for behavior the trainer asked for, so after the failed attempt he returned to a position he knows he won’t spoil anything in. The same position which meant START now becomes an answer for SAFE PLACE. It provides some form of security, something that makes the sea lion sure that he’s doing right. And it can be even his STOP request – if he doesn’t want to go on any more and the training grows over his sea lion head, he just stops doing and sits down. It’s all depending on the situation’s context.

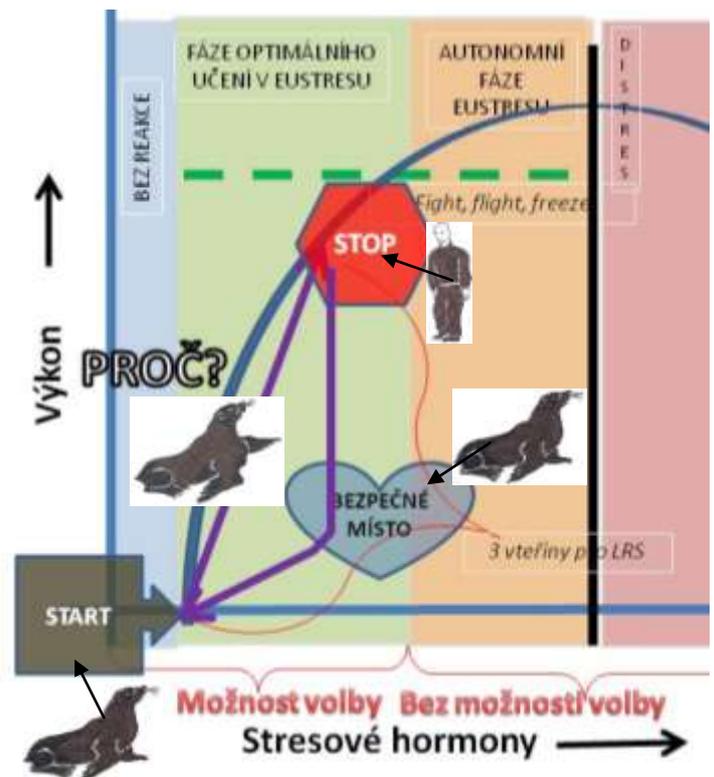
So this so-looking “slacking” in default relaxed posture in front of the trainer can have different meanings and that’s why I call them differently. I call it “first step for the animal” in case it’s an answer for START, “Zero alternative of behavior” in case it’s an answer for SAFE PLACE or a STOP request. Nevertheless, in English training terminology only one term exists – default behavior. And because this chapter is going to be complicated and I don’t want to complicate it even more, I will be using the unifying term “default behavior” (or abbreviation DB) until its end. And this DB is an important condition for applying another technique, known as LRS.



LRS (Least Reinforcing Scenario)

This important technique of positive reinforcement training can be explained as a “mid-sized stress triangle”. Although it doesn’t protect our sea-lion from over-stressing and stepping over FFF, but it’s important for not approaching the FFF borderline unnecessarily. It is way how to deal with a mistake without saying “no”.

How does a LRS look like? Quite inconspicuously. Let’s say that the trainer doesn’t want to exercise only easy behaviors, but he asks for something more difficult. The Sea Lion can already lift his front flipper and now the trainer want’s to teach him to lift his left back flipper. He’s at the phase when the sea lion can lift his back left flipper by following the target. Now the trainer wants to fade the target away and the sea lion should react only to the trainer’s hand gesture. So the trainer put the target away, cued the behavior with his hand gesture, but the sea lion misinterpreted the cue and lifted his front flipper instead of the back. From the trainer’s point of view it’s a mistake and so he cannot reinforce him. But from the sea lion’s point of view he was correct so he doesn’t have a clue why the reinforcement isn’t coming. If he started to panic because of his lack of success now and started offering lots of other behaviors in spite of being reinforced, it could be a problem. The Sea Lion was successful until now, but now, in just a couple of seconds, collected a whole bunch of failures - one failure with each behavior he offered. He was “working his fingers to the bone” and received no reinforcement... That’s almost exploitation from sea lion’s point of view. And as we know from the history of the mankind, exploitation often leads to revolution. For 70kgs trainer, it’s a bad idea to make the 200kgs predator feel that he’s being exploited. The sea lion’s revolution could be rather quick and fatal for the trainer. This is exactly the right time to implement LRS. Because the Sea Lion already mastered the default behavior in which can never be wrong, so after his first mistake he gets into this secure position instead of offering behaviors frantically. From the observer’s point of view the situation looks like the trainer doesn’t pay any attention to the sea lion. From sea lion’s point of view it might feel like the world has frozen for a moment. In this situation, when he gets no reaction from the trainer, stops his struggle and moves into his secure position, he performs the default behavior. The “no-reaction” from the trainer serves as STOP (so the sea lion stopped struggling) and his default behavior serves as SAFE PLACE (he knows that he cannot be wrong). Three seconds pass during which the sea lion kept this “zero position” in front of the trainer. At this moment, after the three seconds are gone, we can interpret this behavior as a signal that the sea lion is ready to cooperate, the START signal. And the sea lion is reinforced for this behavior by fish or by a simple task that is reinforced by the fish. So the purpose of LRS is to inform the sea lion that “Everything is okay. During the imaginary journey over the unstable bridge you made a wrong step, but you returned to



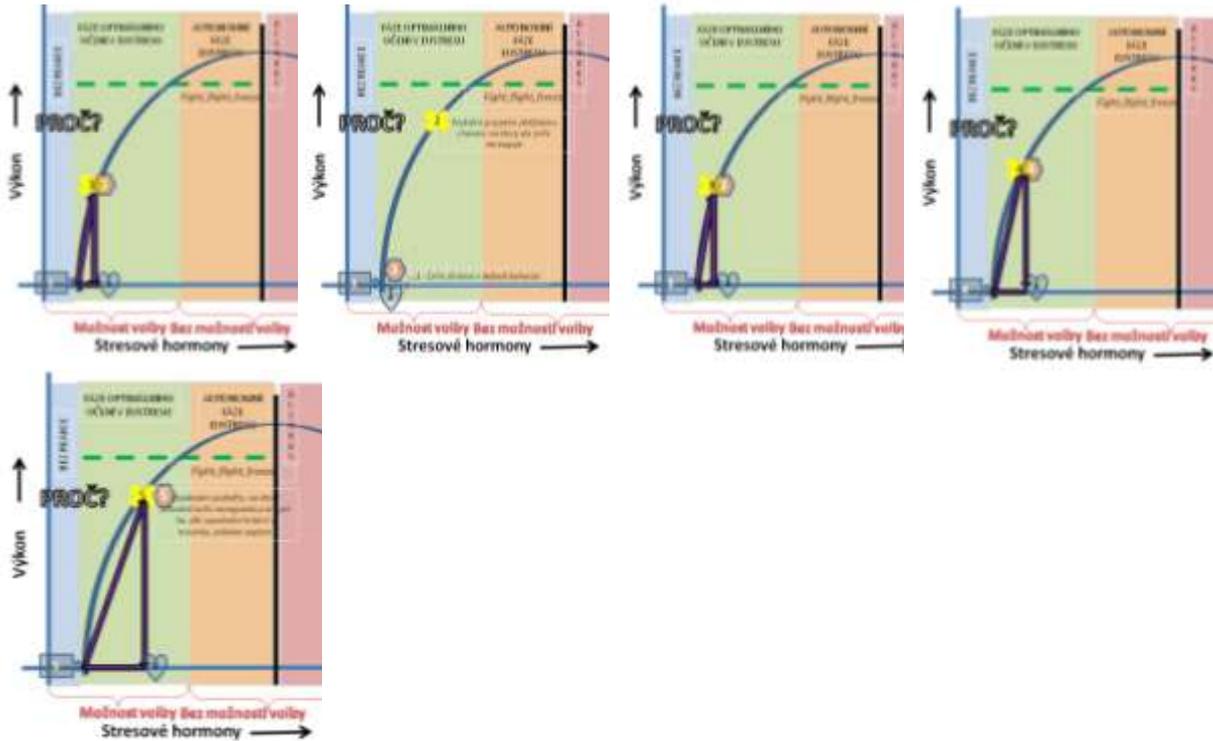
the shore. You are a good boy and I know that it was too difficult for you. Let's try this again in a while (after a couple of "behavior momentum" behaviors) again and I promise I'll give you a task you're gonna be successful in. We will step over this imaginary bridge of a new behavior together and without trouble."

One step back, back to kindergarten

Does the proverb from the previous paragraph about an imaginary journey over the shaky bridge, making a wrong step and return to the shore seem a bit weird to you? No wonder. Imagine yourself on a narrow bridge over a stream. When do you return to the shore? After the bridge starts shaking too much under your feet or after you fall into the water. But you won't be running back to the shore every time you make a wrong step out of the bridge when you are at the middle of the bridge. In this case, you just put your foot back, you make just a tiny small step back and return to the place where everything was going well. You use the most famous technique of positive reinforcement training, one step back, sometimes poetically called back to kindergarten.

How would the example with a sea lion look like? Logically and inconspicuously, like the previous one did. Let's illustrate this on lifting the back flipper to the target. The sea lion lifted his back left flipper, touched the target, got the bridge confirming that the behavior was performed correctly and the behavior was reinforced. So far, everything is fine and normal. At the next, the keeper casts the verbal cue first, lifts the target, the sea lion touches the target, bridge, reinforcement. Now the keeper wants to fade the target and keep only the verbal cue. He casts the cue, doesn't move the target... and the sea lion doesn't move as well. He stays in the default position, like saying: "I don't understand, I'm not going, that's too hard for me". We can understand this as sea lion's STOP request and reverting to the SAFE PLACE (he won't make a mistake in this position). The keeper waits for a couple of seconds (maybe 3 seconds like in the case of LRS, but even fewer might be enough) and if the sea lion stays in the default position (default behavior that means START now), the trainer gives him another try at the level the sea lion was successful before: verbal cue-target-touch-bridge-reinforcement. We made one step back and found solid ground under our feet. And in order not to lose it again, we will approach the goal more carefully – that means we relax the criteria. We split our journey into more steps which are easier to accomplish. So we do not try to the same thing we were unsuccessful at last time, but we will fade the target out more slowly. "verbal cue – just a hint with moving target – movement of the flipper – bridge – reinforcement". After a couple of such repetitions we are able to accomplish what failed before; verbal cue -movement of the flipper – brdge -reinforcement. This series of pictures show us a simplified of what's going on:

Now we have to explain why the trainer implemented a brief pause similar to LRS, but didn't cue another behavior after it. He just went one step back of the same task. The answer is that in fact the sea lion made no mistake. It's even possible that he didn't notice the verbal cue and that's why he keeps default position, awaiting what will happen next. From the sea lion's point of view everything was okay in that case, no pointless work, no exploitation, he's just waiting for a cue. And that's why, thanks to the trainer's one step back he received a cue he understands and he can go on smoothly.



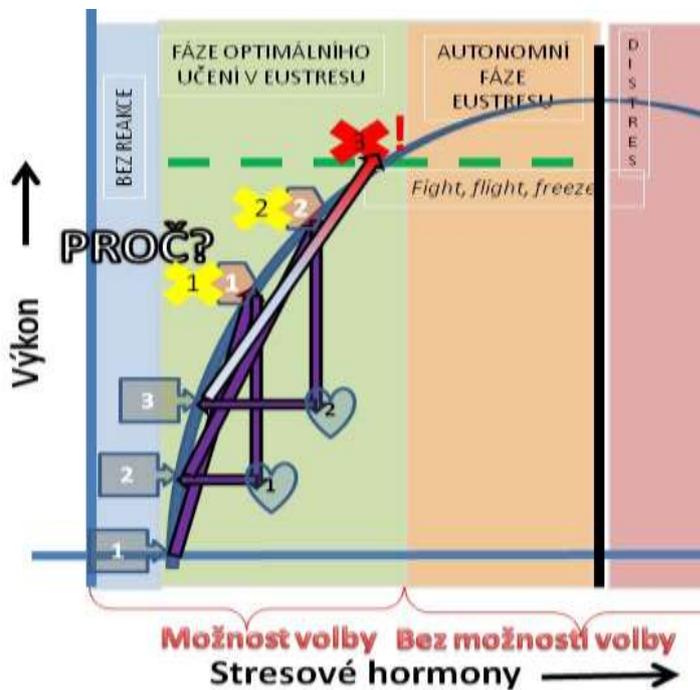
What's going in the graph: To make things clearer, we will extend our set of START , STOP  and SAFE PLACE  symbols by a symbol for cue the animal received . It shows us how much effort (physical or psychical) the animal must put in if it completes the behavior successfully. In the first graph the success is reachable and the sea lion performs the behavior, hears the bridge  and gets reinforced . After it consumed the reward, it asks for another cue. But this one is out of its range, or the sea lion didn't even recognize the cue, so he stays in the base position, default behavior. In the third graph, the trainer asks for the same behavior as in the first one. In the fourth one, the trainer relaxes the criteria so that animal is able to achieve success and in the fifth one (or it can be even later in practice) the animal is able to successfully perform the behavior that was unreachable in the second graph. (Side note: To be exact, in fact the animal doesn't show higher performance with each successfully performed behavior, but thanks to being successful in the previous tasks, it is the goals that „approach“ the animal.

High energy and low energy behaviors

To complete our thoughts about small and large stress triangles, let's analyze another situation.

Imagine a dolphin during the show instead of the sea lion. The dolphin gets a cue to jump after a ball hanging above the water surface. He jumps, touches the ball and deserves a fish... and as soon as he swallows, another cue is coming – a cue for a behavior with a similar level of physical effort. This time it can be a series of jumps around the pool's edge. After this a vigorous swimming at the surface level from point A to point B... And during other behaviors, the dolphin flies in the air and cruises the pool as a ball lightning. In addition to this, imaging that the trainer is asking for behavior when the trainer is in the water together with dolphin. The audience and the trainers are having fun and it seems that the dolphin is having fun, too. „And why wouldn't he? He's doing all the behaviors voluntarily and he's a young dolphin who likes to do all these vigorous behaviors.“ At least that's what the trainer thinks.

But then, all of a sudden, the dolphin hits the trainer's belly at full speed. „Ouch, what are you doing, you crazy animal?“ But the dolphin didn't go crazy on his own. What made him crazy was a



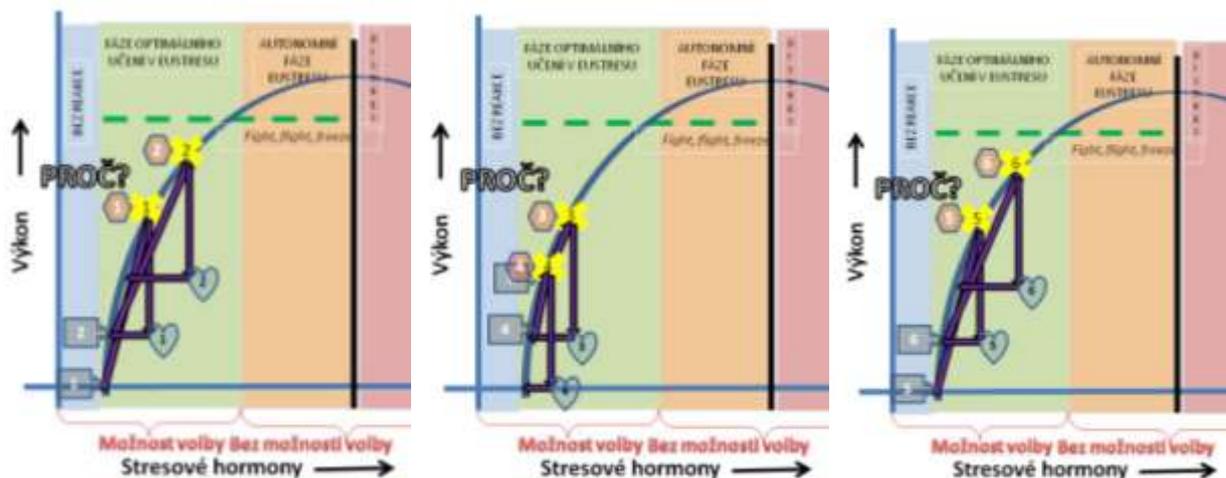
long series of behaviors that cause a rise of adrenaline. These high energy behaviors alone got the dolphin to a higher level of stress. If he wasn't at this level, he wouldn't be able to perform them. But unfortunately, thanks to this series of high energy behaviors sent the dolphin to the FFF borderline and he's losing control over himself. He asked for each of the cues by his START behaviors when he was in a state he wasn't calm enough and everything was cumulating until it accumulated. The strike to the trainer's belly could be called „play aggression“, aggression induced by too energetic play and losing selfcontrol at the FFF border as the picture shows.

What's going on in the graph: We already know the symbols from the previous graph. In this case the animal receives three consecutive cue **1**s in a short period of time, that require high performance (HE behaviors) and completing them moves the animal closer to FFF than it is able to process (decrease) during the consumption. That's why even its START **1** moves closer towards the FFF with each attempt. The result is that when it attempts to complete the third cue **3**, it crosses the FFF borderline and loses self-control

What should the dolphin trainer do to prevent being hit by dolphin's in his belly? He should have interleaved high energy behaviors with low energy behaviors. During these low energy behaviors dolphin's body and mind would have an opportunity to relax and the FFF border line would have stayed at a safe distance.

Let's take a look at a small proposal how the series of behaviors might look like so that the dolphin doesn't only exhibit spectacular jumps for the audience, but also stays under the FFF borderline. The high energy behaviors (HE) could be jumps through a hoop, fast swimming, pushing the trainer across the pool by its nose etc.

The Low Energy (LE) behaviors could be for example a face to face position to the trainer, slow swimming at the surface or floating at the surface with longer duration. In practice, the HE behavior would follow LE behavior as shown in the pictures:



What's going on in the graph: We already know the symbols from the previous graph and in fact we even know what's going on. In the first graph the dolphin gets a cue for a HE behavior two times consecutively, so he rises up than he's able to fall when consuming the reward. His START is getting closer to the FFF and in order not to cross it, he must get two cues for LE behaviors as shown in the second graph. In case of these LE behaviors, the increase is lower than the decrease when consuming the reward. His starts falls down to the original level and the trainer can (as shown in the third graph) ask for two consecutive HE behaviors, but definitely not more.

Small and Big Default Behavior

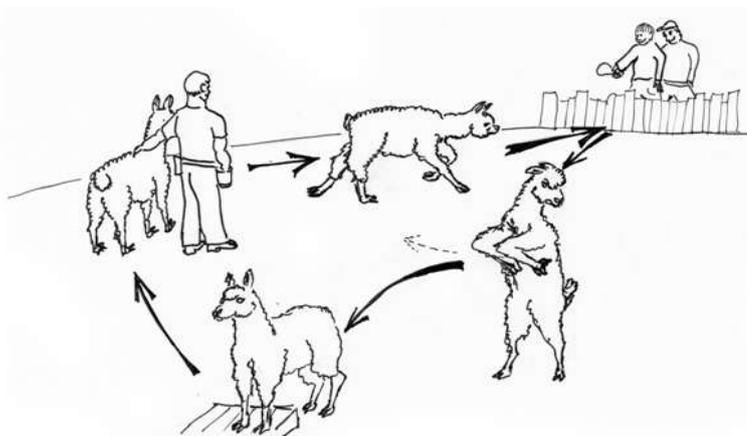
Careful reader of previous chapter might think that if the dolphin receives each cue for behavior after he asks for it by a calm "first step for the animal" (default behavior), then he will never cross the FFF borderline because he will start each consecutive behavior in a calm state. But can we be sure about that? What happened before the dolphin received a cue for HE behavior? In fact the cue was cast right after he consumed the fish and threw a quick look at the trainer. The quick look was definitely a START request. But it wasn't a START request from relaxed animal. Because the default behavior, no matter if the animal asks for START or it's its SAFE PLACE, doesn't have to be the same behavior all the time. Every single animal might

have two to three default behaviors from which the animal chooses depending on the context.

Let's take a look at an example from my practice of animal show at Prague Zoo. A young alpaca male named Sancho is in his pubescence and sometimes his legs kick and his mouth spits on its own. If he gets too close to the FFF borderline during the show, problems arise and a spit into the trainer's face is the smallest one. Much worse is the alpaca's foot kicking under your shank or alpaca standing on his back feet above the trainer. Unfortunately, only three failures in a row or two quick chases of the sound of rattle (which is HE behavior) are enough to cause Sancho to cross this critical borderline. To avoid such problems, Sancho has two basic positions, two default behaviors in his repertoire he is choosing from depending on how he feels: Sancho takes a heel position at the trainer's left side and is looking to the left (away from the trainer). He takes this position when asked for a cue or when failed when performing a new task and doesn't know what to do next. It's a default behavior of a more or less relaxed animal and if not relaxed, at least of an animal that wants to continue. But Sancho has another default behavior, which we call "go home". That means the alpaca goes across the whole stage to the back wall and he puts his front legs on a platform, heading away from the audience. That poor boy looks like he is there for punishment. That's why the spectators are surprised when Sancho from time to time goes home on his own. Both of these default behavior, the small one and the big one, were previously trained by using positive reinforcement. But now he communicates with us through them, so we are able to recognize how he feels.

Let's take a look at this example.

Sancho is sent by the trainer to go to the volunteer, separated by fencing, who rattles the "magic



llama pumpkin". Sancho runs as fast as he can, touches the pumpkins and is expecting to get reinforcement from the volunteer. But the volunteers are two, they are brothers and they are currently fighting for Sancho's carrot. Poor llama boy, excited by chasing the pumpkin

doesn't know why no reinforcement is coming, so he touches the pumpkin once again. At the moment one of the brothers finally won the fight for carrot and gives it to Sancho. Sancho has mouth full of carrot, both boys which we never take as volunteers again keep spanking each other behind the fence in his close proximity and the aroused llama boy is expected to return back to the trainer's left side. He's a pubescent, too so he shows how naughty he can be on his way back. He jumps up when being close to the trainer, both of his front legs high in the air. That doesn't make you feel comfortable when you're so close to him. But luckily, as soon as Sancho hits the ground after the jump, he bows his head and goes home by himself, which causes the audience laughing. But he didn't go there for punishment as it might seem. He sent himself there to have a pause from all the show. He doesn't want to start a fight and he probably knows that if stayed close to the trainer, he probably wouldn't be able to control

his pubescent agitation. He needs a pause, to go to an exhibit or to the first elevated platform. All of this serves as a guarantee of safety and good time when working, a guarantee of our mutual communication.

If we think about it, we realize that even dogs when trained properly have two or three default positions they choose from depending on their momentary needs. And if the trainer doesn't give them a choice, they find them by themselves. Let's imagine that a dog with extreme working drive is standing in front of the trainer, a dog from a working line with an obsessive need to please the trainer. If this dog has a person in front of him, he is working and runs his work drive to the extent where he loses control over himself. His smallest "default behavior" is a quick stare at his person, sitting down is a bit bigger, but with tense body and an effort to figure something out instantly. What he lacks is the ability to leave when in crisis and get relaxed again. He cannot make a few steps further from his trainer to find sanity again. So he keeps working. He's just learning to put his left front paw to an elevated platform.... But he can do this only with his right paw. He makes the first attempt, it didn't work, looks at his trainer, tries again... second attempt, third attempt... and still no success. Now the dog has his nose at the ground and is sniffing something he wasn't interested in a while ago. Or he starts scratching behind his neck for an infinite period of time. Did a new scent appear or did something start to itch him? What's more probable is that this dog gave his "big default behavior" to himself. A behavior in which he doesn't have to work, he is in his own world, far from the trainer and his requests. It's an escape strategy from a situation he cannot cope with on his own. Sancho the alpaca was taught to step up to the platform in this situation, but this dog taught himself to leave for his own world of scents and non-existing fleas. Okay, but what now? At the moment, let him finish his scratching and ask him if he has any other option. Heritage of his hyper-working ancestors order him to work and work his fingers to the bone when his human is watching. So to be able to perform big default behavior on his own, the person has to look away, make a step back from the dog, relax his posture. And if we want to give him a super-big default behavior, we need a kennel several meters from the working team, where the dog can find a shelter in case of really big trouble. Then he might find his calm confidence even in presence of his person and treats, his "safe place far from the work where he can leave for a couple of seconds instead of infinite scratching or sniffing.

Let's put it into a table

I can imagine that a couple of previous pages is difficult for the reader. Words, words, words. One might even drown in them. Perhaps graphs and tables will give us a better understanding. Anyway, we can try. (a small hint: if the explanation using tables and graphs causes you even more confused, skip the rest of this chapter and read the following one. One can survive without graphs and tables)

How could be this animal session recorded in a table? Let's remind once again that the dialogue between the trainer and the animal consists of five words:

I want to work (animal)	Here you go (trainer)	I am working (animal)	You're doing it right (trainer)	And now we're celebrating (both – the trainer delivered a reinforcer, the animal consume it) – or we are mourning (animal – no reinforcement came, the animal reacts in some way)
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That's a nice table, but a bit sloppy. Let's translate it to the animal training and stress triangle terminology:

START (default behavior in the sense „first step for the animal“)	Cue	Behavior	STOP (bridge other terminating event)	SAFE PLACE(reinforcement or animal's reaction to no reinforcement coming)
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That's better, but we still need to elaborate it a bit. What can the animal and the trainer say in each phase of the training dialogue? Let's take a look at an example with a dog:

START: The dog can express a small START (small default behavior, an eye contact with the trainer) or a big START (mid-sized default behavior, for example a sit in front of the trainer). Small and big in this case doesn't mean "how much energy was put into a behavior", but how many time is needed to get relaxed, what is the duration of the behavior and how close to the base of the imaginary stress triangle can the dog get.

Cue: The person can give a lot of discriminative stimuli to the dog. If I was a dog, it would be most important for me if I understand it or not. So, let's differentiate between cues for a well-trained behaviors and incomplete/unclear behaviors. As mentioned above, the well-trained behavior can in fact be high-energy and low-energy.

Behavior: After the cue, the animal can react in a couple of different ways. It can perform the behavior flawlessly, or it reacts but makes a mistake (and then no reinforcement is coming). One type of a mistake can be that the animal offers a different behavior. Or it may even not react to the cue at all and can stay in the same position as in START. Regarding stress, it probably makes no difference which way did the animal make a mistake. It's important whether its reaction required much or little energy (High energy, HE / Low energy, LE) and if the response led to a bridge and reinforcement. When a mistake happened, the animal most probably won't get the anticipated STOP.

Stop: If the animal was successful in its behavior, in the ideal case the bridge sounds and reinforcement is coming. Since that moment, the animal stops its struggle and rising in the graph towards the FFF. If there's nothing to reinforce, the trainer can choose to LRS, count to three in his mind and then react depending on the situation. In practice, none of this may

come, some trainer (and especially the young and ambitious ones) cast the same cue instantly after the animal's mistake. Sometimes it's a successful strategy, sometimes it can cause a completely demotivated animal or bite in the trainer's hand. Let's remember Tonicek that was asked to draw the circle all over again. That's why I would consider only a bridge or LRS and not "giving another try". And we cannot forget the original reason for STOP – the animal can give it to itself when it's too close towards the FFF and starts losing self-control. We have to count on this in the table too.

Safe place: Safe place can have a form of space, time or even a well-known behavior that serves to calm down after the training sequence. It can be the time the animal is consuming the reward (or it uses it in any other way and we can even take into consideration whether it's a primary or secondary reinforcer). It can be the animal positioning itself into default behavior (abbreviated as DB further in the text), in this case we mean DB as a "zero alternative of behavior". And it can be a small DB – the dog made a quick eye contact with the trainer, mid-sized DB – like the dog sits in front of the trainer (both of this is already mentioned at the START box so we won't record it into the table again) or for the first time, the big DB – for example a ferret ran into the transport box after a couple of unsuccessful attempts and after a couple of seconds she goes out of the crate and gives a quick glance to the trainer as a request for another cue (which moves us to START of the next sequence). In a similar way, our dog could decide to leave into the kennel for a while as the bull-terrier from previous chapter. It's a pity that in practice dogs usually don't have this option. But despite that, we will definitely record the big DB into the table. But the animal can find its SAFE place in some escape strategy, like the dog sniffing infinitely or scratching behind his ear, the hen starts to peck phantom grain at the table or a tiny mammal starts cycling at his location. All of this serves as an escape from reality, away from all the mistakes and stress as products of sloppy training.

A couple of words about "Escaping to animal's own world"

It may be useful to go off-topic for a moment and say something about these strange behaviors without a reason. This seemingly unlogical behavior in moments of uncertainty has a technical term "displacement behavior". It appears most often when the animal's motivations are contradictory and it doesn't know what to do – for example a feeling of hunger and fear to go for food. Displacement behavior is in fact the animal's private SAFE PLACE, protecting the animal from other requests of the environment that the animal is not able to cope with. It can also serve for relaxation. For example the scratching dog – it's not impossible that he will ask for more work after a while of scratching.

Such displacement behavior might cause only a small pause in the training process. But if the animal loses self-confidence that's it's capable of achieving success, if the reason WHY to work disappears, such displacement behavior can become pleasant and self-reinforcing. The animal has no reason to react to stimuli of the outer world, it found a pleasant, safe world... And that looks tragically from the outside. We are not talking about harmless scratching behind the ear in moments of insecurity in training, but we're talking about never-ending stereotypic tilting of polar bears, dogs chasing their tails, parrots plucking their feathers or predators licking certain places of their bodies to the blood. Such serious stereotypes are, fortunately, not caused by a single mistake in training. It's usually not a message that says that the animal lost its safe place in a training session, but more often than not, in its whole life. The problem is that nobody else knows what's going on in the animal's head and

whether the private stereotype doesn't feel more comfortable than the outside, real world. Anyway, it's sad to look at it and it is never a good sign.

To make things trickier, it's necessary to differentiate between a true stereotype (which is the case we mention here – the behavior is self-reinforcing and the animal is losing contact with world) and an untrue stereotype (which is the case when the behavior is a way to get something as a result of the behavior – or at least the animal thinks so). But stereotypes are out of this book's scope, so let's leave them and go back to fill our training table.

Back to the table

Let's record all previously mentioned possibilities into the table, depending on what can happen in our training dialogue. Regarding Default behavior, to simplify things, let's put a small DB (a glance at the trainer), midsize DB (sitting in front of the trainer) only into the START column, because in fact the animal uses all of these to ask for work. Let's put the big DB (going into the cage) only into the column SAFE PLACE, because the animal goes into the cage only in case things are going wrong. Where a specific action happened, let's make a cross (x) in the corresponding field. Let's see how could the situation when Sancho was confused by undisciplined volunteers and sent himself „home“ look like when recorded in a table.

Dialogue#	START		Cue			Behavior			STOP			SAFE PLACE			
	Small DB	Midsized DB	Knows the behavior		Doesn't know the behavior	Correct	Incorrect		Gave to himself	Bridge	LRS	Reinforcement		Big DB	Escape strategy
			LE	HE								Primary	Secondary		
1		X										X			

1 – Sancho took a heel position at the left side of the trainer (midsize DB), received a click and was reinforced by a piece of vegetable

2		X		X		x					x				
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2 - Sancho took a heel position again (midsize DB) and was cued to run over the scene to a place where volunteers rattle the „magic pumpkin“ (knows, HE – high energy behavior). He made this behavior and received a click. But the pubescents are fighting instead of reinforcing Sancho, so he got nothing.

3	X		x			x					x		X		
---	---	--	---	--	--	---	--	--	--	--	---	--	---	--	--

3 – Sancho is watching the fighting boys (small DB) and sees the pumpkin (LE that he knows). So he tries to touch it again (correct) and the trainer clicks the clicker (bridge) and boys finally stop fighting and give him a carrot (primary reinforcer).

4	X			X				x	X						x
---	---	--	--	---	--	--	--	---	---	--	--	--	--	--	---

4 – Sancho eats the food quickly and is watching the fighting boys in confusion. The trainer chooses to call him back over the scene using the „magic pumpkin“ (knows, HE) and Sancho starts to run. But it's already too much for him, he cannot handle the situation psychically, so he stops on his ways and throws his feet into the air (incorrect, did HE). That's why gives himself a STOP and goes „home“ (big DB)

5	X										x		X		
---	---	--	--	--	--	--	--	--	--	--	---	--	---	--	--

6		X									x		Xxx		
---	--	---	--	--	--	--	--	--	--	--	---	--	-----	--	--

5- at home Sancho offers a glance to the left (a small DB in this case) and is reinforced

6- then the trainer offers him a place at his left side (midsized DB), where Sancho receives a click and reinforcement... And he even might throw a couple of treats to the ground, so that Sancho gets relaxed when consuming them before being sent to kneel, this time better-chosen, volunteers.

What's between the table, graph and reality

You say you still don't understand Sancho's behavior? Because it's necessary to translate the rows full of crosses into reality. Or at least to the pictures, which correspond more to the reality – to small and big stress triangles.

It has been shown that each training dialogue can be translated as: „I want to work – here you go – I'm working – you're doing right – now we celebrate (or mourn)“ is an imaginary stress triangle containing STAERT, STOP SAFE PLACE and two more entries (cue, behavior). That means each row of our table can be drawn as one stress triangle that gives us a hint what's going on in the animal's head at the moment.

Before we start drawing, let's establish some rules. These rules will be definitely simplified in comparison to reality – anyway, we are trying to see what's going on in the animal's head through them and, as known, nobody can do that. But they can give us a small hint. So now we will create the rules to fit Sancho:

START (marked as  in the graph): Small DB (a quick glance to a human in Sancho's case) means that the animal is not relaxed and is going for another behavior at the same stress level it finished at the end of previous line. Midsized DB means, that the animal relaxed a little bit. It probably won't be at the base of the stress hill, it is working and wants the reward... So, in Sancho's case, let's put the midsized DB at the level of 1/3 of distance between the bottom edge of the stress hill and the FFF borderline.

Cue (marked as ): The cue shows a place at the imaginary stress hill to which the animal rises if the behavior was completed successfully. It will be in a different height each time and it's always only our estimation. But if we have some experience with the animal, we can make a good estimation. In Sancho's case, running over the scene multiple times in a short period of time (with minima or no reward) will definitely cause a blackout (passing over the FFF). So if we call the distance between the base of the hill (horizontal axis of the graph) and the FFF border line a „base length“ (BL), then each run over the scene moves him at least by 1/3 of the base length towards FFF. However, touching the target with his nose can Sancho make six times consecutively – so each of these touches means a movement of 1/6 of the base length towards the FFF. Fetching the pine cone from the ground to trainer's hand means 1/6 shift as well, jumping over the obstacle 1/4.

Behavior (shown as a rising arrow of the stress triangle) Let's say that if the animal was successful, the line of current stress triangle stretches from START exactly to the point determined by the cue. If he wasn't successful and it cost him less effort than when successfully completed, the line is proportionally shorter, if he wasn't and it cost him more effort than when successfully completed, the line is longer and so closer to the FFF. This line shows increasing performance of the animal under pressure.

STOP (marked as  in the graph): Both bridge and LRS terminate the curve of rising performance. If none of this happened and the animal keeps struggling, the line continues. If the animal stopped by itself, the line ends.

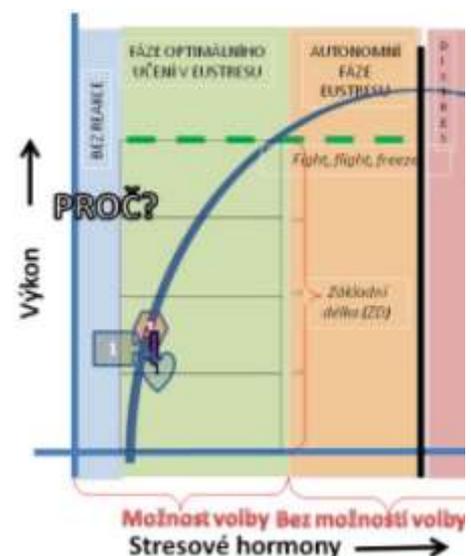
Safe Place (shown as  in the graph): The safe place determines a position towards which is the curve heading from stop. It shows how relaxed the animal will be when not working. If the animal is eating food, it's a period of at least partial relaxation of his mind and body. Of course it depends how long it takes to eat the food and how much time is spent. In case of Sancho, who eats very quickly, it provides no significant relaxation. Let's say that consuming of a standard reward causes the curve to fall by 1/3 of base length. If Sancho was eating more pieces of vegetables and his head was heading down (that's what happened in the end of our example), the curve would fall by 1/3 of base length. If he performs a big DB („going home“ for Sancho), the curve gets to the very base of the hill, the same happens in case of an escape strategy (Sancho doesn't have many of them, perhaps scratching with his back leg, similar to the dog mentioned).

So what do the table and the graphs tell us about the Sancho's episode with the two pubescents? Let's record it once more, but instead of crosses, let's fill the part of base length that Sancho moves on his stress hill when possible.

Dialogue #	START		Cue			Behavior			STOP			Safe place		
	Small DB	Midsized DB (goes to 1/3 of BL)	Knows behavior		Doesn't know the behavior	Successful	Unsuccessful	Gave to himself	Bridge	LRS	Reinforcement		Big DB (At the base of the stress hill)	Escape strategy
			LE	HE							performed LE	Performed HE		
1		X							x		1/10			

1 – Sancho took a heel position at the left side of the trainer (midsized DB), received a click and was reinforced by a piece of vegetable

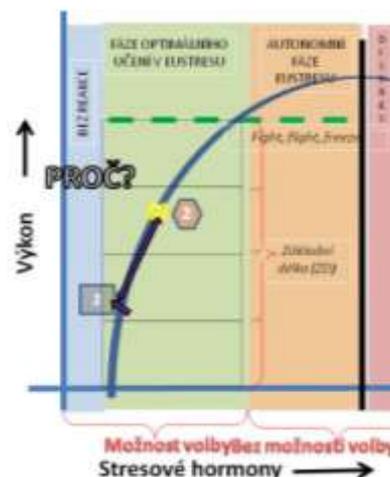
What's going on in the graph: In this case START and STOP are at the same place (Sancho didn't perform anything) and because he was reinforced, he gets relaxed by 1/10 BL



2		X	1/3	x				x					
---	--	---	-----	---	--	--	--	---	--	--	--	--	--

2 - Sancho took a heel position again (midsize DB) and was cued to run over the scene to a place where volunteers rattle the „magic pumpkin) (knows, HE – high energy behavior). He made this behavior and received a click. But the pubescents are fighting instead of reinforcing Sancho, so he got nothing. (SAFE PLACE is missing, stress level doesn't fall)

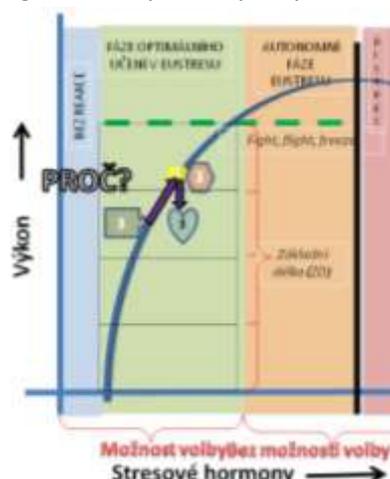
What's going on in the graph: Thanks to the midsize DB at the START we're starting at the 1/3 of BL again and by completing a difficult task we're moving by 1/3 towards the FFF.. Because the reinforcer is missing, so the SAFE PLACE is also missing and Sancho's state doesn't fall down and stays at the current level.



3	x		1/6		x			x		1/10			
---	---	--	-----	--	---	--	--	---	--	------	--	--	--

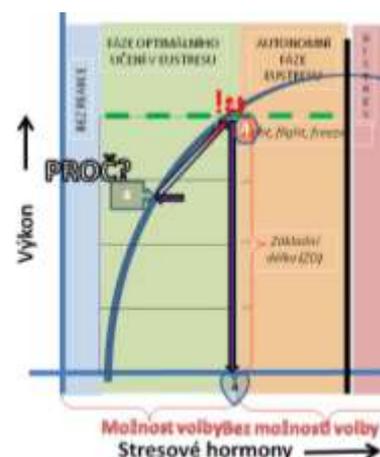
3 – Sancho is watching the fighting boys (small DB) and sees the pumpkin (LE that he knows, 1/6.). So he tries to touch it again (correct) and the trainer clicks the clicker (bridge) and boys finally stop fighting and give him a carrot (primary reinforcer, fall by 1/10).

What's going on in the graph: START begins where Sancho stopped during the previous behavior. By touching the target it increased by 1/6 towards the FFF, but finally he received a standard reinforcement due to which it falls by 1/10.



4	X		1/3			X	X						X
---	---	--	-----	--	--	---	---	--	--	--	--	--	---

4 - Sancho eats the food quickly and is watching the fighting boys in confusion. The trainer chooses to call him back over the scene using the „magic pumpkin“ (knows, HE, 1/3) and Sancho starts to run. But it's already too much for him, he cannot handle the situation psychically, so he stops on his way and throws his feet into the air (incorrect, HE). That's he why gives himself a STOP and goes „home“ (big DB)



What's going on in the graph: Sancho starts another behavior behavior from START at quite high stress level and that's why completing the HE behavior would rise him over the FFF and he would lose control. So he doesn't complete the task, but when approaching towards the FFF, he rather gives STOP to himself and chooses a big DB, in which he gets completely calm.

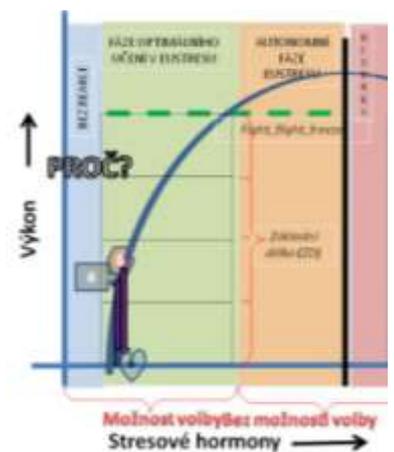
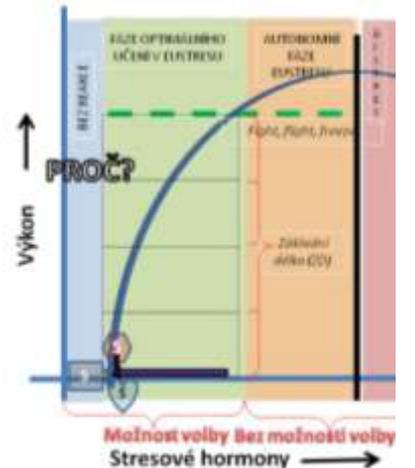
5	X									X				
6		x								X				

5- at home Sancho offers a glance to the left (a small DB in this case, movement 0) and is reinforced (small primary reinforcer, decrease by 1/10)

What's going on in the graph: Sancho didn't do any behavior and was reinforced at the base position, he stays at the completely relaxed state. START, STOP and SAFE PLACE are just next to each other.

6- then the trainer offers him a place at his left side (midsized DB, he goes to 1/3 of BL), where Sancho receives a click and reinforcement... And he even might throw a couple of treats to the ground, so that Sancho gets relaxed when consuming them before being sent to knew, this time better-chosen, volunteers.

What's going on in the graph: Because the midsized DB was incorporated, Sancho's START is at the 1/3 of base length, but the trainer gives him a bigger reward to make sure that he starts the next behaviors with completely relaxed animal.



I hope that this conversion to the ever-changing stress triangles helps you to imagine what may happen in the animal's head during the training session. Yes, it's true that we never know for sure, so let's consider all these pictures as an estimation. But it's definitely worth considering, especially when we want to keep our animal in an „operant“ state under the FFF borderline. And not only the animal.

FOR ANY QUESTIONS CONTACT ME THROUGH WWW.TRAININGISDIALOGUE.COM
or on my e-mail trainingisdialoque@gmail.com

František Šusta, PhD.