

emotionSync®: Solving Dysfunctional Cognitions by Reversing Pavlovian Conditioning

Christian Hanisch*ⁱ

*European Business Ecademy, Goslar
Universidad Central de Nicaragua (UCN)
Managua, Republic of Nicaragua, Central America
International School of Psychology
UCN Representative Office Berlin, Germany

Abstract

Introduction: Pavlovian conditioning establishes stimulus-response connections. The neural basis is provided by Hebbian learning; an almost forgotten dispute in psychology asks whether this is a gradual build-up of the strength of a connection of an all-or none-learning.

Objectives: This article focuses on dysfunctional cognitions which are stimulus-response connections often learned with one-shot conditioning and investigates the option of reversing this learning within one session, by using a type of Anti-Pavlovian conditioning.

Methods: First a relatively new method, emotionSync®, is introduced and described. It is neurophysiologically based and founded on overexciting existing dysfunctional connections. emotionSync® can involve different representational systems. Here the auditory system is investigated, as lots of dysfunctional cognitions rely on auditory representations. I present two studies with different methods to evaluate the emotional state of the subjects before and after the intervention with emotionSync®.

Results: The data provide evidence for the effectiveness of emotionSync®. Pre-post comparisons show an improvement of the emotional state of the clients regardless of measurement scale. The effect was still stable after three months. Further studies even showed lasting stability.

Conclusions: I suggest that learning can be both – gradual and all-or-one. I further suggest that for effective de-learning single sessions overexciting neural connections through emotionSync® may be more effective than slow gradual replacement of existing connection with new connections, without deleting old memory traces.

Keywords: learning, psychotherapy, neuropsychology, exposure, conditioning, dysfunctional cognitions, beliefs, emotionSync®

ⁱ Corresponding author: prof. dr. Christian Hanisch, email: hanisch@european-business-ecademy.de.

I. Introduction

Learning is among the most researched topics in psychology in the 20th century, maybe THE topic (Roediger & Arnold, 2012). Pavlov's experiments are legendary and led to the behavioristic period in psychology. During the cognitive revolution, the paired-associate learning became fashionable, echoing classical conditioning (as in both paradigms, a stimulus elicits a response after learning). Actually, the paired-association tasks predated Pavlov's study of conditioned response (Calkins, 1894).

Dysfunctional cognitions can also be considered a stimulus-response reaction, as specific stimuli can elicit a response as is the feeling/ belief "I am not good enough". The idea that dysfunctional cognitions influence persons in a stimulus-response manner is present in Cognitive Behavioral Therapy (CBT; Beck, 2011; also in rational-emotive therapy, Ellis, 1993). CBT is based on the idea that unhelpful dysfunctional cognitions (e.g. thoughts, beliefs, and attitudes) influence the reaction of a person both on emotional as well as behavioral level.

They are often based on something one experienced in early childhood, but can also stem from a triggering event in adulthood. For instance, a teacher scolds a child for bad grades and he generates the belief "I am always stupid". It is one of the characteristics of dysfunctional cognitions that they often are overgeneralizations – from "I did something wrong one time" to "I always do everything wrong".

How does that learning occur?

In Pavlov's experiments learning took many trials. A basic assumption from many researchers (ranging from Ebbinghaus (1885/ 1964) to Hull (1943)) is that learning occurs as a gradual buildup of the strength of a representation.

Hebb (1949) provided the neural basis of this type of learning. According to his theory, also called Hebb's rule, Hebb's postulate, or cell assembly theory, an increase in synaptic efficacy arises from a presynaptic cell's repeated and persistent stimulation of a postsynaptic cell. Simply said, the Hebbian theory is the neural basis of Pavlov's conditioning.

This idea of gradual increasing strength of associations found entrance into associative memory models, most prominent in Rumelhart & McClelland (1986).

However, this assumption still very present in nowadays research was not always undisputed. In early experiments with chimpanzees, Yerkes (1916) and Köhler (1925) observed that chimpanzees seemed to

have insight into a problem all at once and did not increase their knowledge gradually. Garcia, Kimeldorf, & Koelling (1955) showed in a traditional conditioning experiment that a stimulus-response conditioning can be learned within one trial. The psychologist Guthrie (1946) is the most famous for going against Pavlov's theory by stating that all learning is done within a single exposure to a situation. This theory is also known as one-trial learning (Smith & Guthrie, 1922). Rock (1957) ignited a controversy that although almost forgotten today had dominated the field of verbal learning for a decade. He provided evidence that learning does not occur with a gradual, incremental increase in strength of memory traces, but rather in an all-or-non-fashion. Estes (1960) published research that led to a similar conclusion. Unfortunately, after some heavy debates this work was summarily dismissed.

Therapists working with clients and their dysfunctional cognition and belief systems often notice that such dysfunctional cognitions can develop within a single experience – one-shot-conditioning. This is specifically true if the event is coupled with intense (mostly negative) emotions, as shame, pain, shock and similar traumatizing feelings.

If it is not too difficult to learn within one trial, why should it not be possible to unlearn within one trial? First, it is important to remember that Pavlovian or Hebbian learning implies an electrical connection. In other contexts (electricity in our houses) we all know how to "kill" an electrical connection: overexciting until it breaks through, by making a short circuit.

Why should that not be possible for neural (electrical) connections? The more intense a stimulus is, the higher the neural firing rate. What if the neural connection, that is the dysfunctional stimulus-response connection on a neural level, is overexcited so much that it breaks? That it "burns through"?

emotionSync® is a neurophysiologically based theory which does exactly that. Based on knowledge about the representation and perception of stimuli, the therapist wears out a dysfunctional connection until it no longer exists. emotionSync® is a group of methods based on different sensory representations (see discussions). The method evaluated here uses the auditory channel (clapSync; see below, for further details see Hanisch, 2019; Hanisch & Wilimzig, 2017). That means it is used for dysfunctional cognitions that are represented verbally, mostly in a single sentence. It is the therapist's task to work out a sentence that is a sententious representation of the client's dysfunctional cognitions.

This specific method is mostly good for something that is represented verbally. Such verbal representations in this study were for example:

- "I have to be perfect."
- "I am too stupid."
- "I have to be in control of everything."

More single case studies are provided and described in Hanisch & Wilimzig (2017). "Feeling guilty, to be guilty, performance pressure, not feeling satisfied with oneself, not being able to take decisions..." The actual intervention starts after working this out.

Description of clapSync

A basically loud sound is required to use clapSync. You can really use any sound. The method chosen in this study is clapping because it is easy to use anywhere. But it has to be loud. With loud clapping, the dysfunctional cognition is conditioned on it (see Pavlov). The conditioning must be accelerated and then ended with an energy pulse.

To do this, the client is instructed to close his/her eyes. This is simply used to prevent the client from being distracted from visual stimulation.

Then Pavlov comes into play (see above). The dysfunctional cognition is conditioned with the loud noise. As already pointed out, that conditioning can be pretty fast if one uses intense stimuli and/or items that provide strong emotions. Here it is both. The noise is intense and the dysfunctional cognition leads to heavy emotions.

The therapist repeats the sentence of the dysfunctional cognition and the conditioning with the noise several times, by repeatedly speaking out the sentence together (at the same time) with the noise. Then he stops staying it out loud and the subject is instructed to only think about the sentence.

Then the therapist starts clapping faster and faster. This has two effects. First the energy is increased and, as already discussed, energy is important. Secondly the subject is not able to think about the exact sentence every time. It gets distorted/ abbreviated more and more. For example, if the dysfunctional cognition is "I am nothing" it gets distorted from "I am noth..." to "I am" to "L..., L..., I". The conditioning, the stimulus-response connection, gets disrupted. The experience is so intense that the neural connection becomes a short circuit current.

The therapist ends the intervention by setting an intense stop (energy impulse). There are several options (see Hanisch & Wilimzig, 2017). This time it was a different intense noise, a loud yell or something similar. This intervention further disrupts the long-time established neural connection.

II. Methods and results

This intervention, which is designed to work on dysfunctional cognitions represented verbally, was investigated empirically. The data were collected using two different methods. *Study 1* used a relatively simple but intuitive way to evaluate the emotional valence of the cognitions for the subjects. *Study 2* used a more complex and established method, the multidimensional mood state questionnaire (MDMQ, first published in German by Steyer, Notz, Schwenkmezger & Eid, 1997), which differentiates emotional valence into different subcategories of emotional valence.

In both studies emotional valence was collected before and after the intervention. In *Study 1* emotional valence was evaluated by instructing the subjects to think about the dysfunctional cognition before (pre condition, t_0) and after the intervention (post cognition, t_1). A new, functional cognition the subject felt confident with was developed. The emotional valence was collected again when subjects were thinking of the new cognition (t_2).

In *Study 2* the emotional valence of subjects was tested before the intervention (t_0), after the intervention (t_1) and retested after three months (t_2).

Study 1

A rating scale was used to let the subjects judge the valence and intensity of their feelings. A scale from -10 to +10 was used as established in several interventions. 0 is neutral, no emotions and no feelings. If the emotion is as high as imaginable the rating is +10; -10 is the worst imaginable negative feeling. Obviously, subjects choose something in between (as such some strong feelings are quite rare). What is interesting for the study is whether they are positive and negative and how strong they are. Since their introduction by Thurstone (1929) and Likert (1932), rating scales are among the most important and most commonly used instruments in empirical data analysis in psychological studies. The number of categories is heavily debated. New studies show a linear correlation between the number of categories and quality of the measurements (Saris & Gallhofer, 2007; Pajares, Hartley, & Vahante, 2001; Preston & Colman, 2000). The maximum of used categories in these studies varies between 10, 11 and 100 categories. The number of 10 negative and 10 positive ones seemed a good compromise in pretests. This measurement is only one-dimensional. But in another context, Ajzen (2002) found out that such one-dimensional measures are astonishingly good indicators of more complex measurements.

Subjects

32 subjects were females and 20 males. Age varied between 26 and 61 years. The participants gave their informed consent.

Results

Before the intervention, emotional valences were rated as -6.89 ± 1.89 which lies within the highly negative range of this simple but still eloquent scale (see figure 1, t_0). After intervention, emotions were rated as 0.48 ± 1.42 , so relatively neutral (see figure 1, t_1). On average the mean difference pre versus posttest was 6.40 ± 2.23 ($p < 0.001$).

When thinking about the new cognition, emotional valence was rated as 2.42 ± 0.31 (figure 1, t_2), which is within the positive range. So emotions improved a lot into positive feelings. Difference to t_1 again was significant (figure 1, t_2).

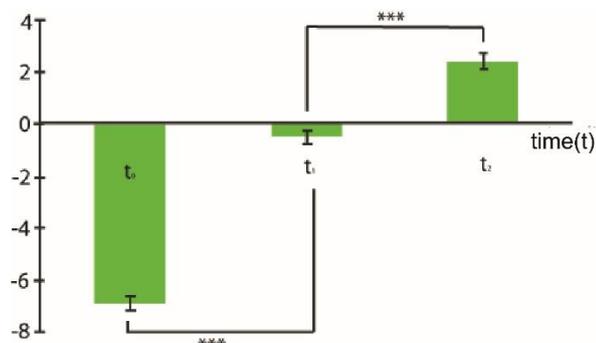


Figure 1. Results of Study 1. Emotions before (t_0) and after intervention (t_2). t_2 shows emotions after working on a new, functional cognition. Emotions were measured using a scale from -10 (the most negative emotion, the one I am feeling worst with) to +10 (the most positive emotion – the emotional state I am most happy with). *** means highly significant difference.

The results point towards evidence for the high effectiveness. Emotional valence was rated one dimensionally. To investigate the results of the intervention in a more discriminative manner an evaluated, validated questionnaire was used, the MDMQ (Steyer et al., 1997).

Study 2

Methods

The MDMQ rises of the emotional conditions of the subjects, the current psychological state (Steyer et al., 1997). It is subdivided into three subscales.

1. Good mood – Bad mood (scale 1): this scale tests items as happy, content, good or bad and unhappy. High measurements represent a positive mood (well-

being, satisfaction, happiness). Low measurements represent dysphoria, melancholy, a feeling of being rejected by other people.

2. Alertness – Wariness (scale 2): high values indicate that a person is relaxed and well-rested. Low scales describe tiredness and fatigue.

3. Calmness – Restlessness (scale 3): high values mean a person is in harmony and at peace with oneself. Low values indicate listlessness.

On each scale the maximum is 40 points, the minimum 8 points. Each scale consists of 24 questions. The MDMQ offers standard values for each of these scales.

Subjects

50 subjects of both genders and various ages participated. The subjects were re-tested after three months to investigate the long-term effect of the intervention.

Results

Before the intervention the subjects rated their emotional feeling as 18.35 ± 7.23 for scale 1 (figure 2), 21.13 ± 9.04 for scale 2 (figure 3) and 23.04 ± 6.04 for scale 3 (see figure 4) when thinking of their dysfunctional condition. These values are significantly below the standard value (for scale 1 $p < 0.001$, $p < 0.002$ for scale 2 and $y = 0.014$ for scale 3), suggesting that the emotional valence of such cognitions is highly negative and they are experienced as highly stressful.

The pre-post difference between t_0 and t_1 provides evidence for the effectivity of clapSync. On scale 1 the values changed from 18.35 ± 7.23 to 33.96 ± 3.71 (figure 2). For scale 2 they changed from 21.13 ± 9.04 to 31.74 ± 5.44 (figure 3) and regarding scale 3 from 23.04 ± 6.04 (figure 4) to 31.16 ± 5.05 . The individual differences showed an improvement of 15.61 ± 9.29 on scale 1, of 10.61 ± 9.49 on scale 2 and of 9.74 ± 8.20 on scale 3. All improvements were highly significant ($p < 0.001$). These experiments confirm the evidence for a high effectiveness of clapSync.

Does the intervention have a long-term effect? By retesting after three months, results indicated 33.30 ± 5.97 for scale 1 (figure 2), 33.09 ± 3.94 for scale 2 (figure 3) and 30.57 ± 5.22 for scale 3 (see figure 4). There were no significant differences between after the intervention (t_1) and a further moment in the future (t_2) ($p = 0.619$ for scale 1, $p = 0.274$ for scale 2 and $p = 0.084$ for scale 3). Therefore, there is no evidence for a decrease after three months. The continuing of the effect was further tested by comparing session 1 (before the intervention, t_0) and after three months (t_2). The difference between t_0 and t_2 were 14.96 ± 8.01 for scale 1, 11.96 ± 9.49 for scale 2 and 9.74 ± 8.21 for scale 3. Differences were highly significant for all scales.

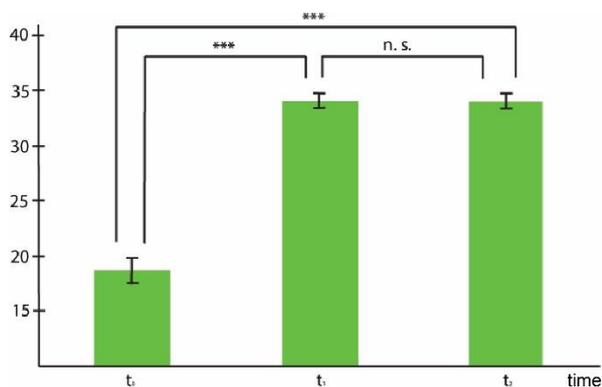


Figure 2. Results of Study 2. Emotions before (t₀), after intervention (t₁) and after three months using the Good mood – Bad mood scale of the MDMQ. *** means highly significant difference, n. s. means not significant

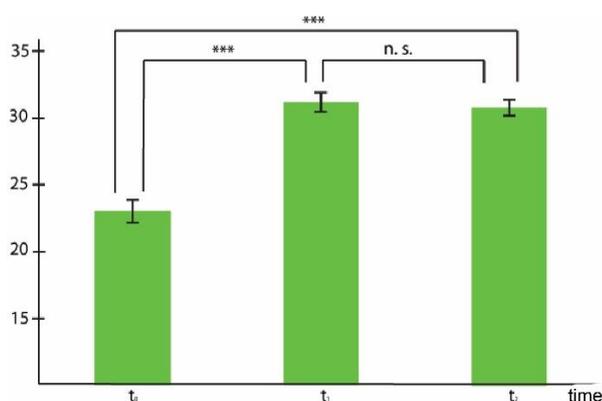


Figure 3. Results of Study 2. Emotions before (t₀), after intervention (t₁) and after three months using the Alertness – Wariness scale of the MDMQ. *** means highly significant difference, n. s. means not significant.

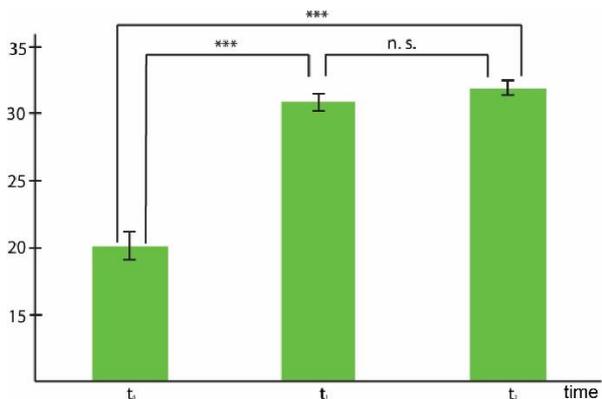


Figure 4. Results of Study 2. Emotions before (t₀), after intervention (t₁) and after three months using the Calmness – Restlessness scale of the MDMQ. *** means highly significant difference, n. s. means not significant.

III. Discussion

The results provide evidence that emotionSync® (clapSync) improves the negative emotional valence of dysfunctional cognitions, both when tested with an one-dimensional scale and when tested with a validated more-dimensional standard test. Furthermore, the evidence suggests that the positive effects last at list for three months. On a side note – after three months, 10 out of 23 subjects could not even remember their earlier dysfunctional cognitions.

Are there not enough kinds of interventions yet? Yes and no. There are methods. These methods rely on habituation and desensibilization and can either be done in sensu or in vivo.

But a lot of interventions are not time-effective, as without the increase in energy of the stimulus they simply take a lot time. Of course, some things take time but it should not take longer than absolutely necessary, since each intervention is emotionally stressful. And there is another, even worse danger. If the old dysfunctional cognition is not deleted, not resolved, there are still traces of it left. And these traces may become active again if they are reinforced in any way. Even worth – there may be a double-bind in which the old dysfunctional connection actively competes with the new, functional one.

In popular science there is a lot of self-help advice like “find your dysfunctional belief, invent a functional one and then tell yourself the functional one over and over again”. This does not work. The dysfunctional belief is too strong – or it would not be a belief.

That is why emotionSync® works with intense, energetic stimuli to “kill” the dysfunctional connection. One further method of the group of methods of emotionSync®, eyeSync, has already been described (Wilimzig, 2018). It is based on eye movement desensitization and reprocessing (EMDR), originally developed by Shapiro (e.g. 1995) and supported by a lot of studies both psychologically (e.g. Schnyder & Cloitre, 2015) and physiologically (e.g. Sack, Hofmann, Wizelman, & Lempa, 2008). eyeSync is basically EMDR+, as it combines the ideas and evidence of EMDR with the energy principle of emotionSync®. It is the energetic version of EMDR, so to speak.

Psychology tells us that you can represent information in the broad ways known as VAK (visual, auditory and kinesthetic) or even VAKOG (five modalities, if you include olfactory and gustatory) (for an easy to understand description see Ready & Burton,

2015). Dysfunctional cognition can be represented in all of these dimensions. emotionSync® provides different methods for different types of representation (Hanisch & Wilimzig, 2017). Descriptions and preliminary data were provided by Hanisch & Wilimzig (2017).

In practice these emotionSync® techniques have been used to solve a varieties of disorders up to the point of clinically relevant ones, such as mental blockages, demotivation, all kinds of anxieties up to phobias, traumas, all kinds of dysfunctional beliefs, psychosomatic disorders like allergies and neurodermatitis, value management, coaching in general,

motivation and much more (single case studies provided in Hanisch & Wilimzig, 2017).

Roediger & Arnold (2012) conclude that the important question addressed in the Rock (1957) debate – the nature of how associations are learned – remains unanswered and suggest this topic is due for a comeback. I suggest that they can be learned both ways – all-or-none and gradual. But the most effective de-learning is deleting the memory trace by means of emotionSync®. Further studies are needed to evaluate other emotionSync® methods and the effectiveness of emotionSync® for other types of disorders.

*

* *

References

- Ajzen, I. (2002). Attitudes. In R. Fernandez Ballesteros (Ed.), *Encyclopedia of psychological assessments* (Vol. 1, p. 110-115). London: Sage Publications.
- Beck, J. S. (2011). *Cognitive behavior therapy: Basics and beyond*. New York, NY: The Guilford Press.
- Calkins, M. W. (1894). Association. *Studies from the Harvard Psychology Laboratory Psychology Review*, 1, 476-483.
- Ebbinghaus, H. (1885/1964). *Memory: A contribution to experimental psychology*. New York, NY: Dover.
- Ellis, A. (1993). Changing rational-emotive therapy (RET) to rational emotive behavior therapy (REBT). *The Behavior Therapist*, 16, 257-258.
- Estes, W. K. (1960). Learning theory and the new “mental chemistry”. *Psychological Review*, 67:207-223.
- Garcia, J., Kimeldorf, D. J., & Koelling, R. A. (1955). Conditioned aversion to saccharin resulting from exposure to gamma radiation. *Science*, 122, 157-158.
- Guthrie, E. R. (1946). Psychological facts and psychological theory. *Psychological Bulletin*, 43, 1-20.
- Hanisch, C. (2018). *Neuroscientific based therapy of dysfunctional cognitive overgeneralizations caused by stimulus overload with an “emotionSync” method*. Books on Demand.
- Hanisch, C., & Wilimzig, C. (2017). *Neuro-Coaching with emotionSync: The Revolution in Coaching and Psychotherapy*. Books on Demand.
- Hull, C. L. (1943). *Principles of behavior: An introduction to behavior theory*. Oxford, England: Appleton-Century.
- Köhler, W. (1925). *The mentality of apes*. New York, NY: Harcourt, Brace.
- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*, 140, 1-55.
- Pajares, F., Hartley, J., & Vahante, G. (2001): Response format in writing self-efficacy assessment: Greater discrimination increases prediction. *Measurement and Evaluation in Counseling and Development*, 33, 214-221.
- Preston, C. C., & Colman, A. (2000). Optimal number of response categories in rating scales: reliability, validity, discriminating power, and respondent preferences. *Acta Psychologica*, 104, 1-15.
- Ready, R., & Burton, K. (2015). *Neuro-linguistic programming for dummies*. John Wiley & Sons.
- Rock, I. (1957). The role of repetition in associative learning. *American Journal of Psychology*, 70, 186-193.
- Roediger, III, H. L., & Arnold, K. M. (2012). The One-Trial Learning Controversy and Its Aftermath: Remembering Rock (1957). *American Journal of Psychology*, 125, 127-143.
- Rumelhart, D., & McClelland, J. L. (1986). *Parallel distributed processing: Explorations in the microstructure of cognition*. Cambridge, MA: MIT Press.
- Sack, M., Lempa, W., Steinmetz, A., Lamprecht, F., & Hofmann, A. (2008). Alterations in autonomic tone during trauma exposure using eye movement desensitization and reprocessing (EMDR) – results of a preliminary investigation. *Journal of Anxiety Disorders*, 22, 1264-1271.
- Saris, W. E., & Gallhofer, I. N. (2007). *Design, evaluation, and analysis of questionnaires for survey research*. Hoboken, New Jersey: John Wiley & Sons, Inc.
- Schnyder, U., & Cloitre, M. (2015). *Evidence based treatments for trauma-related psychological disorders: a practical guide for clinicians*. New York: Springer.
- Shapiro, F. (1995). *Eye movement desensitization and reprocessing: basic principles, protocols, and procedures*. New York: Guilford.
- Smith, S., & Guthrie, E. (1922). Exhibitionism. *The Journal of Abnormal Psychology and Social Psychology*, 17, 206-209.
- Steyer, R., Notz, P., Schwenkmezger, P., & Eid, M. (1997). *Der Mehrdimensionale Befindlichkeitsfragebogen* [Multidimensional Mood State Questionnaire]. Göttingen: Hogrefe.
- Thurstone, L. L. (1929). Theory of attitude measurement. *Psychological Review*, 36, 222-241.
- Yerkes, R. M. (1916). The mental life of monkeys and apes, a study of ideational behavior. *Behavioral Monographs*, 12, 1-145.