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"Implementing the NLP[1] 'Visual Swish' Technique to improve coping with severe mental images by reducing negative emotional response and increasing positive feelings"

Experimental design study

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[1] NLP - Neuro Linguistic Programming

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Abbreviations

EDR/EDA - Electrodermal Response /Electrodermal Activity

fMRI - Functional Magnetic Resonance Imaging

GSR - Galvanic Skin Response

NLP - Neuro Linguistic Programming

NLPt - Neurolinguistic Psychotherapy

PTSD - Post-Traumatic Stress Disorder

"We gain strength, and courage, and confidence by each experience in which we really stop to look fear in the face... we must do that which we think we cannot."

Eleanor Roosevelt

Abstract

Visual Swish (also known as – The Visual Swish Pattern) is a commonly used technique in Neuro Linguistic Programming (NLP), whose purpose is to lead a person to react to mental images in a resource-like manner (recruiting natural or acquired mechanisms), thus helping such person to cope successfully with such images. The procedure (Bandler, 1985) was originally designed to help people coping with compulsive and/or obsessive responses, related to mental images. This procedure operates according to the 'stimulation-response' principle. Harsh visual stimulation raises emotions related to personal strength, history, connotations, values, believes and so on. Problematic coping ability with unpleasant or harsh images will be expressed in the cognitive, emotional and behavioral levels and as a result will damage these functions. Visual Swish was designed to locate problematic trigger-images and to change the unpleasant conditioned reaction (re-conditioning) to a limited and contained negative emotional arousal and to raise positive emotions.

This research examined the effectiveness of the Visual Swish in coping with harsh mental image. Two hypotheses related to the change in the subjective negative emotional response posit that the negative response following the mental image will decline significantly post-exposure to Visual Swish and that the degree of the decline in the response among the Visual Swish group (intervention) will be greater than among the control group. Two additional hypotheses related to the level of the emotional arousal as expressed in physiological indicators posit that the level of the arousal in response to the image will decline significantly post-exposure Visual Swish and that the degree of the decline in the response among the Visual Swish group will be greater than among the control group. The study included 52 participants without mental disorder diagnosis. The emotional response was measured using self-report questionnaires. The emotional arousal was measured using a biofeedback device (GSR) and introspective questionnaire. Subjects were randomly assigned into two groups and asked to

bring to mind an unpleasant event from their past, which was expressed as a mental image that raises harsh/unpleasant feelings. The intervention group underwent a Visual Swish procedure, while the control group underwent the procedure only after 10 minutes, during which it was asked to think about the harsh image, so the difference within the control group could be observed. The emotional arousal response was measured before and after the interventions. At the end of the session 5 subjects from the experimental group filled-up introspective reports.

The negative response to the image declined significantly post-exposure to Visual Swish. The decline in the emotional response among the Visual Swish group was greater than among the control group. A telephonic follow-up two months later among 46 subjects found that the decline in the emotional response and the change to positive feelings was stable. However, the emotional arousal level before/after the interventions was not found significantly different and the values of the Biofeedback indicators remained similar. The qualitative analysis indicated that the procedure was perceived empowering and exciting.

The findings indicate that Visual Swish effectively reduced emotional responses to harsh mental images, and may contribute if combined in therapy of patients, who have maladaptive responses to harsh images. Additionally, it suggests to incorporate Visual Swish in cognitive-behavioral therapy plans for PTSD, since it can relieve patients suffering symptoms relating to the Re-experiencing Cluster, which are expressed in harsh out-bursting images (criterion B in the *DSM-V*, intrusion - Re-experiencing). Finally, it is proposed to further explore this field, especially in light of the pioneering nature of this research.

Chapter 1

Concepts, Theories, Tools and Skills, at the Foundation of the Therapeutic Work

1.1 Introduction

Throughout the years, two main schools developed regarding the purpose of psychological treatment (Blass, 2003). The first school claims that treatment is intended to reduce the patient's suffering and alleviate the symptoms and the feelings of distress, due to which he is treated. The second school claims that the aim of treatment is investigation of the unconscious, and an attempt to assist the patient to know himself better and to formulate a more "complete" self-image. One can list further aims, such as: relieving harsh feelings, helping people adapt to new situations and rehabilitating the functioning of long-term patterns of thought and behavior.

Generally, one may say that the goals of the therapy, from the slightest to the most significant, are: alleviating the patient's suffering, helping him cope with the situations and structural change of thought- and behavior- patterns which existed before the current situation developed.

Over the years, various methods of psychological treatment designed to reach those goals, were developed, starting with dynamic treatment (psychoanalytical approach), through behavioral treatment, cognitive treatment and finally behavioral-cognitive treatment (Kaplan & Kaplan, 2009). The technique investigated in this work, Visual Swish, is one of the earliest processes developed in the field of NLP. NLP may be assigned to behavioral-cognitive therapies (Andreas, 2009). The purpose of NLP is to enable the individual to feel control over his life, while being able to perform emotional, mental and behavioral adjustment. NLP offers

practical, quick and effective ways to understand patterns of thoughts and behaviors, which may be used in order to achieve actual change in the way of life (Andreas, 2009).

The technique itself focuses on the connection between stimulus and reaction - a visual-mental stimulus, arousing an unpleasant or even harsh emotional response, after which the Visual Swish process is applied. The purpose of the process is to significantly reduce the negative emotional response to the visual trigger. As a result, each time this trigger will appear in the patient's life, it will arouse an emotional response different from the original one, embodying feelings of control and vitality. This process may fit together with any process of treatment in which the patient brings to light a harsh memory, connected with specific mental images. Thus this process embodies an opportunity to bring relief to the population suffering from PTSD, due to its influence on memory and the direct work on emerging images, characteristic of the re-experiencing cluster.

The rationale for this procedural protocol which takes place at the sphere of thoughts (visual imagination) is based on theories of learning and up-to-date research in the field of Neuroscience, which established the claim that there is not much difference, as far as the brain is concerned, between imagination (mental image) and tangible perception of an object or picture (concrete image) (Doidge, 2009). Brain scans have shown that during actual perception and imagination, most active parts of the brain are the same ones (Slotnick et al, 2011).

While NLP research is still at its infancy, there is not any research about Visual Swish to be found, despite the fact that it is one of the processes which appear almost in any NLP-related literature and one of the most widely used during NLP treatment. However, actual clinical experiences constitute a testimony for the effectiveness of this process.

The following experimental research focuses on examining the effectiveness of the Visual Swish treatment in reducing emotional responses which arise in response to harsh mental

images. The literature review, shown in the first chapter, consists of three sub-chapters. The first sub-chapter deals with the following aspects: background about NLP and one of the most important components to the understanding of the Visual Swish process – Sub-Modalities; the Biofeedback device chosen as a tool for measuring the variable of emotional arousal; presenting the subject of emotions and classification of emotions; review of learning models related to the treatment of memories; the connection between the three concepts: emotion, memory and learning; review of the connection between the brain, reality and imagination. The second sub-chapter presents the subject of NLP in more detail, emphasizing the skills which constitute the basis for the treatment work. The third sub-chapter focuses on the Visual Swish procedure, its history and how it works. The second chapter focuses on presenting and establishing the rationale for this research, and its hypotheses. The hypotheses focus on the connection between intervention using the Visual Swish technique and reduction of harsh emotional responses while increasing positive emotions.

1.2 Theories and Concepts

1.2.1 NLP (Neuro Linguistic Programming) - Background

NLP includes an epistemology, a methodology and a set of techniques creating models of human behavior. The method was developed during the mid-1970s by psychology graduate Richard Bandler and linguist John Grinder. Grinder was at the time a professor of linguistics in Santa-Cruz University in California, who drew inspiration from Noam Chomsky's theory of transformative grammar. Grinder understood that it is possible to create models out of the structure of language and experiences using concepts of sequences of sensual experience. Those sequences include things which may be seen, heard, felt, tasted and smelt - the visual, auditory, kinesthetic elements, as well of those of tasting and smelling. Those sequences, when exactly mapped, shall provide the keys not only to the model of a certain kind of behavior, but to changing unwanted or ineffective behaviors. (Bandler & Grinder, 1975, 1979)

At first, Bandler and Grinder applied their model on Fritz Perls' Gestalt therapy. During the following years, encouraged by anthropologist Gregory Bateson, they applied their skill in creating models and isolated patterns and techniques out of the works of Virginia Satir, pioneer of family therapy, Milton Erickson, usually described as the father of modern hypnotherapy and others. During their researches they created a technique for building models of behavior, and established a sequence of tools which may be applied therapeutically, by interventions to specific pathologies, to learning difficulties and in behavioral matters (Bandler & Grinder, 1975; Vaknin, 2010).

The uniqueness of this field is manifested in the combination of three main components:

N (Neuro) – understanding the neural processes in the brain, the aim of which is perceiving messages in all modalities, processing them and translating them into experiences;

L (Linguistic) – recognition of brain activity by analyzing linguistic models which manifest themselves in verbal communication (the way a person chooses to express himself) and inner communication which includes thought processes;

P (Programming) – organizing the outcome of the analysis of brain and linguistic activities, including defining goals and planning the ways to achieve them.

In general, it may be said that NLP is a goal-oriented method, focusing on achieving optimal results relative to the chosen goal (Karunaratne, 2010).

During many years, the attitude towards the field of NLP and its literature was as "black magic". NLP itself didn't help in changing this image, by proclaiming itself as "a cure for all diseases" (Wake, 2009). Moreover, NLP was developed outside academic frameworks, while its developers invested their vigor in developing its methodology rather than allotting resources for its research. (Andreas, 2009) However, a community of therapists coming from various disciplines, who started to integrate elements and processes of NLP in their work, discovered that those elements and processes eased the work on their patients and promoted it, while pointing out the skills, the clarity and the detailed procedures (Wake, 2009).

As outlined above, NLP was initially developed as a modeling on the works of Satir, Perls and Erickson rather than as an independent therapy. However, with the passage of time, in view of experience gained with the tools which were developed, nowadays these tools are used as parts of treatments of different types, and there are

those who developed the field into a therapy known as *Neurolinguistic Psychotherapy* (NLPt). This therapy belongs to the cognitive-behavioral-integrative approach (Jelem & Schutz, 2007). One may find in it some overlapping lines to Aaron Beck's cognitive therapy (Beck, 1976). Beck makes three assumptions which manifest themselves also in the field of NLP:

(1) The individual is seen as an active agent, creating an interaction with the universe or with his inner universe.

(2) This interaction is operated out of the interpretations, influences and evaluations which the individual makes regarding his environment.

(3) The outcome of the intellectual processing is reflected as accessible, conscious thoughts and manifested as thoughts and images, therefore the individual has the potential to change them.

Nevertheless, there is an essential conceptual difference between NLPt and cognitive therapy (Wake, 2009). While NLP focuses on processes designed to achieve future-oriented goals, cognitive therapy operates mainly on the area of inner personal reality. It operates toward relieving symptoms and solution of problems, while developing strategies of coping by modification of cognitive structures, aiming to prevent future recurrence.

Reference to Senses in NLP: Modalities and Sub-Modalities

At the basis of NLP understanding lies the observation, that all human experiences include present modality-based experience, modality-based inner representation of recalled past experience or future thought (Andreas, 2009). One cannot know about the universe directly, but rather out of the universe's representation, as perceived by the five modalities. Those representations shall always include at least one of the following modalities: visual, audio, kinesthetic, taste and smell. While the modalities of taste and smell are highly important concerning specific aspects such as choice of food etc., most thoughts and reactions are a combination of the modalities of visual, audio and kinesthetic. These modalities constitute the foundation stones or the "atoms" of all experiences. Even the most abstract thoughts are composed of combinations of images, sounds and emotions. These three modalities may be simultaneously combined at a given moment, or may be combined as a sequence, for example: an image of a singer, followed by listening to a song, and then comes an emotion appearing as a reaction to the song. According to NLP, it is possible to learn how to re-arrange the "atoms" of experience in order to solve problems, thereby achieving desired goals.

Each modality is endowed with small elements, so that one may reach a resolution of insight regarding the manner in which each modality is composed. Those elements are called sub-modalities. Any change in a sub-modality may also alter the whole experience. While modalities are perceived as "atoms", sub-modalities are the "particles" of experience, which build the atom in specific compositions and provide significant, different attributes to experiences.

Visual - An image may have the following characteristics: distance from the observed object, location in space and size. An image may be flat or three-dimensional, framed or panoramic, light or dark, moving or static, multi-colored or black and white. The individual may experience himself as part of the image (inside), as though the

incident is happening again right now, or he may see himself in the image as a spectator (outside). This may happen with regard to both past memories and future thoughts. Multi-colored, three-dimensional and panoramic visual memory shall have higher emotional influence than a memory which is represented as small, distant, two-dimensional and black/white.

Audio – A sound or voice may have the components of distance, location in space and volume. It may sound as mono or stereo, have some rhythm, pitch, frequency, tone etc. The individual may hear it as coming from inside or outside himself. A sound or voice heard in high volume from nearby, as stereo and fully, has the potential for higher emotional influence than a sound or voice from afar, in low volume and monotonous.

Kinesthetic – A feeling may be examined according to its volume, duration and location. It has temperature, pressure and texture. One may experience it as moving or static, inside or outside, full or empty. A recalled feeling experienced as powerful, moving and involving the whole body has a stronger impact than a feeble, static feeling which involves only a small part of the body (Andreas, 2009).

One may enumerate hundreds of sub-modalities. NLP focuses on about a dozen sub-modalities, those which have the highest potential of emotional change (see Appendix 3).

The technique researched in this thesis, Visual Swish, focuses solely on the Visual modality. By changing some sub-modalities, it alters the emotion accompanying the emerging image (for more information about this technique – see 1.4).

1.2.2 Bio-Feedback

This is a bio-psychological framework, recognizing the mutual body-spirit relationship. It has become accessible by means of a computerized system enabling feedback and evaluation, mainly in aspects including stress and tension (Jordanova, 2009). Bio-Feedback is based on EDA (Electrodermal Activity) / EDR (Electrodermal Response) and it includes the receipt of feedback concerning the arousal level of the sympathetic/para-sympathetic system (Jordanova, 2009). The three physiological processes which are usually attributed to hyper-arousal are tension of skeletal muscles (stenosis of peripheral blood vessels), activity of the smooth muscles and electrical activity of the skin. These three processes, especially the first two, are the most common uses of Bio-Feedback. Those processes have been recognized long ago as directly involved with anger, fear, excitement and arousal (Andrasik & Schwartz, 2003). While this device has usually been used as a means to reduce stress/tension/fear by receipt of visual or audio feedback to the physiological reactions (Cohen, 2008), in this research its use has the purpose of monitoring physiological reactions. Several researches have used the Bio-Feedback device to a similar purpose, for example Shapiro et al (2007) who used the Mindlife Bio-Feedback indexes (more about it in sub-chapter 3.2: Tools – Diagnosis and Measurements), in order to measure the skin's electrical conductivity. In that research, which examined the effectiveness of a new environment in the context of dental treatment of children, the researchers used the information obtained from the Bio-Feedback device in order to attest to "calmness" or "arousal". Those were diagnosed according to photographed observations for the diagnosis and encoding of anxiety-related behaviors. This information has been compared and found to be compatible with the information obtained from the analysis of physiological arousal and electrical conductivity of the skin, which is a consequence of a change in the sympathetic system operating the perspiration glands (Shapiro et al, 2007).

Other researches indicate further evidence regarding the use of this device, which may explain the gaps between physiological reactions as manifested in the Bio-Feedback indexes and subjective interpretations. Taylor et al's article (1998) reviews some researches which examine use of the imagination in order to perform self-adjustment. This article examines use of the imagination in order to help people cope with pressure situations (belonging to the past/continuous; conceived as controllable / non-controllable). One of the findings of this review brings the argument that restored emotion (imagining a situation which operated emotions in the past) sometimes creates slight physiological changes which are manifested by slight changes in the Bio-Feedback indexes. According to them, in emotional situations (imaginary in contrast to real) of this type, the device reacts, but moderately (Taylor et al, 1998).

The research by Barrowcliff et al (2004) examined the impact of eye movements on subjective and physiological indexes while bringing to light autobiographical memories, positive or negative. In this research the following situation was examined: The participants had their eyes fixed, in contrast to a situation where they move their eyes methodically. The findings showed a gap between the subjective report of the participant and the physiological indexes. While according to subjective reporting eye movements lower the vividness and emotional valence of positive and negative autobiographical memories, EDR indexes showed a decrease of skin conductivity only when eye movements were associated with negative memory. The results obtained showed a clear difference between subjective reporting of emotion and an objective index (Barrowcliff et al., 2004).

The research by Nikula et al (1993) examined two connections and manifestations in the Bio-Feedback device:

(1) The intensity of the connection between words reflecting individual and current concerns and words reflecting concerns for other people.

(2) The connection between spontaneous jumps in the device's indexes and spontaneous thoughts related to current concerns. In addition, when there are no spontaneous jumps in the device's indexes, does it mean that spontaneous thoughts are not related to current concerns?

This research had three major findings:

1) Words connected with current concerns of the participant cause a significant raise in the EDR indexes, compared with words connected to other people's concerns.

2) Spontaneous jumps in the device's indexes were observed when the thoughts accompanying these jumps were connected with current individual concerns. When there was inactivity in EDR, the thoughts accompanying this inactivity were not related to current individual concerns. This means that thoughts related to current concerns affect the EDR indexes more than thoughts and concerns not relating to the here and now;

3) The contents of thoughts accompanying jumps in EDR indexes was related to current concerns and anxiety, rather than mental images and non-current concerns, compared with the contents of thoughts accompanying inactivity of EDR indexes. These findings testify that current concerns don't necessarily come in the form of mental images. According to Nikula et al (1993), old events don't necessarily operate

the mechanisms of preparation to action, therefore they don't affect objective indexes with the same power as actual events.

In addition, the participants in this research reported more mental images when there was EDR inactivity. This difference was found to be significant. A possible reason for lack of electro-dermal activity was competition between physiological reactions. Imagining something competes with various systems of data processing, therefore causing reduction of electro-dermal activity. Another explanation for the lack of electro-dermal activity while actively imagining is related to the fact that mental images come more easily during calmness rather than arousal. Therefore, when the participant imagines a mental image, he is calmer, which affects electro-dermal activity (Nikula et al, 1993).

1.2.3. Emotions

One may point out four basic components which exist in any typical emotion: recognition, evaluation, motivation and feeling (Ben-Zeev, 2001). The component of recognition includes information about existing circumstances. The component of evaluation assesses the personal significance of this information. The component of motivation directs the desire to act in the existing circumstances, and the component of feeling is a type of awareness reflecting our physiological state. The component of evaluation is the best means to distinguish between different types of emotions. Even when similarities exist between different emotional evaluations, for example regarding their positive or negative character, the uniqueness of each emotion is determined by its unique evaluation pattern. Classification of emotions, which is basic to discussions of various emotions, is based on their evaluation component. The power of emotions depends how we evaluate the significance of things. The factors of emotional power

divide into two main groups: the first one relates to the impact of the incident, and the second one to the background circumstances of the emotional person. The main factors relating to the impact are strength, reality and relevance of the event. The main components of background circumstances are responsibility (mainly control), readiness and deservedness for the incident. Strength of the incident is a main factor in determining emotional power. Usually there is positive correlation between incident strength, as conceived by the individual, and emotional power (Ben-Zeev, 2001).

In Clore's article (1994), the researcher discusses the conscious and unconscious aspects of emotions. Clore claims that the component creating the emotion, which is cognitive evaluation, is not necessarily conscious, while the product of this evaluation, the actual feeling of emotion, is always conscious. From the very definition of feeling, one may not discuss an emotion which is not felt. Since the evaluation creating the emotion isn't necessarily conscious, there is logic in the sentence "I am angry, despite not having done anything", but there is no logic in "I am angry, even though I feel nothing". Clore further claims that feeling is not a sufficient condition for emotion, but it is a necessary condition. This is based on the model of feelings, referring to his 1992 article and the 1983 article by Schwarz & Clore. This model is based on the assumption that experience is an important mediator for the impact of feelings on judgment and decision-making. Man uses sensory feedback in the daily processes of decision-making and judgment. Thus one may examine a person's sensory experience, since the actual experience of emotion, rather than the physiological feedback, constitutes an excellent clue regarding the impact of the researched incident on that person's life (Clore, 1994).

Classification of emotions, in the context of this research, is done according to their positive or negative nature. When the individual experiences a storm of feelings, he is involved in what's happening. Thus emotions can't be neutral. They must be

positive or negative. This division reflects the individual's evaluation of a given situation. The division to positive and negative is not dichotomous. There is a range of intensity between the two poles, such as love-hate; gratefulness-anger; hope-fear; happiness-sadness etc. (Ben-Zeev, 2001). In addition, neurophysiology connects emotional response to specific parts of the so-called "primitive" brain, related to survival functions. The parts of the middle brain such as the hypothalamus, the limbic system and the amygdala are the centers of emotional experiences. Emotional responses are registered in the autonomous nervous system involving changes in heartbeat, blood pressure, temperature, muscle tone etc. These reactions are often attributed to reactions of fleeing or fighting (Dilts & Delozier, 2000).

Kahneman (1999), discusses a lot the good-bad dimension of emotion. According to him, the way to obtain an almost objective index of emotion is clarifying with the person how he feels at a specific moment. Since emotion is a process created at each moment of the continuous present, and since emotion has a conscious component – feeling, a person is able to testify about himself in an almost scientific manner, how does he feel at a specific moment on the axis of positive-negative. Kahneman further claims that the power of emotion measured toward an incident is unrelated to the power of emotion measured on another incident. Therefore, when wishing to compare the power of emotions of the same person, one must make the comparison toward the same incident (Kahneman, 1999). In addition, emotions have a complex status, including inward and outward manifestations (Dilts & Delozier, 2000). The subjective inward aspect is described by terms such as "happy", "sad", "angry", "disgusted" etc. The outward aspect is manifested in terms of behavior, such as "smile", "weep", "hit", "flee" etc. The positive intent of emotions may be understood as the effect of emotions on the behavior in a given environment. Fleeing at the time of danger is a

means of defending the individual. Attacking a threatening stimulus is driven by the desire to stop the threatening agent. Weeping has the effect of calling for help.

The Webster[2] dictionary defines emotions as a "subjective human experience reflected as a feeling (such as: love, hate, desire, fear etc.) and manifested in neuro-muscles, respiratory system, hormonal system and other physiological areas which may be involved". A further extension of this definition[3] says that: "Emotion is a situation affecting the whole organism. It determines how well the individual copes with his environment. Emotions are reactions to significant life events and they dictate responses such as fighting, fleeing, loving or calling for help".

Emotional responses may be conceived as positive or negative. While positive reactions are related to motivation and enthusiasm, negative ones are related to problems and limitations. Most of the time, the problems is not the actual emotions, but rather the behavior which they produce and its effect on the environment. These things determine whether a certain emotion is problematic or it constitutes a resource. NLP copes with negative emotions by recognizing their survival value, understanding the positive intent of emotions and adding alternative behaviors given the relevant context, related to the emotional response. The intent behind the emotional response is actually the intent of the emotion.

1.2.4. Theoretical Models for Explaining, Understanding, Conceptualizing and Treatment of Memories

[2] Webster Dictionary;– Emotions - - http://www.merriam-webster.com/dictionary/emotion

[3] Grolier Encyclopedia ;– Emotions - http://go.grolier.com

This part of the literature review is about some popular theories and models, which suggest an explanation and conceptualization to the connection between memory and learning. Naturally, due to lack of space one cannot present all the theories and models in this field. Some historic classical models are presented, such as learning theories. These models shall later help to establish the rationale at the basis of the compatibility of Visual Swish as an intervention in the context of images arousing an emotional response.

These models include, among others:

(1) **Learning Theories: Behavioristic theories – classical conditioning and operant conditioning** (Wessa & Flor, 2007);
(2) **Theory of emotional processing** (Hepert, 2011)**;**
(3) **Chronological Dynamic Model of processing emotional memory** (Diamond et al, 2007);
(4) **Hebb's Rule** (Brown & Milner, 2003)

Learning theories: One may use behavioristic theories – classical conditioning and operant conditioning, in order to explain the process of development of the connection between a specific memory and the emotions arising when that memory is recalled. During a dramatic event, classical conditioning takes place, i.e. association between various characteristics of the event and a range of emotions, such as joy, exhilaration, fear, terror etc. As a result, when the individual later encounters some secondary characteristics of the event, this arouses/ignites the same primary reactions, which underwent conditioning. The operant learning process is manifested when the individual learns that avoidance of situations, thoughts, emotions and memories attached to a negative dramatic event, helps him defend against fear and anxiety (Wessa

& Flor 2007). While classical conditioning involves typical automatic reactions, instrumental conditioning involves learned behaviors. In addition, while classical conditioning involves association between two stimuli, instrumental conditioning involves association between reaction and stimulus. Instrumental conditioning is a more flexible form of learning. It enables the organism to modify its behavior according to the outcome of this behavior. In other words, when a behavior is followed by favorable consequences, this behavior tends to occur more frequently; when it is followed by unfavorable consequences, it tends to occur less frequently (Carlson, 1998).

One of the basic components of NLP is using classical conditioning (Pavlov, 1927) in order to free oneself from negative emotions: by using the anchoring methodology (see subchapter 1.3), change of conditioned reaction becomes accessible, and a more effective reaction becomes accessible, while associating the present situation and the desired situation (Wake, 2009). Actually, those are components related to stimulus-reaction learning in order to replace automatic unpleasant emotional response with automatic resourceful reaction. When the action of replacement is repeated, connections between new neural cycles are created, while activating the synapse over and over to reinforce the new connections. This learning occurs mostly in the associative-sensory cortex of each modality, and in the prefrontal side-rear cortex. As mentioned above, changes in synaptic connections create new cycles which operate whenever a similar pattern of neural activity occurs (Carlson, 2007).

Theory of emotional processing: Hepert (2011), describes Foa & Kozak's 1986 theory of emotional processing, presenting the structures of fear as propositional networks containing information about: (1) stimuli; (2) verbal, behavioral and physiological reactions; (3) Significance of stimuli and reactions. It is conjectured that in order to

effect a change in a structure of fear, two components are necessary: its activation and the assimilation of new information which is contradictory to the information previously stored. This means that cognitive processes explain the acclimation (decrease in the power of emotional response) gradually built during the sessions and between them.

The chronological dynamic model of emotional memory processing: This model provides an explanation to the manner in which the action of the emotion and memory systems may be disrupted during a dramatic event and consequently bring about the creation of post-traumatic symptoms. As mentioned above, in the introduction to this thesis, it addresses the researched technique in a wider sense which includes its integration into therapeutic interventions in the context of PTSD.

According to the chronological dynamic model, during a traumatic event the activity of the hippocampus increases, and it focuses on the event's immediate context. After the event, this activity decreases and the hippocampus doesn't consolidate this event into the episodic memory. As a result, the memory of the traumatic event is the flash memory, constituting the basis for flashbacks and nightmares. Simultaneously, the action of the amygdala is increased, which brings about the creation of strong connections between the characteristics of the traumatic events and the reaction of fear. These connections are relatively durable to obliteration. Moreover, the prefrontal cortex, which is supposed to moderate and monitor the action of the amygdala, is inactive due to the extreme stress situation (Diamond et al, 2007).

Hebb's rule: according to Hebb's rule, if a synapse becomes repeatedly active at about the same time when a post-synaptic neuron shoots, changes will occur in the structure or the chemistry of the synapse, which will strengthen it. In other words, this rule

explains how neurons are changed by experience in such a way causing behavioral changes (Carlson, 1998).

There follows a reference to the two main types of learning, classical learning and instrumental learning, since they provide a possible explanation to the manner in which Visual Swish operates.

(1) Classical learning applies to automatic behaviors. By its means an insignificant stimulus becomes a significant one, after two stimuli has been paired, one of them reflexively arousing emotion and the other neutral; when the stimuli arrive in proximity and the neutral stimulus precedes the unconditioned stimulus, the synapse is strengthened according to Hebb's rule. The strengthened synapses are those connected to a common synapse to the neurons shooting at the time.

(2) In instrumental learning, a connection between stimulus and reaction is created in a learned manner rather than automatically. This occurs with the help of reinforcement and punishment. In this form of learning, the organism learns to change its behavior according to its consequences. There exist a connection in the brain between the cognitive area and the motoric area. A reinforcing stimuli (desirable consequence) increases the reaction, while a punishing stimuli (undesirable consequences) decreases the reaction.

(3) This reinforcement causes changes in the nervous system, so that a certain stimulus will produce a certain reaction. A reinforcing stimuli (desirable consequence) increases the reaction, while a punishing stimuli (undesirable consequences) decreases the reaction. In other words, when something good happens, reinforcement mechanisms are activated in the brain and powerful changes occur. The rule of reinforcement applies between stimulus and reaction – if a stimulus is good and effective, in other words producing a positive

reaction, we study it, and as a result the connection between stimulus and reaction is reinforced.

Hebb's rule states that if a synapse is activated repeatedly while the post-synaptic neuron shoots, its structure and chemical composition are modified so that it becomes stronger. This is actually the physiological basis for explaining classical conditioning. Hebb's rule depends upon two conditions:

(1) Proximity of stimuli – the time span between the neutral stimulus and the unconditioned stimulus is short. It is also important that the neutral (conditioned) stimulus arrives before the unconditioned stimulus.

(2) A common synapse to both stimuli – in order to create the connection it is necessary to have an existing common synapse.

According to Hebb's rule, a synapse which is operated while the post-synaptic neuron is also active becomes stronger. Electrical stimulation of neural cycles in the hippocampus configuration may lead to long-term synaptic changes taking part in the learning process. It has been found that strong electrical stimulation of the exons going from the antorine cortex to the toothed ridge increases the power of the post-synaptic potentials, causing them to react also to future stimuli in a larger volume than usual. This increase is called long-range enhancement. Many experiments have proved that long-range enhancement existing in the sections of the hippocampus is conducted according to Hebb's rule. In other words, if a weak synapse and a strong synapse connecting at the same neuron are stimulated approximately at the same time, the weaker synapse will strengthen. This phenomenon is called associative long-range enhancement (Carlson, 1998).

1.2.5 Emotion, Memory and Learning

Usually one may predict that enhanced memory of a significant event will biologically ignite a similar emotion when a similar event will take place. From a human behavioral viewpoint, the importance of this type of memory is related to the ability to provide a potential connection between a psychological mechanism and psychopathological conditions, such as phobias or PTSD. fMRI researches point out the importance and the involvement if the amygdala in the process of learning and emotional response. The amygdala has been found to be closely connected with the concept of classical conditioning (Dolan, 2002). Classical conditioning describes a situation in which a stimulus connected with specific physiological reactions, such as frightening stimulus, is systematically connected with a neutral stimulus, so that the neutral stimulus becomes a frightening stimulus. Researches about people with a damaged amygdala have found that those people cannot learn to fear stimuli by classical conditioning, but they can logically explain the connection between the conditioned stimulus and the unconditioned stimulus. Other researchers have found, that when the hippocampus is damaged and the amygdala is intact, the opposite phenomenon occurs, in other words, those people may be taught to fear stimuli by classical conditioning, but they are unaware of this and can't explain it. Thus the amygdala is connected to learning of fear, but it doesn't deal exclusively with fear. Other researchers have found that the amygdala is also connected to other associative learning, connected to learning of rewards and punishments. It may be claimed that the amygdala knows which stimuli we should avoid and which stimuli we should approach. It may also be claimed that it knows it even before the person knows (Dolan, 2002).

A further angle in the context of learned emotional response arises out of researches pointing out that, the more frightening the observed stimulus is, the shorter is the time of emotional and physiological reaction. (Ohman, Flykt & Esteves, 2011).

In addition, researches in the field of neuropsychology (Levit, Ben-Nun 2012) support the claim that the brain may be "trained" in order to change thoughts and emotions. One of the quoted researches was conducted by Richard Davidson with the participation of Buddhist meditators and participants with no experience of meditation. fMRI finding have shown that mental exercising of positive thoughts changes emotions in a positive direction. This is manifested in brain activity characterized by changes in areas such as the prefrontal left cortex (connected to happiness) and the prefrontal right cortex (attributed to negative emotions).

1.2.6 Brain – Reality and Imagination

Balugami's article (2008), on the uniqueness of Ericksonian psychotherapy, exhibits the connection of the impact of imagination on the brain. Balugami quotes the research of Rizzolatti et al (1996). The researchers have found three groups of neurons connected to functional cycles in the motoric cortex:

(1) Action-location neurons, responsible for performing specific actions in the personal space.
(2) Cannonical (computational) neurons which are operated when an action related to an object is done and also when the object is perceived.
(3) Neurons in the pre-motoric cortex and the rear crown areas, which act when the mouth, hand and foot operate, but also when one perceives somebody else making the same action. The neurons of this third group are called mirror neurons, because their action is a type of inner representation of an exterior action taking place.

Thus when we see a person making some action, neurons are operated which simulate this action at the same sensory-motoric locations in the brain, as though we were

making this action ourselves. Out of this whole group of neurons, a certain percentage reacts to auditory, visual or sensory stimuli. Iacobini et al (2005), have found out a further ability of these neurons, which is to continue to act even after the end of the action is hidden from the participant. A certain percentage of these neurons continue to act till the end of the action, even when the end of the action is not perceived. The brain completes the action, according to its expectations regarding the aim of the action. Fogassi et al (2005), further add that if we perceive or hear another's action and also conclude the aim of the action, which is the last stage of the action, this ability creates a simulative representation of the same action in the same areas of performing the actual action. One may say that the person steps into someone else's shoes and prepares his motoric cortex to an exact imitative action. Mental simulation, or imagination, also creates the same neuronal reactions. The same vertex and pre-motoric areas are operated when actions are imagined and also when actions are perceived. The contents of visual and motoric imagination undergoes the same processes as perception, as though the imagined content were real. Decety et al (1989), examined imagination of a cube's rotation, and found out that the time needed by the participants was is significant correlation to the cube's dimensions and the angle of the rotation, as though the cube's rotation was real. Imagination of motion brings about considerable action in all brain areas, while action itself is prevented by action below the threshold of neural shooting or by cortico-spinal inhibitors. Thus, imagination actually gives us the possibility to represent actions and emotions, and to identify goals and expectations. Therefore imagination is the basic mechanism which unifies preforming actions, identifying actions, empathy and mental images. (Balugami, 2008).

Brain researches from the last two decades report similar findings. Visual simulation and stimulation of a concrete image are located in the same brain areas. The

first researches to test this hypothesis were performed were BOLD (blood oxygen level depended), but they could point out the location of brain activity without observing that simulation and perception do arouse the same representations (O'Craven & Kanwisher, 2000). Researches performed by fMRI (Cichy et al, 2011) point out a similar cortical action in the context of visual simulation and a concrete image.

1.2.7 Additional therapies which include procedures focused on modifying emotions which arise as reaction to harsh images

The therapeutic space includes several therapies designed as a focused answer to harsh images which arouse harsh emotional response. In the context of this research we shall mention two therapies: EMDR (Eye Movement Desensitization and Reprocessing) and Hypnotherapy. These two therapies have three things in common:

(1) Both have overlapping lines with Visual Swish (use of modalities to modify emotion).
(2) Both are well-known therapies which have been researched and found to be beneficial.
(3) Despite research-proven efficacy, an unequivocal explanation for this efficacy has not yet been found.

EMDR – This system was developed in the late 1980's by American psychologist Dr. Francine Shapiro, aiming to bring about fast procession of traumatic memories in a manner causing a stable cognitive and emotional change and considerable relief of behavioral-physiological symptoms. EMDR uses the various components of experience, including sensory elements (visual, kinesthetic and auditory) while the patient focuses mentally on the traumatic event, combining cognitive (negative beliefs), emotional and physiological elements. A position paper published in 2002 by the

National Council of Mental Health (Bleich et al, 2002) recommended using EMDR as one out of three methods of treatments which are effective in trauma and anxiety situations. As for today, dozens of researches, meta-analyses and case descriptions, examining the efficacy of the system have been published. Most researches point out positive durable therapeutic results (Bisson & Andrew, 2009).

Typical criticism leveled at EMDR is that an unequivocal explanation for its efficacy is still lacking. Specifically, there is no explanation or proof for the unique influence of the two-lobe brain stimulus, which constitute a major element of the system. Here are three possible theoretical explanations or routes, which have been mentioned over the years (Oren, 2000):

(1) An explanation relating to the REM stage of sleep, which also involves information processing during eye movement.

(2) An explanation relating to the connection between the right and left hemispheres in the brain. As a result of researches comparing brain function before and after EMDR treatment, the possibility was mentioned that traumatic memories are "engraved" in the right lobe while being "ignored" by the left hemisphere. The assumption is that EMDR treatment facilitates opening communication channels between the two hemispheres, thus enabling procession of traumatic memories.

(3) An explanation relating to the phenomenon of dual attention, when the patient is focused on the traumatic memory for only short periods of time, while being in a reality of safe and supportive treatment.

So in fact he goes back and forth from focus and attention on the harsh past experiences to focus on the current supportive presence of the therapist. Shapiro assumes that dual

attention is composed of two components: a feeling of control and mindfulness. During treatment the patient goes in and out of the traumatic experience many times, while receiving support and encouragement from the therapist to continue the process. This seems to enable a feeling of control rather than avoidance and fear toward the traumatic experiences. In addition, a special emotional-cognitive mindfulness is created, looking at the negative experience (similar to meditation). Such mindfulness is not carried away emotionally, but at the same time it is not detached and estranged (Oren, 2000).

Hypnotherapy – According to the American Psychological Association (APA, 2013), hypnosis is defined as a process involving cognitive procedures such as imagination, where the person is guided by the therapist to react to suggestions to modify sensations, conceptions, thoughts emotions and behaviors. The process of hypnosis has been found to be effective for treating and reducing symptoms of a wide variety of problems and disorders, including post-traumatic disorder (Auringer, 2011). The use of hypnosis include working with modalities. During hypnosis, the patient is attentive to the aspects of the environment suggested by the therapist. He can experience sights, sounds, sensation, smells and tastes according to the therapist's suggestions, even when these are in contradiction with real stimuli (Dilts & Delozier, 2000). For example, one of the common ways to put a person into a hypnotic state is Betty Erickson's technique, combining sensory stimuli (visual, auditory and kinesthetic) in such a manner which starts with real stimuli and continues into imagined stimuli (see www.ericksonian.info/BETTY.html). When hypnosis is used to treat PTSD, sensory components are combined in order to modify the content of the traumatic experience, making it more healthy. One of the methods for modifying this content uses the visual sub-modality of disassociation by imagining two parallel television screens. The patient imagines the content of the traumatic event in one of them, while being asked to create

a content which enables him to cope with the event in the other screen. (Abramovitz & Bonne, 2013).

Even today there is no scientific agreement about the manner in which hypnosis operates, so hypnotherapy is criticized for lack of an explanation to its effectiveness. Here are several possible explanations for the phenomenon of hypnosis (Kaplan, 2013):

(1) Erickson & Rossi (1979), representing the naturalist approach, claim that hypnosis is a natural daily state.

(2) Alexander (1968), explains, using the learning theories, that a hypnotic suggestion is a conditioned stimulus similar to a parental authoritative direction, and the patient's reaction to hypnosis is a conditioned reaction.

(3) Weitzenhoffer (1989), uses the theory of playing roles to explain that the efficacy of hypnosis is caused by the motivation and imagination of the patient who is aiming for a specific goal. This enables the hypnotized patient to enter a passive state. The patient predicts that he has to obey, otherwise he will be considered an antagonist. In researches were the participants had to play "as though they were hypnotized", experts couldn't recognized who was really hypnotized and who was playing the role. However, the naturalistic approach claims that when a person plays "as though he is hypnotized", he is really hypnotized.

(4) Watzlawick (1978), claims that hypnosis is a result of hemispheric asymmetry. The left hemisphere is rational, while the right hemisphere ,the creative and intuitive one, is the one listening to suggestions (Kaplan, 2013).

1.3 NLP tools and skills comprising the foundation of the work of treatment

NLP techniques, such as Visual Swish, are based (among others) on eight NLP basic concepts: NLP presuppositions, Rapport, Calibration, Anchoring, Association and Disassociation, Reframing, work with "parts" and sub-modalities. The descriptions of these concepts follow:

NLP Presuppositions: NLP is based on a collection of presuppositions, constituting an epistemology (Vaknin, 2010). These are beliefs about the universe which create the foundation on which NLP concepts, models and methods are built. This foundation itself is considered a presupposition. It is not possible to prove that these presuppositions are correct, but when accepting them, working with them and assimilating them, they are manifested in our daily experiences in a positive and constructive manner. There are more than 30 presuppositions in NLP, while this review lists only eight of them, which are especially relevant for work with patients. The presuppositions do not appear at the Visual Swish protocol attached to this thesis, but they constitute a basis which is required in order to understand the protocol and act accordingly.

The first assumption is about "mental maps". According to the NLP approach, people create for themselves inner mental maps, which represent the exterior reality. As mentioned above, these maps comprise of sights, sounds, sensations, smells and tastes. In addition, each person is characterized by his own unique maps, some conscious, some unconscious. There is not one single map which is "correct" or "real". Apparently there is a gap between the exterior reality and its inner representation in the mental map, while the person acts and reacts according to his mental map rather than directly relating to the exterior reality. The second presupposition claims that any person whatsoever has the resources which he requires in order to achieve his goals. The third presupposition reframes the concept of "failure", viewing it as an opportunity for growth. The fourth presupposition claims that inter-subjective communication gets its significance from the manner in which it is accepted by the other party, and that people communicate incessantly both verbally and underbelly. The fifth presupposition emphasizes that each behavior has positive intent for the person, and that the person has no inner enemies. The sixth presupposition says that at a certain context, any behavior may be effective and useful, while the seventh and eighth presuppositions explain that we always make the best possible choice for us at any given moment, and that there are at least three possible choices in any situation (McDonald, 2001).

Rapport **–** according to NLP, rapport is defined as "establishing trust, harmony and cooperation in a relationship". One may create and establish rapport by making direct and personal contact with the patient, as well as by matching as close as possible his body language, style, speech, content and recognizing his world of beliefs and values, etc. One may not exaggerate the emphasis on the importance of rapport in NLP, as this is the basis enabling the therapist to understand the patient's mental map and adjust himself to the patient's aims, thereby helping him to make a change. In addition, rapport

has a unique importance in the treatment of trauma, due to the need to establish the present as a safe place. (andreas 1989, Bandler & Grinder 1979, Dillts & Delozier 2000).

Calibration: The ability to "read" a person and associate his specific behaviors and exterior signals with inner processes or specific mental states. The skill of calibration is manifested by attending to different reactions in order to compare different emotional states of the same person. The signals and behaviors may be tone of the face muscles, skin color (redness, pallor), type of breath etc. Using this skill successfully helps the therapist in establishing rapport, as well as leading the patient between different states of association and disassociation (which will be explained further on) (Vaknin, 2010, Dilts & Delozier 2000).

Anchoring: this is a natural phenomenon which occurs randomly, when any stimulus (visual, auditory, kinesthetic, smell or taste) is associated with an emotional, mental or behavioral reaction. In NLP terms, anchoring is making an intentional connection between a specific signal and a specific emotional state, so that the emotional state may be reconstructed in an easy and simple manner (Dilts & Delozier 2000). Regarding the visual swish protocol, the anchor is established using delicate touch in the patient's arm, and it is timed to match the disclosure of signals of association/disassociation which may include body pose, breath, facial expression, tone of voice etc. The anchor constitutes a safe base to the work with the patient. It simultaneously creates association with a positive powerful state and disassociation from the problematic state (this will be explained further on).

Association and Dissociation: **Association** occurs when a person experiences reality or a memory as from inside his body, looking through his own eyes, hearing through

his own ears, feeling his own sensations and his own emotions. Association means being in an experience represented in all modalities or recalling such an experience in present time. **Disassociation** occurs when a person looks at himself as though from the outside, seeing himself as a "movie character" representing memory. Accordingly, in a state of disassociation, the person is also detached from the emotions accompanying this experience. An important emphasis is that in NLP terminology, the concept of disassociation means a cognitive reflective state, in contrast with psychiatric terminology, where this concept represents a tendency or a pathological disorder. The skill of transition between these states enables: (1) Association to pleasant memories and experience which are a strengthening resource; (2) Disassociation from harsh experiences and unpleasant memories which may be a stumbling block preventing the achievement of desired results in life. There are physiological signals for association and disassociation. One may observe that when a person is in a state of association, his body pose and movements are more alert and dynamic, while in a state of disassociation, his pose and movements are passive or in total rest (Dilts & Delozier, 2000).

Change of State: In order to help the patient move rapidly from one emotional state to the other, one has to use neutral questions, taking him back to the here and now, for example: "Tell me your phone number at the reverse order, from the end to the beginning". Such a question directs the patient to the area of processing visual information and moves him out rapidly from the emotional area. In the above context, change of state is used after the patient enters the emotional state related to the traumatic experience, in order to stop it, with a secondary benefit of enhanced feeling of control (Andreas & Andreas 1987; Bandler 1985; Bandler & Grinder 1979).

Reframing: People give interpretations to events. These interpretations affect reactions (behavior, emotions and thoughts). Thus a change in interpretation enables changing the whole cycle of experience. Reframing is placing the image in another frame, in other words giving a different interpretation to the same situation (usually a more positive interpretation) (Dilts & Delozier 2000).

Work with "parts": This idea draws inspiration from the works of Virginia Satir and Fritz Perls. The concept of "parts" is a metaphoric way to represent the idea that systems of beliefs, ideas and abilities team up to form the individual's "awareness stream". Those systems are composed of subsystems which may act more or less independently. Usually the individual is becoming aware to its parts in a state of conflict (Dilts & Delozier 2000). Conversation with various parts of the individual is aimed at understanding the positive intent of that part for the individual, in order to preserve the positive intent by new and more beneficial manners of action.

Sub-Modalities: each of the five modalities has characteristics which are called Sub-Modalities. For example the sub-modalities of vision are brightness, color / white-black, clarity, distance etc. The sub-modalities of auditory are volume, speed, rhythm, mono/stereo etc., and so on for the rest of the modalities. The arrangement of sub-modalities determines the way in which things are registered in memory and the personal interpretation to reality. Modification of sub-modalities changes emotion, thoughts and beliefs accompanying memory (Andreas & Andreas 1989; Vaknin, 2010) (An expanded review of this subject was presented in chapter 1.4).

The above skills comprise the foundation to the work of the NLP therapist, in general and particularly in the context of work in the field of harsh memories including Visual Swish. Establishment of rapport lays the basis for secure work of change, mainly

in situations where the experience has a dramatic context. The presuppositions guide the therapist in his approach to the therapy and the patient, and the skill of calibration enables the therapist to "know" where the patient is at any moment during the process. Change of state and anchoring are skills required for successfully operating several NLP procedures, including Visual Swish. Reframing, and also work with "parts", are verbal tools in the hands of the therapist to help the patient redefine issues which may become a stumbling block in achieving the aim. Sub-modalities and the states of association and disassociation are part of the manner in which the traumatic memory is coded, and the procedures which appear in the protocol are based on work to identify and modify this coding, in order to enable the patient to recall the traumatic events without the accompanying harsh emotions.

1.4 The Visual Swish Procedure and Reduction of Harsh Emotions

Whenever we independently recall, or are asked to recall past events, each such recall involves a mixture of the various modalities. It appears in the form of an image, a (visual) movie, sounds, sensations, smells and tastes. Each such recall may bring about various emotions regarding the event which is being recalled: a neutral emotion, a positive emotion or a harsh emotion (of course, on a continuum of volume). The volume and directions of emotions depend on several components: (1) The content of the event – bad/ good/ neutral; (2) The amount or manner of mental processing which has been done regarding the content of the events influences the dosage of the components of the various modalities which appear in the recall (for example: more visual, less auditory). The recall may emerge on purpose, but sometimes it erupts into the awareness unintentionally, without consciously inviting it. In both cases, the recall brings about emotions according to the emerging content.

The Swish pattern (Bandler 1985; Dilts & Delozier, 2000) is a popular NLP technique, originally designed in order to help people cope with reactions specifically connected to mental images, compulsive or obsessive reactions, such as an

uncontrollable desire for cigarettes, food or candies, for example. Those desires are usually connected with a specific image of the object toward which they are directed. These are types of recurring images. It does not matter how much the person is trying to "take them out" of his awareness. (see Appendix 2 – the Original Visual Swish Procedure).

The first stage of the process is identification of the compulsive idea and its accompanying image.

The second stage is the creation of a mental image, which shall replace the problematic image. It provides a positive intent to the problematic image, but leads to a different effect. Clearly, any alternative image, despite its desirability, shall still not have such a strong "attraction" as the problematic image (the "residue" of the problematic image shall be "deeper" than that of the new desirable image). At this stage, the problematic image shall still be dominant, and stronger than the new desirable image.

The third stage of the process is investigating the characteristics of the sub-modalities and the manner in which they influence the volume of reaction. This is done by modifying the image's characteristics, such as color, brightness, focus, motion, depth, clarity etc., and examining how such modifications influence emotion. The goal is to find those characteristics of the sub-modalities which decrease the volume of reaction to the problematic image and increase the volume of the feelings connected with the new image (in other words, identification of sub-modalities enabling the "residue" of the problematic image become more "shallow" and the "residue" of the positive image become "deeper").

The origin of the Swish procedure and the reason to its name stem from the manner in which the new image replaces the problematic image. The problematic image should become unstable and be replaced in such a manner that the patient feels he is "moving away" from the problematic image and "going toward" the new "factor of attraction".

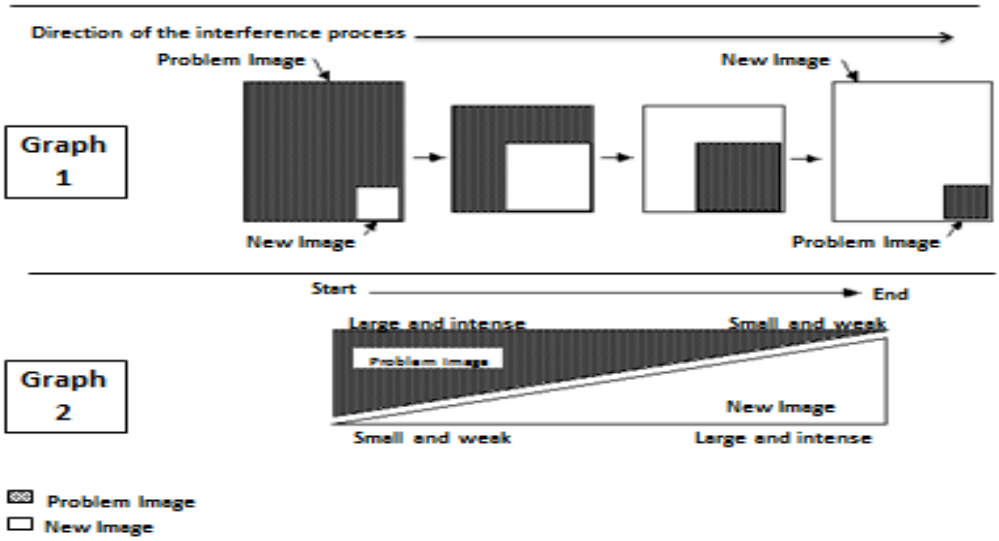
The essence of the Swish procedure was first established in a seminar delivered by Richard Bandler and Robert Dilts in 1981. They arranged a demonstration with a woman who wanted to stop smoking. When they tried to understand what brought about the urge to smoke, they found out that this urge was always accompanied with an image of a big cigarette which appeared before her eyes. When she was asked to modify the sub-modalities of the cigarette by moving it away, thus diminishing it, the woman felt that the urge to smoke decreased instantly. However, a short time afterwards the image returned, as well as the urge to smoke. When Bandler asked the woman to move the image, diminish it and keep it that way, the woman claimed that the cigarette doesn't want to stay that way… it wants to come back. Even though it may sound strange to describe a mental image of a cigarette as though it has its own desire, the woman after all described her own subjective experience precisely. Dilts and Bandler assumed that in order to keep the problematic image small and distant, it shall have to be replaced with something else. They guided the woman to create a mental image of herself when she is acting and behaving the way which she wanted to behave instead of smoking, and imagine that instead of the image of the cigarette – seeing it big and nearby. However, replacing the old image with the new one created a conflict between the two images (such a conflict is always "won" by the former problematic image). In order to make the replacement successful, one has to use the NLP principle of pacing and leading.

At the beginning of Swish research an alternative image was used, where the person sees himself indulging in a more successful behavior, which should replace the problematic behavior. Later it was understood that it was important not to be specific in replacing an old behavior with a new one, but rather create a self-image with desirable abilities.

In a typical Swish procedure, the problematic image is big and near at the beginning, so that the effect of association is strong and direct. The new image is placed on the problematic image (activating image) as small and distant, for example in the lower right or left corner. The Swish procedure continues by the negative image being diminished and becoming more distant, while the new positive image becomes bigger and nearer. Actually, when the problematic image becomes gradually smaller and more distant, its emotional intensity is being diminished, due to the modification of those sub-modalities. As the small image becomes gradually bigger, sub-modalities characteristics of the big negative image start joining it, in order to deepen and enhance it. This is continued to be done until the desirable image fills the visual space and the undesirable image moves away to the point of disappearance.

Illustration 1: the Visual Swish Procedure[4]

[4] Based on illustration from Dilts, R., & Delozier, J. (2000). *The Encyclopedia of Systemic Neuro-Linguistic Programming and NLP New Coding*. NLP University Press.



When the replacement is done one should stop, "clean" the visual space and then start it again from the stage of images placement. This is done in order that the replacement shall always be toward the new desirable image. The replacement is repeated several times, one after the other, at a gradually increasing pace. Between replacements, one always returns to a situation when the patient is asked to see a "white screen", in order to start the new replacement with the "undesirable" image. The repetitiveness and the speed of replacement reflect the theory of learning and classical conditioning. As has been mentioned, the trigger of stimulant is the activating image (the image accompanied with an unpleasant emotion). By using repetitiveness and speed of replacement, learning is accomplished, including a new connection of stimulant and reaction. Originally, the activating image automatically raised an unpleasant emotion. Due to the process, conditioning has been created between the negative image and the desirable image and its resulting positive emotion. Thus an automatic unpleasant emotional response has been replaced with automatic resourceful reaction.

Throughout the years, several version of the original Swish procedure have been developed. This research is based on the version of Dr. Robert McDonald (McDonald, 2001), developer of the Destination Method (see Appendix 1).

1.4.1. Visual Swish Technique and PTSD

As mentioned above, the Visual Swish procedure works on decreasing negative emotional responses and behaviors. The significance of its use may exceed the originally defined limits for its application, regarding the possibility of its integration as a tool for treating PTSD. The so-called Swishes are modalities-based procedures working in the framework of the re-experiencing cluster, which includes the recurring experience and the well-known symptoms of PTSD: nightmares, horror dreams, emerging thoughts and flashbacks (APA, 2000). These processes has been designed so that the patient uploads one of the triggers, creating the harsh feeling and connected to the re-experiencing symptoms. This visual trigger may be manifested as an image (for example: the sight of the road intersection where the accident has taken place, or the sight of a burning tank). An auditory trigger may be manifested as a sound (for example: an alarm, a whistle, an explosion). Kinesthetic, smell and taste triggers may be similarly represented. When the unpleasant/harsh representation emerges, the therapist applies one of the procedures, according to the modality being displayed. The procedure includes a rapid replacement of the image/sound/feeling/taste/smell invoking a harsh emotion by an image/sound/feeling/taste/smell having a positive connotation (Specifically, when we talk about a visual stimulant, the new image shall include an intensified representation of the patient himself, after being released from the problematic reaction to the harsh image). This replacement takes place several times at a high speed, in order to create a renewed conditioning.

Each Swish operates according to the following principles: (1) Rapid replacements. (2) Repetitiveness. (3) Using the emotional recall (in each modality) together with the enhanced positive representation of the patient. Thus "Hebb's rule" is

activated, in other words, when a collection of neurons in the brain, representing any content, is being "shot" or operated once, it increases the chance for this collection of neurons to be operated together in the future, when one of its component neurons is activated alone. As this collection of neurons is operated together repetitively, its chance of being activated together in the future increases. This rule actually enables our brain to learn and remember. When we ask the patient to recall the emotional event, simultaneously accompanied by a different recall, which is actually a representation of a different collection of neurons, we increase the chance that in the future, when the group of neurons representing the harsh emotional experience is activated, the collection of neurons representing the enhancing anchor experience is also activated. This simultaneous activation modifies the emotional experience, as operated in the brain previously (Cooper, 2005). The outcome of the Swish Procedure is directed at the fact, that the problematic trigger shall continue to erupt into the patient's life, but now this trigger shall be immediately accompanied by the new positive representation, followed by a positive feeling of enhancement (rather than the initial negative feeling).

Thus, according to the theories of learning and emotion, the Swish procedure actually involves a king of complex operant conditioning. The person going through the Swish procedure enhances his mental behavior and the order in which the mental images appear in his mind. The first stimulant is a mental image, arising and causing an evaluative-emotional response. This is actually the dramatic/traumatic image, or the problematic image, repetitively creating negative emotion.

Next the person creates, in a proactive and involved manner, a new mental image, in the context of the problematic image. However, it is connected with a positive emotion. This positive emotion is a combination of positive and negative enhancement. The positive enhancement stems from the pleasant emotion and the calmness resulting

from the new mental image, while the negative enhancement stems from the removal of the negative emotion arising out of the problematic image. The stage of image creation involves some questions, examining what exactly should be in the new image, so that the negative emotion disappears and the positive emotion in that context is created.

After creating the new image, and verifying that it does make the negative emotion disappear and create a positive emotion, the person starts a rapid repetitive action of attaching the images in time. He recalls the problematic image and replaces it quickly with the new image. This rapid repetitiveness of the images attachment enhances the images more fully and increases the chance that an operant conditioning does take place. Thus the person has changed the order of the mental images and the act of emotional evaluation. Each time the problematic image "jumps" to the brain, it is quickly replaced by the new image and given a positive evaluation.

So far we have reviewed concepts, theories and tools being used at the present research, including a presentation of NLP as a cognitive-behavioral therapeutic approach, characterized by identification and work by modalities and sub-modalities. In addition, we have reviewed some literature from the field of Bio-Feedback and emotions in order to illustrate the rationale for the use of the measurement tools being used in this research. Nevertheless, the findings of researches are not unequivocal regarding the ability of the device to figure out the classification of emotions arising as a result of visual recall/ stimulation. In this review of the theories concerning emotions, emotions have been presented as having subjective interpretations and ranging on a bi-polar scale including a continuum of emotional volume. Later, some learning theories were reviewed, offering possible explanations for the manner in which Visual Swish works. Moreover, since the therapeutic work of modification takes place at the

mental/imaginary space of the patient, theories concerning the connection between brain components, reality and imagination, were also reviewed. It follows from the research literature, that the brain may be trained by mental exercise (in this case – by NLP's Visual Swish technique), in order to change negative emotional responses into positive emotional responses. Later, this theoretical review focused on the details of NLP's tools and skills, providing a conceptual base for understanding how NLP processes work. Finally, this review focused on the Visual Swish technique while describing the developmental history of the procedure, giving a focused explanation on the manner in which it is operated, and connecting the researched technique with the field of PTSD, based on the theories of learning and emotion.

Chapter 2

Rationale and Research Hypotheses

The Visual Swish technique is described in NLP literature encompassing almost a quarter of a century (Andreas & Andreas, 1989; Bandler, 1985; Dilts & Delozier, 2000), but is documented by a very small number of case descriptions. Thus Juhnke et al (2008), describe the application of this procedure in working with couples and with people who survived a suicide or a suicide attempt of a child. The researchers describe the procedure as a technique designed to promote a rapid change, based on modalities, refocusing the negative thoughts (Andreas, 1986). The patient "gets rid of", or quickly replaces, unwanted visualizations and images, while being focused on positive, desirable visualizations. In one of the examples from this article, negative visualizations are described as memories of the child's suicide, while desirable visualizations are memories of common pleasant moments with the child, before the suicide. In another case description, Masters et al (1991), applied the procedure in order to decrease blood pressure. In yet another case, Beaver (1989), described the use of the procedure by an educational psychologist working with children. Thus there exists a significant dissonance between the widespread clinical use of the method and the lack of empirical evidence and controlled researches, establishing its efficacy.

However, there exist numerous recommendations for the use of NLP, even among professionals in the fields of psychiatry and psychology, for example:

1) Karunaratne (2010), describes the NLP techniques connected with curing phobias. In her article she details the phobia processes and Visual Swish, confirming the validity of NLP procedures by using examples from the

empirical research by Einspruch & Furman (1988), which showed that NLP was a promising method of therapy;

2) In his article dealing with the principles and application of short-term therapies, Battino (2007), discusses effective and rapid therapies, mentioning NLP and the Swish technique as an effective method. He further claims that the NLP therapist must be trained and experienced so that the procedure operates rapidly;
3) Turner (2011), has edited a book of therapies for social workers published by Oxford University. The book describes methods of social work, and its aim is to give teachers, students and social workers a detailed review of effective methods worldwide. The book dedicates a whole chapter to work with NLP, recommending the use of such processes as Visual Swish.

All those recommendations are based on the professionals' experience and work. However, the testimonies concerning the efficacy of the method and the recommendations for its use appearing in the literature are not supported by empirical evidence collected in controlled researches. Thus the paucity of research is compensated in academic literature by multiple descriptions concerning the method's efficacy. The research performed in the framework of this thesis was designed to provide an answer to the dissonance between the lack of controlled researches and the reports concerning the method's efficacy.

The goal of the research is to examine the effectiveness of Visual Swish technique over the negative emotional response and the level of arousal of the investigated persons, following exposure to harsh mental images. This was examined by an experimental study arrangement, comparing a group of participants which were exposed to the procedure with a control group which at first didn’t go through

intervention by the procedure. During the second stage, the control group participants also went through intervention by the procedure, and each participant's reaction was compared.

2.1 Research Hypotheses

1) The negative emotional response to the harsh mental image shall significantly decrease following the exposure to NLP's Visual Swish procedure.
2) The amount of decrease of emotional response among the group exposed to Visual Swish shall be greater than among the control group.
3) The level of emotional arousal in reaction to the harsh mental image shall significantly decrease following exposure to NLP's Visual Swish procedure.
4) The amount of decrease of arousal level among the group exposed to Visual Swish shall be greater than among the control group.

Chapter 3 - Methods

Research Design

This research is an experimental study, with the aim of comparatively examining the effectiveness of the Visual Swish technique. The comparison was done between the intervention group (before/after the process was used) and the control group, which at first did not have any intervention, and their level of arousal were measured at the same periods of time as the intervention group. During the second stage, the participants of the control groups were going through the Visual Swish process as well, and their emotional level of arousal was measured after the late intervention. The decision to administer the Visual Swish procedure to the participants of the control group as well was due to ethical considerations. Since the participants of the control group were also asked to recall an image arousing harsh emotions, it was inappropriate to leave them with a harsh feeling at the end of the session. Consequently, a comparison was possible not only between the participants of the intervention group and the control group, but also within the control group itself. About two months after the end of the intervention, a follow-up survey was done telephonically, in order to examine the stability of the emotional response to the activating image.

3.1 Sample of the research

The research included participants between the ages of 20 and 60. The sample size was set at 52 participants, since the research was a pilot for a broader future research, and due to the ability to assume normal distribution and use parametric tests. The participants were located by several methods:

(1) Facebook ads inviting people to take part in the experiment;

(2) An electronic message sent to a mailing list.

(3) Inviting NLP students (from the NLPPLUS center) who have not yet been exposed to the Visual Swish procedure, to take part in the experiment.

(4) "A friend brings a friend".

Participation in the research - criteria for acceptance

The criteria were set according to a phone interview done by the research coordinator, who has been trained as a NLP Master practitioner, subject to the responses of the potential participants:

(1) Lack of a diagnosis of mental disorder, and lack of a tendency for extreme behaviors;

(2) Having full control of the Hebrew language, reading and writing;

(3) Having a memory including an unpleasant past event, which is manifested as a mental image arousing unpleasant or harsh emotions.

Criteria for rejection

(1) Mental retardation;

(2) A history of schizophrenia or other mental diseases;

(3) Starting using medications or changing the dosage of medications within three months prior to the research;

(4) Attempts at suicide or self-injury;

(5) Use of alcohol or drugs.

The period of recruiting volunteers for the experiment was set at three months (March-May 2013). As mentioned above, all participants went through a telephone interview with the research coordinator, and the selected ones, based on the participation criteria, were invited.

At the end of the selection process, the research participants were randomly divided into two groups, with an equal number of males and females in each group (randomization existed separately within the males and the females).

The research variables

Dependent variables

1. Level of emotional response, as manifested in the self-report questionnaire.

2. Level of emotional arousal, as manifested in Bio-Feedback.

Independent Variables

1. Visual Swish procedure intervention, or lack thereof.
2. Gender of participants.
3. Type of the events arising as a mental image.

3.2 Tools – diagnosis and measurements

(1) **Semi-structured telephone interview –** the interview was designed for preliminary selection of the research participants. It included questions on psychiatric background and taking medicines, being based on a structured questionnaire (see Appendix 5). The interview was done by the research assistant. Its aim was to test preliminary suitability for participation in the research. It included basic questions

aimed at understanding the essence of the dramatic event (for example: "When did the event take place?") and performing a preliminary selection.

(2) Socio-demographic interview – Participants which passed successfully the stage of preliminary selection (semi-structured telephone interview), filled another questionnaire, collecting data concerning personal background, such as: economic situation, level of education, gender, age, country of origin, marital status, employment (see Appendix 6).

(3) Self-report questionnaire in order to diagnose the severity of PTSD (PSS-SR-PTSD). This questionnaire enables to examine PTSD and measure its volume. The questionnaire was designed, based on criteria appearing in *DSM- IV-TR* (APA, 2000). It was developed by Foa, Riggs, Dancu & Rothbum (1993). It includes 17 questions, with each item testing the presence and the severity of one of the symptoms of PTSD during the last week. The answers are based on the Leickert scale with 4 degrees ranging from 0 ("never or only once") to 3 ("five times a week or more"). The questions are gathered into three factors, expressing the three main symptom clusters in PTSD:

(1) intrusion/re-experiencing (items 1-5); alpha-Kronbach 0.93 (for example: "During the last week, did you re-experience the event, behaved or felt that it happens to you again?");

(2) Avoidance (items 6-12); alpha-Kronbach 0.85 (for example: "During the last week, did you try to avoid thinking, talking about or feeling things concerning the event?");

(3) Hyper-arousal (items 13-17); alpha-Kronbach 0.90 (for example: "During the last week, were you jumpy or easily terrified?"); Cut mark for the estimation of PTSD >= 14. The questionnaire is deemed valid and reliable (Foa et al, 1993), while also after its

translation to Hebrew (Ginzburg, Dekel, Nerya and Solomon, 2000), the reliability of its components was found to be at the 0.76-0.84 range (Somer et al, 2009) (See Appendix 7).

(4) Self-report questionnaire – this questionnaire measures the level/volume of emotional response of the participant in response to the mental image. According to Kehneman (1999) and Ben-Zeev (2001) (see subchapter 1.2.3 – theoretical review), the participant is asked to evaluate his feeling in three dimensions: (1) Feeling comfortable-anxious (presented at Chapter 4: findings under the abbreviation **feelcomf**); (2) Feeling good-bad (presented at Chapter 4: findings under the abbreviation **feelgood**); (3) Feeling calm-tense (presented at Chapter 4: findings under the abbreviation **feelcalm**). The evaluation is done according to a 10-degree scale. A low mark (1) reflects a positive feeling/emotion, while a high mark (10) reflects a negative feeling/emotion. This 10-degree scale was chosen so as to include high sensitivity for identification of emotions. The three concepts: comfortable, good and calm are very well-known concepts in the Hebrew language, as well as the concepts anxious, bad and tense.

Five experts in psychology and the Hebrew language have verified the meaning of those words (see Appendix 8). The reliability of the questionnaire was tested by alpha-Kronbach's coefficient. A value of 0.923 has been found. This value testifies for a high level of inner consistency between the three dimensions of the questionnaire. An identical questionnaire was presented to both experiment and control groups. While the intervention group answered the questions three times (before the intervention, after it and during follow-up), the control group answered the questions four times (before placebo, after placebo and before intervention, after the intervention and during follow-up) (see Appendix 9).

(5) **Self-report introspective questionnaire** – This questionnaire was used to collect data about subjective experience – one out of five participants in the control group was asked, at the end of the session, to answer open questions by the experimenter concerning the way in which he experienced the intervention process. The first question is directed at describing the change in feeling (if at all) between the first time that the image arose (at the beginning of the session, before the intervention), and the feeling after the intervention when thinking about the image. The second question is concerned with thoughts arising during the process. The third question is directed at the feeling during the process. The fourth question clarifies whether the process was experienced pleasantly or uncomfortably. The fifth question is a general one, for receiving further comments (see Appendix 10).

(6) Telephone interview, about two months after end of intervention – this questionnaire was delivered by the experimenter in order to follow-up the indexes of the emotional response to the mental image. The participants (both experiment and control groups) were asked to think about the image which arose during the research, and describe their feelings about it, using the scales of the Self-report questionnaire (see (4) above). An open question was added, where each participant was asked to think about the period following the session, in the context of the memory and the image which arose, and describe the change (if any) in the reaction to that image. After answering that question, each participant was asked to present examples (see Appendix 11).

(7) **Bio-Feedback device** – In this research, skin conductivity was measured by using the Prorelax program (Mindlife, Israel). This program is based on Windows versions of RelaxPlus (Ultramind Technologies, Israel) which was used in previous researches (Yahave & Cohen, 2008). Monitoring was done by two electrodes on the edges of the

fingers, based on skin conductivity, providing an index for the activity of the perspiration glands, which include electrical-conducive salts. The data is passed through an infra-red sensor, and the device is electrically safe (Shapiro et al, 2007). Skin Conductance Activity or SCA is correlated with the action of the perspiration glands, reacting to the physiological, emotional and mental state of the participant (Yahav & Cohen, 2008). Together with further electrical traits of the skin, this phenomenon is called Electrodermal Activity (EDA) or the historic name Galvanic Skin Response (GSR). The outcome received in the device is displayed on a computer monitor using a graph and numbers. As mentioned above, it testifies on the level of emotional arousal and expressed on the scale between 200 KOhm and about 5 MegaOhms (Ohm units are represented with the symbol Ω). The higher the resultant value, the lower the level of emotional arousal, and vice versa. This enables receiving information about the given level of arousal and about the differences between arousal levels. The device was operated by another experimenter present in the room. All participants were examined using the same device.

3.3 Visual Swish protocol – intervention group

The protocol included an hour-long one-off session with each participant. The session included four parts:

Part I was dedicated to setting the framework of the session, filling a socio-economical questionnaire, the PTSD questionnaire and signing the consent form.

Part II included an explanation about the process (according to a structured format, see Appendix 12), establishment of rapport (contacting the participant and establishing trust), connecting with the Bio-Feedback device and a baseline measurement by recalling a neutral mental image.

Part III included recalling a mental image, arousing harsh emotions, measuring the reaction by the Self-report Questionnaire and the Bio-Feedback device, and applying the Visual Swish procedure.

Part IV included a second recall of the activating image and a second measurement of the reaction to the image, by the Self-report questionnaire as well as the Bio-Feedback device.

In addition, one of each five participants was asked to reply to the introspective questionnaire.

3.4 Protocol – Control Group

The protocol included an hour-long one-off session with each participant. The sessions were slightly different from those of the intervention groups. They included five parts:

Part I was dedicated to setting the framework of the session, filling a socio-economical questionnaire, the PTSD questionnaire and signing the consent form.

Part II included an explanation about the process (according to a structured format, see Appendix 12), establishment of rapport (contacting the participant and establishing trust), connecting with the Bio-Feedback device and a baseline measurement by recalling a neutral mental image.

Part III included recalling a mental image, arousing harsh emotions, measuring the reaction by the Self-report Questionnaire and the Bio-Feedback device. At this stage, the experimenter asked the participant to think about the memory and the recalled image for 10 minutes without any other activity, except thinking about it. This stage of the research is called Placebo, during which the experimenter went out of the room, leaving the participant alone.

Part IV included a second recall of the activating image and a second measurement of the reaction to the image, by the Self-report questionnaire as well as the Bio-Feedback device.

Part V included application of Visual Swish, followed by a third recall of the activating image and a third measurement of the reaction to the image, by the Self-report questionnaire as well as the Bio-Feedback device.

3.5 research procedure

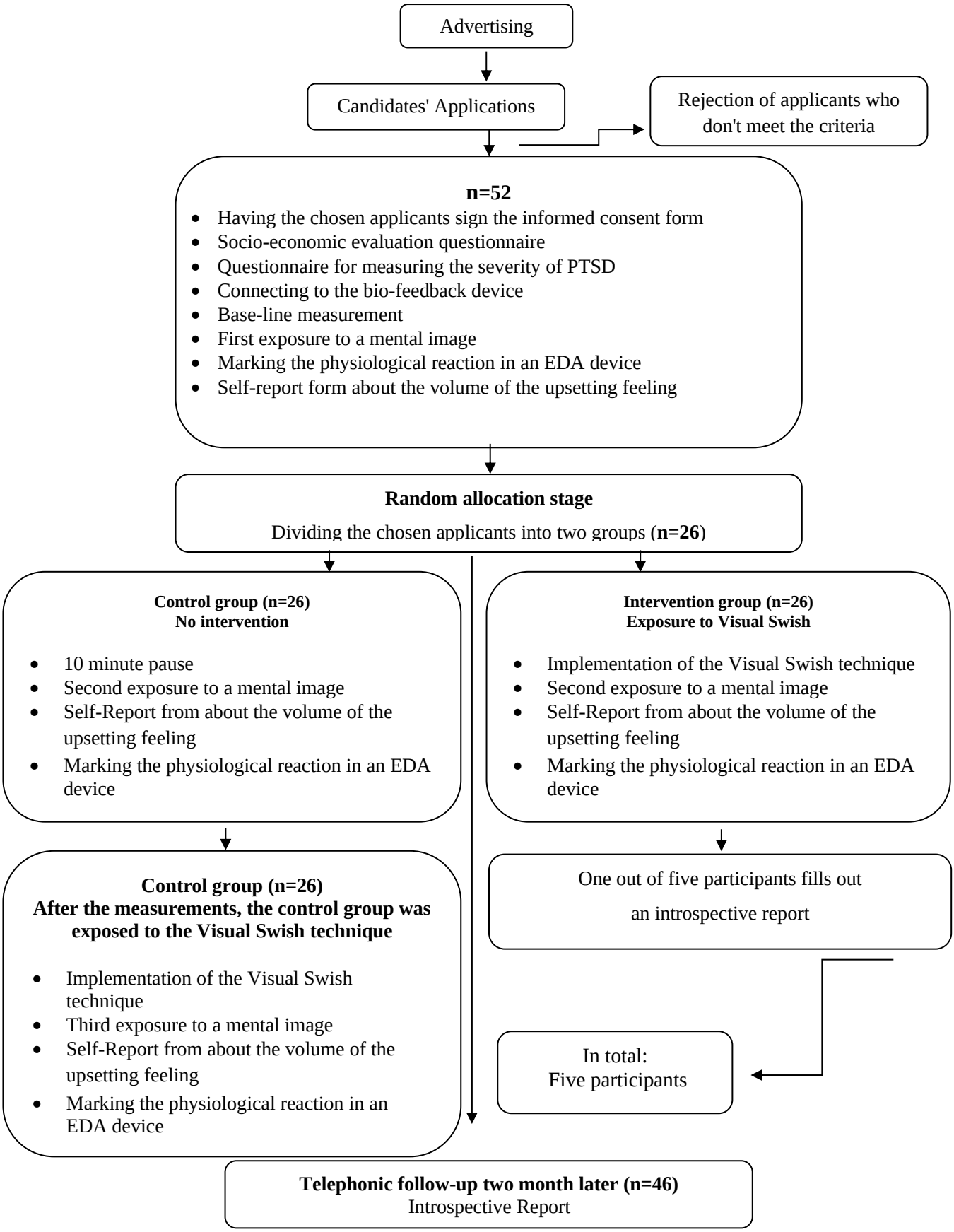


Illustration 2: Flow chart of the research procedure

Candidates who expressed their wish to participate in the research, passed through telephonic selection by the research coordinator. During the telephone interview, each potential participant was informed about the research procedure. The initial information text was uniform (as described in Appendix 4). In case of need, the coordinator answered questions, but answers to questions concerning the essence of the research were a paraphrase of the initial agreed text. Following this stage, the participants which were found suitable, were invited to a one-off session with the experimenter.

The research had a single experimenter, an expert on working with NLP tools having the degree of NLP Master Practitioner. He passed through specific training, which included standardization of the protocol, starting with training on operating the Bio-Feedback device and going through the reception procedure of the participant (see Appendix 12) and also specific training for the Visual Swish procedure. Before the recruitment stage, some simulations were done together with the experimenter. In addition, a short pilot took place, including three participants, following which it became clear that another experimenter was necessary, whose task was looking after the Bio-Feedback device, starting with connecting the participant to the device, and then marking the different stages of the procedure in the device software. This experimenter passed appropriate training for operating the device and its accompanying software, but he was not involved in the Visual Swish process, nor did he converse with the participants. Moreover this experimenter who was looking after the Bio-Feedback device, was located out of the participants' range of sight, so that they saw neither him, nor the computer screen with the resultant data.

When participants were recruited to the present research, they were randomly divided into an intervention group (n=26) and a control group (n=26), while taking care to have an equal number of males and females in each group. Following an excess of

applications by females to participate in the research, 26 females were recruited as an equal number to the males. The chosen females were the first 26 applicants.

The division into an intervention group and a control group was done serially: the first two participants (a male and a female) went through Visual Swish; the third and fourth participants (a male and a female) constituted a control group; the fifth and sixth participants (a male and a female) underwent intervention of the Visual Swish procedure, and so on. As mentioned above, all participants belonging to the control group first went through a 10-minute period of lack of intervention. The effects of placebo were examined, and then they underwent an intervention by implementing the Visual Swish procedure. In addition, one of each five participants (in the intervention group) was asked to fill an introspective report at the end of the session.

This research, as well as the offered methodology, were guided by the **"Golden Standards"** (Rothbaum et al, 2005) which include: trained evaluators, a specific duplicable program/protocol, structured as a book of instructions, sticking to the protocol, an impartial approach to the treatment.

3.6 Statistical Analyses

The information was manually typed into Excel, and processed by the SPSS program (version 21). For the use of parametric testing, the normal distribution of the research variables was tested by Test 1 Kolmogorov-Smirnov, Q-Q charts and visual examining of frequent histograms.

The research hypotheses were examined by the following tests: χ^2-tests for comparison of categorical variables, t-Tests for independent samples and paired samples in order to estimate the differences in values of quantitative variables distributing normally, and a-parametric tests such as Mann Whitney Wilcoxon for samples or variables not distributing normally.

The level of statistical significance was chosen to be 5%.

3.7 Ethical aspects of the research

Since the experiment performed in the framework of this research included intervention in a previously almost untested method, some actions were performed in order to minimize the possibility of injuring the participants, while keeping the required ethical standards. The following steps were taken:

(1) All accepted participants signed the informed consent form (see Appendix 13) as mentioned in the guidelines of the Helsinki committee (2010), according to the procedure of the Ministry of Health;

(2) The participants were informed about all aspects derived from their participation in the research, including risks and issues connected with keeping confidentiality;

(3) The right of each participant to stop his/her participation in the research at any time according to his/her wish was honored. One out of the 52 participants expressed his wish to stop the session, soon after it started, and so it was done: a new participant was included instead of him, so that the total number of participants remained at 52;

(4) All control group participants went through the Visual Swish procedure in order to relieve the unpleasant emotions which arose as a result of the direction to recall an image which included unpleasant memory and emotions;

(5) It was clarified to the participants, that should they express distress at any stage of the research, requiring psychological intervention, they shall be directed to further treatment, outside the framework of the research;

(6) Each participant received, as acknowledgement of his participation in the research, a book – the cost of which was between 30 and 40 NIS.

Chapter 4 - Evidence

4.1 Quantitative Analysis

Comparison between the groups – demographic characteristics

In order to test whether the two groups had similar demographic characteristics, a comparison was made between them concerning each characteristic. The results of this comparison are shown in Table 1.

Table 1 – Participants' data, divided into intervention and control groups

		Experiment		Control		P Value
gender	male	13	50%	13	50%	1.0
	female	13	50%	13	50%	
age	20-29	4	50%	4	50%	0.907
	30-39	7	50%	7	50%	
	40-49	8	44.4%	10	55.6%	
	50-60	7	58.3%	5	41.7%	
Marital status	Single	9	42.9%	12	57.1%	0.463
	Married + children	11	50%	11	50%	
	Married, no children	2	100%	0	0	
	Widower/divorced	4	57.1%	3	42.9%	
education	12 years or less	4	40%	6	60%	0.144
	13-15	5	33.3%	10	67%	
	15+	17	63%	10	37%	
Employment	Employed	8	44.4%	10	55.6%	0.901
	Unemployed	1	50%	1	50%	
	Self Employed	8	61.5%	5	38.5%	
	Salary Employed	6	50%	6	50%	
	Other	3	42.9%	4	57.1%	
Income	Under average	6	60%	4	40%	0.411
	Average	5	35.7%	9	64.3%	
	Over average	15	55.6%	12	44.4%	
	No answer	0	0	1	100%	
religion	Non-religious	23	51.1%	22	48.9%	0.430
	Traditional	2	33.3%	4	66.7%	

Table 1 displays a comparison between the intervention and the control group using χ^2 tests for categorical variables (age, gender, marital status, education, employment, income and religion).

The demographic data of the participants groups can be seen in Table 1. There were 52 participants in total (26 in the intervention group and 26 in the control group). The groups included an equal number of men and women. Most participants were in the 40-49 age group, single or married + children, with academic education, employed and their income was over average. A clear majority of them were non-religious.

It may be seen that there was no significant statistical difference between the groups, at a confidence level of 5%.

Comparison between the groups – level of PTSD

In order to test whether the two groups had similar PTSD levels before the start of the experiment, a comparison was made between the two groups concerning the total PTSD mark and the mark of the intrusion component. In addition, comparisons were made between men and women concerning these two indexes. The comparisons were made by t-tests for independent samples. The results obtained are shown in Tables 2 and 3.

Table 2 – Description of PTSD values in the division into intervention/control group and men/women

	N	Average	Standard Deviation	P Value
Total	52	12.29	8.46	
Intervention Group	26	11.54	9.15	0.39
Control Group	26	13.04	7.81	
All Male participants	26	10.96	7.71	0.40
All Female participants	26	13.62	9.10	

Table 3 – Description of intrusion values (questions 1-5 in the PTSD questionnaire) in the division into intervention/control group and men/women

	N	Average	Standard Deviation	P Value
Total	52	3.10	3.15	
Intervention Group	26	3.23	2.90	0.46
Control Group	26	2.96	3.43	
All Male participants	26	2.23	2.57	0.06
All Female participants	26	3.96	3.48	

Tables 2 and 3 – the Mann Whitney / Wilcoxon test was used on the PTSD questionnaire, and no significant difference was found between the groups (pv=0.39). In addition, the cluster of questions regarding intrusion was examined according to the PTSD questionnaire (first five questions), and no significant difference was found between the intervention group and the control group (pv=0.46). The difference between men and women in the PTSD questionnaire was examined as well, and was found to be insignificant (pv=0.40). However, the comparison in this cluster between men and women showed a difference close to being significant (PV=0.06). This data may point at the possibility that there exist a difference between the sexes concerning this symptom (median value 3.5 among women and 1.5 among men). In a bigger sample there may be found statistically significant differences.

Examination of the research hypotheses

The research hypotheses claimed that the amount of decrease of mental reaction and arousal level among the group exposed to Visual Swish would be greater than among the control group. In order to examine the research hypotheses, the average values of mental reaction and arousal level were computed in each measurement in both intervention and control groups, and statistical tests were taken, examining the significance of the changes between measurements. This part of the evidence chapter presents the results obtained in these examinations.

(1) Changes in the negative emotional response in both groups – subjective report

Table 4 – Indexes of description of subjective emotional response, in response to the harsh image

		experiment N=26		control N=26	
Measurement	**Description**	**S-D**	**average**	**S-D**	**average**
1	Anxious to Comfortable feeling (Feelcomf)	1.74	8.31	1.58	8.46
Taken before intervention – 1st recall of the image	Bad to Good Feeling (Feelgood)	1.75	8.37	1.40	8.73
	Very tense to Calm feeling (Feelcalm)	1.93	8.42	1.16	8.69
Feel 1 (average 3 Feel)		1.80	8.36	1.22	8.63
2	Anxious to Comfortable feeling (Feelcomf)	1.72	2.92	1.98	7.62
Taken after intervention/ placebo – 2nd recall of the image	Bad to Good Feeling (Feelgood)	1.94	3.19	2.14	7.88
	Very tense to Calm feeling (Feelcalm)	1.61	2.96	2.33	7.65
		1.72	3.03	2.25	7.71
3	Anxious to Comfortable feeling (Feelcomf)			2.03	2.88
Taken after intervention in control group only - 3rd recall of the image	Bad to Good Feeling (Feelgood)			2.46	3.12
	Very tense to Calm feeling (Feelcalm)			1.85	2.64
Feel 2 (average 3 Feel, 2 in intervention and 3 in control)		1.72	3.03	2.03	2.88
4	Anxious to Comfortable feeling (Feelcomf)	1.86	2.80	2.29	3.12
Follow-up, 4th recall of the image	Bad to Good Feeling (Feelgood)	1.84	2.89	2.58	3.41
	Very tense to Calm feeling (Feelcalm)	1.86	2.80	1.99	2.76
Feel 3 (Average 3 Feel)		1.85	2.83	2.21	3.10

* Feelcomf - Anxious to Comfortable feeling
Feelgood - Bad to Good Feeling
FeelCalm - Very tense to Calm feeling
Feel - Average of Sum Feelcomf, Feelgood, Feelcalm

Table 4 presents the results of self-reporting, divided into intervention and control groups. Three measurements were taken among the interventiont group: (1) first recall of the activating image before the intervention; (2) second recall of the image after intervention by the Visual Swish Process; (3) third recall of the image - follow-up after about two months. Four measurements were taken among the control group: (1) first recall of the activating image before the placebo; (2) second recall of the image after placebo; (3) third recall of the image after intervention by the Visual Swish Process; (4) fourth recall of the image - follow-up after about two months. Table 5 shows the results of comparisons made between measurements, in both intervention and control groups.

Table 5 – Comparison between differences in measurements (Feelcomf, Feelgood, Feelcalm) throughout the research (measurements 1 to 4) among the intervention and control groups

Differences between Measurements	intervention		Differences between Measurements	control	
Category of feeling	**Z**	**Asymp. Sig. (2-tailed)**	**Category of feeling**	**Z**	**Asymp. Sig. (2-tailed)**
Feelcomf (1-2)	-4.48	.00	**Feelcomf (1-2)**	-1.66	.10
Feelgood (1-2)	-4.47	.00	**Feelgood (1-2)**	-2.01	.04
Feelcalm (1-2)	-4.47	.00	**Feelcalm (1-2)**	-2.23	.02
			Feelcomf (2-3)	-4.38	.00
			Feelgood (2-3)	-4.30	.00
			Feelcalm (2-3)	-4.38	.00
Feelcomf (1-4)	-4.11	.00	**Feelcomf (2-4)**	-3.97	.00
Feelgood (1-4)	-4.11	.00	**Feelgood (2-4)**	-3.98	.00
Feelcalm (1-4)	-4.12	.00	**Feelcalm (2-4)**	-4.02	.00
Feelcomf (2-4)	-.60	.55	**Feelcomf (3-4)**	-.81	.42
Feelgood (2-4)	-.96	.36	**Feelgood (3-4)**	-.98	.33
Feelcalm (2-4)	-.68	.50	**Feelcalm (3-4)**	-1.04	.30
Feel 2,3-Feel 1	4.46	0.00	**Feel 2,3-Feel 1**	4.38	0.00
Feel 4-Feel 1	4.11	0.00	**Feel 4-Feel 1**	4.20	0.00
Feel 4-Feel 2,3	-0.93	0.36	**Feel 4-Feel 2,3**	-0.70	0.48

*Feelcomf/Feelgood/ Feelcalm 1 – First measurement before intervention
Feelcomf/Feelgood/ Feelcalm 2 – second measurement after intervention – intervention group
Feelcomf/Feelgood/ Feelcalm 2 – second measurement after placebo – control group
Feelcomf/Feelgood/ Feelcalm 3 – third measurement after intervention – control group
Feelcomf/Feelgood/ Feelcalm 4 – fourth measurement – follow –up after two months, both groups

Table 5 – analyzing the data by the Wilcoxon Signed Ranks Test points at significant differences between pre- and post- measurements in the intervention group. In addition, the effect of the intervention was preserved also after about two months. There was no statistically significant difference between the post-intervention and the follow-up measurement. On the other hand, there is a significant difference between the pre-intervention and post-intervention measurements.

Chart 1 shows the changes at the level of negative mental reactions between the various measurements, in both intervention and control groups, concerning the average rank of the three feeling dimensions (Feel).

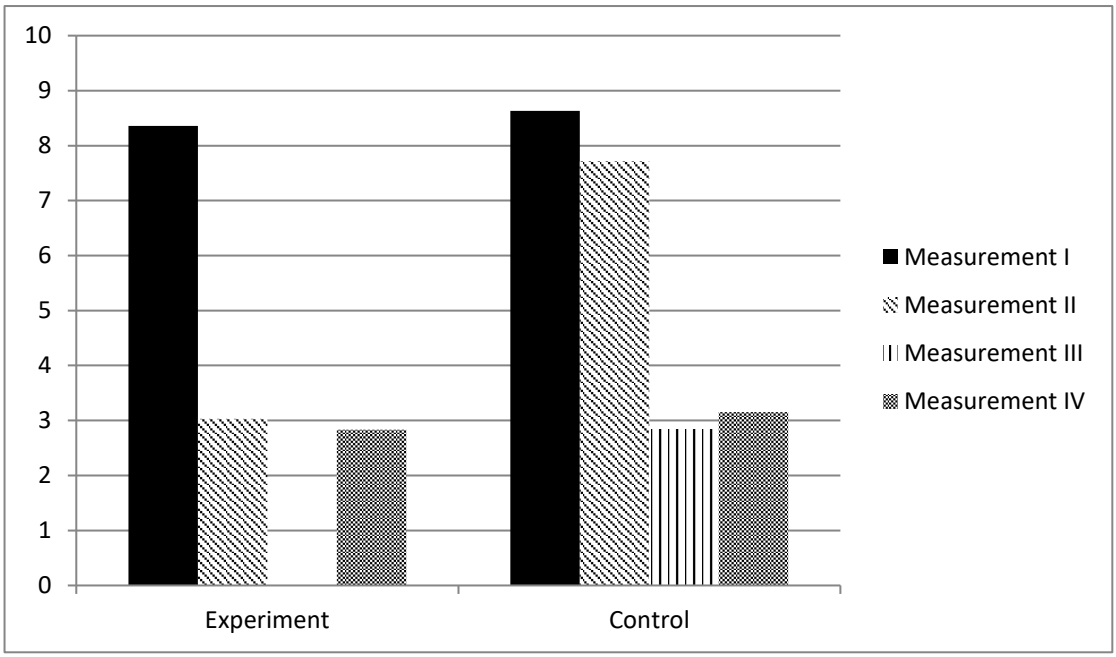


Chart 1: Changes in mental reaction in both intervention and control groups – Feel average

Major conclusions concerning the control group

(1) Concerning the placebo – there was a statistically significant decrease (pv=0.04) in the index Feelgood and Feelcalm, (pv=0.02) and almost significant (pv=0.10) in

Feelcomf. It may be concluded that the placebo had an effect as well, even though the change/improvement was small compared with the intervention group (or compared with further intervention in the control group).

(2) Intervention by the Visual Swish Process led to a significant decrease in all indexes.

(3) During the follow-up a significant statistical difference was observed between the post-placebo and the follow-up measurements. However, no significant difference was observed between the post-intervention and follow-up measurements.

(2) Changes in arousal level in both groups

Table 6 – Comparison of bio-feedback values

	N	Intervention			Control		
		N	Average in Ω units	S-D	N	Average in Ω units	S-D
Measurement 1 – baseline	51	26	7549.9	2043.7	25	6935.4	1845.7
Measurement 2 – first recall of the image	51	26	7328.2	2065.2	25	6777.4	1793.4
Measurement 3 – intervention group after intervention, control group after placebo	51	26	7320.8	2061.7	25	6800.5	1987.0
Measurement 4 – control group after intervention	24	0	N/A		24	6970.3	1961.2
			M3-M2			**M3-M2**	
Differences		26	7.4	778.4	25	23.1	747.1
Significance level			0.53			0.76	
						M4-M2	
Difference					24	157.9	889.3
Significance level						0.69	

***M -** Measurement

Table 6 – comparisons were made in each group separately. Three measurements were taken in the intervention group: (1) baseline; (2) after first recall of activating image, pre-intervention; (3) after second recall of the image, post-intervention. Four measurements were taken in the control group: (1) baseline; (2) after first recall of activating image, pre-placebo; (3) after second recall of the image, post-placebo; (4) after third recall of the image, post-intervention. A comparison was made of the differences in bio-feedback indexes between the various measurements in each group. In the intervention group – a comparison between the second and third measurements (pv=0.53), and in the control group – between the second and third measurements (pv=0.76) and between the second and fourth (pv=0.69). These computations were done by the Wilcoxon test for a-parametric variables in paired samples. The findings point that neither in the intervention group nor in the control group there was a statistically significant difference between the pre-intervention and post-intervention measurements.

(3) Total impact of intervention on the emotional response among all research participants

Concerning the goal of showing the total impact of the intervention on the participants' feeling, while examining the pre-intervention and follow-up values, an analysis of the findings was done separately for each of the three feel categories (FeelCalm/FeelGood/FeelComf), as well as for the feel variable composed of all three categories together (Feel). In addition, in order to perform this analysis, the data of the intervention and control groups were unified. The findings of this analysis are shown in table 7.

Table 7 – Average value in the three feeling categories FeelCalm, FeelComf, FeelGood and the complex feeling variable (Feel) throughout the measurements among all research participants

	Group	N	Average	Standard deviation
Feelcomf 1		52	8.38	1.65
Feelgood 1		52	8.55	1.58
Feelcalm 1		52	8.56	1.58
Feelcomf 2	Experiment	26	2.92	1.72
Feelgood 2	Experiment	26	3.19	1.94
Feelcalm 2	Experiment	26	2.96	1.61
Feelcomf 3	Control	26	2.88	2.03
Feelgood 3	Control	26	3.12	2.46
Feelcalm 3	Control	26	2.64	1.85
Feelcomf 4		46	2.96	2.07
Feelgood 4		46	3.15	2.23
Feelcalm 4		46	2.78	1.91
Feel 1= (Feelcomf+ Feelgood+ Feelcalm)/3		52	**8.50**	**1.50**
Feel 2= (Feelcomf+ Feelgood+ Feelcalm)/3		52	**2.95**	**1.86**
Feel 3= (Feelcomf+ Feelgood+ Feelcalm)/3		46	**2.96**	**2.02**

Table 7 – the calculation of the average of averages unifying the data of the intervention and control groups was done after the correlation calculations between the three variables FeelCalm, FeelComf, FeelGood (see Appendix 14), and as a basis for computing the difference of the emotion (feeling) averages appearing in table 8. **The unification of data between the two groups did not include the second measurement done in the control group** (post-placebo).

Examination of the changes between measurements and among women and men, separately

In order to test the differences between the measurements and to find out whether the significant decrease in emotional response following the intervention existed among women as well as among men, comparisons between measurements were made (as

outlined above) separately for each sex, based on the calculations appearing in Table 7. The results are presented in Table 8.

Table 8 – differences in feelings average (Feel) between measurements (M1, M2+3, M4) for all research participants, and for men and women separately

	Sex	N	Average	Standard deviation	
Measurement 1		52	8.50	1.49	
Emotional average	Male	26	7.87	1.58	
Feel	Female	26	9.12	1.12	
Measurements 2+3[5]		51	2.95	1.86	
Experiment and control	Male	25	2.53	1.60	
groups	Female	26	3.36	2.03	
Emotional average					
Feel					
Measurements 4		46	2.96	2.02	
Follow-up	Male	22	2.52	1.65	
Emotional average	Female	24	3.38	2.25	
Feel					
			Differences	**Standard deviation**	**Significance (pv)**
Feel 1- Feel 2,3		51	5.55	2.18	0.00
	Male	25	5.33	2.05	0.00
	Female	26	5.76	2.32	0.00
Feel 1- Feel 4		46	5.52	2.31	0.00
	Male	22	5.27	2.16	0.00
	Female	24	5.76	2.46	0.00
Feel 2,3- Feel 4		45	0.10	1.62	0.84
	Male	21	0.16	0.86	0.44
	Female	24	0.06	2.11	0.54

Feel=average of (Feelcalm, Feelgood, Feelcomf)
1 – First measurement – pre-intervention
2 – Second measurement – post intervention in intervention group
2 – Second measurement – post placebo in control group
3 – Third measurement - post intervention in control group
4 – Fourth measurement – follow-up after about two months – all research participants

Table 8 – data analysis shows that the results obtained for the whole sample, according to which there was a significant decrease in mental reaction following the intervention,

[5] Measurement no.2 at the intervention group and measurement no.3 at the control group

were also found among women and men separately. In addition, the change was preserved between the last measurement and the follow-up measurement.

Impact of Visual Swish in relation to the content of the image

In order to examine whether the impact of Visual Swish was dependent on the contents of the participant's upsetting image, or comprehensive irrespective of the contents, the following procedure was followed: a content analysis was done, aimed at identifying categories of image content, and then the averages of emotional responses were calculate, pre- and post- intervention, within each category of image content.

The goal of the content analysis was to identify general content categories appearing in the images in the participants' minds. This analysis was done according to a data-directed approach, in other words, it was not guided by pre-defined categories, but identified categories according to the participants' descriptions. The analysis was done by the researcher editor, an expert in NLP treatment. Six different categories were discovered. Table 9 shows the various categories with examples of each one.

Table 9 – content of harsh images, divided into categories

Categories		Death	Inflaming event	Sexual abuse	Anxieties and phobias	Work and family relations	Accidents
Content of image*		Mother's death	Hospital with eldest son – doctor announces a suspicion for head cancer	Parent violence during childhood	Anxiety seizure	Argument with a friend	Almost run over by a car as a kid
		Father's death in car accident	Small sister almost falling from porch	Rape at age 4-5	Fear of elevators	Quarreling with boss	Training accident while serving in the army
		Death of husband – hospital corridor	Basin full of dishes	Sexual abuse in childhood	Skiing – going up in funicular	Former boss	Car accident
		Death of father	Stress and nerves while driving	40-year-old man asked me to sit on his knees and kissed my lips		Repetitive argument with spouse due to mess at home	Helicopter accident 21 years ago
		A case of suicide by hanging	My daughter swallowed pills.	Father beating	Fear of worms	Divorce in rabbinical court	My father's car accident
		Surgery and death of dog	Going to hospital			Mother lies on a couch, gazing into space	Drowning while learning to swim
		Mother informed of father's death	Kindergarten teacher feeding			Father's emotionless face	
		Death of mother	Treatment by splint, age 0-2			Relationship while moving to another flat	
			Computer screen reports that son hasn't done his homework			Seperation from spouse	
			Daughter's birthday party			Stopping to work	
			Vacation with uncle			Conversation with wife	
			Removal of dog's skin			Daughter's marriage	
			Brother's python eats a chicken and swallows it			Farewell from girlfriend	
			Childhood memory - Going to the cinema on the eve of independence day				
Total according to category	49	**8**	**13**	**5**	4	**13**	**6**
Average **feelcalm+feelgood+ feelcomf** 1st measurement		9.17	8.59	9.23	7.58	8.38	7.78
Standard deviation		1.15	1.47	0.92	1.71	1.51	1.85

* Three participants didn't share the image content

Table 10 – Impact of Visual Swish on participants' emotional (Feel), dividing according to categories of image content

Categories		Death	Inciteful event	Sexual abuse	Anxieties and phobias	Work and family relations	Accidents
Feel 1*	**N**	8	13	5	4	13	6
	Average	9.17	8.59	9.23	7.58	8.38	7.78
	Standard deviation	1.15	1.47	0.92	1.71	1.51	1.85
Feel 2,3	**N**	8	12	5	4	13	6
	Average	3.79	2.28	3.27	4.00	2.59	3.00
	Standard deviation	2.25	1.23	2.35	2.94	1.59	2.20
Feel 4	**N**	7	10	3	4	13	6
	Average	3.26	2.77	2.28	4.75	2.58	3.53
	Standard deviation	1.59	2.22	1.25	3.30	1.75	2.22
Feel 1 - Feel 2,3	**N**	8	12	5	4	13	6
	Average	5.38	6.36	5.97	3.58	5.79	4.78
	Standard deviation	1.93	2.08	3.26	1.26	1.98	2.58
Feel 1 – Feel 4	**N**	7	10	3	4	13	6
	Average	5.93	5.97	7.11	2.83	5.81	4.25
	Standard deviation	2.01	2.41	2.01	2.29	2.18	2.29
Feel 2,3 – Feel 4	**N**	7	9	3	4	13	6
	Average	0.26	-0.74	0.83	-0.75	0.01	-0.53
	Standard deviation	2.38	2.17	0.93	2.22	0.88	0.76

*Feel=average of (Feelcalm, Feelgood, Feelcomf)
1 – First measurement – pre-intervention
2 – Second measurement – post intervention in intervention group
2 – Second measurement – post placebo in control group
3 – Third measurement - post intervention in control group
4 – Fourth measurement – follow-up after about two months – all research participants

Tables 9 and 10 – the participants have been classified according to the categorization of the image content. It may be inferred from Table 9 that the participants estimated the emotional difficulty associated with the image very highly (values between 9.13 and 7.58), irrespective of the category. Table 10 examines the differences between the measurements, according to the division to categories. One may see the significant difference between measurements 2+3 (post-intervention) and measurement 1 (pre-

intervention), as well as between measurement 4 (follow-up) and measurement 1. In other words, the intervention reduced the negative emotional volume accompanying the content of the harsh image. Moreover, there was little difference between measurement 4 and the post-intervention measurement. This indicates that the effect was preserved after about two months. Nevertheless one should note that this division into categories of content resulted in groups including a small number of participants. Therefore these results are presented at the descriptive level, and are not accompanied by statistical tests examining significance. However, one may point at consistent findings in each category, showing a decrease in the level of negative emotional response. These findings show that the Visual Swish Process "worked" in each category, irrespective of the content and character of the image.

4.2 Qualitative Analysis

Qualitative data analysis: conclusions out of the introspective interviews (See Appendix 10).

Following the intervention, five participants were randomly sampled out of the intervention group. They were asked to answer five questions and describe in their own words, the experience they went through (intervention by the Visual Swish Process) without guidance by the therapist. The findings obtained by analyzing the content of their answers are presented below.

1. **Comparison between recalling the activating image for the first time and recalling it again (after the intervention)** – all participants which were interviewed noted that there was a difference in their feeling. Three participants

said that initially they had a tough time emotionally coping with the arising image. They used such words as: discomfort, anxious, trapped, difficulty to cope with the need to look or verbalize the image.

2. Regarding **thoughts and emotions arising during the process itself** – the description of the experience according to the reports is characterized by personal and subjective variety. Nevertheless, one may identify a tendency of change throughout the process in the direction of a better feeling. Below ther are some quotations presented referring to this stage:

   "A pleasant feeling during the process"

   "During the process I felt that it was too fast, and that I was unable to contain things, that I didn't know if it worked. However, I felt that as it progressed I became more relaxed."

   "During the process two voices arose within me: the rational and the critical. The critical said that it is "weird", while the rational said that there was something sequential – orderly guidance of the imagination."

   "At first I felt discomfort due to recalling the image, but during the process it changed until I even felt sleepy."

   "During the process I felt very concentrated. Physically, it felt like ants. Even my breath changed, it became different, as though something was happening in my body all the time… in my whole body… mainly in the breathing area… health, excitement."

"The diamond with the "wonderful-I" gave me the power to feel that I am sufficiently strong to cope with it. During the process I felt that I was recharging. For me this process was like recharging."

3. Referring to **the end of the process** – in the descriptions one may identify a positive emotional change as well as an insight regarding the latent benefit in the process. Some quotations referring to that stage are presented below.

   "At the cards part I felt tears within me – not out of sadness but out of excitement."

   "At this stage I let the process penetrate within me."

   "Already towards the end of the process I thought to myself that it's so simple, that it's worthwhile to utilize this and do this to myself alone at home as well…"

   "Right at the end of the process I understood that now I could sit at home, and during periods of being down and confused I could simply do it again…"

4. When the interviewed participants were asked to add comments or any other thing they would like to mention regarding the process they underwent, the first one used the word "interesting", the second one – "pleasant" and the other three - "intriguing".

Telephonic follow-up after about two months

About two months after the session, the participants were asked to recall the original image and answer the three feeling questions, and also to describe freely the change which occurred (if any change at all) in their reaction to the image. A quantitative analysis was done, accompanied with a qualitative analysis of the frequency of the

categories which arose during content analysis. This analysis was done according to the responses of 46 participants.

The findings revealed three evaluation categories:

Participants reporting a big change; participants whose reports were ambiguous and participants reporting no change at all in the volume of negative emotional response to the upsetting image.

The category ***"reporting a big change"*** included 34 participants.

1. **Here is a collection of responses referring to the image itself**: "Now this image is less intimidating". "This specific image is more blurred". "The image seems to be more distant, and this makes me feel indifferent towards it". "Now when I recall this image again, it is not absolutely clear, and I have to make an effort to see it". "When I think about the image I see more the diamond and the blank screen". "That image has almost been deleted from my awareness. It returns in more distant flashes, during moments of tiredness or anger, but much less, much less powerfully". "A very striking change. The image has become foggy". "A long time afterwards I saw only a blank screen and felt nothing". "That event has disappeared as if it never happened. It didn't influence the conduct of my life. It was a 'pain in the ass' which was no longer there, as if it had never existed. Like a fog with which I had no emotional association". "That image which used to pop up all the time is no longer existent or upsetting". "I feel that such a blank memory has been implanted. If I forcibly try to remember, I see a blank image". "The image does not pop up anymore while thinking. The dreams and nightmares have disappeared as well. Now I have different dreams". "I can't recall the image – my feeling is that this image is just running away".

This collection of reactions is characterized by recalling the image in a manner emphasizing the modification of its components. The participants used words indicating changes towards dullness and reduction of the sight, such as: blurry, distant, foggy, less acute.

2. **Here is a collection of responses referring to the emotions accompanying the visual memory**: "There is a certain relief compared with the past. During the commemoration at Memorial Day I felt better than usually. Leading up to the commemoration, the memories come back. This time it was less difficult". "When I think of it I don't become nervous and stressed like before. I remain calm while driving". "When I recall this, it even makes me smile". "The anger which I used to have, has disappeared. I don't think of it anymore and it doesn't upset me any longer – now I'm calmer when I think of my friend". "Feeling better, a feeling of more relief. I live with it more peacefully. The image itself is less clear". "I am almost indifferent to the image". "I don't cry anymore when I think of her. In my emotional response – there is no anger, it has become duller – it's really nothing". "When I recall this I am much less irritated and nervous". "At the beginning, when I recalled the image I felt nothing. Now when I see it and remember, I feel no anxiety, nothing of the sort. A general feeling of release, relief". "The fear has disappeared. It has become a non-issue. Strange…". "When I recall it, now I have a feeling of well-being, as though something has expanded in my heart". "…Even the dreams and nightmares have disappeared. There are dreams, but different ones. I feel better". "Feeling much better with much less anxiety. This is really 'hocus-pocus' ". "Generally I am calmer recently. I don't know if it's connected to this. Regarding the event – I have less anxiety. It's harder to recall the image". "When thinking of the dog or

about that image – I feel less irritated. In this aspect the intervention has worked. This is how I feel".

One may find repeated use of the motif of reduction: "less excited", "less feeling". On the other hand, there is repeated us of "more calm". Moreover, two people used the words "Now I have a choice", contrasting with the automatic reaction according to which (this is how they describe it) they had acted previously.

3. **Here is a collection of responses referring to noticing a conceptual change regarding self-behaviors/perceptions**: "It's hard for me to define. Generally I felt more opportunities to know people, not necessarily boys, both girls and boys. I feel a more secure presence. Regarding the image – it is less emotional. Feels like an object, the same image is now pressing less buttons, a much lower emotional level". "First of all I discovered my wonderful self. I have never defined it before. I discovered that I have powers, I discovered new powers to cope. I no longer have that anxiety". "It doesn't 'turn me on' anymore. Much calmer. I see it and don't react like before". "I put the whole subject aside now, not occupying myself with it. It's hard to separate between the image and the whole incident. When I try to recall the image, it's harder. I happened to watch a YouTube video on crashing helicopters, and I didn't react like before. I could see it and remain relatively calm". "There was an immediate change in the manner in which I interpreted an emotionless facial expression. After years of avoiding standing before an audience because of this, kind of an unexplained fear, I gave a lecture which I prepared, and I could give the facial expressions a totally different interpretation, of people listening and being interested. This is moving, how this process works. Since then I have already delivered another lecture, and I enrolled to study at Adler Institute". "Quietly sleeping at night.

Not afraid of going to sleep. The day's stress doesn't make bad emotions pop up. I am free to occupy myself with the day's events".

Generally one may say that this collection of responses is characterized by the fact that the image no longer activates the old habit/reaction. In addition, the responses shed light on a new response, not of avoidance.

The category of "***participants whose reports were ambiguous***" included 10 participants.

Here is a collection of responses characterized by an ambivalent reference to the memory: "I have still not completely forgiven my father, even though nowadays our relations are better. I still feel angry about him, but I don't think a lot about it. There is a change regarding the image. I remember this, but it affects me less". "I don't feel an essential change, because it's not something occupying me in daily life. I don't recall it or think about it. When I think about the image now, it doesn't arouse anything special within me. It seems to be distant". "I didn't think about it. Maybe the fact that I didn't occupy myself with it says that it's better". "I was a bit shocked when I came out. Gradually I got it and I found myself trying to recreate it… gradually I got it and it permeated… the indecent habits remained, but now it's because I want it, not because I need it… my mind is more open to look and perceive things… the incident became empowering-painful, but empowering – not something bad". "I went out jogging in Sacher park. I felt secure, but any man who came near me or any image I felt behind me, aroused a fear within me". "Since then, it didn't happen again, there was no such situation. I don't feel an essential change. Regarding the image – it seems more distant and it doesn't arouse any emotional response". "I am still in a legal process with my husband. Therefore it still activates me. There are anxieties concerning the trial, the

outcome, the conduct. If I try to separate this from the image, then the image itself seems more blurry and less threatening". "I generally don't think about this incident. I can't point at a change. Now that you ask me to recall the image – my reaction to it is moderate". "It's hard for me to say that there was a change. I don't think so… also it has not become worse… it didn't make a change within me. Maybe immediately afterwards I felt better, but in the long run it stayed the same". "We went out to a trip in nature, and I hoped to encounter worms in order to see whether a change occurred. I didn't fear encountering them, but their season is over, so actually I don't know".

The category of *"**participants reporting no change at all**"* in the volume of the negative emotional response to the upsetting image, included two participants.

Here are the responses of the two participants, which according to their report no change has occurred at all: "The image is still there, it's not that I went and coped with it. But it's there – this diamond, this image, and there is a feeling of "everything's OK" and I can trust myself. But I have still not entered an elevator, and I can't see myself do it". "Before Tuesday, I would have said 3-4. I thought that something happened, I was less aware of it in the period following our session. And now it has returned big time. After our session, it managed to reduce the experience and its recall. All in all, this part of the experience as though reduced. And on Tuesday it returned big time" (She didn't share what happened on Tuesday).

Chapter 5 - Discussion

The goal of this research was empirically testing the effectiveness of the Visual Swish procedure, regarding negative emotional response and level of emotional arousal of participants, following exposure to harsh mental images. This goal was achieved by an experimental study design, comparing a group of participants exposed to the procedure with a control group, which received placebo intervention at the first stage, and Visual Swish intervention at the second stage. For each participant, the reactions have been compared. The discussion of the findings consists of three parts: The first part of the discussion focuses on the research hypotheses concerning change in emotional response to the mental image. The second part addresses the findings related to the hypotheses about the component of mental arousal. The third part discusses the evaluations by the participants, given as a qualitative feedback to the procedure they underwent in this research.

5.1 Change of emotional response to the harsh mental image – subjective report

The research findings point at a similar tendency concerning the two research hypotheses, relating to a change in the negative emotional response (hypotheses 1.2).

The negative emotional response to the harsh mental image which characterized the first recall of the image, prior to the intervention, changed into an emotional response tending to the direction of the value "feel good" after the intervention by the Visual Swish procedure. This has been found both by testing each scale (Feelcalm, Feelcomf, Feelgood) differently and by merging these three evaluations to one representative parameter (Feel). The significant differences found between the pre-

intervention emotional response compared to the post-intervention emotional response for the whole group of participants (52 participants) are essential, pointing at the effectiveness of the procedure at that point in time (immediately after the session). The average of measurement 1 was at 8.50, while after the intervention, the average of measurements 2+3 was at 2.95, a difference of 5.55 units, indicating significant emotional relief.

Moreover, when the stability of change over time was tested, by a telephonic follow-up after about two months (46 participants), it has been found that the change achieved after the process was preserved also after the elapsed time. It has been found, that there was no significant difference between the post-intervention measurement and the follow-up measurement. Measurement 4 (follow-up) had a Feel average of 2.06. Thus it may be said that the change has remained stable.

Possible explanations to this stability may be found in three sources:

(1) **Theories of learning** – the Swish operation includes quick replacements of images/stimulations (the first image, arousing harsh emotions, immediately followed by the second image, arousing positive feelings) and multiple repetitions. Those characteristics activate "Hebb's rule", so that raising the stimulation (the problematic image) in the future increases the chance that the image arousing positive emotions shall be activated next. In this manner the brain learns and remembers the connection between the two stimulants, thus changing the emotional experience, as had been activated in the brain previously.

(2) An explanation relating to the **dual attention phenomenon**, which includes a feeling of control and observation – this explanation is based on the attempts to explain the effectiveness of EMDR, according to which the patient is focused on the

memory while being in a safe and supportive therapeutic environment. It seems that, similarly to EMDR, this enables a feeling of control rather than a tendency to avoidance and fear of the harsh experiences. In addition, a special emotional-cognitive observation of the negative experiences is created (similar to meditation). This observation is not carried away emotionally However, it is also not detached and distant (Oren, 2000).

(3) **A feeling of control and self-efficacy** – this explanation is based on the contents of the qualitative feedback. Even though the participants had not been verbally directed to continue to drill the procedure, out of the qualitative feedback it may be understood that at least some of them understood that this procedure may serve them also in the future, both regarding the specific image on which the action of emotional change has been performed, and as a cognitive strategy for emotional modification. Here are some examples for such insights: "Already towards the end of the procedure I thought to myself that it was so simple, that it would be beneficial to exploit it and do this myself at home…"; "Right at the end of the process I understood that now I will be able to sit at home during periods of down and confusion, and I will just be able to do it again…"; "I feel that such a white memory has been implanted. When I make an effort to remember, I see a white image". Hence one may infer that the participants probably assimilated the technique, using it consciously or unconsciously in daily situations, when the same harsh mental image had arisen. This explanation suggests that Visual Swish technique has been integrated into the alignment of acquired ways of coping, which people "recruit" at stress situations. Thus they have received a tool which enables them more control and a feeling of **self-efficacy**.

The effectiveness of Visual Swish in reducing negative emotional responses and the stability of the change has been found both among males and among females. This enhances the generalization ability of the procedure's effectiveness. The similarity in

reaction between males and females is congruent to the researches testing this issue in the context of cognitive-behavioral treatments. Those researches focused on two populations: people suffering from depression (Friedman E.S, Thase M.E, & Wright J.H., 2008) and people diagnosed for PTSD (Felmingham & Bryant, 2012). The findings are that among those two groups, there are no essential differences between the post-treatment reactions of men and women to cognitive-behavioral treatments. However, a difference was found after six months: males showed more PTSD symptoms than females.

The second hypotheses confirmed in this research was about the differences between the intervention group and the control group. While the gap between the pre-intervention emotional response and the same indexes post-intervention stood at 5.33 units, the gap between the indexes registered among the control group at the first and second recall (after placebo intervention) of the activating image, stood at 1.25 units. In the control group, the Feel average of the second measurement (post placebo- which included thinking about the image for 10 minutes without the experimenter's presence) was at 7.71. This finding indicates that the intervention among the control group did effect a certain change, close to being significant. Therefore it may be argued that placebo intervention was also effective, although very mildly. The differences between the experiment and control groups were 4.08 units, indicating the effectiveness of the intervention by the Visual Swish procedure compared with placebo.

Furthermore, when the control group also underwent the Visual Swish procedure, later in the session, a significant change was registered in the direction of reducing harsh emotions. During the third measurement after the intervention, the indexes were at 2.88, the difference between first and third measurements being 5.75 units.

It is important to note that the analysis of the data of emotional response (pre- and post- intervention) in relation to the differences between the various contents of the harsh images, indicated that they were very similar. It turns out that the tendency of reduced emotional difficulty has been preserved even while testing according to different categories of image content. This finding also enhances the ability of generalization of the procedure's effectiveness, as it is independent of the content imagined by the person.

5.2 Level of mental arousal in reaction to exposure to the mental image

In both groups, experiment and control, no significant difference in the level of emotional arousal was apparent, when compared between pre-exposure to Visual Swish or placebo and post-exposure to the intervention. Biofeedback indexes remained similar. The conclusion is that the procedure didn't have an impact on the level of emotional arousal measured as a physiological feedback. Thus it turns out that there was a gap between the findings concerning the physiological feedback and the findings concerning the psychological/subjective feedback. Therefore both research hypotheses (3,4) were not confirmed by the data. There may be several explanations for this gap:

(1) Researches in the field of emotion which tested the bio-feedback device directly and were reviewed in our literature review, may offer one explanation: It may be inferred from the research by Taylor et al (1998), that reconstructed emotion arising as a result of imaginary reconstruction (rather than actual stimulation) of a situation which activates emotions, manifests itself on the bio-feedback device as a mild reaction or small changes of indexes (Taylor et al, 1998). A similar explanation follows from the research by Barrowcliff et al (2004), which tested the impact of eye motions on subjective and physiological indexes (EDR) when autobiographical

memories, positive or negative, were recalled. The results obtained showed a clear difference between the subjective report of emotion and the objective indexes (Barrowcliff et al, 2004). It should be emphasized that, in contrast with the research by Nikula et al (1993), which claimed that old events don't necessarily activate the mechanisms of readiness for action, therefore they don't influence objective indexes with the same volume as actual events (Nikula et al, 1993), in this research the level of arousal measured following the reaction to the mental image was higher than the level of arousal measured at the baseline.

(2) The bio-feedback device measures arousal, which existed both before and after the intervention, or after the placebo and after the Visual Swish. However, this index of arousal didn't provide access to the subjective interpretation of the essence of arousal, moving on the continuous scale between positive and negative interpretation. Many psychological theories discuss the subject of emotions. Those of a cognitive nature claim that emotion is the product of cognitive evaluation of the physiological situation, while others are more physiological, claiming that the resultant emotion is disconnected from cognition (Larsen, Berntson, Poehlmann, Ito and Cacioppo, 2008). In Bradley & Lang's article (Bradley & Lang, 2000), the authors reviewed studies mixing different physiological indexes and discussed them in order to test whether one may infer according physiology which emotion has been created. Bradley & Lang quote out of the researches of Winton, Putnam & Krauss (1984) and Manning & Melchiori (1974), claiming that while there are several physiological factors differentiating between pleasant and unpleasant emotions, skin conductivity constitutes an excellent index for measuring the volume of physiological arousal, but it does not differentiate between pleasant and unpleasant emotion (Bradley & Lang, 2000). The physiological-cognitive theory of

emotions supports the evidence claiming that skin conductivity does not indicate the type of emotion. According to that theory, the emotion is a product of the cognition evaluating the physiology. In other words, the same physiological indexes of a person may indicate an emotional label of happiness, anger or a neutral emotion, according to the evaluating cognition (Schachter & Singer, 1962). These findings may explain the fact, that in the present study, the device measuring skin conductivity did not find essential differences between the conductivity indexes before the operation of the researched procedure and after it, while the self-reports of the participants showed a significant gap between these two specific times. The participants experienced physiological arousal when they were asked to recall the harsh mental image both before the procedure and after it, which manifested itself in the skin conductivity index. Thus the procedure modified both the cognition evaluating memory and the emotional label attached to the physiological arousal. In other words, before the operation of the Visual Swish procedure, the evaluating cognition was negative, while after the process it became positive.

(3) A third explanation may be hidden in the verbal feedback and the introspective report of the participants. The recall of the activating image in the first time, before the intervention, aroused the body to react to the difficulty latent in the image, and this was registered by the bio-feedback device. After the intervention, following another recall of the image, the participant reacted with arousal once again, but this time the psychological significance of this arousal was different. It was caused by the excitement attached to the fact that this time, the same image with the same historical connection, didn't operate the former set of emotions. This explanation is supported by reports such as: "… I felt tears rising within me – not out of sadness, but out of excitement"; "as though something happens in the body all the time… in

the whole body… mainly in the area of breathing… healthiness, excitement"; "during the process I felt that I was recharged. The process was for me like recharging". This finding coincides with Clore's argument (1994), that the actual experience of emotion, rather than merely the physiological feedback, constitutes an excellent clue for the impact of events on the manner of examining experience.

5.3 The Visual Swish Process – a Qualitative Feedback

This research included qualitative analysis of data collected from the participants. As mentioned above, five participants out of the intervention group answered an open questionnaire, including five questions relating to the manner in which they experienced the procedure, while 46 participants were asked to answer the three feeling questions (Feelcalm, Feelcomf, Feelgood) and describe freely the manner in which the harsh image was recalled, about two months after the end of the session. As it was observed in the theoretical review (Ben-Zeev, 2001), the volume of emotions depends on the manner in which we evaluate the significance of things. The main factors for the event's impact are: strength, reality and relevance of the event. In this study the participants were asked in advance to come with a harsh image. Indeed, according to the descriptions of the content of the images, one may conclude that in most cases it was images related to memories of dramatic events (however, it may be noted that the participants were not diagnosed as PTSD). "Event strength" constitutes a main factor in determining the emotional volume. Usually there is a positive correlation between the event strength, as conceived by the individual, and the volume of emotion. The emotional volume, as manifested in the totality of feelings (feel) was high, tending toward the negative direction. Nevertheless, the reports by the participants showed that the procedure was conceived as non-threatening and even interesting, even though they

"put themselves" in an unpleasant emotional situation. Moreover, most of them described the process as reinforcing and exciting. In addition, during the follow-up interviews, most participants were talking about a conceptual change, manifested in the sub-modalities components in the image. This enabled them to refer to the image from a more relaxed and receptive place. Those descriptions, taken out of the participants' words, may contribute to an explanation regarding the stability of change following the operation of the procedure, which was probably assimilated as a way of coping which was also applied later on, thus it was not confined merely to the immediate future. The Visual Swish process was not designed to "erase" the unpleasant memory, manifested as a mental image, but rather to enable a rapid conversion from connecting a stimulation (activating image) with a harsh emotional response to connecting a stimulation (activating image) with a relaxed emotional response. According to the reports by the majority of participants, this aim has been achieved by this procedure.

Chapter 6 – Research Limitations; Implications on Practice and Suggestions for Further Research

6.1 Research Limitations

Sampling Method and Volunteer Bias: The sample included participants who accepted an invitation to take part in the research. This group did not necessarily represent the whole population, and it may have been characterized by a higher level of willingness to try new personal experiences. This attitude may have contributed to the effectiveness of the using the procedure.

Validity of the Research: The population which accepted the research invitation was mainly non-religious Jewish population with middle to high socio-economic status. This is a pilot research with a rather limited number of participants. In view of the above, the findings may not be generalized to the whole population. Our aim is that this pilot research may enable us to prepare for and design a follow up research.

Duration of Research and Stability of Change Over Time: This research was conducted by a one-off session and a telephonic follow-up including a talk which was done about two months later, in order to examine the stability (or instability) of the reaction to the mental image. A continuation of the follow-up is called for, in order to examine the stability of the change which occurred among the participants.

Information Bias: **Interviewer/Therapist Bias** – Researches of process and result in the field of psychotherapy have shown that there are various parameters which explain the variable of treatment effectiveness, beyond the specific treatment method. In other words, there are common factors helping to forecast the success of the treatment, independently of the specific treatment method. Among these factors one may list the quality of the therapeutic alliance, variables connected to the patients and variables

connected to the therapist's personal characteristics. In this research, a single therapist delivered the process for all participants. This reduces the therapist's bias. The therapist was trained and guided, working according to a structured and uniform protocol of the Visual Swish process.

Social Desirability - This bias, related also to desirability bias, seems to be unlikely in this research, since the differences in subjective reports were found to be significant. Thus even if there were participants which did placate the therapist, it is unlikely that such a large number of them did this.

It is important to note, that since it was the first research of its kind to test the effectiveness of the Visual Swish technique, there was neither a source for comparison, nor a possibility to learn from previous similar researches in this field.

6.2 Implications on Practice and Suggestions for Further Research

The findings of this research tend to reinforce the claims of therapists regarding the efficacy of the method however, it is merely a pilot research. Despite being well-known, common and used often among NLP practitioners, the Visual Swish process is hardly known within the therapists' community. This research points at the hidden potential of this technique to create a rapid, effective change, which is stable over time. In the field of psychology (in this context, cognitive-behavioral psychology), most reported changes require a process, and very few tools are recognized, which enable a focused conceptual/emotional change during a single session. This process may be combined with any therapeutic alignment including work with memories which activate the patient emotionally, mentally and behaviorally. These arousing memories are not limited to specific types of images (one may see this from the division into various categories of harsh image content).

Moreover, the research evidence indicates that one may achieve an emotional change even in harsh images arousing a harsh emotional response. Therefore, further studies should be done in order to test the possibility of combining the Visual Swish technique within a therapeutic alignment for the population suffering from PTSD. As mentioned above, erupting images (re-experiencing cluster) are one of the characteristic symptoms of PTSD. The research evidence also suggests that direct work with the Visual Swish technique may bring relief regarding this symptom, up to being able to conduct one's life without the limitation resulting from erupting images as an effect with latent long-term potential.

While this research tested the Visual Swish procedure, dealing with the visual element, there are Auditory, Kinesthetic, Smell and Taste Swishes, which operate

according to the same principles. This research may form a basis to testing the effectiveness of the Swishes appearing in other sensory systems, as an answer to erupting voices, sensory triggers and other factors. The alignment of Swishes has the potential to serve therapists as a tool, addressing the whole range of the re-experiencing cluster.

Even though the protocol of this procedure looks simple and easy to use, it's important to remark that operating it requires a high level of skill. First of all, this therapeutic style may be different from what is common in the world of psychology. During the session the therapist is active, takes the initiative, moves his hands (in order to demonstrate modification in sub-modalities), sits beside the patient, and so on. This therapeutic style, despite its efficacy given the Visual Swish protocol, may not suit every therapist and even create initial restraint. Secondly, the protocol is based on extensive therapy skills, including the art of rapport, reframing, Ericksonian language and anchoring. Executing the protocol while lacking an extensive base in operating it may produce less significant results or even no results at all.

In addition, the simplicity of the procedure enables the patient to study the protocol sequence easily, thus operating the Swish by himself any time he is required to by life's challenges, in any context and given any type of image content. In this way one obtains a coping strategy which is easy to pull out and apply, and does not necessitate dependence on an external helping factor.

Integrating Visual Swish may occur as part of a long-range psychological treatment. However, it may be beneficial to consider using this protocol (with the above limitations) also as a primary intervention, as part of a program to prevent the development of PTSD - in other words, already at the initial stages after the occurrence

of a traumatic event (at the stage of ASD – Acute Stress Disorder). Of course, in order to achieve this it is recommended to expand this research and address population which underwent a traumatic event.

Another issue which should be given attention is the subject of cost-benefit. Systems of mental support look for effective and short treatment. Visual Swish may appear to be a treatment of this type, obviously as part of a wider therapeutic alignment. The technique requires a single session of less than 60 minutes, and it doesn't involve any accompanying equipment.

Finally, this research was a pioneering research in the field. Its purpose was to give an answer to the dissonance between lack of controlled researches and reports from the field about the efficiency of the method. Its findings constitute an invitation for further studies, in which it is recommended to expand the number of participants, to test the procedure among more heterogeneous populations, to examine the effectiveness of Swishes in other sensory systems, to integrate new measurement tools, due to the fact that bio-feedback has been shown to be inadequate in measuring emotional classification, and of course to consider integrating this technique and examining its effectiveness among populations which underwent a traumatic event.

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Appendix 1 – The Visual Swish Process – Research Protocol

1. Help your client find an upsetting **Start Image** by asking him or her to:

a) "Remember an upsetting image from your past, or

b) "Think of an upsetting image associated with your future", or

c) "Recall an upsetting feeling; Let this feeling get so strong that it becomes an image you can see".

2. Once your client has an upsetting image in mind, say to him or her, "Think of [the **Start or Yucky Image**] as seen from your own eyes". The Start, or Yucky Image must be an associated image; if your client sees a dissociated image, say "Please see the experience from your own eyes". Being associated will insure that your client has a strong "Yucky" feeling about the image. Then ask your client to see [the **Yucky Image**] one hundred yards away; If your client reports feeling less upset, the Visual Swish will be useful.

3. Change State: Ask your client, "What's your telephone number, backwards?"

4. Say to your client, "Create a large and bright image of yourself **being different**, a wonderful-you! This is a you who has already solved the issues contained within [the **Yucky Image**], and therefore no longer has the unwanted experience. This wonderful-you is just a step ahead of you in time: is wearing what you are wearing, and is not a perfect you, but is resourceful, confident and has a sense of humor."

5. Tell your client to: "Shrink the image of the wonderful-you down to the size of a dot, a sparkling dot. Allow the dot to blossom out, revealing the wonderful-you getting larger and brighter until that image becomes life-size. Then shrink and blossom that image twice."

6. Change State: Ask your client, "What's your telephone number, backwards?"

7. Say to your client: "Now, place the sparkling dot (containing the wonderful-you" in the bull's eye center of [the **Yucky Image**]. And now, watch [the **Yucky Image**] get smaller and darker, fading like a water-color painting left out in the rain, as **simultaneously**, the sparkling dot image of the wonderful-you begins to get bigger and brighter, until that large and bright image of yourself overwhelms [the **Yucky Image**].

8. Say to your client: "Now see a Blank Screen, as you would see in a movie theatre."

9. Have your client Repeat numbers 7 and 8 about three times, slowly. Then repeat them three times very fast.

10. Say to your client: "What would happen if you had already seen this process a thousand times, now?" Pause for a moment and then go on to #11.

11. Test: Say to your client: "Now, what happens when you try to get those upsetting feelings?" If your client has a difficult time seeing the "yucky" image and/or there are no upsetting feelings, the process is complete. If your client can still get the upsetting feelings, have him or her ask the part which creates the "yucky" feelings for its positive intention and then repeat the Visual Swish Process.

12. Stabilizing: When the Process is complete, say, "And if the wonderful-you image were multiplied a thousand times and spread around you in concentric circles, in your past, present and future, what would this feel like now? Now think of how you will continue to experience these changes tonight, tomorrow, and all the days and nights, weeks and months and years to come."

Appendix 2 – The Visual Swish Process – original version (Bandler 1985)

The following is a brief review of the "Swish" process.

1. Identify the compulsive desire or idea and the associated image.

2. Identify or create an image, to take the place of the problematic image, that satisfies any positive purposes of the problematic image but leads to a different affect.

3. Explore which submodality qualities of the images influence their degree of intensity by altering such qualities as the color, brightness, focus, movement, depth, shape etc. of the images and noticing how it influences your feelings in reaction to them. Find the submodality qualities that diminish the intensity of response associated with the problematic image and augment the intensity of the response associated with the new image.

4. Begin with the limiting image very large and intense and the desired image small and weak. Slowly make the problem image smaller and weaker. *At the same time* make the new image larger and more intense. Repeat this at least five times, making the process faster and faster each time.

5. Test by trying to make the limiting image and hold it.

Appendix 3 – Sub-Modalities

Each sensory unit has characteristics which are called "sub-modalities". The composition of sub-modalities determines how things are recorded in our memory, as well as our personal interpretation of reality.

Modification of sub-modalities will change emotions, thoughts and beliefs accompanying memory.

(Partial) List of Sub-Modalities

Visual

1. Color
   Black/white
2. Moving
   Static ("frozen")
3. In front
   To the right
   To the left
   At eyes' height
   Below eyes' height
   Above eyes' height
4. Near
   Far
5. Bright like daylight
   Brighter
   Dimmer
6. At natural size
   Bigger
   Smaller
7. Three dimensional

Flat

8. Framed

   Panoramic (open and unframed)

9. Seeing oneself in the image (disassociation)

   Seeing through one's own eyes (association)

10. Single image

    Many images

Auditory

1. In front/behind/ to the right/to the left/above/below
2. Near/far
3. Loud as my voice/ louder/ less loud
4. At the pitch of my voice

   Higher pitch/deeper pitch

5. Slow/moderate/fast
6. A single voice/ many voices
7. Mono / stereo
8. Attitude/ tone

Kinesthetic

1. Hot/cold
2. Moving (+direction)/ static
3. Pressing/relaxed
4. Location
5. Expanding (+direction)/ shrinking
6. Full / empty
7. On the body/within the body

Appendix 4 – Advertisement for Recruiting Volunteers to the Research

Hi,

As part of a doctorate thesis in the Faculty of Medicine in Tal Aviv University, I am researching a therapeutic tool (NLP*) involving change of emotional arousal connected with exposure to mental images.

Therefore we are looking for volunteers for a research, who have experienced a dramatic event and carry an image which still arouses in them harsh/unpleasant feelings.

The research includes the following:

- One session including taking personal details, answering questionnaires for diagnosis the level of arousal, connecting to a Bio-Feedback machine and performing a NLP process.
- The session takes about 90 minutes, and it takes place in Ramat Hachayal, Tel Aviv.
- The questionnaires, as well as the data collected, are anonymous. One may not identify the person who filled the questionnaire.

We will be very glad if you take part in this evaluation process.

Research participants shall receive a gift as an appreciation of their volunteering.

For coordinating a session, please call Ophir: 054-6611548 or mail

yfatwein@mail.tau.ac.il

I thank each one of you in advance,

Yfat Weinstein-Zohar

*NLP - N Neuro; understanding the neurological processes in the brain, the purpose of which is to perceive in all senses, process the data and translate it into experience. L Linguistic; identifying brain activity by analyzing linguistic patterns manifested in verbal communication (the wording chosen by the person) and inner communication including thought processes. P Programming; organizing the results of analysis of brain and linguistic activity, including defining goals and planning the ways to obtain them.

Appendix 5 – Telephonic Interview; Preliminary Selection

1. Age of applicant.

2. Gender of applicant.

3. Medical background: Description of present and past diseases.

4. Medication: which medications do you take?

5. Are you in psychological treatment or any other treatment?

6. Tendency for extreme or suicidal behaviors, use of drugs and alcohol.

7. Why do you want to take part in the research?

8. When did the dramatic event occur?

9. Do you have an image from that event which still arouses within you harsh/unpleasant feelings?

Appendix 6 – Socio-economic Background Questionnaire

Here is a general background questionnaire, please tick with V the data which is appropriate to you.

.1	**Gender**	
	Male	
	Female	
.2	**Age**	
	20-29	
	30-39	
	40-49	
	50-60	
.3	**Marital Status**	
	Single	
	Married + children	
	Married without children	
	Divorced or widow(er)	
.4	**Education**	
	Up to 12 years	
	13-15 years	
	15 or more years	
.5	**Employment**	
	Employed	
	Unemployed	
	Self-employed	
	Salary employed	
	other	
.6	**Income – the average monthly income is 10,920 NIS per family. How would you define your income?**	
	Less than average	
	average	
	Above average	
.7	**Religiousness**	
	religious	
	traditional	
	Non-religious	

Appendix 7 – Questionnaire for Measuring the Severity of PTSD (Foa, 1995)

PTSD Symptom Scale: Self-Report Version - PDS; Foa et al., 1997

The following questions include a list of complaints and reactions by people who went through a harsh event. Please read the sentences below and estimate the number of times you have experienced the reactions during the last month, regarding the harsh event you went through.

In order to remove doubt, please indicate which event (_____).

	Never or just once	**Once a week or less**	**2-4 times a week**	**5 times or more a week**
1. Last week, did you have images or emotional thoughts from that event even when you didn't want this?				
2. Last week, did you have nightmares concerning the event?				
3. Last week, have you re-experienced the event, behaved or felt like it happens to you again?				
4. Last week, have you experienced inflaming emotions such as fear, anger, sadness or guilt, which reminded you of the event?				
5. Last week, have you experienced physiological reactions such as over-perspiration or fast pulse when reminded of the event?				
6. Last week, Have you tried to avoid thinking or feeling things concerning the event?				
7. Last week, have you tried to avoid activities, people or places which reminded you of the event?				
8. Last week, did it happen that you were unable to recall an important part of the event?				
9. Last week, Did it happen to you that you were less interested or participated less in important activities?				
10. Last week, have you felt distant or disconnected from people around you?				
11. Last week, have you felt lack of sensitivity (for example, you couldn't weep or love)?				
12. Last week, have you felt that your future programs or hopes shall not be realized (for example, regarding profession, family etc.)?				
Last week, Did you have difficulties falling asleep or staying asleep?				
14. Last week, have you become irritated easily or had seizures of anger?				
15. Last week, did you have concentration difficulties (for example: in conversations with people, watching TV or reading)?				
16. Last week, have you felt too much "readiness" (for example, you were checking who were the people in your neighborhood, or was "in readiness" when driving?)				
17. Last week, have you been jumpy or easily terrified (for example, You jumped following a sudden noise)?				

Cutoff mark – 14

Appendix 8 – Self-Report Questionnaire for Measurement of Emotional response (for intervention group only)

This questionnaire shall be asked orally and filled by the experimenter, once in the beginning of the session (after recalling the stimulating image) and once at the end of the Visual Swish procedure (after recalling the image again)

First Questioning

When you think about the annoying image now, how would you describe your feeling at a scale of 1 to 10:

Comfortable (1) ---------- Anxious (10) _____ (indicate estimate)

Good (1) ---------- Bad (10) _____ (indicate estimate)

Calm (1) ---------- Very Tense (10) _____ (indicate estimate)

Second Questioning

When you think about the annoying image now, how would you describe your feeling at a scale of 1 to 10:

Comfortable (1) ---------- Anxious (10) _____ (indicate estimate)

Good (1) ---------- Bad (10) _____ (indicate estimate)

Calm (1) ---------- Very Tense (10) _____ (indicate estimate)

Appendix 9 - Self-Report Questionnaire for Measurement of Emotional response (for control group only)

*Participants were exposed to Visual Swish only after a silence of 10 minutes.

This questionnaire will be filled after a third exposure to the stimulating image.

Third Questioning

When you think about the annoying image now, how would you describe your feeling at a scale of 1 to 10:

Comfortable (1) ---------- Anxious (10) _____ (indicate estimate)

Good (1) ---------- Bad (10) _____ (indicate estimate)

Calm (1) ---------- Very Tense (10) _____ (indicate estimate)

Appendix 10 – Introspective Interview

This interview is being done and recorded by the experimenter.

I would like to ask you a few questions about the experience you went through:

1. Was there a change between your feeling when looking at the image and your feeling now?

2. What did you think about during the process?

3. What did you feel during the process?

4. Did you have a pleasant feeling during the process or did you feel uncomfortable (we mean the process which the participant underwent rather than the image)?

5. Would you like to mention any additional comments?

Appendix 11 – Telephonic questioning about two months after going through the process:

Fourth Questioning

Date of session: _____

Date of questioning: _____

Time elapsed between two questionings: _____

When you think about the upsetting image now, how would you describe your feeling at a scale of 1 to 10:

Comfortable (1---------- Anxious (10) _____ (indicate estimate)

Good (1) ----------Bad (10) _____ (indicate estimate)

Calm (1) ---------- Very Tense (10) _____ (indicate estimate)

When thinking about the time elapsed since the session, in the context of the memory and the image which was recalled, please describe the change (if any) in your reaction to the image.

_____

_____

_____

Give some examples

_____

_____

_____

Appendix 12 – Execution Protocol for the Experimenter

Hi,
Experimenter introduces himself and says:

"As part of a doctorate research thesis in the Tel Aviv University Faculty of Medicine by Yfat Weinstein-Zohar, we investigate a therapeutic procedure involving change of reaction and emotional arousal connected with exposure to mental images. Therefore we will start by filling an informed consent form, followed by two general questionnaires. Then I am going to connect you to the bio-feedback device in order to examine your physiological reaction to the upsetting image".

Experimenter's actions:

1. Getting the participant to sign an informed consent from.
2. General background questionnaire.
3. Questionnaire for measuring the severity of PTSD.
4. A short explanation: "Soon I am going to connect you to the bio-feedback device, and then I will ask you to start thinking about the unpleasant/harsh image. I will ask you a few questions, and then we will start the process. Is this OK?"
5. Connecting to the bio-feedback device.
6. Application of the Procedure – association with the harsh image.
7. Measurement of arousal in the bio-feedback device.
8. Self-Report questionnaire for measuring the amount of emotional response. (**First** questioning).

Control Group	Intervention Group
9. Experimenter guides the participant to think about the image for 10 minutes without doing anything else, while he goes out of the room.	9. Intervention with the Visual Swish process.
10. After 10 minutes, experimenter comes back. Second recall of the upsetting image – measurement of arousal in the bio-feedback device.	10. Second recall of the upsetting image – measurement of arousal in the bio-feedback device.
11. Self-Report questionnaire for measuring the amount of emotional reaction (**Second** questioning).	11. Self-Report questionnaire for measuring the amount of emotional response (**Second** questioning).
12. Intervention with the Visual Swish process.	12. One out of five participants fills out the introspective interview.
13. Third recall of the upsetting image – measurement of arousal in the bio-feedback device.	13. Finally – giving a book to the participant.
14. Self-Report questionnaire for measuring the amount of emotional reaction (**Third** questioning).	
15. Finally – giving a book to the participant.	

Appendix 13 – Informed Consent Form

Informed Consent Form for Participation In a research

I, the undersigned:

Family Name _____ First Name _____ ID number _____

Address _____ Zip _____

Hereby declare that:

a) I agree to take part in the research _____, according to the details in this document.

b) It has been explained to me by [Researcher's Name] _____ as follows:

1. That the researcher _____ has got approval to conduct the research.
2. That the research is in the subject of emotional arousal.
3. That I am free to stop my participation in the experiment at any time.
4. That secrecy regarding my personal identity in scientific publications is guaranteed.
5. That I can turn to the researcher _____for further consultation regarding any problem related to the research.

c) I have been given detailed information about the research, in particular the following details related to the goals of the research, methods, expected duration, common hidden risks and discomfort which may be caused.

d) I have agreed by my own free will, having understood all of the above.

_____ _____ _____

Name of research participant Signature Date

(e) Researcher's declaration

I have received the above agreement, after having explained to the research participant all of the above and made sure that all my explanations were understood by him/her.

_____ _____ _____

Name of explaining researcher Signature Date

Appendix 14 – Calculation of Feel correlation

Table 11 – Correlation between Feelcomf-Feelgood-Feelcalm

Experiment/control group	N	Feelcomf / Feelgood	Feelcomf / Feelcalm	Feelcalm / Feelgood
Measurement 1 (before intervention/placebo)	**52**	**.73**	**.81**	**.88**
Measurement 2 (after intervention - intervention group/ after placebo – control group)	**52**	**.98**	**.98**	**.97**
Measurement 3 (after intervention - control group)	**25**	**.91**	**.94**	**.97**
Measurements 2,3 (Experiment – measurement 2 after intervention and control – measurement 3 after intervention)	**51**	**.94**	**.93**	**.95**
Measurement 3,4 Follow-up for both groups	**46**	**.93**	**.97**	**.95**

Table 11- Measuring correlation (pv<0.01) between the three components of the subjective report (Feelcomf-Feelgood-Feelcalm) by the Spearman test for ordinal variables (without normality assumption). Findings of the analysis point at high correlation values between the variables. This data supports calculating a mean value of the three variables while turning them into a single value (table 7) (feelcalmn+feelgoodn+feelcomfn)/3, when n=1, 2/3 or 4.