A methodology for registering and interpreating affective countenance as exposed in view through two different types of psychotherapy.

Certified psychologist, spec. of
clinical psychology, Certified psychotherapist

Word count (exc. figures/tables): 4659

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Abstract:

Objectives and methods

The objectives of the present study were to test a recording method for evaluation of

psychotherapy in itself. A method was therefore applied to the study of the change in affective

state in two clinical treatment groups in an ordinary psychotherapy department for outpatients.

Data were collected from affective expressions, according to Silvan Tomkins´ theory of nine

inborn affects. Therapy sessions for twenty consecutive patients were video recorded in an

ordinary psychiatric clinic for outpatients. The patients engaged were undergoing psychodynamic therapy (PDT) and cognitive behaviour therapy (CBT) respectively.

Design

Video-recorded clinical therapy in an ordinary treatment department and patients with no severe personality disturbances.

Results and conclusions.

Based on the results of the clinical study, the conclusion is that it is possible to evaluate psychotherapy treatments by recordings of a client's anatomical facial action and his/her possibility to reach the affect category *positive* after treatment.

With the quantitative method of measurement as a point of departure, the result shows a significant probability that a continuous realized therapy reach the affect category *positive* for the therapy method psychodynamic therapy (PDT) and cognitive behavioural therapy (CBT) taken together, though (PDT) supply a better result after therapy.

Practitioner's points

Differentiate the basic and inborn affects is important for a success in therapeutic work. From the perspective of affect investigation in psychodynamic therapy (PDT) and cognitive behaviour therapy (CBT), the difference in affect development in the two treatment groups were studied by an objective method for recording affective facial expressions. PDT displays a positive result after concluded therapy.

Keywords

Objective registering, affects, facial expressions, psychodynamic therapy, cognitive behaviour therapy, inter-subjectivity, change after therapy.

Introduction

This study will present an instrument, an objective method, making it possible to evaluate psychotherapy treatment in itself. Two different types of psychotherapy were used for testing, by recording facial expressions during the therapeutic process.

The theory behind recording facial expressions derives from Silvan Tomkin's (1962, 1963, 1991) propos that the "affect system," in contrast to the drives, is temporally unattached, and thus a human's "primary motivation system". Furthermore, Tomkins maintained that what we identify, through observation, as affectional expressions in infants as well as in adults, primarily emerge as expressions in the face and the eyes. Tomkins specifies the following nine affects and their main identifying features:

Interest/excitement: eyebrows down, tracking behaviour, looking and listening.
Enjoyment/joy: smile, lips widened and out, slow deep breathing.
Distress/anguish: crying, arched eyebrows, corners of the mouth turned down, tears and
                     rhythmic sobbing.
Anger/rage: frown, jaw clenched, face (turns) red.
Surprise/startle: eyebrows up, eyes blink.
Fear/terror: eyes frozen open, pale, cold sweaty, facial tremble.
Shame/humiliation: eyes cast down, head down.
Disgust: sneer, upper lip raised, eyebrows pulled down.
Dissmell: drawing the head and body away from the bad smell.

In therapy, the patient supplies messages from memory or previous experiences which can activate the negative affects *fear, anger, distress, disgust, dissmell* and *shame*, which in turn may interfere with ongoing purposeful therapeutic activity. All central assemblies in therapy involve

consciousness, but only when there is some aim to be fulfilled and an attempt to reach this goal does a central assembly operate on feedback principles. Another aim is to build motivation in the patient so that s/he can tolerate the punishing negative affect involved in the working drama (Demos, 1995).

From the perspective of affective focus in therapy, the therapist's object is to guide the client towards the positive affect *interest/excitement* and the positive discharge affect *enjoyment/joy* (Tomkins, 1995; Stålfors & Sandahl, 2008). The intention of this is to give the client the experience of differentiating the present affects during therapy through the understanding provided by the therapist. Through this experience of affective states, shown unconsciously in the face, the client's self-understanding is increased. By this the therapy creates an opportunity to alter the therapeutic relation, and thereby all other relations (Schanche et al., 2011).

From earlier clinical experiences and a study of affective oriented therapy (Stålfors & Sandahl, 2008) we have developed a model for psychotherapeutic use (Stålfors, 2013). Besides the discharge affect *enjoyment/joy,* this model includes three categories of affective state. The category level reflects the degree of severity of the psychopathological state in which the patient may live. This is a question of the (lay-out of the) therapeutic work. For instance, if the patient begins her/his therapy in the *Negative Grand* category (III), where the affects *dissmell* and *disgust* predominate, this means that s/he has severe and difficult acting-out problems to handle. If the patient begins her/his therapy in the *Negative Severe* category (II), where the affects *surprise, fear* and *shame* predominate, the patient's state could change between shame and occasionally fear. For a child, the negative affect *anger/rage* has an innate position in the *Positive* category I, but the affect may change its place to Category II in connection with the socialisation process. In Category I, where *interest/excitement, enjoyment/joy* and *distress/anguish* in a mild shape predominate, the affective state is characterized by an open restitution for all affects. A

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proposal for the affect *distress/anguish* to belong to this category is that we all live with this affect from the beginning of life (the birth cry) until death with the feeling of mourning in case of loss and regret (Nilsson, 2014). For the study we selected patients without severe personality disturbances belonging to Category II.

Objects and hypotheses

The object of the present project was to test this evaluating instrument in studying the change in affective state in two clinical treatment therapy groups of outpatients from ordinary psychiatric clinics. The two treatment groups were one, Cognitive Behaviour Therapy, CBT, with the limitation of ten sessions, and the other, Psycho-Dynamic Therapy, PDT, with no limitation. The performance for the two treatments, is grounded in scientific research for respective PDT and CBT.

The general point of departure was that both CBT and PDT processing with unconscious emotional transference on the therapist and the trend in the therapy is an affective strive towards Category I, *Positive*, which thus consists of the affects *interest/excitement, distress/anguish* and, in addition, the discharge affect *enjoyment/joy.*

Measuring facial movement

The method of describing facial movement is based on an anatomical analysis of facial action, the facial action code system (FACS), constructed by Ekman & Friesen (1978). Since every facial movement is the result of muscular action, it is possible to list names and anatomic bases of each action and give the muscles numbers and then impartially classify specific muscle combinations into emotion categories. In our measurements, we have combinations of more than one muscle and sometimes the inner or outer portion of the same muscle working in an action

unit, which implicate the emotion. An example: In our study we got the action unit of 23C + 38D which means the affect name; anger/rage, the number for the muscles and the letter for its tension.

Two therapeutic treatment methods

We <u>examined our methodology</u> by video-recordings from clinical therapies for two kinds of therapy, CBT and PDT. From the perspective of CBT, with its top-down working model (Nilsson, 2011) the main point is focused at thoughts and assumptions. The suffering that brings the patient to therapy is conceived as a result of incorrect learning, beyond her/his cognitive progress. The therapy focus is behaviour change through allowing the patient to test his/her pathological cognitive thoughts and/or behaviour, by confrontation of the upsetting stimuli in small steps, with support of the teaching therapist (Beck, 1995). The working process in CBT is new appropriate learning, which reduces the patient's dread. CBT today has on an interesting way directed the method towards integration of emotions in the treatment. New learning postulate activation of the whole body of man, the whole system; emotions, body thoughts, behaviour. As LeDoux formulate it, the therapeut need to help the patient to consciously *wake up* and *activate* the patients negative affects. Nothing can be learnd if the affects are strong negative (Kåver 2016).

From the perspective of PDT, with its bottom-up working model (Nilsson 2011), a central element here is that the patient converts his/her inner conflicts on the therapist. The other element in the therapy treatment is the relation between the therapist and patient. In the transference process insufficient care from childhood is processed. In the working process the primary goal is to strive for positive affects at the cost of negative ones (Tomkins, 1995) and an increased inter-subjective and positive relationship (Fosha, 2000,).

Data and methodological procedure

The research plan for testing the instrument was presented to interested therapists in a number of open psychiatric clinics for outpatients in a region in northern Sweden. A group of twelve therapists accepted participation in the study. The therapist's first task was to meet the patient on two occasions to determine if s/he was considered suitable to participate. After that, the therapist asked the patient if s/he would like to participate in the study and being video recorded during their therapy work. All the patients were well informed that their engagement was quite voluntary, and that s/he could turn off the camera without losing his/her therapy. The inquiry applied was based on a standardized questionnaire, approved by an ethics committee.

The video camera was placed behind the therapist and focused on the patient's face. The camera was started when the patient entered the treatment room and stopped after ten minutes (Ekman 2003). This procedure was repeated at every session. The camera was managed by remote control to minimize disturbance in the therapy work and the recordings were stored on videotapes and then transferred to DVD for further working up in slow motion on a computer for registration of emotions (FACS, see below).

The study consisted of two parts. The first one examined differences in the patients' affective states in the beginning of the therapy compared to the end of the completed therapy (statistic of probabilities, see below), taking CBT and PDT methods together, the second one whether there was any difference between the two treatment methods concerning the patients' affective state before and after therapy.

The collection of data were standardized and for the analyses a quantitative method was chosen (McBurney, 1994). Paul Ekman has developed a method to assess affects by looking at facial activity: the Ekman-Friesen Facial Action Coding System (FACS, Ekman & Frisen, 1978). This method is based on Tomkins' theories. This method will separate the detection of visible facial

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mimic movement and the relevance and reliability for the method has been deemed to be good (Steimer-Krause et al., 1990).

n the study, the recording of facial affectional activity began as soon as the client and the therapist met each other for the therapy session. At this occasion, the client would express her/his affective message immediately in form of an unclouded affect. Also at this occasion, the primary affect expression from the client could be expected to be relatively free from influence of the therapist. This is also assumed to reflect her/his "nuclear script," which refers to an early, fundamental affect pattern imprinting that consists of strong personality traits in the individual (Tomkins, 1979; Monsen & Monsen, 1999). Another reason why this measuring point could be expected to be optimal in the beginning of the therapy session is, that between therapy sessions the patient is alone and their affective tides are running strong (Wallin, 2007). So, this moment was of great interest to catch.

As said above, the video camera recorded the first ten minutes of each therapy session, and a clip of 30 seconds was extracted 4 minutes from the beginning of the recording. These 30 second extracts were examined for facial muscle activity and corresponding affects. The length of the video recording at every session was established from experience of how long it will take for the patient to come into the therapy room, sit down, take a chair and begin to show his/her primary affective expressions.

After collection of data from all therapies was concluded, we had 10 PDT therapies consisting of 30 video recordings of 30 seconds and 10 CBT therapies consisting of 10 video recordings of 30 seconds. To get the data from the two treatment groups comparable, we carried out a sampling procedure. From the PDT treatments we collected video recordings from each session from the beginning, the central part and from the concluding part of the therapy.

The DVDs containing recordings were sent for noting to a laboratory (Visual Emotion LLC,

USA). A reading was done of the 30 second extracted recorded videotapes in slow motion, in this case at every hundredth of a second. The registrar noted every face muscle activity from a five-step scale: minimal – visible – convincing – great deviation – optimum. From level convincing to a stronger indication, the muscle activity was registered in a straight manner: working or not working muscles under second 1, 2, 3 and so on up to 30 seconds. The data supplied from the registrar consisted of the number of working muscles noted at second 1 and so on for every sampled therapy session. For PDT, it meant 30 registrations of a couple of muscle activities for 30 therapy sessions and for CBT, 30 registrations of a couple of muscle activities in 10 therapy sessions. Notable is that the registrar had no information about the aim of the study and that she knew neither the recorded clients nor the kind of therapy.

Subjects – patients and therapists

All patients in the present research project came from an ordinary, medium-size community in northern Sweden as consent patients. None of them made an active choice of treatment method they were just invited for therapy. Twenty patients between 23 and 63 years of age were recorded. The majority were women (75%) of which 70% were married. Seventy-five per cent had children and most of them a higher academic education; 80% were employed. Ten per cent were undergoing psychopharmacological treatment. The following DSM-IV axis I diagnosis were represented: Dysthymic disorder n=11, Depressive disorder n=9. There were no differences in description of the diagnosis between the two treatment groups of patients. The diagnoses were established by the clinic according to prevailing professional procedures. Those two diagnoses were common at these open clinics as well as for the selected therapists. The diagnoses were equivalent with *negative* affects Category ll. The idea was to avoid diagnoses of which the therapists had little experience, such as diagnoses equivalent with *negative* affects Category lll.

The patients met for therapy once a week. The CBT treatments consisted of ten sessions, worked after prevalent praxis, grounded on the theory that it is sufficient to attaining behavioural change for the two kinds of diagnoses mentioned above. The PDT treatments, performed according to prevalent praxis grounded on theories of unconscious emotional conflicts, were always longer. The end point for the PDT treatments taken into account in the study was session 30.

A total of ten therapists were engaged, all with a university education, complemented with at least a basic education in psychotherapy. The therapists completed therapies with two patients. Five of them practised CBT, and five practised PDT.

Arrangement and Statistics.

 In our procedure, we summate all the negative affects (Category II) and study the trend towards the positive affects (Category l), for the patients. The affective statements along the therapy process are not presented in this study.

The following statistical methods were applied: In a logistic regression analysis for repeated measures, we compared the two treatment methods to determine the probability that a certain phenomenon would occur, in this case the probability that the treatment would end in the affect Category I, *Positive.* The McNemar test was employed to assess differences between the outcomes for Category I, *Positive* affect at the first occasion the category is coded against the last occasion (Appendix A).

Results

The point of departure was to test the recording method in itself. For this aim, differences in the affect patterns between the beginning and the end of the completed CBT and PDT treatments taken altogether, were searched for. The affect patterns in the form of average values for both
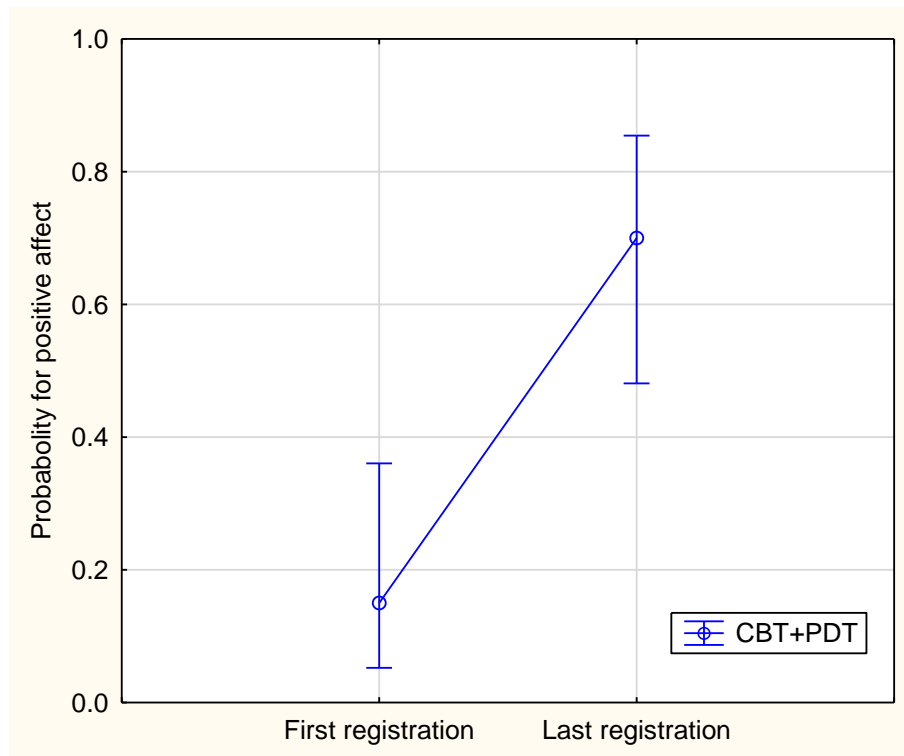
groups, are here presented in Figure 1.

Figure 1. The probability for the affect to be positive with 95% confidence interval: first registration 0.15 (0.0524 0.3604) and last registration 0.70 (0.481 0.8545).
A statistical significant difference between the first and last registration can be demonstrated, p=0.0023.

Within the analysis of the trend for both groups taken together, we can determinate an increased probability for a positive affect (p=0.0021). The trend effect is illustrated in Table 1 "Score Statistics for Type 3 GEE Analysis" (Appendix A).

When using our methodology for affective recording, we find that the overall increase in the category positive affect for both groups can, in many respects, be attributed to the effects of PDT treatment. The data in Figure 2, seems to express an obvious change of probability over time for a positive affect from 0.1 at the beginning of the therapy to 0.9 at the last registration. The probability of this trend is significant to a p=0.0018. For the CBT therapy, the probability to

register a positive affect increases from 0.2 to 0.5. The probability for a trend by CBT method is

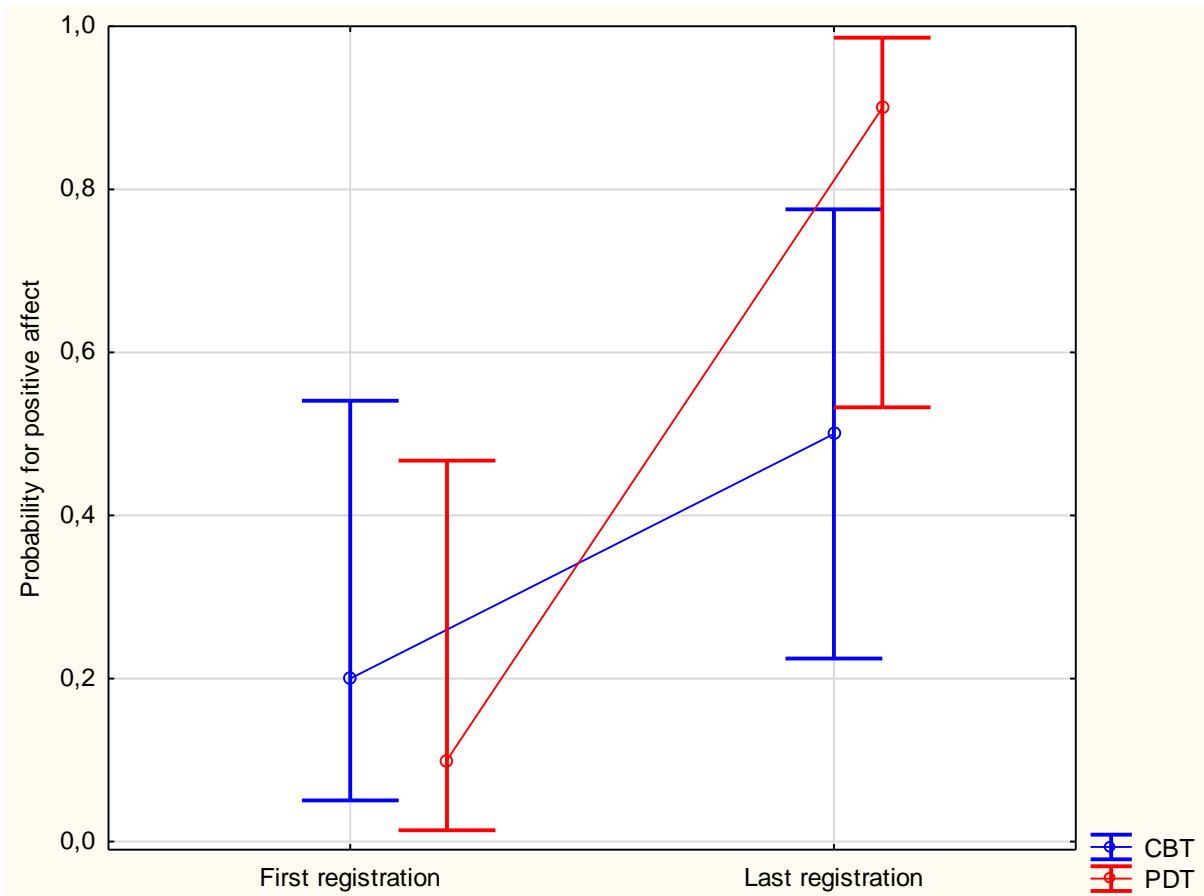not significant with a p=0.17 (Appendix B).

Figure 2. Instruction of the first and the last recording of the CBT group and PDT group average values. The probability for the affect to be positive with 95% confidence interval: CBT start therapy 0,2 (0.05 0,54), finish therapy 0,5 (0,22 0,78) PDT start therapy 0,1 (0,01 0,46), finish therapy 0,9 (0,53 0,98). Only the PDT therapy is significant. There the two lines cross eeach other, means there is not difference in the probability to attain positive affect.

It would be desirable to study the integration effect between trend and therapy for the two

treatment groups. This was not possible because of lack of data. To do that we need to expand

our sample by at least 5 patients in each treatment group CBT and PDT.

Discussion

The clinical method applied makes it possible to evaluate psychotherapy treatment empirically/objectively in itself. The evaluation was not the aim for this study, but let us illustrate how a discussion could convey.

We tested the instrument on a psychiatric clinic for outpatients. To my knowledge no previous clinical research has examined the outcome of therapy by using an objective recording of affects expressed in the face as was done in this study.

In our investigation area, northern-Sweden, two treatments methods were available.

In taking the CBT and PDT groups together a positive affect could be registered at the cost of negative ones in the last session (Figure 1, Appendix A, Table 1). This means achieving Category I, p*ositive – interest/excitement, distress/anguish* and *enjoyment/joy* – more often than Category II, *negative severe – surprise/startle, fear/terror, shame/humiliation* and *anger/rage* – plus Category III, *negative grand – disgust* and *dissmell* – taken together.

When we took the second step and compared the two treatment groups for the possibility of achieving Category I, we noticed a better opportunity for PDT than for CBT, which is clearly illustrated in Figure 2.

With application of the method for recording facial affects, our interpretation of the outcome of this study is that PDT treatment gives the patient a major alternative to reach positive affects. The difference between the treatment methods may be understood as follow:

Given the focus on cognition and influence of the patient's thought patterns in CBT, it will eventuality create a something more silent face (an intellectual/cognitive transference instead of an emotional) from the therapist that withdraws the patient and confirms her/his affect-driven belief that isolation is justified (Nathanson, 1992).

The psychodynamic theory has grounded its understanding of the patient-therapist relationship to

transposing relational conditions, conductive to the patient´s optimal safety, exploration and growth (Fosha, 2000). For that climate to be optimum, what Nilsson (2005) names "affect contagion" in the transference from the patient, the patient need help with affective discharge from the therapist. As an explanation for trouble to progress positive affects, may be the sense of allians, witch was perhaps not strong enough for the extent of the emotial problems.

The psychodynamic therapist is a projection object for the patient's rapid affective reactions, and will detoxify the affects, which lets the patient progress slowly along the pathway, thus towards Category I. Perhaps the cognitive therapist, misses the patient's rapid inundated affects because of his/her focus on cognition and its capacity to lead the patient to an affective feeling of enjoyment. According to the results of this study, the CBT therapist had problems allowing the patient to accomplish the positive affects, Category I. But again, it´s important to remember that the aim of this study was not to compare the treatment methods, instead illustrate how this instrument will operate.

One weakness of the layout of the study is the limited size of the sample. A greater size should probably facilitate the statistical analysis for trends and differences for the two treatment groups. Another formal weakness is that the patients were not randomized to the two treatment groups. This was not possible for a study on ordinary psychiatric outpatients. With these weakness taken into consideration and focus instead on the process adjusting instrument in itself, an objective measuring method, most likely are of clinical interest for the study and analysis of clients' affects changeable in psychotherapy.

An enlarge interest to bring affects into treatment methods will be observanced in several theoretical stream today. In the CBT tradition Barlow has picked up affects in treatment. The study of affect psychology has experienced completion from biology, affective neurological science. In the collaboration between brain and body arises the feeling/emotion, postulates

Damasio (1999). Planksepp and Schore (2004 and 2012) is another scientist in this field of research.

Appendix A

Score Statistics For Type 3 GEE Analysis			
Source	DF	Chi-Square	Pr > ChiSq
t	1	9.42	0.0021
Treat	1	0.45	0.5003
Treat*t	1	2.41	0.1204

Table 1. The analys of the trend for registration positive affect for the treatment groups CBT and PDT (t) taken together is significant to p=0,0021. Other data are not of interest for testing the hypotheses.

Appendix B.

Analysis Of GEE Parameter Estimates							
Empirical Standard Error Estimates							
Parameter			Estimate	Standard Error	95% Confidence Limits		Z	Pr > |Z|
Intercept			0.0000	0.0000	0.0000	0.0000	.	.
Treat	0		-0.0000	0.6325	-1.2396	1.2396	-0.00	1.0000
Treat	1		2.1972	1.0541	0.1312	4.2632	2.08	0.0371
Treat*t	0	1	-1.3863	1.0124	-3.3706	0.5980	-1.37	0.1709
Treat*t	0	2	0.0000	0.0000	0.0000	0.0000	.	.
Treat*t	1	1	-4.3944	1.4055	-7.1491	-1.6398	-3.13	0.0018
Treat*t	1	2	0.0000	0.0000	0.0000	0.0000	.	.

Table 2. The analysis of the probability for a trend towards registration positive affect for the two tereatment groups CBT (Treat*t 0) and PDT (Treat*t 1) separated. For the CBT group we can not see any trend, p=0,1709. The PDT group can show a probability for a trend with p=0,0018. Remaining data are working up for settle the probability to positive affect at the last and first therapysession for both therapy methods each.

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