

**Changes in symptom intensity and emotion valence during the process
of assimilation of a problematic experience: A quantitative study of a
good outcome case of CBT**

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Abstract: The assimilation model describes the change process in psychotherapy. In this study we analyzed the relation of assimilation with changes in symptom intensity, measured session by session, and changes in emotional valence, measured for each emotional episode, in the case of a 33 year old woman treated for depression with cognitive behavioral therapy. Results showed the theoretically expected negative relation between assimilation of the client's main concerns and symptom intensity, and the relation between assimilation levels and emotional valence corresponded closely to the assimilation model's theoretical feelings curve. The results show how emotions work as markers of the client's current assimilation level, which could help the therapist adjust the intervention, moment by moment, to the client's needs.

Keywords: Assimilation Model, Change process, Cognitive-Behavioral Therapy, Depression; Symptom Decrease; Emotional Valence

Introduction

The Assimilation Model (Stiles, 2001; Stiles et al., 1990) is a theory about the process of change in psychotherapy. This model explains change as a gradual integration of problematic experiences into the self in a regular sequence of stages (Stiles et al., 1990). Associated with this assimilation sequence is a distinctive pattern of affective changes (Stiles, Osatuke, Glick, & Mackay, 2004).

Previous case studies (Honos-Webb et al., 1998, 1999; Stiles, 2006; Stiles et al., 1991) as well as group comparisons (Detert et al., 2006) have confirmed that good-outcome cases tend to achieve higher levels of assimilation than poor-outcome cases. We extended this by quantitatively and longitudinally examining two processes that are theoretically associated with the assimilation of problematic experiences: changes in symptom intensity and changes in emotion valence (Stiles et al., 2004). We studied

these processes session by session in a good-outcome case of cognitive-behavioral therapy (CBT).

The process of assimilation in psychotherapy

In the Assimilation Model the self is seen as multivocal, composed of several, sometimes contradictory internal voices (Honos-Webb & Stiles, 1998; Honos-Webb, Surko, Stiles, & Greenberg, 1999; Stiles, 1999). Each voice is composed of traces left by previous experiences (Stiles, 2011). The multiple voices interact with each other forming an organized structure, a community of voices that comprises the person's usual self (Honos-Webb & Stiles, 1998). The voices are agentic entities that function as psychological resources--activated and used as required in each new situation. When the situation resembles that in which particular voices were formed, these voices are activated and step forward, bringing to bear the relevant past experiences on the present situation (Detert et al., 2006; Stiles 2011).

Some voices, however, jeopardize the stability of the community. These problematic voices represent experiences that are incompatible with the usual self (e.g., traumatic incidents, destructive relationships, threatening or painful situations). Although all voices, including problematic voices, try to be heard when relevant circumstances arise, in the case of problematic voices, the incompatibility leads to rejection, avoidance, or dissociation of this voice. The emergence of such a problematic voice in consciousness causes a painful internal conflict between voices (Honos-Webb & Stiles, 1998). On the other hand, when problematic voices are dissociated or avoided, important experiences are disregarded and valuable resources are unavailable. Clinically significant problems tend to occur when the self-community of voices becomes

restrictive or inflexible, and the same voices assume over and over again a dominant role (Stiles, 1999).

Psychotherapy promotes integration of problematic voices into the self-community by the creation of links between them (Honos-Webb, Surko, Stiles, & Greenberg, 1999). This ongoing process involves the development of a common language between voices, that is, the creation of meaning bridges--signs (words, gestures, images, etc.), that have similar meaning to both voices. The gradual emergence of meaning bridges permits dialogue and mutual understanding between the conflicting parts (Stiles, 2011). Building meaning bridges between the dominant voices of the community and non-dominant, problematic voices is the core of the therapeutic assimilation process; it is the mechanism of integration of previously disregarded voices into the self-community of voices (Stiles, 2011).

The assimilation of problematic voices seems to involve a developmental process, which can be assessed using the Assimilation of Problematic Experiences Scale (APES; Caro Gabalda & Stiles, 2009; Stiles, 1999; Stiles et al., 1991). As shown in Table 1, the APES tracks the assimilation of the problematic experience through eight levels or stages, numbered 0 to 7, which describe the changing relation of the problematic experience to the dominant self (0 = Warded off/Dissociation; 1 = Unwanted thoughts/ Active avoidance; 2 = Vague awareness/Emergence; Level 3 = Problem statement/Clarification; 4 = Understanding/Insight; 5 = Application/Working through; 6 = Resourcefulness/ Problem solution; 7 = Integration/ Mastery). Clients may enter therapy at any level, and any progress through the sequence may be considered as improvement.

A series of case studies has supported the assimilation model's contention that the process of change follows a common sequence approximated by the APES in a

variety of therapies. These include Emotion Focused Therapy (Brinegar, Salvi, Stiles & Greenberg, 2006), Client-Centered Therapy (Brinegar, Salvi, Stiles & Greenberg, 2006; Osatuke et al., 2005), Psychodynamic Therapy (Knobloch, Endres, Stiles & Silberschatz, 2001), Linguistic Therapy of Evaluation (Caro Gabalda, 2007), couple therapy (Schielke et al., 2011), and family therapy (Laitila, & Aaltonen, 1998), as well as CBT (Gray & Stiles, 2011).

Studies have illuminated a few distinctive aspects of the assimilation process in different therapies. For example, in one study clients with well formulated problems had relatively better results in CBT than in a psychodynamic-interpersonal therapy (Stiles et al., 1997). Plausibly, CBT focuses on problematic experiences that are clearly formulated and thus work better for problems at intermediate and higher levels of assimilation, whereas psychodynamic strategies emphasize problems that aren't yet formulated (Honos-Webb & Stiles, 2002).

The relation between assimilation and improvement

The assimilation model proposes that development toward higher levels of assimilation is associated with psychological improvement, including a decrease in symptomatology, as assessed with conventional symptom intensity scales (Stiles, 2006). This link has been shown empirically in numerous case studies (Stiles, 2001; see also citations in previous section) as well as in group comparisons (Detert et al., 2006). Studies of poor-outcome cases have shown how assimilation failed to progress to high levels (i.e., to APES \geq 4; Honos-Webb, Stiles, Greenberg, & Goldman, 1998).

At a fine-grained level, progress measured by the APES is typically irregular. Setbacks in the assimilation process, defined as movement from a higher APES level to a lower one in successive passages, are common in all therapies that have been studied

(e.g., Caro Gabalda & Stiles, 2013; Detert et al., 2006; Knobloch et al., 2001). Rather than representing something undesirable, setbacks, so defined, usually involve a subtle shift of topics, from a more assimilated to a less assimilated strand of a problem (Caro Gabalda & Stiles, 2013). Setbacks in cognitive therapies often seem to reflect active and directive therapeutic strategies used push the person to the limits of their comfort zone or to redirect attention to a new aspect of the problem. This yields an irregular progression through the APES: a sawtooth pattern with brief, rapid advances followed by setbacks within a broader pattern of APES progress (Caro Gablada & Stiles, 2013). By contrast, in experiential therapies, progress seems more steady, with slower advances and smaller setbacks (Osatuke et al., 2005).

Feelings and Assimilation

The assimilation process--the conflict and progressive understanding between voices described by the APES--involves powerful emotional forces. Theoretically, each level of assimilation is associated with a specific valence and intensity of feelings (Detert, et al., 2006; Stiles et al., 1991; Stiles, Osatuke et al., 2004). Of course, feelings vary in many ways besides salience and valence; arguably, each feeling is unique, reflecting the circumstances and content. However, the theoretical relation of these two aspects of feelings to assimilation level is interestingly systematic, as represented graphically in Figure 1. The S-shaped feelings curve represents the characteristic level of feeling at each assimilation level, in which "The client moves from being oblivious, to experiencing the content as acutely painful, then as less distressing, merely puzzling, then understood, and finally as confidently mastered" (Stiles et al., 1990, p. 411).

(Figure 1)

Theoretically, the feelings level is the product of the salience of the experience and its potential valence. The normal curve appearing in figure 1 represents the salience

or amount of attention paid to the experience. At low assimilation levels (APES 0 and 1) the experience is avoided, and at the highest level (APES 7) the experience is fully integrated and therefore unremarkable, so at these levels the salience is low. In the middle phase of the assimilation progress (from APES 3 to 5), when the experience is being clarified, understood and applied, salience is high. The ascending diagonal line represents the potential valence of a direct encounter with a particular problematic experience: negative at lower levels of assimilation, and positive at higher levels of assimilation. The feelings curve is obtainable mathematically by multiplying the salience and valence curves (Stiles et al., 2004, p. 97).

Psychologically, the feelings curve represents the client's reportable emotional experience that characterizes each assimilation level. To illustrate, consider a client who has lost a loved one (problematic experience). When the loss is at APES level 0 or 1, he avoids thinking about his loved one or about the event. Although the experience has a very negative potential, negative feelings are less strong because the client is not attending to it. At APES level 2, the client gains awareness of his loss and negative feelings emerge powerfully. At APES level 3, as the client clearly understands that he misses his loved one, his full attention is given to this experience; negative feelings are present but in a manageable way. For instance the client is able to go to the cemetery or talk about the deceased. At APES level 4, the client is able to understand that, although his loved one will always be missed, he can move on with his life. This entails mixture of positive and negative feeling; the client may feel pain for knowing that his loved one will never be back in his life and, at the same time tranquility for knowing that he can move on. At APES level 5 the client starts to put the new understanding into practice. For example, he is now able to resume activities he had stopped after the traumatic event. At APES level 6 the client is able to overcome his loss and recover his life. At APES 5 and

6 the client may have positive emotions, such as a sense of achievement and renewed enthusiasm for life. At APES level 7, the problematic experience is fully integrated. Although the client still misses his loved one, feelings tend to become more neutral, since this experience progressively has less impact in the client's life. Early work comparing APES ratings with sentence-by-sentence coding of affect was consistent with this account (Mackay et al., 2002).

The feelings curve helps to explain the interesting observation by Detert et al. (2006) that APES level 4 (insight/new understanding) seemed to represent a cutoff between conventionally-defined good and poor outcome cases. That is, the good outcome cases, defined in terms of achieving low scores on symptom intensity measures, reached at least level 4, whereas poor outcome cases reached at most level 3 (Detert et al., 2006). The feelings curve describes a nonlinear relation between assimilation and emotional suffering, which is presumably a large component of symptom intensity. Increasing assimilation may even entail an increase in distress across low (0-2) APES levels. Likewise, at high (6-7) APES levels, positive feelings may be level or decreasing (see Figure 1). Between levels 2 and 6, however, distress should decline, and level 4 (insight/understanding) is in the center of this range. Thus, Detert et al's. cut point at level 4 represents the theoretical center of the segment in which increases in assimilation are associated with decreases in distress. It is also the point at which the feelings curve passes from negative feeling to positive feeling (see Figure 1).

Research design and purpose

In this study we analyzed the progress of assimilation in a successful CBT clinical case, along with measures of symptom intensity and measures of emotional arousal during

sessions. This allowed us to assess the theoretical expectations that symptom intensity would decrease as assimilation of core problems increased and that emotion expression would conform to the theoretical feelings curve (Figure 1). Insofar as this was a theory-building study, we were interested in how our observations conformed to the theory or suggested elaborations or modifications, recognizing that any generalization proceeds from the theory, not from the results of this particular case (Stiles, 2015).

Method

Client

Laura (a pseudonym) was a 33-year old Portuguese woman, married and mother of one child. She participated in the ISMAI Depression Study (Salgado et al., 2010), a randomized clinical trial that compared the efficacy of Emotion Focused Therapy and CBT in clients diagnosed with mild or moderate Major Depressive Disorder. She was considered to be a good outcome case based on her scores on standard symptom intensity measures.

The inclusion criteria for the ISMAI Depression Study were: being diagnosed with Major Depression Disorder; Global Assessment of Functioning (GAF)>50; and not being medicated. The exclusion criteria were: currently on medication or another form of treatment; or currently or previously diagnosed with one of the following DSM–IV Axis I disorders: panic, substance abuse, psychotic, bipolar, or eating disorder; or one of the following DSM–IV Axis II disorders: borderline, antisocial, narcissistic, or schizotypal; or at high risk of suicide. The assessment was conducted by a clinician, a psychologist with 10 years of clinical experience. Laura met criteria for inclusion in the study after being diagnosed with moderate major depressive disorder assessed using the Structural Clinical Interview for the DSM-IV-TR (First, Gibbon, Spitzer, Williams &

Benjamin, 1997; First, Spitzer, Gibbon & Williams, 2002). She was randomly assigned to the CBT treatment. Laura received her treatment in the psychotherapeutic lab at Maia University Institute (ISMAI), Portugal, by a trained cognitive behavioral therapist, for 16 weekly sessions.

Laura's main concerns were related to her professional situation and her body image. She was having difficulties coping with the negative experience of having quit her job for health reasons and being unemployed since then (1 year previously). When Laura came to therapy, she was feeling depressed, tired, insecure, and low in self-esteem, which intensified her sense of guilt and failure. Her appetite and weight had increased, which contributed to her body-image issues. During the therapeutic process a conflict with her mother emerged. Laura's had not felt accepted and loved during her childhood, and at the beginning of therapy she complained about a critical and demanding relationship with her mother.

From the initial to the final phase of therapy, there was a significant decrease in symptomatology and an increase in her well-being, assessed by self-report questionnaires. The self-report questionnaires presented in Table 2 were all used to assess the evolution of symptoms and therapeutic outcome but in this study only BDI-II and OQ-10 were used for comparison with assimilation.

Laura improved in self-esteem and self-image which allowed her to invest in new professional goals. The therapeutic improvements were maintained 1 year after the end of treatment.

Therapy

The intervention used in Laura's case was based on a CBT protocol for depression proposed by Beck and collaborators (Beck, Rush, Shaw, & Emery, 1997) and adapted

within the ISMAI Depression Study (Salgado et al., 2010). CBT theory suggests that maladaptive emotions or behaviors proceed not from reality but errors in the processing of information about reality and that these errors originate in dysfunctional beliefs. The cognitive-behavior therapist and client collaborate first to determine which dysfunctional beliefs are sustaining the problem, then to change environmental factors contributing to the problem, and then, through cognitive-restructuring, to challenge the dysfunctional beliefs in order to create more adaptive ways of thinking, and consequently, more positive emotions and adaptive behaviors. From an assimilation model perspective, dysfunctional beliefs may be grounded in dominant rigid voices that bias the processing of information, leading to automatic thoughts. The more adaptive ways of thinking may be considered as new meaning bridges that encompass the previously problematic voices, turning them from problems into resources. These meaning bridges and the subsequent integration of the problematic voice into the community of voices promotes a change in the core maladaptive beliefs, transforming them into more adaptive and flexible views of the self and reality.

Symptom intensity measures

Beck Depression Inventory (BDI). The BDI-II (translated into Portuguese from Beck, Steer, & Brown, 1996 by Coelho, Martins, & Barros, 2002) is a 21-item self-report inventory designed to measure the intensity of cognitive, affective and somatic depressive symptoms. Items are scored from 0 to 3, so total scores can range from 0 to 63. Higher scores indicate greater severity of depressive symptomatology. The cut-off point for Portuguese population separating minimal from mild depressive depression is 13. The Cronbach's Alpha was 0.89 (Coelho, Martins, & Barros, 2002). The results

obtained in the Portuguese validation of BDI-II were congruent with the ones obtained in the American population (Coelho, Martins, & Barros, 2002).

Outcome Questionnaire-10 (OQ-10). The OQ-10 (Lambert, Finch, Okiishi, Burlingame, McKelvey, & Reisinger 1998) is a 10-item self-report inventory designed to assess psychotherapy outcome. Each item is scored on a scale ranging from 0 to 4 (total scored from 0 to 40). Higher scores indicate poorer mental health functionality.

The total score of the English version of the OQ-10 has a reported internal consistency (Cronbach's Alpha) of .88 (Seelert, 1997) and a test-retest reliability of .62 over a 3-weeks interval (Lambert et al., 2005).

Based on the ISMAI Depression Study sample (n=64; Salgado et al., 2010), we found that the internal consistency (Cronbach's Alpha) of the total score of the Portuguese OQ-10 ranged from .63 to .92 and the test-retest reliability that was of .74 over a 1-week interval. Following the procedures of Lambert and collaborators (2005), we found that the concurrent validity of the OQ-10 total score, as compared with the BDI-II was .82. Also following the Lambert et al. (2005) procedures, we assessed construct validity using a t-test for correlated samples, testing the hypothesis that symptoms decreased with therapy. A significant improvement, $t(48) = 10.72, p < .001$, was found from session 1 to 16, indicating good construct validity.

Process measures

Assimilation of Problematic Experiences Scale (Caro Gabalda & Stiles, 2009; Stiles et al., 1991). The APES was used to assess the levels of assimilation of the problematic experiences (described earlier; see Table 1).

Client Emotional Arousal Scale–III (CEAS-III; Warwar & Greenberg, 1999).

The CEAS-III assesses the quality and intensity of client emotions, classifying the emotion category (pain/hurt; sadness; hopelessness/helplessness; loneliness; anger/resentment; contempt/disgust; fear/anxiety; shame/guilt; anger and sadness; love; joy/excitement; pride and anger; contentment/calm/relief; pride/selfconfidence.) and the arousal level (i.e., intensity of that emotion). The arousal level is measure throughout a 7-point scale. Modal and peak expressed arousal are rated in each segment selected. The modal rating specifies the client's global level of expressed arousal in the selected segment. The peak rating indicates the highest level of expressed arousal in that specific segment (Greenberg, Auszra, & Herrmann, 2007). This is assessed through the evaluation of client's vocal and body expressions. Warwar and Greenberg (2000) described interrater reliability coefficients of .70 for modal and of 0.73 for peak arousal ratings.

Procedure

Outcome measurement

The BDI-II was administered immediately before sessions 1, 4, 8, 12 and 16. The OQ-10 was administered immediately before all 16 sessions.

Process measurement

Assimilation analysis. The therapeutic sessions were transcribed according to the procedures of Mergenthaler and Stinson (1992). Then, using the transcripts, the analysis of the case according to APES followed procedures used in previous studies (e.g., Honos-Webb, Stiles, & Greenberg, 2003; Stiles et al., 1991; Stiles & Angus, 2001). The 2 raters who did the APES ratings were a PhD student and a research assistant with a

Master's degree in clinical psychology. Both had had previous experience in the assimilation model and supervised experience in CBT. Training lasted approximately four months, during which raters met every week for 2 hours. The first part of training involved reading and discussing journal articles and previous rating manuals. Then, raters were given sessions to rate, initially together with an expert rater, and then independently to establish reliability. These practice ratings were compared with ratings of those sessions by an expert judge to assess reliability. Discrepancies were discussed in meetings of the raters and an expert judge and resolved by consensus. The coders were considered to be reliable and able to start coding the case when interrater reliability between each other and in comparison with the expert judge ratings reached $ICC [2,1] \geq .60$.

Following procedures described by Stiles and Angus (2001), first, all sessions were read by both raters and the recurring issues were identified. Then, by consensual judgment the most relevant themes were selected based on their clinical relevancy (high proportion of time spent in therapeutic sessions), and the non-dominant (problematic) and dominant voices were identified and characterized. In Laura's case, a single theme was selected because it was the focal problem across the entire therapeutic process. We characterized this theme as "perfectionism" since it represented the high demanding standards Laura imposed to herself in different intra- and interpersonal contexts, including her body image, her occupational performance and her relationship with mother. Since these standards were so difficult to achieve, Laura frequently felt she was failing, and this contributed to her feeling depressed. Laura's dominant voices could be characterized as saying, in various ways, "I must be perfect." The non-dominant (problematic) voices that emerged in various intra- and interpersonal contexts could be characterized as saying "I am failing." The sense she was a failure

(problematic voice) collided with her dominant voice of perfectionism: whereas the dominant voice required Laura to be perfect in all situations; the problematic voice appeared to point out Laura's failures in a variety of intra- and interpersonal contexts.

Based on multiple readings and process notes, the raters identified excerpts in the transcripts where the perfectionism theme appeared. Then, the raters independently coded the excerpts according to the APES, identifying APES passages and the assimilation levels. The unit of analysis for the APES ratings was the passage (Honos-Webb, Stiles, & Greenberg, 2003). The raters coded a new passage every time there was a change on a topic, in the assimilation marker (see Honos-Webb, Lani & Stiles, 1999) or in the assimilation level (Honos-Webb et al., 2003). Disagreements were resolved by consensus between judges (see Hill, Knox, Thompson, Williams, Hess, & Ladany, 2005). The interrater reliability (before consensus discussions) calculated using the Intraclass Correlation Coefficient, ICC (2,1), which gives the average reliability between raters (Shrout & Fleiss, 1979), was high (ICC [2,1] = .93). The reliability between coders was calculated on 100% of the material.

We found 629 passages representing the theme perfectionism in Laura's therapy. These were distributed irregularly throughout the 16 sessions; however every session included at least 22 passages.

CEAS-III. CEAS-III coding followed the two-part procedure used in previous studies (Missirlan, Toukmanian, Warwar & Greenberg, 2005). First, each client emotional episode was identified. Second, in each emotional episode, the client's primary emotion was coded for its intensity (modal and peak emotional arousal) and its valence (positive or negative; Warwar & Greenberg, 1999). For our valence ratings, negative emotions included: pain/hurt; sadness; hopelessness/ helplessness; loneliness; anger/resentment; contempt/disgust; fear/anxiety; shame/guilt; anger and sadness.

Positive emotions included: love; joy/excitement; contentment/calm/ relief; pride/self-confidence; and pride and anger. Note that we considered anger associated with pride as a positive emotion because we viewed it as an adaptive or assertive anger, a very important emotion in the therapeutic change process (Pascual-Leone & Greenberg, 2007), particularly in cases where clients have difficulty in expressing their needs or state their rights.

For emotional intensity, each emotional episode was rated in terms of modal and peak emotional arousal.

The CEAS-III raters included three PhD students and one Master's student in clinical psychology, all with clinical experience and three with supervised experience in CBT. The four raters were divided into two pairs to optimize resources. Three of the raters applied only the CEAS-III. The fourth rater applied both the APES and CEAS-III (this rater coded 38% of the CEAS-III material). This person completed the APES rating before beginning CEAS-III coding. The previous knowledge this rater had of the APES coding could have influenced the CEAS-III results. To prevent and diminish this possible bias, the main rater, who was unaware of the APES rating, supervised all the CEAS-III codification.

CEAS-III training lasted approximately 2 months (weekly meetings of two hours). Raters first read and discussed journal articles. Then, they viewed videotapes of therapeutic sessions and discussed the presence of each emotional episode, its category and intensity. Afterwards, independently, raters coded the same sessions in order to establish reliability. Raters discussed any discrepancy that appeared and disagreements were resolved by consensus. When raters mastered the coding of the CEAS-III they

were given the sessions to code. For that they had to achieve a good inter rater reliability (Cohen's $\kappa \geq 0.75$)

The unit of analysis was the Emotional Episode (EE) (Greenberg & Korman, 1993), which is a segment of psychotherapy where the client indicates having experienced an emotion (emotional response or action tendency) in a specific situation. In order to code a complete EE segment, it is necessary to observe a new emotional response or a change in the theme of the client's discourse. The EE segments were selected from the 629 passages that deal with the main problem/theme. Each group of 2 raters identified the EEs within the passages they rated by inter-rater consensus.

Next the two raters independently coded each emotional episode within their assigned passages, categorizing its valence (positive or negative) for comparison with the feelings curve. They also rated the level of emotional intensity (arousal) in each emotional episode. For that, in each emotional episode they rated a modal and a peak expressed emotional arousal. There was a high agreement (Cohen's $\kappa = .911$) in the categorization of emotional valence. There was also a good agreement for modal emotional arousal rating (ICC [2,2] = .763) and very good agreement for peak emotional arousal rating (ICC [2,2] = .826). Disagreements were resolved by consensus. We computed the total frequency of EEs and the frequencies of positive and negative EEs. Then, we calculated the proportion of positive and of negative EEs of the total EEs, in each session. After that, we calculated the CEAS-III valence index in each session by subtracting the proportion of negative EEs in that session from the proportion of positive EEs. The possible range of the valence index was thus +1.00 to -1.00. In Laura's 629 passages, we identified 179 EEs (range: 5 to 21 per session); the valence index ranged from -1 to 1 across Laura's 16 sessions.

Results

We first summarize our qualitative assimilation analysis of Laura's therapy and then report the quantitative results of comparing APES levels to symptom intensity and emotional arousal and valence across sessions.

Assimilation of the problematic voice during therapy

Laura's voices of failure emerged particularly in three contexts: 1) thoughts and events associated with future professional performance and fear of disappointing other's expectations; 2) negative body image, after a significant increase in her weight; 3) relationship with her mother (specifically, Laura felt that her mother didn't care about her and that she lacked assertiveness toward her mother). Figure 2 plots the assimilation of this problematic theme across the 629 APES-rated passages in Laura's therapy organized into three phases. There was a clear trend toward higher assimilation as treatment proceeded, though there were many setbacks to lower levels along the way. In the initial phase of therapy (sessions 1 to 4) we observed mostly lower APES levels: APES level 2 was coded for 57.6% of the passages in the initial phase. This prevalence of lower APES levels implies that the problematic experiences were not yet understood or formulated.

The following excerpt illustrates how a dominant voice appeared early in the therapeutic process:

Laura: I cannot explain why I have such a need to be perfect. Why am I so afraid of the possibility of other people judging or evaluating me? (APES level 2, session 3)

The following excerpt illustrates how the emergence of a problematic voice created discomfort and acute psychological pain or panic:

Laura: or to say "look I really got fat" I am very ashamed about that and those people who do not see me for some time. I think - I almost panic to find someone, because it really is because it's a big difference, if I showed you a picture before and after the difference is huge, twenty kilos of difference, it really is, so ah, this is how I feel, I feel so bad, I can't see myself, it's very hard to see myself in the mirror" (APES level 2, Session 2).

In the middle phase of therapy (sessions 5 to 11), the problematic voices achieved intermediate levels of assimilation: APES level 3 was coded for 38.9% of the passages in the middle phase. This implies that the problematic experiences became clearly formulated and there was a movement towards a new understanding (APES level 4 accounted for 8.4% of the passages in the middle phase). Negative feelings were still present but in a manageable way. The following excerpt illustrates the problematic voice at APES level 3:

Therapist: interesting... we fear the worst and but it's even difficult to conceive what is worst

Laura: yes

Therapist: (laugh) interesting

Laura: it is the fear of failure and not being capable...not only....if I fail what is the problem? I don't know...but I'm afraid to fail." (APES level 3; session 9).

A new understanding, coded as APES level 4, is illustrated by the following excerpt (the text in boldface seemed to represent a meaning bridge between the

dominant voice and the problematic voice). There was a mixture of positive and negative feelings connected to the discovery of new understandings or insights:

“Laura: But, it wasn’t so bad. **I realized that, even when I fail, I can do it.**

Therapist: You won’t explode.

Laura: Right. **It doesn’t mean that everything will go back. Therefore I am getting used to it and I realized that I go slowly** [referring to her efforts in losing weight]. (APES level 4; Session 8).

In the final phase of therapy (sessions 12 to 16) Laura achieved higher levels of assimilation, as her new understanding was used to work on the problem (APES level 5 was coded for 39.7% of the passages in the final phase), and describing resolution of the problem (APES level 6 was 26.6 % of the passages in the final phase).

Problem-solving efforts at APES level 5, where feelings are mainly positive and the tone is optimistic, are illustrated in the following excerpt:

Laura: I think that now the test is not very important to me because I am well aware that in this type of course the test is not very complicated, is it? It is not a test, is it? I am sure it's something simple and is based in what they taught us.

Therapist: mm-hm.

Laura: Therefore, I feel a bit comfortable with that. (APES Level 5; Session 12)

The resolution of the problem, at APES Level 6, characterized by positive feelings and a feeling of accomplishment is illustrated in this excerpt:

Laura: but now I don't feel that 'I have to be perfect anymore, that I have to do everything right'. (APES level 6; session 16)

(Figure 2)

Assimilation and Symptom Intensity

To compare assimilation level with the intensity of depressive symptoms measured by the BDI-II, we computed the mean assimilation level scored in each session (i.e., based on varying numbers of excerpts). Figure 3 shows that, across sessions, assimilation level tended to increase whereas depressive symptoms decreased, consistent with the expected negative relation between these two variables. To statistically assess the relation between these two variables we used the Simulation Modelling Analysis Software (SMA; Borckardt, 2006) developed to deal with statistical problems generated by case-based time series studies. The Spearman rho correlation, computed on the basis of the SMA bootstrap sampling method showed a significant negative association between assimilation and BDI-II scores (Rho = -0.97, $p = .003$).

(Figure 3)

Similarly, Figure 4 shows that APES level tended to increase while the OQ-10 scores, tended to decrease, signaling an improvement in mental health functionality. The Spearman rho correlation, computed on the basis of the SMA bootstrap sampling method showed a significant negative association between assimilation and OQ-10 scores (rho = -.77; $p < .01$).

(Figure 4)

Assimilation and Feelings

Emotional intensity and assimilation. Laura's valence ratings showed marked changes as measured by the CEAS-III. However her absolute emotional intensity remained at about the same low level across sessions (in terms of modal and peak emotional arousal ratings), seemingly reflecting a stable client characteristic. That is, throughout her treatment, Laura was able to acknowledge and describe her emotional state but the arousal was mild in her voice and body. That is, it was possible to reliably distinguish positive and negative emotional episodes, but their absolute intensity was very similar.

Emotional valence and assimilation. We calculated the CEAS-III valence index as the proportion of negative EEs in each session subtracted from the proportion of positive EEs in that session. Figure 5 shows the evolution of the assimilation and this global valence index across Laura's 16 sessions.

Both the APES and the CEAS-III valence index had lower values in the initial phase of the therapeutic process and higher values at the final phase. Spearman rho correlation analysis found a significant positive association between assimilation and the valence of Laura's emotional arousal across sessions ($\rho = .64$; $p < .01$). That is, across Laura's 16 sessions, as the APES increased or decreased, the CEAS-III valence index also tended to increase or decrease. There was, however, an exception to this mirroring. Between session 1 and 2, assimilation decreased while the CEAS-III valence index increased.

(Figure 5)

Figure 6 shows the CEAS-III valence index (the proportion of positive EEs minus the proportion of negative EEs) as a function of assimilation level (i.e., aggregated without regard to session number). The plot clearly resembled the theoretical curve predicted by

the assimilation model. That is, the valence of Laura's EEs at each APES level showed a recognizable correspondence with that suggested by the theoretical feelings curve.

There were negative feelings at APES level 1 and even slightly more negative at APES level 2. At APES level 3 the CEAS-III valence index was less negative than in the lower APES levels (1 and 2). At APES 4 the client's CEAS-III valence index was positive. At APES levels 5 and 6, there were progressively more positive feelings.

(Figure 6)

Discussion

The evolution of Laura's case followed the expected pattern of assimilation in a good outcome case of CBT. The assimilation was lower in the initial phase of therapy, reaching intermediate levels in the middle phase and achieving higher levels of assimilation in the final phase. Passages rated at APES level 4 and higher occurred in the middle to the final phases of therapy as predicted for good outcome cases and replicating observations by Detert et al. (2006).

Although Laura showed the expected increase in assimilation levels from the initial to the final phase of therapy, the evolution followed an irregular pattern, with many brief setbacks (see Figure 2). Previous studies indicated that such setbacks are common in the assimilation process of good outcome cases in cognitive therapies (Caro Gabalda, 2007; Caro Gabalda & Stiles, 2009, 2013). Caro Gabalda (2007) pointed out that in cognitive therapies the therapist has an active role, pushing the client to higher levels of assimilation. However, when the therapeutic work pushes beyond the client's current comfort zone along the APES continuum, setbacks tend to appear, and this seemed to occur in Laura's case. However, across her 16 sessions, the setbacks became

progressively less severe, consistent with the interpretation that Laura was progressively assimilating the problematic voice.

The association of the assimilation of problematic voices into the self-community of voices with the significant decrease in the depression (BDI-II) and improvement of general mental health (OQ-10) lends further empirical support to the contention that assimilation of problematic experiences promotes good outcome. Our results converge with those of previous case studies (e.g., Honos-Webb, Stiles, et al., 1998; Honos-Webb et al., 1999; Knobloch et al., 2001; Varvin & Stiles, 1999) in associating assimilation of problematic experiences with symptomatic improvement. However, those previous studies did not analyze this relation longitudinally. By tracking both assimilation and symptom intensity across sessions, the current study supports the contention in greater detail. For instance, Laura's BDI scores improved substantially from session 4 to session 8. (Figure 3). Although we cannot say exactly when this improvement occurred, we can see that it corresponded to substantial assimilation progress from session 4 to 8.

Laura's progress across sessions 4-8 was not smooth, however. Laura achieved APES level 4 at session 6, decreased to APES level 2 at session 7 and then increased again to APES level 4 at session 8. This could be a reflection of shifting attention among different strands/aspects of the problem. That is, some, aspects of Laura's problematic theme evolved more rapidly than others in assimilation terms (Caro Gabalda & Stiles, 2013). During the therapeutic process, the therapist may explicitly focus on strands of the problem that are not yet understood and integrated. This could help to promote a more complete integration of the problematic experience but may also produce temporary setback. This sort of process may explain how the irregular

assimilation pattern co-occurs with a significant decrease in the BDI-II (Caro Gabalda & Stiles, 2013).

The relation between assimilation and feelings aggregated across sessions, as shown in Figure 6, corresponded fairly closely with the theoretical feelings curve (Figure 1; Stiles et al., 2004). Laura's feelings were negative as she avoided her problematic sense of failure (APES level 1), but they were even more negative when she confronted it (APES level 2). When she clearly understood the problematic voice (APES level 3), negative feelings were less, and when the problematic voice progressively became integrated (APES levels 4, 5, and 6), positive feelings were correspondingly higher, following this progression.

Because Laura began with problems at low APES levels and was a good outcome case, we were able to assess the feeling curve across most of the APES range (APES 1-APES 6; see Figure 6). In a poor outcome case we could probably observe only the lower part of the curve, insofar as poor-outcome cases are less likely to reach higher assimilation levels (APES ≥ 4). The dip in feelings from APES 1 to APES 2 (Figure 6) is consistent with the theoretical suggestion (and clinical lore) that for cases starting at lower levels of assimilation (0 or 1) it may be an important step to experience more negative emotions in order to contact and then assimilate the problematic experience.

Thus, generally, these results are in agreement with Varvin and Stiles's (1999) suggestion that one important step in the resolution of avoided problems is an immersion in negative feelings--feeling worse before feeling better. However, it is important to notice that in Laura's case "feeling worse" did not entail a significant increase of symptom intensity as measured by the BDI-II or OQ-10. Although the CEAS-III measured valence of arousal passage-by-passage, whereas the BDI-II and

OQ-10 measured symptom intensity only session-by-session, limiting our ability to assess this correspondence.

Stiles et al. (2004) suggested that APES level 4 should be associated with a neutral valence, involving a mix of unpleasant recognitions and pleasant surprises. In Laura's case, however, APES level 4 was associated with a higher proportion of positive than negative feelings (Figure 6). Finding relatively more positive emotions associated with APES 4 than expected suggests that reaching an understanding with the problematic voice, and achieving sustainable meaning-bridges was associated with an earlier than expected improvement in Laura's well-being.

The lack of variation in the intensity of emotion was somewhat surprising. We had expected that intensity would increase across therapy, particularly when Laura's problematic experience was emerging at APES level 2 and 3. Perhaps Laura's style of expression didn't show variations in intensity. In any case, this didn't seem to adversely impact the development of the case, as Laura was able to connect, understand and integrate her problematic experience.

Conclusion

This study supported important theoretical tenets of the assimilation model, including the association of assimilation progress with declining symptoms intensity across the therapeutic process and the theoretically predicted relation between assimilation level and feelings. Of course, this was single case study and any of its particular results could be specific to this particular case. The strength of the study is its detailed consistency with theory. Analyzing further clinical cases will be important to support our interpretations.

References

- Beck, A.T.; Rush, A. J., Shaw, B. F. & Emery, G. (1997). *Terapia cognitiva da depressão*. Porto Alegre: Artes Médicas.
- Brinegar, M. G., Salvi, L. M., Stiles, W. B., & Greenberg, L. S. (2006). Building a meaning bridge: Therapeutic progress from problem formulation to understanding. *Journal of Counseling Psychology*, 53, 165-180.
- Borckardt, J. (2006). *Simulation modeling analysis: Time series analysis program for short time series data streams* [Computer software].
- Caro Gabalda, I. (2007). La asimilación de experiencias problemáticas en la terapia lingüística de evaluación. ¿Cómo asimiló María su incapacidad para hacer cosas? *Boletín de Psicología*, 89, 47-73.
- Caro Gabalda I. & Stiles, W. (2009) Retrocessos no contexto da terapia linguística de avaliação. *Análise Psicológica*, 2, 199-212.
- Caro Gabalda, I., & Stiles, W. B. (2013). Irregular assimilation progress: Reasons for setbacks in the context of linguistic therapy of evaluation. *Psychotherapy Research*, 23, 35-53.
- Coelho, R., Martins, A. & Barros, H. (2002) Clinical profiles relating gender and depressive symptoms among adolescents ascertained by the Beck Depression Inventory II. *European Psychiatry*. 17, 222-226.
- Detert, N. B., Llewelyn, S., Hardy, G. E, Barkham, M., & Stiles, W. B. (2006). Assimilation in good- and poor-outcome cases of very brief psychotherapy for mild depression: An initial comparison. *Psychotherapy Research*, 16 , 393-407.

- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (2002). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, research version*. New York: Biometrics Research.
- First, M. B., Gibbon, M., Spitzer, R. L., Williams, J.B.W., & Benjamin, L. S. (1997). *SCID-II Personality Questionnaire*. Washington, DC: American Psychiatric Press.
- Gray, M. A., & Stiles, W. B. (2011). Employing a case study in building an assimilation theory account of generalized anxiety disorder and its treatment with cognitive-behavioral therapy. *Pragmatic Case Studies in Psychotherapy, 7*, 529-557.
- Greenberg, L. S., & Korman, L. (1993). Assimilating emotion into psychotherapy integration. *Journal of Psychotherapy Integration, 3*, 249–265.
- Greenberg, L. S., Auszra, L. & Herrmann, I. R. (2007). The relationship among emotional productivity, emotional arousal and outcome in experiential therapy of depression. *Psychotherapy Research, 17*, 482-493.
- Hill, C. E., Knox, S., Thompson, B. J., Williams, E. N., Hess, S. A., & Ladany, N. (2005). Consensual Qualitative Research: An update. *Journal of Counseling Psychology, 52*, 196-205.
- Honos-Webb, L., Lani, J. A., & Stiles, W. B. (1999). Discovering markers of assimilation stages: The fear of losing control marker. *Journal of Clinical Psychology, 55*, 1441–1452.
- Honos-Webb, L., & Stiles, W. B. (1998). Reformulation of assimilation analysis in terms of voices. *Psychotherapy, 35*, 23-33.

- Honos-Webb, L., & Stiles, W. B. (2002). Assimilative integration and responsive use of the assimilation model. *Journal of Psychotherapy Integration, 12*, 406-420.
- Honos-Webb, L., Stiles, W.B., & Greenberg, L.S. (2003). A Method of Rating in Psychotherapy Based on Markers of Change. *Journal of Counseling Psychology, 50* , 189-198
- Honos-Webb, L., Stiles, W. B., Greenberg, L. S., & Goldman, R. (1998). Assimilation analysis of process-experiential psychotherapy: A comparison of two cases. *Psychotherapy Research, 8*, 264-286.
- Honos-Webb, L., Surko, M., Stiles, W. B., & Greenberg, L S. (1999). Assimilation of voices in psychotherapy: The case of Jan. *Journal of Counseling Psychology, 46*, 448-460.
- Knobloch, L. M. Endres, L. M., Stiles, W. B., & Silberschatz, G. (2001). Convergence and divergence of themes in successful psychotherapy: An assimilation analysis. *Psychotherapy, 38*, 31-39.
- Laitila, A., & Aaltonen, J. (1998). Application of the assimilation model in the context of family therapy: A case study. *Contemporary Family Therapy, 20*, 277-290.
- Lambert, M. J., Finch, A. M., Okiishi, J. C., Burlingame, G. M., McKelvey, C., & Reisinger, C. W. (1998). *Administration and Scoring Manual for the OQ-10.2: An Adult Outcome Questionnaire for Screening Individuals And Population Outcome Monitoring*. American Professional Credentialing Services LLC.
- Lambert, M. J., Finch, A. M., Okiishi, J., & Burlingame, G. M. (2005). *OQ-10.2 Manual*. American Professional Credentialing Services, LLC.

- Mackay, H. C., Barkham, M., Stiles, W. B., & Goldfried, M. R. (2002). Patterns of client emotion in helpful sessions of cognitive-behavioral and psychodynamic-interpersonal therapy. *Journal of Counseling Psychology, 49*, 376–380.
- Mergenthaler, E. & Stinson, C. (1992). Psychotherapy transcription standards. *Psychotherapy Research, 2* 125-142.
- Missirlian TM1, Toukmanian SG, Warwar SH, Greenberg LS.(2005). Emotional arousal, client perceptual processing, and the working alliance in experiential psychotherapy for depression. *Journal of counselling and clinical psychology. 71*, 861-871.
- Osatuke, K., Glick, M. J., Stiles, W. B., Greenberg, L. S., Shapiro, D. A., & Barkham, M. (2005). Temporal patterns of improvement in client-centred therapy and cognitive-behaviour therapy. *Counselling Psychology Quarterly, 18*, 95-108.
- Pascual-Leone, A., & Greenberg, L.S. (2007). Emotional Processing in Experiential Therapy: Why “the Only Way Out Is Through.”. *Journal of Consulting and Clinical Psychology, 75*, 875-887.
- Salgado, J., Meira, L., Santos, A., Cunha, C., Bento, T., Almeida, C., Nogueira, D., Tavares, S., Petracchi, P., Barbosa., E. & Pinheiro, P. (2010). Protocolo clínico para investigação: adaptação do manual de terapia cognitivo-comportamental para a depressão. Unpublished manuscript.
- Schielke, H. J., Stiles, W. B., Cuellar, R. E., Fishman, J. L., Hoener, C., Del Castillo, D., Dye, A. K., Zerubavel, N., Walker, D. P, & Greenberg, L. S. (2011). A case investigating whether the process of resolving interpersonal problems in couple therapy is isomorphic to the process of resolving problems in individual therapy.

Pragmatic Case Studies in Psychotherapy, 7, 477-528.

Seelert, K. R. (1997). *Validation of a brief measure of distress in a primary care setting*. Unpublished masters thesis, University of Utah, Salt Lake City.

Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Users in assessing rater reliability. *Psychological Bulletin*, 86, 420-428.

Stiles, W. B. (1999). Signs and voices in psychotherapy. *Psychotherapy Research*, 9, 1-21.

Stiles, W. B. (2001). Assimilation of problematic experiences. *Psychotherapy*, 38, 462-465.

Stiles, W. B. (2006). Assimilation and the process of outcome: Introduction to a special section. *Psychotherapy Research*, 16, 389-392.

Stiles, W. B. (2011). Coming to terms. *Psychotherapy Research*, 21 (4), 367-384

Stiles, W. B. (2015). Theory-building, enriching, and fact-gathering: Alternative purposes of psychotherapy research. In O. Gelo, A. Pritz, & B. Rieken (Eds.), *Psychotherapy research: General issues, process, and outcome* (pp 159-180). New York: Springer-Verlag.

Stiles, W. B., & Angus, L. (2001). Qualitative research on clients' assimilation of problematic experiences in psychotherapy. *Psychologische Beiträge*, 43, 570-585.

Stiles, W. B., Elliott, R., Llewelyn, S. P., Firth-Cozens, J. A., Margison, F. R., Shapiro, D. A., & Hardy, G. (1990). Assimilation of problematic experiences by clients

in psychotherapy. *Psychotherapy*, 27, 411-420.

Stiles, W. B., Morrison, L. A., Haw, S. K., Harper, H., Shapiro, D. A., & Firth-Cozens, J. (1991). Longitudinal study of assimilation in exploratory psychotherapy.

Psychotherapy, 28, 195-206.

Stiles, W. B., Osatuke, K., Glick, M. J., & Mackay, H. C. (2004). Encounters between internal voices generate emotion: An elaboration of the assimilation model. In H. H. Hermans & G. Dimaggio (Eds.), *The dialogical self in psychotherapy* (pp. 91-107). New York: Brunner-Routledge.

Stiles, W. B., Shankland, M. C., Wright, J., & Field, S. D. (1997). Aptitude-treatment interactions based on clients' assimilation of their presenting problems. *Journal of Consulting and Clinical Psychology*, 65, 889-893.

Varvin, S., & Stiles, W. B. (1999). Emergence of severe traumatic experiences: An assimilation analysis of psychoanalytic therapy with a political refugee.

Psychotherapy Research, 9, 381-404.

Warwar, S., H. & Greenberg, L. S. (1999). *Client emotional arousal scale III-R*.

Unpublished manuscript, York Psychotherapy Research Center, Toronto.

Warwar, S., & Greenberg, L. S. (2000, June). *Catharsis is not enough: Changes in emotional processing related to psychotherapy outcome*. Paper presented at the annual meeting of the International Society for Psychotherapy Research, Indian Hills, Chicago.

Table 1. Assimilation of Problematic Experiences Scale (adapted from Caro Gabalda & Stiles, 2009)

APES LEVEL	COGNITIVE CONTENT	EMOTIONAL CONTENT
0. Warded off/ Dissociated	Content is unformed; client is unaware of the problem.	Distress may be minimal, reflecting successful avoidance.
1.Unwanted thoughts/ Active avoidance	Content includes distressing thoughts. Client prefers not to think about it.	Strong negative feelings.
2.Vague awareness/ Emergence	Client acknowledges his problematic experience and describes the distressing thoughts, but cannot formulate the problem clearly.	Feelings include acute psychological pain or panic.
3.Problem statement/ Clarification	Includes a clear statement of a problem, that is, something that could be worked on.	Feelings are mainly negative but manageable, not panicky.
4.Understanding/ Insight	The problematic experience is placed into a schema, formulated, understood, with clear connective links (meaning bridge).	There may mixed feelings with some unpleasant recognitions, but also with curiosity or even pleasant surprise.

5.Application/ Working through	The understanding is used to work on a problem, so there are specific problem-solving efforts.	Affective tone is positive and optimistic.
6. Resourcefulness/ Problem solution	Client achieves a solution for a specific problem. As the problem recedes, feelings become more neutral.	Feelings are positive, satisfied, proud of accomplishment.
7. Integration/ Mastery	Client successfully uses solutions in new situations, automatically.	Feelings are neutral because problem is no longer a problem.

Table 2. Pre-test, post-test and follow-up scores from Laura

Questionnaires	Pre-test	Last Session	Follow-up (1 year)
BDI-II	31	0	0
OQ-45.2	94	17	18
HDRS	8	0	N/A
OQ-10	25	4	1

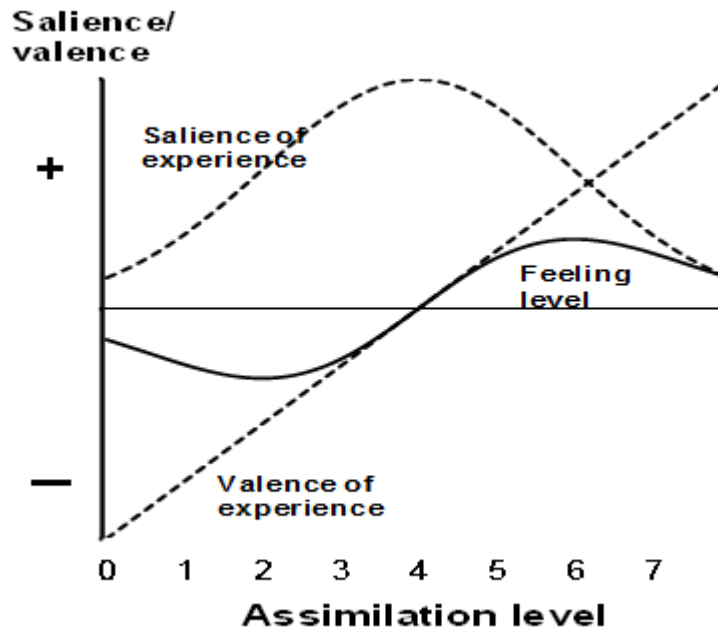


Figure 1. Theoretical relations of salience and valence of a problematic experience with specific feelings level at each stage of the Assimilation of Problematic Experiences Scale (APES): 0 = warded off; 1 = avoided; 2 = emerging; 3 = recognized; 4 = understood; 5 = applied; 6 = solved; 7 = mastered.

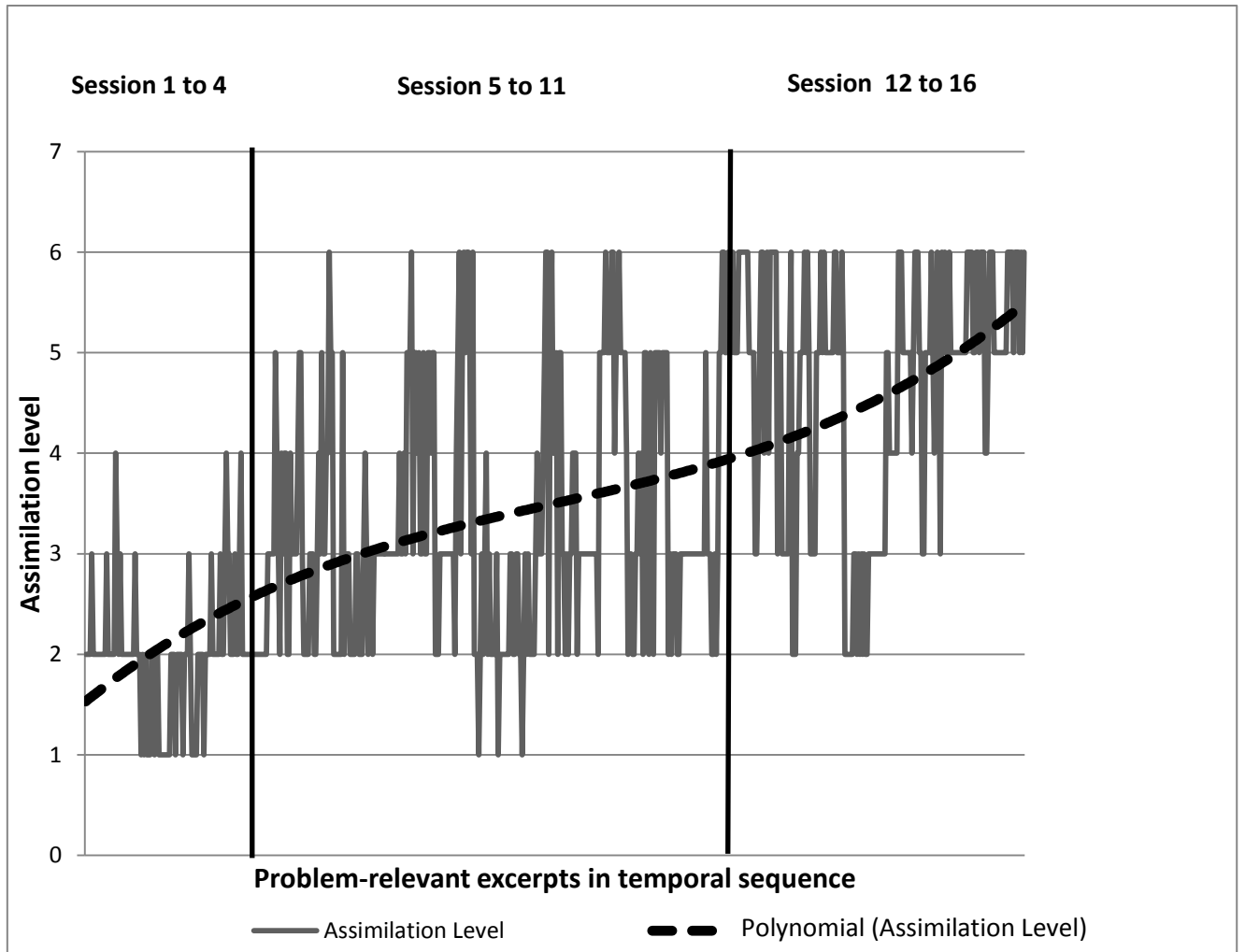


Figure 2. Assimilation process throughout sessions (629 passages)

Note: Polynomial (Assimilation Level) = Polynomial trendline of the assimilation evolution throughout therapeutic process ($y = 3E-08x^3 - 3E-05x^2 + 0.0121x + 1.5195$)

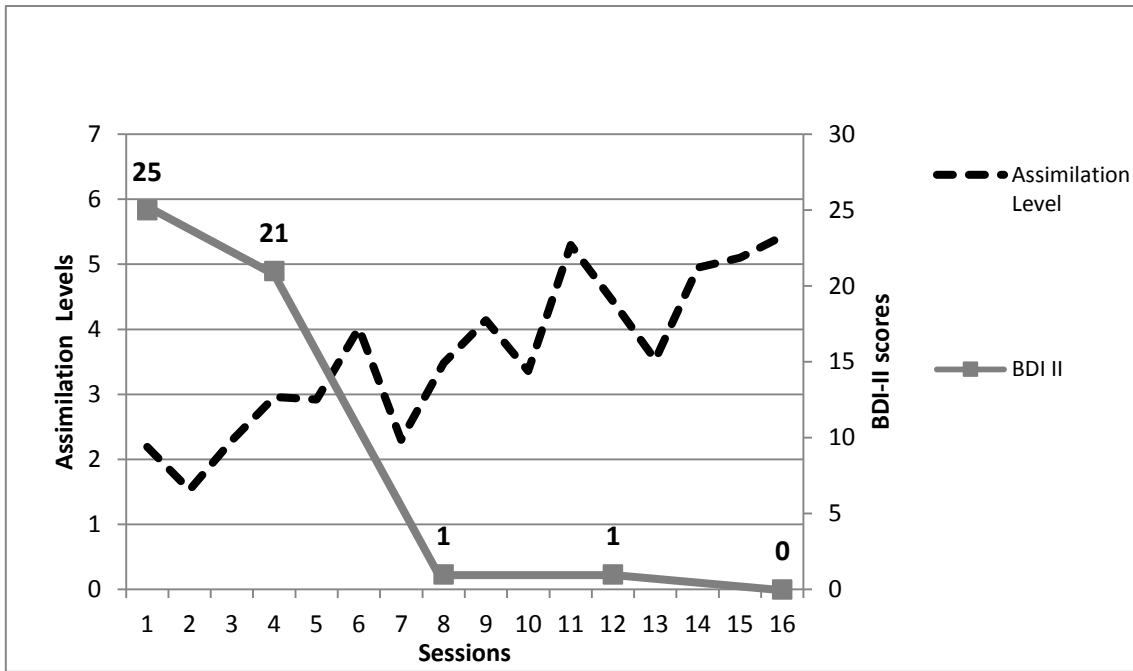


Figure 3. Comparison of assimilation with depressive symptoms measured by the Beck Depression Inventory – II (BDI-II).

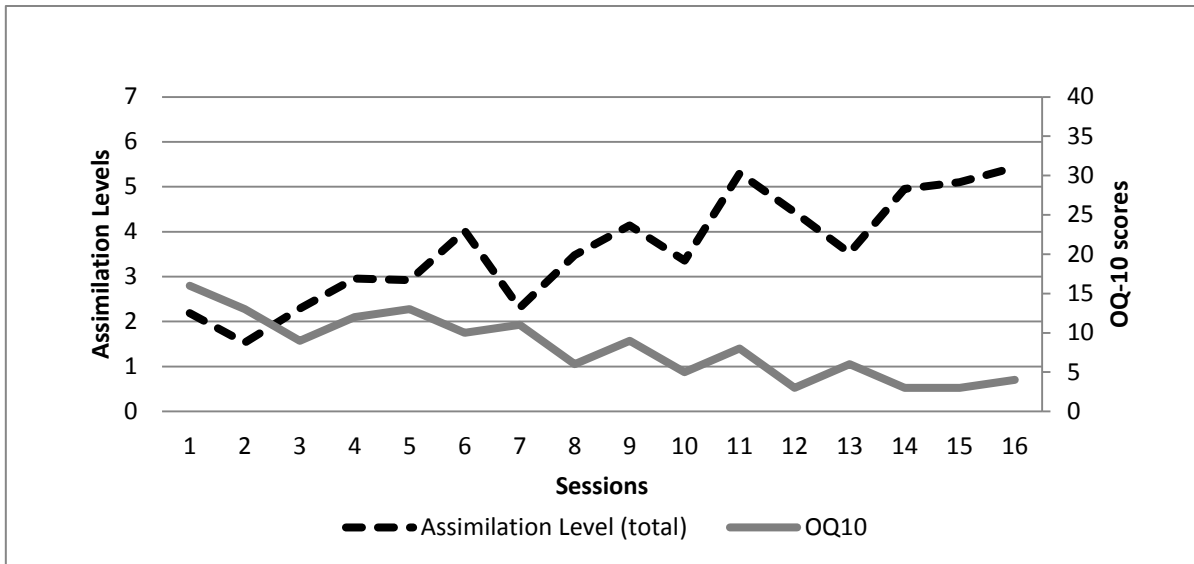


Figure 4. Comparative results between assimilation level and mental health functionality measured by the Outcome Questionnaire (OQ-10)

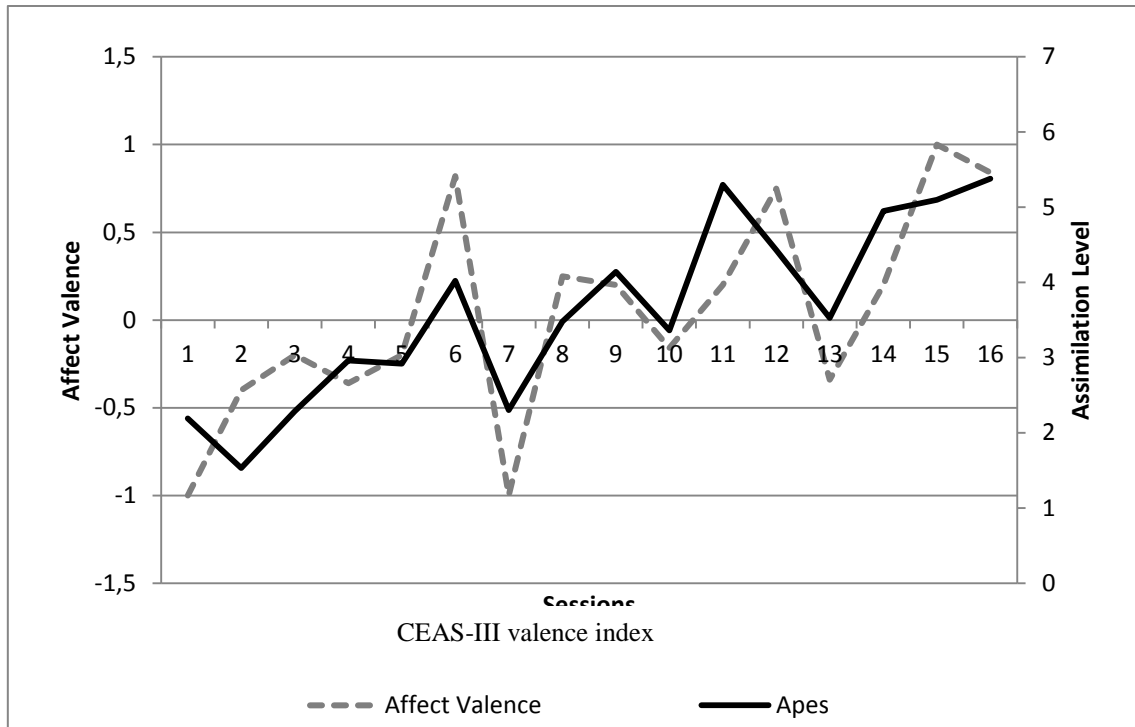


Figure 5. Evolution of assimilation and CEAS-III valence index throughout the 16 sessions

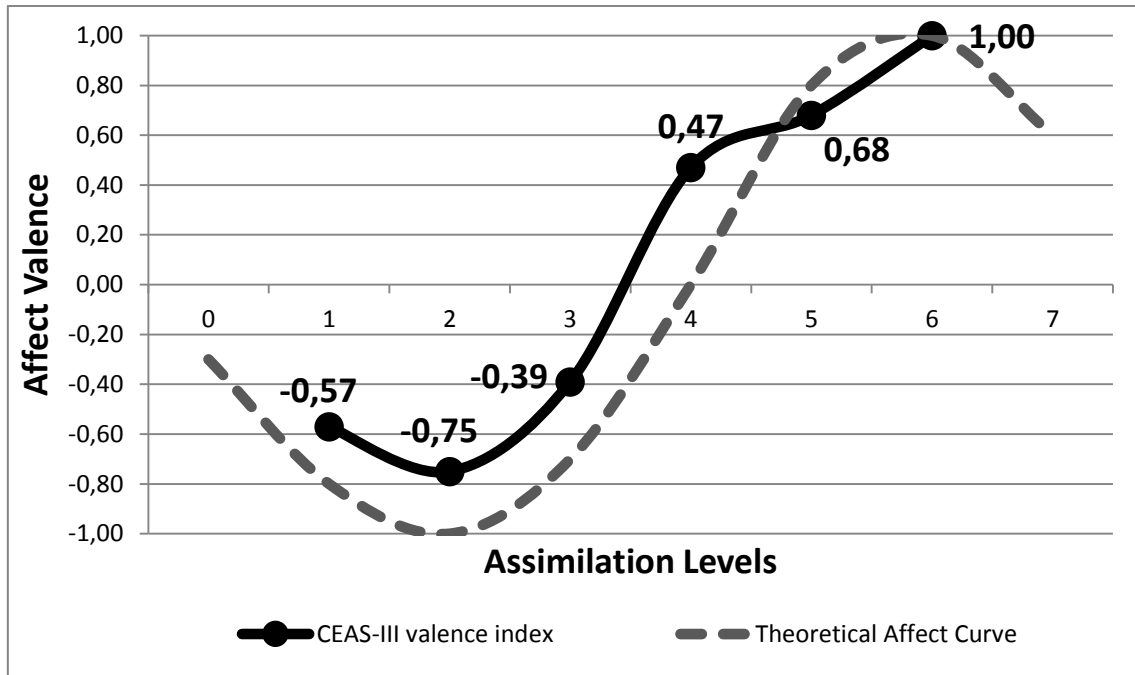


Figure 6. Relation between the CEAS-III valence index within each assimilation level and the theoretical feelings curve.