CASE REPORT

Temporal organization of discursive voices and their association with outcomes in a case of psychotherapy

Organización temporal de voces discursivas y su asociación con los resultados en un caso de psicoterapia

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Abstract

Voices are the expression of subjective states of patients and therapists in their discourse during psychotherapy. Some voices can be monological, potentially becoming rigid and limiting the experience, and others dialogical, allowing for greater flexibility and reflexivity. The interaction of voices may be disorganized or organized throughout the psychotherapy. A secondary analysis is presented of a case study of a patient diagnosed with Borderline Personality Disorder (BPD). In this 44-session successful psychotherapy (OQ-45.2), different voices were identified using the Discourse Positioning Analysis Model in Psychotherapy (MAPP), and entropy levels (Hs) were assessed in the interaction of these voices using the State Space Grid (SSG) technique. The objective of this study was to describe the temporal association between the interaction of the patient and therapist's reflective voices, their level of organization (entropy), and the patient's outcomes in psychotherapy. To achieve this objective, an idiographic analysis based on vector auto regression (VAR) was conducted. The results suggest a good fit of the model for one-session delays (lag 1). There was temporal stability (autoregression) [p < .01] and a positive trend [p < .00] of the patient's outcomes, and a positive cross-regression between the degree of organization of voices (t-1) and patient outcomes (t) [p < .01]. A temporal dynamic is suggested in which greater organization of patient-therapist voice interactions influences the quality of the patient's outcomes. No significant association could be established between outcomes and reflective voices despite their positive synchronous correlation (lag 0). Studies at the nomothetic level are needed to test an extension of this model.

Keywords: discursive voices; change in psychotherapy; case study; vector auto-regression; entropy; borderline personality disorder; dialogical self theory.

Resumen

Las voces en psicoterapia se refieren a la expresión de estados subjetivos de pacientes y terapeutas en su discurso durante la misma. Algunas voces pueden ser monológicas, pudiendo llegar a ser rígidas y limitar la experiencia, y otras dialógicas, permitiendo una mayor flexibilidad y reflexividad. La interacción de las voces puede ser desorganizada u organizada a lo largo de la psicoterapia. Se presenta un análisis secundario de un estudio de caso de una paciente diagnosticada con Trastorno Límite de la Personalidad (TLP). En esta psicoterapia exitosa de 44 sesiones (OQ-45.2), se identificaron diferentes voces utilizando el Modelo de Análisis del Posicionamiento Discursivo en Psicoterapia (MAPP), y se evaluaron los niveles de entropía (Hs) en la interacción de estas voces utilizando la técnica *State Space Grid* (SSG). El objetivo de este estudio fue describir la asociación temporal entre la interacción de las voces reflexivas de la paciente y del terapeuta, su nivel de organización (entropía) y los resultados de la paciente en la psicoterapia. Para lograr este objetivo, se realizó un análisis idiográfico basado en el modelo de auto-regresión vectorial (VAR). Los resultados sugieren un buen ajuste del modelo para un retraso de una sesión (lag 1). Se presentó estabilidad temporal (auto-regresión) [p < 0,01] y una tendencia positiva [p < 0,001] de los resultados de la paciente; y una regresión cruzada positiva entre el grado de organización de las voces (t-1) y los resultados de la paciente (t) [p < 0,01]. Se sugiere una dinámica temporal en la que una mayor organización de las

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interacciones de voz paciente-terapeuta influye en la calidad de los resultados de la paciente. No se pudo establecer una asociación significativa entre los resultados y las voces reflexivas a pesar de su correlación sincrónica positiva (lag 0). Se necesitan estudios a nivel nomotético para probar una extensión de este modelo.

Palabras clave: voces discursivas; cambio en psicoterapia; estudio de casos; auto-regresión vectorial; entropía; trastorno de personalidad límite; teoría del *self* dialógico.

Introduction

Within dialogical approaches in psychology, one path to understanding change in psychotherapy is through the emergence of meanings that reestablish former patterns of acting, feeling, thinking, and relating, in an interplay of voices and subjective positions (Ribeiro, & Gonçalves, 2011). The above is reflected in the formation of new narratives by patients as organizing patterns emerge in the dynamics of the dialogue between patients and therapists (Lyra, 2011). Change can be observed in a dialogal integration and the construction of a dialogical space between internal and external positions (Konopka et al., 2018), and in the development of a reflexive metaposition that allows for taking distance and acquiring an encompassing view regarding the other positions of the self (Hermans, 2003; 2014; Hermans, & Hermans-Konopka, 2010), integrating positions that are usually monological, dominant, rigid or unknown in a dialogical, flexible and inclusive exchange.

Reflexive metapositions and dialogical spaces would allow narratives and self-narratives to be continuously structured and restructured by the exchange among multiple voices (Hermans & Dimaggio, 2004). These voices can continuously tell stories, allowing them to be rewritten and reimagined as well as the sense of self (Frances, 2024). Dialogical practices are generated that facilitate polyphonic and diverse perspectives (Sidis et al., 2023), which may be mediated by the internalization of voices (Viou & Georgaca, 2023) based on the intersubjective foundation established in psychotherapy.

The achievement of reflective abilities and skills of patients is part of the benefits that are usually recognized in psychotherapy. Within the dialogical self-theory tradition, these capacities imply a relational experience, and a fundamental dimension of self-observation that is enhanced in psychotherapy, a space in which inner experiences become tangible through verbal expressions (Leiman, 2012). Reflexivity can be understood as a subjective activity made possible by the interactions between different aspects of the self, either in collaboration, and/or in conflict, and which conceptually can be considered subjective positions that have emerged throughout the development of individuals (Georgaca, 2003; Martínez et al., 2012), and specific voices that express these positions (Hermans, 2004; 2008; 2014; Martínez et al., 2014), as they relate to themselves and others. Reflective voices emerge from patients' personal positions and can make coexistence with other voices that were undesired more flexible (Avdi, 2012), allowing a better adaptation to the internal and external environment.

In patients diagnosed with Borderline Personality Disorder (BPD) the change process in dialogical terms has been described as a transition from fragmented states of the self to an integration of their voices (Osatuke & Stiles, 2006), which occurs in a comprehensive manner as patients begin to recognize and accept aspects of themselves that were previously denied, questioned or not fully conscious. It has been identified that these patients have a low capacity to reflect on their mental states, and those of others, and it has been studied that if these patients have a higher capacity in this area, they achieve better results in psychotherapy (Maillard et al., 2017). This impairment in reflexivity can be considered as one of the key points that from the dialogical perspective has been called disintegration, dissociation and disorganization of the aspects of the self (Barani, 2019; Dimaggio, 2012; Hermans & Dimaggio, 2007), and that as a result of therapeutic interventions can reach an integration understood as the consolidation of a reflexive metaposition that can observe and talk about other positions, a notion that is associated with other psychological concepts such as meta-cognition, self-reflection, and mentalization (Avdi & Georgaca, 2009).

The psychotherapy process is an activity that unfolds over time and generates time-dependent dynamics. Temporal dynamics have been recognized at the individual level, for example, among emotion sequences in

patients with different diagnoses (Kockler et al., 2017; Reisch et al., 2008) or in correlations of self-ratings of psychological states (Olthof, 2020). Moreover, psychotherapy, as a relational space, could be understood as an irreversible communicational flow in which what happens depends on what has happened previously and sets the basis for what will happen in the future (Salvatore & Tschacher, 2012). In this continuous communicational exchange, relevant temporal processes and associations are established (Ramseyer et al., 2014). One manner used for accounting for the temporal dynamics in psychotherapy is through the application of entropy measurements (Badalamenti & Langs, 1992; McKenzie & Murray, 2013; Pincus & Guastello, 2005; Rapp et al., 2011; Schiepek et al., 2020). The notion of entropy was proposed by Shannon (1948; Shannon & Weaver, 1949) and, in broad terms, it is a measure of the amount of uncertainty associated with a process, indicating the higher or lower probability of a future state of that process based on the information available in the present. Shannon entropy allows expressing variations in the complexity of psychological states and psychological interactions (Guastello, 2016), and it can be used as a measure of the degree of uncertainty and complexity in the information exchange flows among participants in psychotherapy (Pincus et al., 2016). Previous studies in psychotherapy have shown that order (reduction of the degrees of freedom of a system) is related to the outcome of therapy (Tschacher et al., 1998), and that alternating periods of stability and flexibility in process variables are beneficial for successful psychotherapies (de Felice et al., 2022). In terms of stability, a high level of entropy could impact patient outcomes over time.

Shannon entropy-based measures can be used to assess the degree of flexibility of temporal interactions among the voices of therapists and patients in psychotherapy. A low level of entropy indicates a high predictability of a sequence of such interactions and thus a high order of the sequences, whereas a high level of entropy indicates a highly unpredictable sequence and thus a high randomness of the sequences (Hollenstein, 2013). Entropy can be assessed at different levels of the interaction of dialogic-discursive voices in consideration of their time dependence, and individual patient outcomes in psychotherapy. These types of models focus on the temporal aspect of psychotherapy, including multivariate associations, and the understanding of idiographic processes (Ramseyer et al., 2014), which allow describing these emergent dynamics of psychotherapy.

Identification of personal positions and voices through the Model of Analysis of Discursive Positioning in Psychotherapy

Model of Analysis of Discursive Positioning in Psychotherapy (MAPP) (Martínez & Tomicic, 2018) is a method designed to track subjective aspects of patients and therapists throughout psychotherapy. Its conceptual basis lies in the dialogical self-theory, considering that patients and therapists can express self-states or personal positions by means of different discursive voices through the therapeutic conversation. A description can be made of the way in which patients and therapists adopt different points of view about themselves and their surrounding world, or of their construction and interpretation of reality (Martínez et al., 2012).

This method is organized along three interrelated levels of analysis. The first level is made up of the voices that constitute the idiosyncratic expression of subjectivity in the therapeutic conversation. The second level is formed by the personal positions that group together the voices that give them expression. Finally, there is a third level which is an abstract taxonomy representing the typical organization of positions in patients and therapists as they have emerged in a variety of psychotherapies studied so far with MAPP.

Through the specific voices, patients' personal positions often reflect idiosyncratic perspectives characteristic of their subjectivity, while in the case of therapists the perspectives are often associated with their intervening-therapeutic role. The taxonomy describes three typical configurations of personal positions in patients: namely, reflective, dependent, and independent, and two in therapists, proposer, and professor. The general category reflective accounts for a subjective stance in which patients take a distant perspective, without disconnecting from their emotions by listening and critically considering, as well as dialoguing with other positions. The general dependent category is characterized by a self-positioning of patients as needy, weak, damaged, and vulnerable. While the independent category is characterized by a positioning of patients as strong and self-sufficient, not requiring help from others. On the other hand, with the proposer category, therapists are positioned as someone

who presents patients with elements to generate new perspectives and facilitate dialogue between different positions. While the professor category positioned them as someone in possession of knowledge that must be recognized by the patients, accepting it as the only possibility.

Adaptability (organization and disorganization) in voices interaction of patient - therapist by means of the State Space Grid

State Space Grid (SSG) (Hollenstein, 2013) is a technique that allows tracing the trajectory of categorically coded dyadic interactions, seeking to recognize their level of adaptability over time. To do this, the data to be analyzed are organized in the Gridware software (Lamey et al., 2004), in order to perform the necessary procedures to describe trajectories in certain time segments. For this study, in the psychotherapeutic context, the interactions of the voices (belonging to the personal positions found throughout the therapy) were represented in grids of "Therapist's voices" (y-axis) x "Patient's voices" (x-axis), wherein each cell there was one and only one interaction between two voices, thus forming categorical time series for each session. In this way, the trajectory of voice interactions was represented. Each point on the grid was an event in the time, i.e., an interaction that started with a speech turn (starting with the therapist) with a specific voice and ended with the end of the patient's speech turn, which also presented a specific voice. Then, the same voices interaction can continue, i.e., another point in the same cell, or change to another interaction or another cell in the following speech turns. Furthermore, the number of events can be counted session by session and numerical time series based on their arithmetic sum can be formed using the SSG.

Gridware provides measures to evaluate the adaptability of the states of interactions of the variables evaluated in a given dyad. One of these measures is the global entropy (Hs) which is based on the notion of entropy of information theory (Shannon, 1948; Shannon & Weaver, 1979). Entropy represents the level of transitions between different states, following a probability calculation from the duration of the different events:

$$\sum (Pi * \ln(1 - Pi)) \qquad (1)$$

where i is an index of each cell on the grid and Pi is the probability in cell i. Pi is the total duration in cell i divided by the total duration of the entire trajectory (Hollenstein, 2013).

Thus, the entropy value yields an estimate of the predictability of the states of voices interactions between therapist and patient in each session. Low entropy values can be interpreted as high predictability in the transition from one state to another, while high values indicate low predictability of such transition.

Temporal association of variables through Vector Auto-Regression technique

The Vector Auto-Regression (VAR) (Ramseyer et al., 2014) technique allows the quantification of the linear dependency of a set of variables at time (t) on the values of the same set at n previous time points (t -1). To accomplish this, organizing the variables of psychotherapy into numerical time series. This linear dependency includes both auto-regressive components, i.e. components that are related to themselves over time, and multivariate associations, i.e. associations between different variables over time. Ramseyer et al. (2014), proposed a VAR-based model (Time Series Panel Analysis, TSPA) that allows generating nomothetic aggregation from idiographic modeling. In this study, only the techniques at the idiographic modeling level (specifically the VAR-based stages) were applied and they are described as follows:

Selection of Lag. In this type of analysis, stepwise inclusion of temporal information (lags in time-series analysis) it is necessary, and the number of temporal steps that a time-series model 'regresses' in the treatment of associations among variables should be determined.

The selection of the appropriate lag may be consistent with theory or chosen empirically, based on goodness of fit indicators for a given model (Akaike's Information Criterion [AIC]). Lower AIC values indicate a better fit. In

the case of psychotherapy, there are consistent temporal steps at t-1 (for the previous session) and t (for the current session), implying a lag 1 time-lagged association.

Trends. Trend refers to systematic changes in the average levels of a variable over time. Ramseyer et al. (2014) note that in psychotherapy, most time series show some kind of trend, either positive (e.g., alliance quality) or negative (e.g., symptom severity). The model provides an estimate of the trend for the dependent variable in each specific regression equation.

Auto-regression. Auto-regression is established when the output of a variable linearly depends on its own previous values. The strength of this temporal association is quantified by φ(phi), which ranges between -1 and 1. According to Ramseyer et al. (2014), in psychotherapy, positive auto-regression is found in variables that exhibit stability over time.

Cross-regression. Cross-regressions are established when the outputs of certain variables linearly depend on the previous values of other variables, considered simultaneously. The strength of these regressions among variables is quantified by φ (phi). Positive values indicate positive associations, while negative values denote inverse relationships.

Synchronous associations. Auto-regression and cross-regression explicitly consider the information in time series, and synchronous associations indicate the strength of the associations between two variables at identical points in time. Their calculation is by Pearson correlations between the residuals of the VAR analysis, thus controlling for serial dependence (auto-regression) and cross-variable dependence (cross-regression). Residual correlations are more reliable than conventional correlations because they account for dependent measures from idiosyncratic models. Correlation coefficients of the residuals are transformed into Fisher's Z and can be considered indicators of the effect size of synchronous associations (lag 0).

The present study

The present study is secondary analysis based on a case study in which MAPP was applied to identify voices and personal positions of a patient diagnosed with BPD and the therapist.

Throughout this psychotherapy, each interaction between a patient's voice and a therapist's voice (events) was plotted on the SSG, session by session. Among the different events that unfolded in this psychotherapy, those formed by the therapist's meta-analytical voice (proposer position), and the patient's self-dialogue voice (reflective position) were considered potentially relevant in this study because of their possible contribution to therapeutic change, and termed "reflective events." The term "reflective event" is based on the notion of reflective meta-position or meta-perspective, which allows for the exploration of the self, the distancing between the self and the flow of experiences, the authorship of specific situations, the interaction between different positions and voices, and the facilitation of a dialogical space (Avdi & Georgaca, 2009; Gonçalves & Ribeiro, 2012; Hermans, 2003; Montesano et al., 2017). The interaction between these two voices reflects a therapist who promotes a perspective based on possible relationships between aspects present (although not always manifest) in the process, and a patient who reflects on herself, and who elaborates and understands what is being treated during the time in which this interaction takes place. These are events that theoretically help to create a dialogical space between the therapist and the patient case study also found that reflective events were part of so-called dialogical patterns that were present in some of the therapy's sessions and were positively associated with her outcomes (Mellado et al., 2022b). Although the association between dialogical patterns and outcomes was significant at a general level, the previous study did not evaluate temporal associations of the events, their organization and disorganization, or their relationship with the patient's session-to-session outcomes. The relevance of this secondary analysis lies in the specific emphasis on this group of reflective events that had not been sufficiently described in previous studies. These events are now examined in a temporal dynamic involving the organization of other psychotherapy events (entropy) and the patient's session-to-session outcomes. In this way, it can be understood whether this type of dialogical exchange between patient and therapist requires a

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relatively stable interactional basis over time to impact psychotherapy outcomes.

The aim of the present study was to describe the temporal association among reflective events, the level of organization of events of voices and subjective positions presents in the psychotherapy of a patient diagnosed with BPD and the therapist, and her outcomes. For this purpose, the following hypotheses were tested: H_1: Reflective events of psychotherapy will have a positive temporal association with the patient's outcomes; H_2: The organization of events will have a positive temporal association with the psychotherapy outcomes; and H_3: The patient's outcomes will have a positive temporal association between sessions.

Methods

Participants

The participants[1] were a 31-year-old female patient diagnosed with BPD, and a 53-year-old male therapist, a psychodynamic therapist with 25 years of experience as a psychodynamic therapist. The therapy consisted of 44 individual sessions, once a week, for approximately 18 months. The patient was referred by a psychiatrist in a public health center located in Santiago, Chile, for her aggressive behavior towards her 10-year-old daughter.

The decision to choose this case has already been described previously (Mellado et al., 2022a) and is that the process begins with a state of dissociation of the patient's self, which becomes reorganized as therapy progresses. Thus, it is possible to follow different stages of the patient's subjective change.

At the time of starting therapy, the patient had been married for 11 years and had two school-age children. One of her initial concerns was the aggressive behavior toward her daughter, which she was able to recognize and question but which she could not initially experience as something she had done. This diffusion in her identity was something that occurred on many other occasions. The patient points out ambivalent relationships with her parents, especially because since she was a child she was organizing a fragmented image of them, and she was a victim of sexual abuse due to their negligent care. Her mother committed suicide, which made the patient feel guilty, and her father presented health problems associated with his alcoholism, a situation that complicated the patient until his death. The patient also presented alcohol abuse, especially on weekends, behavior that reinforces her ambivalence towards herself, her relationship with her children, and her husband.

The sampling unit in this reanalysis included each of the sessions of this psychotherapy, in which the voices of therapist and patient were identified in each speech turn. The patient's outcome measurements were taken session by session. Three sessions (sessions 26, 38, and 43) could not be included in the analysis because they were not fully recorded.

The voices and positions identified in this case can be noted in Table 1, and the description and characterization of each one of them can be found in Mellado et al. (2022a).

Table 1. Patient´s and her therapist´s personal positions, MAPP taxonomy, and voices.

Patient´s personal positions and voices	Therapist´s personal positions and voices
1 The Reflective (The integrative)	**1 The Proposer (The proposer)**
1.1 Continuity voice	1.1 Inquirer voice
1.2 Self-dialogue voice	1.2 Confrontational voice
1.3 Grounded voice	1.3 Meta-analytical voice
	1.4 Self-revealing voice

2 The Dependent (The incapable)	**2 The Professor (The expert)**
2.1 Good for nothing voice	2.1 Asserting voice
2.2 Envious girl voice	2.2 Specialist´s voice
2.3 Fearful voice	
2.4 Confused voice	
2.5 Sad and guilty voice	
2.6 Desire voice	
2.7 Fear to fail voice	

3 The Independent (The detached)	
3.1 The voice of duty	
3.2 Disaffectionate voice	
3.3 Angry voice	
3.4 Carefree voice	

Note: The personal positions of the patient and therapist are indicated in parentheses.

Instruments

Lambert's Outcome Questionnaire (OQ-45.2; Lambert et al., 1996). Therapy outcome was assessed by this instrument which has been adapted and validated for Chilean population (von Bergen & de La Parra, 2002). For this population the Reliable Change Index (RCI) was defined at 17 points, test-retest reliability was of 0.90 for the total scale in non-clinical samples, and Cronbach's Alpha was of 0.91 both in clinical as well as non-clinical samples. The lower the scores obtained, the higher the quality of patient outcomes. This therapy was considered successful since the patient presented a baseline score of 123 points, and a final score of 51 points (<73 points, considered for the functional population), and on the OQ-45.2 scored a Reliable Change Index (RCI) of 72 points (>17 points), which, according to the Chilean version criteria, is considered a statistically and clinically significant change.

Procedure

In previous works in which this case was analyzed (Mellado et al., 2022a, b), the MAPP was applied to identify the voices (and personal positions) of the patient and the therapist throughout the psychotherapy. To ensure reliability in the application of MAPP, a procedure similar to that suggested by Clara Hill and her team (Hill et al., 2005; Hill et al., 1997) for Consensual Qualitative Research (CQR) was followed.

Each coding was discussed and agreed upon, with the participation of a judge (a researcher from the team with a psychology doctoral degree), and then categorized into different idiosyncratic personal positions. The data were cross-checked against the general MAPP taxonomy. Subsequently, from the categories of voices and personal positions already identified, their correspondence was assessed at each speech turn during all psychotherapy sessions. The judge collaborated in coding the speech turns in which the two coders had more doubts and/or disagreements. Half of the psychotherapy (sessions 1 - 22) was coded by the first author and coder 2 (a qualified, MAPP-trained psychologist), while the second half (sessions 23 - 44) was coded by the first author and coder 3 (a qualified, MAPP-trained psychologist).

Following the suggestions of Hill et al., (1997; 2005), a mapping of the processes has been carried out in order to have a more accurate assessment. The data were organized in a CAQDAS Atlas.ti version 8.4 (Friese, 2020), from which the process could be carried out sequentially. Using one of the inter-coder agreement measures provided by Atlas.ti, coders in the first half of the therapy obtained a Holsti index of 70.3%, while those in the second half obtained a Holsti index of 75.7%.

Subsequently, the categories of voices obtained were imported into GridWare software for analysis. The identified patient and therapist voices were placed in a grid (in SSG) representing all possible interactions in a given session. In each cell of each grid, the x-axis represents the categories of the patient's voices, while the y-

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axis represents the categories of the therapist's voices. The grid points represent an event through different trajectories unfolded over time. That is, the elapsed time in which the patient and the therapist have remained in that defined state before continuing, either speech turn to speech turn, or in a given span in which a given voice begins and ceases to be present for another to appear. One grid per session was obtained, and each grid consisted of the interaction of each patient and therapist voice (14 x 6 grids). The data imported into the SSG allows to obtain the frequency of reflective events during each of the psychotherapy sessions. Likewise, formula 1 calculates the degree of organization in the interaction of voices or global level of entropy (Hs), from the probability of occurrence of the events derived from the frequencies observed in each session.

Data Analysis

In GridWare software (SSG), the frequency of each interaction between the patient's and therapist's voices was found, along with the analysis of the global level of entropy (Hs) for each session. Among the different events, the frequencies of reflective events were selected to continue with the model described below.

Idiosyncratic VAR analyses (Ramseyer et al., 2014) were performed by introducing the variables 'reflective events,' 'entropy level' of all interactions, and 'patient outcomes' in each of the psychotherapy sessions, allowing for the analysis of autoregressive, and cross-sectional associations both at a single point in time and across time. The codes for each stage of the VAR analysis were run in RStudio 2022.12.0 (Posit team, 2022) and are included as supplementary material to this study.

The VAR model (Ramseyer et al., 2014) allowed for quantifying the linear dependence of each of these variables over time (t) on the values of the same variables at n previous time points (t -1). To calculate the model lag, goodness-of-fit indicators (Akaike Information Criterion [AIC]) were used, choosing the lowest AIC value, which indicates a better fit. The trend (TR) of the patient's outcomes (dependent variable) was then assessed using a T-value measure, searching for systematic changes over time. Autoregressive or temporal stability components and cross-regressions were tested for the three described variables, evaluating the strength of their temporal association using $_\varphi$ (phi) values. Finally, synchronous associations, i.e., at the same point in time (lag 0), were considered. As described previously, the model allows for calculating these associations through Pearson correlations between the residuals of the analysis, thus controlling for serial dependence (autoregression) and dependence between variables (cross-regression).

Results

On average, there were 201.2 events in each session depicting the interactions of voices between therapist and patient that occurred in this psychotherapy. Table 2 indicates the average number of events in the sessions, considering the personal positions grouping the patient's and the therapist's voices.

Table 2. Average number of events in this psychotherapy.

		Voices belonging to the Therapist's Personal Positions	
		Proposer Position	Professor Position
		Meta-analytical voice	
Voices belonging to the Patient's Personal Positions	Reflective Position	93.6	60.7
	Self-dialogue voice	6.3	
	Dependent Position	19.9	8.3
	Independent Position	13.4	5.0

Note: The average number of reflective events, i.e., interactions between the patient's self-dialogue voice and the therapist's metaanalytical voice are shown in italics.

Figure 1 shows the trajectory of reflective events for each of sessions of the psychotherapy (A), as well as the levels of entropy (B). The entropy level (Hs) of all events (interaction of voices between patient and therapist) in

each session. The minimal level was 1.97; and the maximal level was 3.22 (Mean = 2.7, SD = 0.31). In this psychotherapy, it is observed that the frequency of reflective events is variable during the sessions, although there appears to be an increase concentrated in the middle and final phases. The patient's worst outcome coincides with a low number of reflective events (1 event), while the best outcome coincides with a number of reflective events above average (9 events). Regarding the entropy levels (Hs) of the exchange among discursive voices, an oscillating distribution is observed throughout the psychotherapy, suggesting that moments of greater stability are generated over the course of therapy, but a steady state point is not reached.
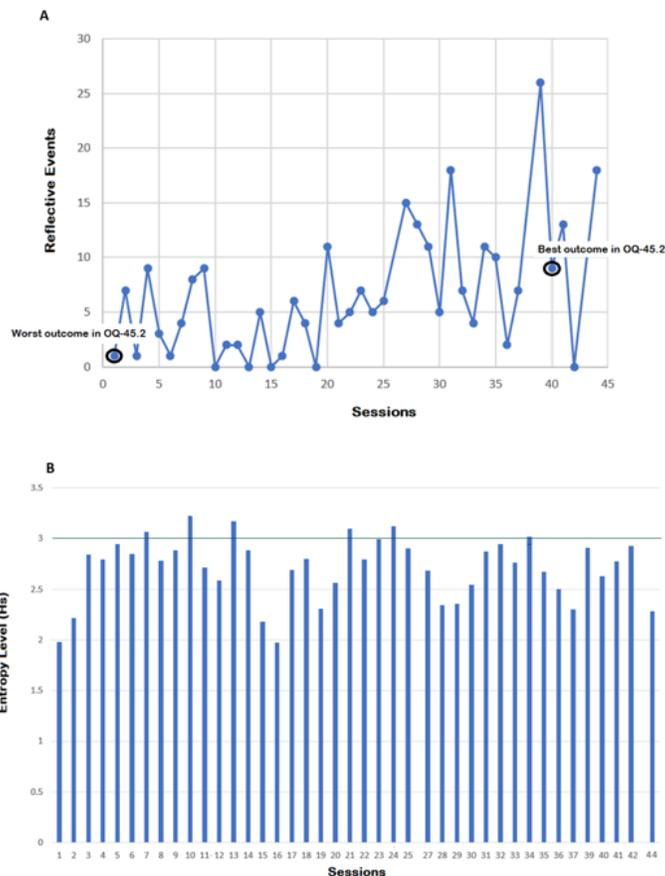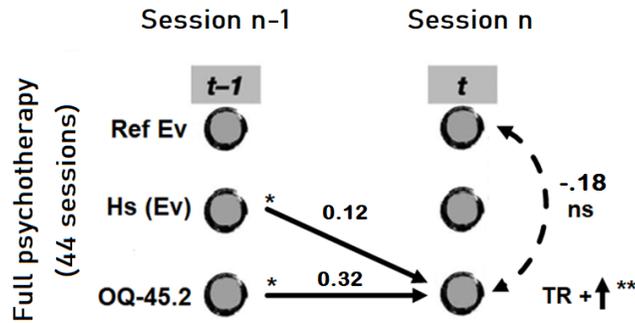

Figure 1. (A) Trajectory of reflective events, and (B) entropy level (Hs) of all events in each session of the psychotherapy.

The calculation for time-lagged indicated that a lag 1 model provided the best overall model fit [lag = 1 (AIC = -1.062767 x 10^1) < lag = 2 (AIC = -1.038825 x 10^1) or lag = 3 (AIC = -1.058079 x 10^1)].

Figure 2 depicts a diagram of the idiographic model obtained from VAR analysis for this psychotherapy. Each of the input variables, namely, reflective events, entropy level of all events, and the patient's outcomes in each session, were processed as lagged numerical time series by one session (t, and t - 1).

The model reported a multiple R^2 of .8558, indicating that about 85.58% of the variability in the baseline dependent variable (OQ-45.2) is explained by the independent variables included in the model (entropy level and reflective events). The adjusted R^2 was .8393, adjusting this value by the number of variables and observations in the model, F = 51.93 (DF = 4, 35), p < .001. A significant auto-regression could be observed for OQ-45.2 (β = .32, p < .01), and a significant cross-regression between Hs (Ev) and OQ-45.2 (β = .12, p < .01) (lag 1). A positive linear trend (Tr) was also found for OQ-45.2 (T = -.011, p < .001), which presented systematic changes throughout psychotherapy (see Table 3).

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Note: Ref Ev = Reflective Events, Hs (Ev) = entropy level of all events, OQ-45.2 = patient outcomes. The model presents auto-regression for OQ-45.2, a cross-regression between Hs (Ev) and OQ-45.2, and a positive linear trend for OQ-45.2 (lag = 1). It also shows a non-significant synchronous association between Ref Ev and OQ-45.2 (lag = 0). * p < .001; ** p = 0. The trend is considered positive, describing continuous improvement in the quality of the patient's outcomes.

Figure 2. Diagram of the idiographic model obtained from VAR analysis.

Table 3. Estimation results for equation OQ-45.2 = Hs.l1 + Ref.l1 + oq.l1 + const + trend.

Variable	Estimate	Std. Error	t value	Pr(>|t|)
Hs.l1	.122628	.059425	2.064	.046536 *
Ref.l1	-.032761	.079125	-0.414	.681371
OQ-45.2.l1	.321938	.142674	2.256	.030392 *
const	.420074	.125653	3.343	.001983 **
trend	-.011512	.002962	-3.887	.000432 ***

Note: l1 = lag 1. Residual standard error: .09229 on 35 degrees of freedom; Multiple R^2: .8558, Adjusted R^2: .8393; F-statistic: 51.93 on 4 and 35 DF, p < .001. * p < .01; ** p < .0001, *** p < .001.

Finally, a non-significant synchronous association was presented between Ref Ev and OQ-45.2 (r = -.18) (lag 0). The respective covariance and correlation matrices of the model residuals can be seen in Tables 4 and 5. These results support H_2 and H_3 proposed for the study but are not sufficient to support H_1.

Table 4. Covariance matrix of residuals.

Variable	Hs	Ref	OQ-45.2
Hs	.0529	.0046	-.0010
Ref	.0046	.0396	-.0033
OQ-45.2	-.001	-.003	.0085

Table 5. Correlation matrix of residuals.

Variable	Hs	Ref	OQ-45.2
Hs	1.00000	.1003	-.04851
Ref	.10029	1.0000	-.18203
OQ-45.2	-.04851	-.1820	1.00000

Figure 3 presents a comparison between two sessions (A = session 10, and B = session 30) plotted in Gridware (SSG). It can be seen that in session 30 there is a higher organization of the interaction of events in general (Hs = 2.54), than in session 10 (Hs = 3.22). It is also observed that in session 30 there are more interactions of patient's

and therapist's voices that include the transit through the reflective events of this psychotherapy. In session 10, which presents a high level of entropy (Hs), the interactions between the voices of patient and therapist are dispersed and the therapeutic dialogue seems to go through different events without an apparent organization. While in session 30, which presents a lower level of entropy (Hs), the dispersion of the interaction is also reduced, and the therapeutic dialogue is concentrated in the reflective and propositive voices, moving more frequently between the reflective events.
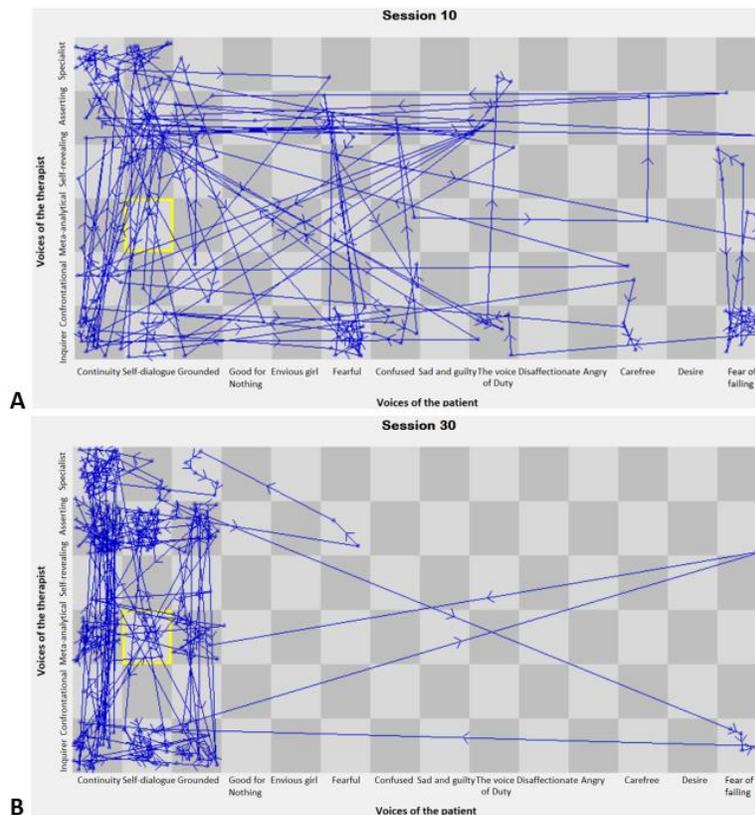
Note: In the square the reflective events (interaction between the therapist's meta-analytical voice and the patient's self-dialogue voice) present in these sessions are highlighted. The arrows indicate the transition from one event to the other.

Figure 3. Description of the events and their trajectory in sessions 10 (A), and 30 (B), based on their respective SSG grid.

Discussion

The aim of this study was to describe the temporal association among reflective events, the level of organization of events of voices and subjective positions presents in the psychotherapy of a patient diagnosed with BPD and the therapist, and her outcomes. For this purpose, to test the following hypotheses: H1: Reflective events in psychotherapy will have a positive temporal association with the patient's outcomes (not satisfied, only a non-significant synchronous association is presented); H2: The organization of events will have a positive temporal association with psychotherapy outcomes (satisfied); and H3: The patient's outcomes will have a positive temporal association between sessions (satisfied). Among the interactions of the discursive voices, the reflective events, that is, the therapist's meta-analytical voice and the patient's self-dialogue voice, belonging to their proposer and reflective positions respectively, could play a specific role as the psychotherapy progressed. The results allowed for the identification of an idiographic model in which the patient's outcomes follow a systematic and recursive temporal sequence, and they improve as the interaction between therapist's and patient's voices becomes more predictable or decreases in entropy. In other words, when the transition of a type of voice interaction between the patient and therapist, or events, becomes more predictable, stable, or demonstrates

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higher adaptability to its environment. In another study, it had been suggested that, in any case, stability would primarily be established due to dynamic dialogical patterns, which include reflective events. Although throughout the therapy, there were also monological patterns, where both the independent and dependent voices of the patient had prominence, but no positive association with therapeutic change (Mellado et al., 2022a).

The work of Ramseyer et al. (2014) found stable temporal associations of process and outcome variables in psychotherapy, describing amongst other findings, temporal stability in therapist interventions, serving as a predictive factor for favorable therapy outcomes. This is consistent with the results of this study, in which the instability of interactions between monological and dialogical voices is negatively associated with positive patient outcomes between sessions. This stability seems to be understood as regular interactions among voices that promote reflective or dialogical states and is not contradictory to the notion of dynamic multiplicity of positions and voices that are constantly in dialogue (Lopes-de-Oliveira et al., 2020), since the monological voices seem to have ceased to be dominant (without disappearing from the repertoire) and have come to be regulated by the dialogical voices that are beginning to dominate, into the reeditions of the patient's self-narratives.

The fact that the stabilization of the interaction of voices may involve an increase in reflective events could indicate an active ingredient for change in the patient of this study. The therapist intervening from a position that integrates psychological elements, and the patient engaging in a reflective exercise that persisted over time and integrated with other aspects of herself. Another study has described that the adoption and promotion of observing positions by therapists, avoiding closed judgments and confrontational actions, among others, allows the development of meta-positions in the dialogical self, which psychoanalytically could be considered as a promotion of the ego's observation capacities, of mentalizing processes, and of the management of the transference (Georgaca & Avdi, 2019). Although it has generally been thought that a meta-position is an achievement that requires a gradual construction, in the present study it was observed that the interactions between a rather active voice of the therapist and an integrative voice of the patient were present from the first session. This suggests that the therapeutic dialogue already could generate meta-perspectives and that it was consolidated in a better-organized metaposition manifested in more complex dialogues with other protagonists and secondary voices of this psychotherapy.

Regarding as above, the results of this study suggest that each meta-position is formed session by session, with active ingredients (including interactions similar to reflective events) that require some stability, such as the quality of the therapeutic alliance, and that allow patients to enhance self-reflective capacities that help them to connect some I-positions, observe their inner voices and their unfolding dialogues (Gkantona, 2023). Such reflective positions were linked in another case study with the growth of emotional I-positions, which increased the dialogical breadth of patients and the integration of experience (Kay et al., 2023).

Now then, without wishing to make an overlapping between terms from different psychological traditions, since they are in fact different constructs, the events formed between the meta-analytical voice of the therapist and the self-dialogue voice of the patient could suggest the development of aspects that have been described as forming part of the mentalizing capacity of patients (and also of the therapist in this case) and of the core role of the reflective function in psychotherapy (Kivity et al., 2021; Lüdemann et al., 2021). The meta-analytical voice under this perspective operates in a mentalizing way, generating different associations proposed to the patient about her own and others' mental states, and the patient, at the moment she integrates her different voices, also often performs mentalizing operations. In the therapy experienced by this patient, the activation of these voices allowed her to elaborate on her childhood traumas related to parental neglect and sexual abuse by others, showing from the beginning the appearance of this reflective voice, although not initially integrated, as a basal resource that allowed her to progress in her therapy. This resource could be considered similar to a good level of the reflective function that some patients diagnosed with BPD present and that allows them a protective capacity against psychopathology, mentalizing about the behavior of their primary caregivers, and allowing for higher levels of personality organization (Fischer-Kern et al., 2010). This resource was possibly enhanced by

psychotherapy as evidenced by the improvement of the RF achieved by patients when working on polarized affective states and on "split" representations of oneself and others (Fischer-Kern et al., 2015). The patient was thus able to hypothesize possible intentional mental states of her parents associated with their poor caregiving and neglect, their alcoholic behavior, and even the quality of her experiences as a child, transforming over time her initial emotions and psychological states of grief, guilt, and confusion. She managed to reconfigure herself by revisiting her past life and subsequently generating realistic possibilities in her role as a wife and mother. Her reconfiguration, or reorganization of subjectivity in dialogical terms (Martínez & Tomicic, 2018), was observed in her ability to achieve such dialogical patterns with the therapist as interlocutor. It is not a minor issue that these patterns have been configured in the presence of the therapist, since patients who have a higher level of reflective function establish the therapeutic alliance more easily than those who present lower levels, possibly being a moderator of the alliance towards therapeutic outcomes (Taubner et al., 2011), and it is possible that later this productive circle can be transposed to other situations in their daily lives where their interaction with significant others fosters such a reflective process.

The positive linear trend of this patient's outcomes contributes to the evidence regarding the systematic variation of these types of variables in psychotherapy. Other studies in the psychopathological area have shown sustained decreases in symptomatology over time, and a strong temporal dependence among different symptoms (O'Driscoll et al., 2022), as well as decreases or increases in stress, somatic distress, and catastrophic cognitions, etc., through positive autocorrelations (Imperiale et al., 2023). These findings and those of the present study suggest that some psychotherapy outcomes exhibit gradual and sustained, rather linear shifts that continue to promote therapeutic change. But there are also emergent and sudden processes that can often be considered phase transitions, or emergences in self-organizing systems (Schiepek et al., 2020). These emergent and nonlinear changes should be studied in greater detail in the variables of the psychotherapeutic process.

In this psychotherapy, reflective events emerged amidst a set of interacting voices. Therapeutic work with voices is how therapists can intervene. In this context, the particular voices expressed in therapeutic dialogue may be more or less dispersed, coalescing from time to time around specific discursive axes, that is, organizing themselves and generating coherent narratives of the stories that emerge in psychotherapy. Regardless of the content, a unifying axis may be situated in reflective positions that, when enhanced in clinical work, achieve the ability to meta-position themselves in front of the other voices in relatively short periods, between sessions.

The MAPP can be used as a tool for recognizing positions that promote the dialogical space between therapists and patients, such as in this case, the proposer position of the therapist and the reflective position of the patient. These are positions that have been found in other patients, and in different models of psychotherapy (Tomicic et al., 2015). In the case of this patient, the dialogical events were formed by the therapist's meta-analytical voice, which can be understood as a subjective expression of mentalizing, and by the patient's self-dialogue voice, which is a self-reflective and mentalizing expression. Therapists can recognize these types of voices and positions in themselves and in patients by being sensitive to their emergence at different stages (e.g., problem formulation, initial approach, emergence of new problems and solutions, etc.), and by actively encouraging their recognition and use in a context in which other expressions of subjectivity are also allowed and elaborated.

On a different level, Falkenström et al. (2022) suggest that within process-outcome psychotherapy research, it is necessary to use repeated measures and test predictive models that control for possible cross-lagged and autoregressive effects. While this implies a challenge for moving from idiographic to nomothetic models, it also highlights the importance of considering these types of specific temporal dynamics as part of the mechanisms of change in psychotherapy or as biases for descriptive or predictive results.

Limitations and future research

This study has some methodological and theoretical limitations that can be summarized in three general aspects. (1) This is a single case study, and therefore, the first point is to limit these results to a unique successful psychotherapy. (2) The proposed model is simple and aims to outline an association of temporal variables in

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psychotherapy, leaving out other variables of the same type that need to be considered later before performing the nomothetic stage. (3) Finally, the events are interactions between a specific therapist's voice (e.g., metanalytical) and a specific patient's voice (e.g., self-dialogue), identified through MAPP, so they adhere to a specific definition of voices and positions based on a dialogical self-theory.

Future research in this line should include other clinical cases to refine the model and a design that can generate a nomothetic stage integrating individual patient variability and the relational aspects of each therapist-patient dyad, considering their influence on the model. Treatments of dialogical, postmodern, constructivist or relational psychoanalytic orientation can be included, interested in applying a model such as MAPP to identify propositional (therapist's) and reflective (patient's) voices and actively work with this material in clinical supervisions, to enhance the effect of these reflective interactions.

Another possible topic to explore, following previous work by Reisch et al. (2008) and Kockler et al. (2017) who found oscillatory patterns between anxiety and sadness in patients diagnosed with BPD, as a specific aspect of their emotional instability, is the search for temporal patterns in patients' individual voices (reflective and non-reflective), which may help to describe specific voice sequences depending on symptom severity, clinical condition, and the therapeutic interventions undertaken.

Conflict of Interest
The authors declare that they have no conflict of interest.

Informed consent
Informed consent was obtained from all individual participants included in the study. The ethical protocol for this study was approved by the Scientific Ethics Board of Universidad Diego Portales, and informed consent forms were signed by both the patient and the therapist, who allowed the therapy material to be used for research purposes and related publications. In addition, the ethical process was approved by the Scientific Ethical Committee of Social Sciences, Arts and Humanities, of the Pontificia Universidad Católica de Chile, ID: 181108008.

Availability of data and material (data transparency): Anonymized data will be made available upon reasonable request to the first author.

Authors' contributions: AM participated in the study design, data analyses, and writing the draft of the manuscript. CM participated in the critical review of the draft of the manuscript. Both authors contributed to the article and approved the submitted version.

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