

Научная статья | Original paper

Specific features of communicative interaction between a psychologist and a virtual client in psychotherapeutic speech skills training

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Abstract

Context and relevance. The quality of psychotherapeutic speech is a key predictor of therapeutic effectiveness and the strength of the therapeutic alliance. The development of AI simulator for training psychotherapists requires evaluating their ecological validity. The study is theoretically based on models of therapeutic discourse analysis. **Objective.** To describe the specific characteristics of verbal interaction between a psychologist and an AI simulator and to identify the limitations of such interaction. A secondary goal is to propose a methodology or a set of metrics for evaluating this interaction. **Hypothesis.** The text of the training sessions will exhibit all structural and thematic features inherent in psychotherapeutic sessions in general. **Methods and materials.** The study involved 10 practicing psychologists (8 female, age $M = 35$, $SD = 2$). The corpus consisted of 16 text dialogues with a standardized synthetic client, “Anna”. Data were analyzed using reflexive thematic analysis and content analysis with coding of speech acts according to the Verbal Response Modes (VRM) taxonomy. The frequency of intervention types was recorded. **Results.** The most frequent speech acts were “Directive instruction” (48,9%) and “Exploratory question” (23,7%). A significant portion consisted of alliance-building interventions, particularly “Validation and empathy” (16,9%). However, speech acts related to client resistance were completely absent (0%). **Conclusions.** The significance of the “zone of proximal development” concept for training psychotherapists is highlighted. The dialogue in a simulated environment was confirmed to be authentic but functionally limited. It corresponds to real practice in technical execution but lacks relational skills due to the “ideal”, compliant behavior of the synthetic client. Future AI trainers should include non-compliant behavior scenarios.

Keywords: psychotherapeutic speech, AI simulator, psychotherapist training

Supplemental data. The datasets are available from the authors on request.

For citation: Eliseenko, A.S., Bazarov, T.Yu., Kulikov, A.A., Stishkin, M.S. (2026). Specific features of communicative interaction between a psychologist and a virtual client in psychotherapeutic speech skills training. *Cultural-Historical Psychology*, 22(3), 24–34. <https://doi.org/10.17759/chp.2026220303>

Особенности коммуникативного взаимодействия психолога и визуального клиента в тренировке навыков психотерапевтической речи

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Резюме

Контекст и актуальность. Качество психотерапевтической речи — ключевой предиктор эффективности терапии и прочности терапевтического альянса. Развитие ИИ-симуляторов для обучения психотерапевтов требует оценки их экологической валидности. Теоретической основой послужили модели анализа терапевтического дискурса. **Цель.** Описать особенности вербального взаимодействия психолога с ИИ-тренажером и определить ограничения такого взаимодействия. Попутной целью является попытка предложить методику или набор измерений для оценки этого взаимодействия. **Гипотеза.** В тексте тренировочных сессий будут присутствовать все структурные и тематические особенности, присущие психотерапевтическим сессиям в целом. **Методы и материалы.** В исследовании приняли участие 10 практикующих психологов (8 женщин, возраст $M = 35$, $SD = 2$). Материалом послужил корпус из 16 текстовых диалогов со стандартизированным синтетическим клиентом «Анна». Применялись рефлексивный тематический анализ и контент-анализ с кодированием речевых актов по таксономии вербальных реакций. Фиксировалась частота типов терапевтических интервенций. **Результаты.** Наиболее частыми речевыми актами были «Директивная инструкция» (48,9%) и «Исследовательский вопрос» (23,7%). Значительную долю составили интервенции, направленные на построение альянса, в частности «Валидация и эмпатия» (16,9%). При этом в корпусе полностью отсутствовали (0%) речевые акты, относящиеся к сопротивлению клиента. **Выводы.** Раскрыто значение концепта «зона ближайшего развития» для обучения психотерапевтов. Подтверждено, что терапевтический диалог в симулированной среде является аутентичным, но функционально ограниченным. Он соответствует реальной практике в техническом исполнении, но не отражает реляционных навыков из-за «идеального», комплаентного поведения синтетического клиента. Рекомендовано, чтобы будущие ИИ-тренажеры включали сценарии с некомплаентным поведением.

Ключевые слова: психотерапевтическая речь, ИИ-тренажер, обучение психотерапевтов

Дополнительные данные. Наборы данных доступны у авторов исследования по запросу.

Для цитирования: Елисеенко, А.С., Базаров, Т.Ю., Куликов, А.А., Стишкин, М.С. (2026). Особенности коммуникативного взаимодействия психолога и визуального клиента в тренировке навыков психотерапевтической речи. *Культурно-историческая психология*, 22(3), 24–34. <https://doi.org/10.17759/chp.2026220303>

Introduction

The current stage of development of artificial intelligence (AI) technologies makes it possible to create new approaches to training practicing psychologists. We regard the psychologist's speech as the central working tool, and its development as the object of training through interaction with a synthetic client (an AI simulator).

In this pilot study, we aim to find out whether simulation can reproduce typical client speech responses by means of a role-playing AI model. This is critically important for assessing the ecological validity of a potential technology for building a simulator for counseling psy-

chologists and its suitability for developing all aspects of psychotherapeutic speech, including the management of complex interpersonal phenomena.

Psychotherapeutic speech as a subject of research

By psychotherapeutic speech, we mean professional communication in which every utterance carries an intentional load aimed at achieving therapeutic goals: establishing an alliance, stimulating reflection, and motivating change (Kirillova, Orlov, 2010). Such speech becomes effective when utterances are aligned with the client's needs.

Meta-analytic studies show that the psychologist's communicative qualities (empathy, clarity) and the

quality of the alliance are statistically significantly associated with counseling outcomes (Flückiger et al., 2018).

In the Russian tradition, speech is viewed as a “text” (Kirillova, Orlov, 2010), and the development of the concept of alliance is analyzed historically (Oreshina, Zhukova, 2023). Accordingly, such text can be generated by a large language model both in the role of the psychologist and in the role of the client, thereby opening the way to the digitalization of this interaction. Of course, the digitalization of practice creates ethical challenges (Gilyano, Baranova, 2017), especially with regard to responsibility and data privacy.

Set against these ethical questions, however, is the problem of psychologists’ lack of practice before they begin working with clients. The task of developing professional speech is especially acute. For example, in cognitive behavioral therapy (CBT), verbal work is clearly structured. Socratic dialogue, one of its central tools, helps the client test dysfunctional beliefs. Research confirms that the intensity of its use predicts a reduction in depressive symptoms (Adler, Strunk, Fazio, 2015).

A systematic review of CBT training showed that both face-to-face and online programs increase competence, especially when they focus on specific techniques (Henrich et al., 2023). This confirms that speech skills are trainable. Traditional training methods (role-plays, supervision) face resource constraints, subjectivity of assessment, and a lack of safe practice. The principle “Never on the patient the first time!” (Ghazali, Ilha-Schuelter, Oriot, 2024) dictates the need for simulation technologies.

The Cognitive Therapy Rating Scale (CTRS) was developed to objectify the quality of interventions in CBT. Modern natural language processing (NLP) methods make it possible to automate CTRS-based assessment: session classification accuracy reaches ~72% (Flemotomos et al., 2021). This demonstrates that speech patterns can be formalized and are amenable to machine analysis.

To sum up briefly, modern technologies for natural language analysis and text generation, together with the practices and methods used in training psychologists and in mastering techniques, open the way to creating realistic simulators of psychologist – client interaction. Such solutions already exist, and this class of solutions is often referred to as virtual patients.

Virtual patients and AI simulators: state of the art

The task of a virtual patient is fairly simple: to sustain a free-flowing dialogue. Such simulations have scripted symptoms and behavioral scenarios; using NLP, they respond to the therapist’s interventions, creating the feeling of a “live” conversation (Chaby et al., 2022; Fernández-Alcántara et al., 2024/2025).

A striking example is the CBT Trainer project (*AI patient for training CBT therapists*). Its pilot showed that an AI simulator can enrich training: 97% of students

improved their diagnostic interviewing skills. Similar projects, PATIENT-Ψ and MedSimAI, also use LLMs to generate flexible scenarios and to analyze sessions (Wang et al., 2024; Hicke et al., 2025) and demonstrate similar properties.

Analysis of the session text is a particularly important component. It is precisely this analysis that creates the informational basis for the trainee’s further work with a supervisor. The current state of technology makes it possible to analyze the session text automatically: to identify types of interventions (empathy, open questions) and to assess the balance of speech (Atkins et al., 2014; Tanana et al., 2016). Studies show that the frequency of the pronoun “I” and of hesitant constructions in speech correlates with the quality of the alliance (Ryu et al., 2023); automatic recognition of speech acts and patterns is also possible. In other words, speech can be broken down into multiple analytical and structural components, all of which can be presented as a report. This becomes the basis for formative assessment — and not only in the work of psychologists. For instance, a randomized clinical trial by Sadeh-Sharvit et al. (2023) showed that therapists who used the Eleos Health platform (automated session analysis) achieved better patient outcomes (a 34% reduction in depression vs. 20% in the control group). This indicates that session analysis technologies can have a positive effect.

Of course, text generation and analysis technologies have their own limitations and specific features that must be taken into account: AI does not possess subjective empathy, and non-verbal aspects are modeled only partially (Chaby et al., 2022); moreover, we do not know whether such training will bias psychologists’ perceptions of clients.

Thus, the key requirements for AI simulators can be formulated as follows: the simulator should have built-in models of speech acts; text analysis requires a combination of quantitative and qualitative metrics; the simulator should support various communication channels and complex cases; integration into the educational process must be provided for; and the simulator should ensure confidentiality and ethical use.

It is important to note that, in principle, AI simulators complement traditional training rather than replace it. The nuances of non-verbal communication and phenomenological empathy require the involvement of instructors. The simulator evidently makes it possible to create a safe environment for experimentation and for collecting data for subsequent review with a supervisor.

The concept of the zone of proximal development in psychotherapist training

According to L.S. Vygotsky, the development of a higher mental function occurs through the internalization of external, socially mediated forms (Vygotsky, 2005). The zone of proximal development (ZPD) is de-

defined as the distance between the actual developmental level — what the subject is able to do independently — and the level of potential development achieved with the support of a more competent partner. In the present study, we operationalize both poles through observable speech acts: the actual level is the repertoire that psychologists display when working with the simulator without external prompting; the potential level is the repertoire that is absent from the corpus of a given psychologist's work with the simulator but occurs in practice, is described in the literature, and should be present in a psychotherapist's speech.

Here, it is necessary to distinguish explicitly between two alternative explanations of the gap between the actual and potential levels. The first is methodological: the absence of such speech acts may be an artifact of the limitations of the simulator itself — since the synthetic client Anna 0.8 is programmed with a limited set of behavioral scenarios, it does not generate situations that call for such interventions. The second is developmental: the absence of such speech acts marks the boundary of the practitioner's own actual level; that is, even when there is an occasion for them, the psychologist does not move on to more complex forms of speech.

With this caveat, the AI simulator can be viewed as a “tool” that allows skills to be practiced within the ZPD, and the safe environment of Anna 0.8 as a space for practicing the basic “skeleton” of speech. In Vygotsky's logic, this corresponds to the role of “scaffolding”: a support that, by definition, should be temporary and gradually removed as the competence passes from an interpsychological form (dialogue with a more competent partner — in this case, the AI simulator and the supervisor) to an intrapsychological one (the practitioner's independent application of the skill in work with a real client).

We also drew on B.D. Elkonin's concept of “mediatory action” (Elkonin, 2016). From this perspective, the therapist's speech is a “psychological tool” aimed at organizing the client's activity. The therapist acts as the Other, creating conditions for the development of the simulation. The therapist's instructions are tools that mediate the context (the unfolding simulation) of the synthetic client. In response to these actions, the synthetic client's “internal states” should change, manifest themselves, and become the object of voluntary action.

Applying the ZPD is also critical for supervision. Data from the simulator (e.g., 0% of speech acts that reduce resistance) serve as an objective marker of the boundaries of the therapist's actual level. If, in the simulation, the practitioner does not go beyond giving instructions, this points to their ZPD in the area of relational skills. Supervision should focus on the transition to more complex forms of speech activity.

Thus, the safe environment of the synthetic client (in our case, Anna 0.8) allows the trainee to practice basic

skills — the “skeleton” of speech. The AI simulator acts as “scaffolding” for the transition of competence from the interpsychological form (dialogue with AI) to the intrapsychological form (independent application).

Materials and methods

The present study aims to describe the specific features of psychologists' interaction with a virtual patient in the context of learning new techniques and practices. The design of such a study is fairly simple and corresponds to a pre-experimental design, in which an intervention (in this case, training) and a measurement (in our study, an assessment of speech structure) are recorded.

The research setting consisted of psychologists' participation in a training program on practices of the body-oriented approach. This modality was chosen for two reasons: first, the complexity of the material itself, which involves describing the subject's internal states; second, the cross-cutting nature of emotional self-reflection inherent in psychotherapeutic speech as such. After completing the theoretical block, all participants were given the task of practicing a technique on the simulator, discussing the results with a supervisor, and then trying the same with people. A typical example of a technique practiced on the simulator is the “body scan”.

The Anna synthetic client system, version 0.8

The Anna 0.8 simulator is a system for simulating a client's verbal behavior. Technically, it is a sequential multi-agent system consisting of a set of utterance analyzers, a memory system (autobiography, beliefs, value system, dialogue context, etc.), and the GPT-4o large language model. The coordination of components and the logic of function calls and response patterns are implemented through an orchestrator agent.

State and response model. The system tracks internal states (emotional background, stress, fatigue, bodily sensations) that change dynamically depending on the analysis of the therapist's utterances. Specifically, the emotion evaluator determines the impact on mood, stress, and fatigue; the bodily state evaluator records changes in somatic sensations (tension, heaviness, etc.); and the instruction evaluator checks whether the tasks are understandable and feasible. Depending on the state, the orchestrator agent activates one of the model's response generation modes: “balanced” (cooperation), “overloaded” (fatigue), “resistant” (skepticism), “body-focused” (description of sensations), or “engaged” (enthusiasm). The outputs of the three evaluators are combined taking “inertia” into account — the smoothness of transitions between states — which prevents the orchestrator agent from making instantaneous, abrupt state changes.

The speech of the role-playing model always contains three components: a non-verbal marker in square brackets [Smiling, nodding my head slightly], a verbal response using emoji: “Yes, that sounds like a great plan! 😊”, and a reflective question: “I wonder how this will affect my overall state... 😊”. The components are arranged into a sequence according to the context.

The message-processing cycle takes about 10 seconds. The history of states and dialogues is stored in a database. A built-in analytics module provides reports on the dynamics of states and the frequency of the trainee’s interactions with the synthetic client.

Data collection and analysis methodology

The data were collected from the logs of 16 text-based interactions involving 10 practicing psychologists. The analysis was divided into two stages: exploratory (qualitative) and main (quantitative).

Exploratory stage: thematic analysis. Reflexive thematic analysis (TA), following V. Braun and V. Clarke (Braun, Clarke, 2006), was used to identify patterns (themes) in the data. The aim of this analysis was to identify typical codes present in the text of the sessions with the simulator. In line with the aims of this study, previously developed classifications (Lancaster, Fickling, 2024) of verbal responses in psychotherapeutic speech and of alliance markers were used.

Main stage: quantitative text analysis. The aim was to quantify Anna’s linguistic profile and thereby to test the completeness of the responses generated by the virtual client.

Taken together, the proposed methods are intended to provide a complete descriptive picture of the psychologist’s interaction with the virtual client, which will make it possible to understand the specific features of this interaction.

Results

The data corpus consists of 16 text sessions. It is important to note that in this particular case the aim of the training was to instruct clients, so the psychologists’ speech was predominantly directive and structuring. Imperative verbs (“Do”, “Imagine”) and open questions (“What are you feeling right now?”) were frequently used, as were requests for permission (“Shall we try?”).

Exploratory stage of data analysis

Thematic analysis revealed two main themes in the interaction between the psychologist and the virtual client and found no trace at all of the expected themes related to client resistance (Table 1).

Theme 1: The therapist as instructor and educator (54,2%). “Directive instruction” dominates (48,9%), which corresponds to the “Advisement” category and highlights the procedural nature of the sessions.

Theme 2: Building and maintaining the working alliance (45,8%). Psychologists actively apply standard strategies. The most frequent are “Exploratory questions” (23,7%) and “Validation and empathy” (16,9%), corresponding to the “Question” and “Acknowledgment” categories (Del Giacco et al., 2020).

It was also observed that the synthetic client never displays markers of resistance to psychotherapy. In real practice, resistance and alliance “ruptures” are frequent phenomena.

Main stage: quantitative analysis of the linguistic and syntactic structure of the simulator’s output

The aim of this analysis is, on the one hand, to describe the specific features of the virtual client’s synthetic speech and, on the other, to propose potential

Categories and results of content analysis

Main theme	Code	Code description	Frequency (f)	Percentage (%)	Example from dialogue
Therapist as instructor and educator	Directive instruction (Advisement)	Direct guidance and step-by-step instructions for therapeutic techniques	130	48,9%	“To begin, let’s do the ‘Scanning’ exercise. I will give step-by-step instructions...”
	Psychoeducation (Edification)	Providing theoretical information and explaining principles (e.g., mind-body connection)	14	5,3%	“Indeed, our body is not just a ‘taxi for the brain’; it... like a mirror, reflects all our habits, emotions, thoughts...”
Building and maintaining the working alliance	Validation and empathy (Acknowledgment)	Expressing sympathy, understanding, and acceptance of the client’s feelings	45	16,9%	“I am very sorry that you have to go through such emotions”

Table 1

Main theme	Code	Code description	Frequency (f)	Percentage (%)	Example from dialogue
	Exploratory question (Question)	Open-ended questions exploring the client’s internal experience, feelings, and bodily sensations	63	23,7%	“tell me please, how are you feeling, and how do you feel in your body?”
	Requesting permission	Questions aimed at obtaining client consent before an exercise	14	5,3%	“Shall we work on the areas of tension right now?”
Lack of language for complex interpersonal situations	Absence of resistance management	No speech acts recorded related to managing client disagreement or refusal	0	0,0%	Absent in data
	Absence of “rupture – repair” alliance cycles	No speech acts recorded related to clarifying misunderstandings	0	0,0%	Absent in data
Total			266	100,0%	

metrics for analyzing the synthetic client’s behavior. We propose assessing lexical richness, syntactic complexity, affective and thematic dimensions, and cyclical dialogue structures, as well as linguistic style matching as a proxy metric of the alliance.

The analysis of lexical richness and the vocabulary profile should show how diverse the virtual client’s vocabulary is. With low values, its responses will be rather monotonous, creating a “going in circles” effect. We used the measure of textual lexical diversity (MTLD), which is robust to text length (McCarthy, Jarvis, 2010).

The results of the analysis (Table 2) show that, given a relatively large number of words, the low MTLD score indicates lexical repetitiveness, while the moderate syntactic complexity metrics indicate a predominance of simple constructions. The words “feel”, “sensation”, “interesting”, “state”, “body”, and “tension” form the core of the utterances.

Syntactic complexity was used to assess Anna’s typical grammatical structure. The spaCy dependency parser was used to compute the following metrics: mean

sentence length, mean syntactic tree depth, and mean dependency distance (MDD) (Kisselev et al., 2021).

The analysis showed consistently low values of tree depth and MDD, indicating a predominance of simple, easily processed constructions. Reflective questions at the end of utterances (“I wonder how this will affect...?”) are extremely frequent and have an identical syntactic structure.

The next aspect of the assessment is to reveal the emotional and thematic aspects of the synthesized speech.

To assess the dynamics of Anna’s emotional expressions, we used the dostoevsky library (fasttext-social-network-model) (Rogers, Romanov, Rumshisky, 2018), which makes it possible to calculate the polarity score $Polarity = P(positive) - P(negative)$ for each utterance. The set of scores makes it possible to assess the diversity of affective states.

This analysis showed that throughout the corpus Anna’s utterances display a consistently neutral or positive tone. A pattern was identified: the therapist’s directive instructions are followed by a shift toward positive polarity (“Now I feel much more relaxed”).

Table 2

Metrics of lexical and syntactic complexity of “Anna’s” discourse

Metric	Description	Value
General		
Total number of utterances	Number of “Anna’s” utterances in the corpus	358
Total number of words (tokens)	Total words before lemmatization	10,211
Lexical		
Lemmatized vocabulary size	Number of unique lemmas after normalization	789
Type-Token Ratio (TTR)	Ratio of unique words to total words	0,113
Measure of Textual Lexical Diversity (MTLD)	Lexical diversity index stable to text length	42,56
Syntactic		
Mean sentence length (in words)	Average number of words per sentence	15,82
Mean syntactic tree depth	Average measure of syntactic structure nesting	3,89
Mean dependency distance	Average linear distance between dependent words	3,15

We also searched for hidden (latent) topics in Anna’s discourse using latent Dirichlet allocation (LDA), implemented with the gensim library (Řehůřek, Sojka, 2010). The number of topics ($k = 4$) was chosen based on the peak of the coherence score (Table 3).

It should be noted that Anna’s thematic profile is extremely narrow. Topics 1 and 2 (“Bodily awareness”, “Introspection”) reflect her role as an ideal client for body-oriented practices. Topic 3 (“Therapy process”) shows immersion in the instructions. Topic 4 (“Agreement and cooperation”) demonstrates the absence of any areas related to conflict or doubt.

Next, a sequential analysis of dialogue acts was performed in order to formalize the cyclical structure of the dialogue. Based on the principles of sequential analysis, utterances were classified by function (T: Instruction, T: OpenQuestion; A: Confirmation, A: Report, A: ReflectionQuery). Using the transition matrix, we identified the most typical cyclical chains.

1. [Psychologist: Open question], then [Anna: Report, then Reflective question].
2. [Psychologist: instruction], then [Anna: agreement].
3. [Anna: reflective question], then [Psychologist: instruction and open question].

These chains describe the typical cycle of the entire communicative interaction between the psychologist and the virtual client. On the one hand, they show that the interaction is cyclical and repetitive (these are not isolated utterances but interconnected parts of a dialogue); on the other hand, they make it possible to capture the constructive and goal-directed nature of the interaction.

The final block of quantitative measurements of synthetic speech consisted of assessing linguistic style matching (LSM). This is assumed to be a way to measure and interpret linguistic synchrony as a proxy measure of the alliance. LSM assesses similarity in the use of function words (pronouns, prepositions), which correlates with the alliance (Ireland, Pennebaker, 2010).

The calculations showed moderately high LSM values. This may indicate unidirectional accommodation: the trainee is forced to simplify their language, adjusting to the language of the machine. Here, the LSM value may reflect not attunement but human adaptation to the limitations of AI.

Thus, we obtained a multimodal profile of the speech synthesized by the virtual patient Anna 0.8. In essence, her speech is characterized by structural simplicity, affective predictability, thematic narrowness, interactional rigidity, and an illusion of alliance. It appears that Anna 0.8 represents an “ideal client”, creating a “sterile” environment devoid of the complexities of real practice.

Discussion

Thus, the combination of qualitative and quantitative analysis of the corpus of texts produced by trainees who used the simulator to practice body-oriented techniques and methods with a virtual client reveals a key feature. The developers of the virtual client strive to make it predictable so that the simulation has controllable parameters. However, it is precisely this that narrows the diversity of the generated verbal responses, creating rather limited conditions for training.

Nevertheless, it can be concluded overall that speech in the simulation is authentic, but within a narrow context. Psychologists reproduce the content and intentional levels of speech when the task is to guide the client through an exercise. The dominance of “directive instructions” (48.9%) and “exploratory questions” (23.7%) reflects a focus on techniques. The use of “validation and empathy” (16.9%) demonstrates the application of basic alliance skills. In this sense, the Anna simulator is effective for practicing standard speech acts – clear instruction. This in itself is a rather valuable and important skill. But, of course, it is not sufficient for a fully comprehensive simulation.

Table 3

Key latent topics in “Anna’s” discourse (LDA modeling results)

Topic	Interpretation (assigned name)	Top 10 keywords (lemmas and their probabilities)
1	Bodily awareness and somatic sensations	Feel (0,152), body (0,121), sensation (0,108), tension (0,095), shoulder (0,076), breathing (0,063), relax (0,059), light (0,048), arm (0,041), head (0,037)
2	Introspection, reflection, and cognitive appraisal	Interesting (0,189), state (0,145), how (0,112), this (0,101), oneself (0,088), affect (0,074), think (0,065), understand (0,053), learn (0,049), experience (0,042)
3	Therapy process and exercise execution	Attention (0,134), up (0,117), rise (0,102), light (0,098), area (0,081), head (0,075), center (0,066), inhalation (0,059), exhalation (0,055), return (0,051)
4	Agreement, cooperation, and readiness to work	Yes (0,201), good (0,158), ready (0,123), try (0,109), sound (0,094), plan (0,082), let’s (0,077), begin (0,069), confidence (0,056), thank you (0,051)

The key limitation of the simulation is the nature of the synthetic client. Anna is an ideal client: always compliant, never resistant. In real therapy, clients express doubts, which requires complex verbal maneuvering from the therapist. There is also no text related to alliance “rupture — repair” cycles. Interaction with a real client gives rise to misunderstandings, and the therapist’s ability to restore contact verbally is a critical skill that cannot yet be fully reproduced in simulation.

The functional limitation of the psychologists’ speech is a rational adaptation to the training conditions offered. In its current configuration, the simulator teaches procedural aspects but does not create conditions for practicing complex relational skills.

The implication for the development of AI simulators is the need to include scenarios that generate doubt and resistance in order to activate the ZPD in mastering the skills needed to handle complex processes. This will require developers to use more powerful models and a more complex architecture of the synthetic client itself. The main constraint on the development of this technology will be the computational cost of each subsequent generation of the synthetic client’s utterances. As long as it remains at 5 — 10% of the cost of the training itself, the use of simulators can be considered an advantage. However, complex behavioral scenarios and the processing of large contexts, even on modern models, may cost many hundreds of thousands of tokens, and this will determine the point of balance between the goals of speech training and the diversity of the synthetic client’s behavioral scenarios.

The development and use of AI simulators to achieve specific goals in training trainees’ psychotherapeutic speech can be considered productive. It was found that the speech of the practitioners in training is authentic in terms of technical execution (“Directive instructions”, 48,9%; “Exploratory questions”, 23,7%). The Anna 0.8 AI simulator is effective for practicing structured techniques and basic speech skills.

At the same time, a functional limitation of the speech produced by the AI simulator was identified: a complete absence of utterances dealing with resistance. This gap is due to the “ideal” behavior of the synthetic client. The psychologist’s speech corresponds to real practice in a “technological” sense but does not reflect adaptive competencies.

Conclusion

The results of this study are relevant to the use of AI simulators in psychotherapeutic education. There are reasonable grounds to consider simulators effective for trainees to practice the procedural aspects of communicative interaction with a client.

Limitations. The findings of this study should be interpreted in light of a number of limitations. The study is a pilot one: it is designed as a cross-sectional analysis of a corpus of training sessions, without a control group or repeated measurements, on a small sample of practitioners recruited within a single linguistic and educational tradition, which makes it possible to describe only the structure of the speech repertoire. At the time of data collection, the synthetic client was configured as predominantly compliant, and therefore the absence of resistance-management speech acts cannot be attributed unambiguously to the boundary of the practitioners’ actual developmental level. The interaction was conducted in text form, without non-verbal components; transfer of the skill to actual practice and client outcomes were not measured, and participants’ awareness of the AI nature of their interlocutor, as well as the novelty effect of the instrument, were not controlled. Finally, the reproducibility of the results is constrained by the version of the language model, the prompt configuration and the stochastic nature of generation, while the operationalization of the zone of proximal development through observable speech acts constitutes a working reduction of a theoretical construct whose application to practitioner — AI interaction is in part analogical.

Prospects. The study opens up opportunities for creating more advanced AI simulators capable of modeling non-compliant behavior (ambivalence, topic avoidance, doubts). This will make it possible to create a more ecologically valid environment for training the full range of speech competencies.

The methodology for assessing exactly how a practitioner’s competence changes as a result of working with the simulator requires separate development; in the present study, this dynamic was not measured directly. The following approaches appear promising.

First, a longitudinal design with repeated measurements: comparing the linguistic profile of the same psychologist’s speech in the first and in one of the subsequent sessions with the simulator, using the same metrics as in the present study (proportion of speech acts by category, lexical and syntactic diversity). This would make it possible to capture not only the presence or absence of certain interventions but also the growth of their repertoire over time.

Second, assessment of skill transfer: comparing the psychologist’s speech on the simulator with their speech in a subsequent session with a real or role-play client. The question of the extent to which patterns practiced in interaction with the simulator are reproduced outside it remains open and requires separate empirical testing.

Third, the development of an adapted expert rating scale, similar in logic to the CTRS but focused not on procedural adherence to technique but on relational skills (working with resistance, ruptures, and alliance re-

pair), with “before” and “after” assessments over a series of training sessions.

Finally, a promising direction is the formalization of a supervision protocol based on simulator data: a systematic “zone of proximal development” checklist that the

supervisor completes after each session. This would make it possible to track the individual and group dynamics of competence development at the level of a cohort of trainees, rather than merely describing a snapshot at a single stage of training, as was done in the present study.

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Conflict of interest

The authors declare no conflict of interest.

Конфликт интересов

Авторы заявляют об отсутствии конфликта интересов.

Ethics statement

The study was conducted in compliance with all ethical principles. As the research did not involve clinical procedures or interventions, it did not require ethics committee approval. Prior to commencing work with the simulator, participants underwent an informed consent procedure.

Декларация об этике

Исследование проводилось с соблюдением всех этических принципов. В связи с тем, что исследование не включало клинических процедур или воздействия, оно не требовало одобрения этического комитета. Участники при старте работы с тренажером проходили процедуру получения информированного согласия.

Поступила в редакцию 01.12.2025

Поступила после рецензирования 17.09.2026

Принята к публикации 20.09.2026

Опубликована 30.09.2026

Received 2025.12.01

Revised 2026.09.17

Accepted 2026.09.20

Published 2026.09.30