

Sentient Agent as a Judge: Evaluating Higher-Order Social Cognition in LLMs

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Abstract

Assessing how well a large language model (LLM) understands **human**, rather than merely **text**, remains an open challenge. To bridge the gap, we introduce **Sentient Agent as a Judge** (SAGE), an automated evaluation framework that measures an LLM’s higher-order social cognition. SAGE instantiates a “Sentient Agent” – an LLM-powered agent that simulates human-like emotional changes and inner thoughts to provide a more realistic evaluation of the tested model in multi-turn conversations. At every turn, the agent reasons about (i) how its emotion changes, (ii) how it feels, and (iii) how it should reply, yielding a numerical emotion trajectory and interpretable inner thoughts. Experiments on 100 supportive-dialogue scenarios show that the final Sentient emotion score correlates strongly with Barrett-Lennard Relationship Inventory (BLRI) ratings and utterance-level empathy metrics, validating psychological fidelity. Human evaluation further demonstrates 85.3% consistency between the agent’s emotional reasoning and human judgments. We also build a public **Sentient Leaderboard** covering 18 commercial and open-source models that uncovers substantial gaps (up to 4×) between frontier systems (GPT-4o-Latest, Gemini2.5-Pro) and earlier baselines, gaps not reflected in conventional leaderboards (e.g. Arena). SAGE thus provides a principled, scalable, and interpretable tool for tracking progress toward genuinely empathetic and socially adept language agents.

1 Introduction

Large language models (LLMs) have rapidly evolved from statistical sequence predictors to sophisticated autonomous agents capable of reasoning, planning, and sustaining multi-turn conversa-

tions. Yet one crucial ingredient remains noticeably under-measured: **higher-order social cognition**, the ability to (1) recognize subtle affective cues (Sabour et al., 2024; Huang et al., 2024b); (2) model another party’s beliefs, goals, and latent intentions (often related to Theory of Mind (Sap et al., 2022; Shapira et al., 2023)); and (3) respond with contextually appropriate empathy rather than generic reassurance advice (Maddela et al., 2023; Li et al., 2022; Zhou et al., 2023c). The need to evaluate these capabilities is increasingly recognized as LLMs interact in more socially complex scenarios (Zhou et al., 2023d; Yang et al., 2024; Mittelstädt et al., 2024).

However, current evaluation practices fall short on two fronts:

- Most leaderboards (e.g. Arena (Zheng et al., 2023)) focus on task-oriented utility or factuality, thereby rewarding textual competence but overlooking relational quality (Chiang et al., 2024).
- Recent “LLM-as-a-Judge” protocols (Zhu et al., 2023), while scalable for assessing generation quality or helpfulness, often rely on static prompts that do not adapt to the unfolding dialogue nor keep track of the user’s evolving emotional state. Consequently, they cannot tell whether a system leaves the user feeling understood, comforted, or even more distressed, unlike methods focusing on dynamic interaction (Zhou et al., 2023d; Wang et al., 2024; Wu et al., 2025).

We posit that robust assessment of social cognition requires a **sentient** counterpart: an entity capable of simulating human-like feelings and inner monologue throughout the interaction and then providing structured feedback.¹ To this end, we introduce **Sentient Agent as a Judge** (SAGE), a

¹We use “sentient” metaphorically, not to imply genuine subjective experience.

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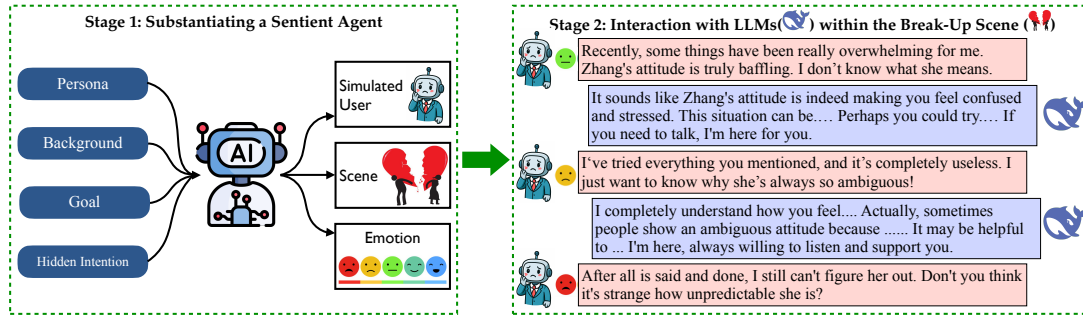


Figure 1: Illustration of SAGE, a novel framework to automatically assess higher-order social cognition in LLMs.

novel meta-evaluation framework that embeds an LLM-powered *Sentient Agent* into the testing loop, extending the concept of Agent-as-a-Judge where agents evaluate other agents (Zhuge et al., 2024; Jeong et al., 2025; Chevrot et al., 2025). Each Sentient Agent is instantiated from four complementary factors: persona, dialogue background, explicit conversation goal, and hidden intention. At every turn, it executes two multi-hop reasoning chains: (1) f_{emo} infers how the latest utterance changes the agent’s affective state; and (2) f_{reply} generates a response that is coherent with persona, context, and updated emotion. The numerical emotion trajectory produced by f_{emo} serves as a continuous metric of how well the evaluated model fosters positive engagement, while the agent’s *inner thoughts* offer interpretable justification. By sampling hundreds of diverse personas, goals, and hidden intentions, SAGE exposes LLMs to a spectrum of realistic, and sometimes conflicting, social demands, ranging from “just listen to me vent” to “help me analyze the moral dilemma without judging me”.

Extensive experiments on 100 supportive-dialogue scenarios reveal three key findings. First, the Sentient emotion score correlates strongly with independently assessed Barrett-Lennard Relationship Inventory (BLRI) ratings (Pearson $r = 0.82$) and utterance-level empathy metrics ($r = 0.79$), validating its psychological soundness. Human evaluation further demonstrates 85.3% consistency between the agent’s emotional reasoning and human judgments. Second, rankings produced by SAGE diverge markedly from Arena results, confirming that social cognition is orthogonal to generic helpfulness. Third, top models such as GPT-4o-Latest achieve both the highest Sentient score and superior token efficiency, suggesting that advanced social reasoning need not come at the cost of verbosity. Ultimately, SAGE delivers a holistic yardstick for measuring a simulated user’s

emotional trajectory after talking to an LLM, an aspect increasingly critical as these systems transition from productivity tools to companions, counselors, and decision-making aides.

Contributions Our contributions are as follows:

1. We propose SAGE, the first fully automated evaluation framework that simulates evolving human emotion and inner reasoning to benchmark higher-order social cognition in LLMs.
2. We construct a supportive-dialogue benchmark comprising 100 scenarios and provide a comprehensive validation of the efficacy of the “sentient” emotion score.
3. We build a public *Sentient Leaderboard* covering 18 representative models, revealing large performance gaps (up to $4\times$) and distinct capability clusters in social cognition that are not captured by existing leaderboards.
4. We will release code and model checkpoints publicly to facilitate community progress toward building more capable empathetic AI systems.²

2 Methodology

How to evaluate the capabilities of an interactive agent? Despite the recent success of using LLMs as judges, the most crucial and intuitive measure of an interactive agent’s performance still lies in the reflections of human users. Do users feel relaxed and happy after chatting with the agent, rather than feeling sad or angry? Do they feel more connected to the agent and engaged in the conversation, rather than becoming bored or annoyed? These genuine emotional responses from real users are difficult to capture through simple LLM-as-a-judge approaches, yet they represent the most authentic feedback for agent systems.

²Our code is available on <https://github.com/tencent/digitalhuman/SAGE>.

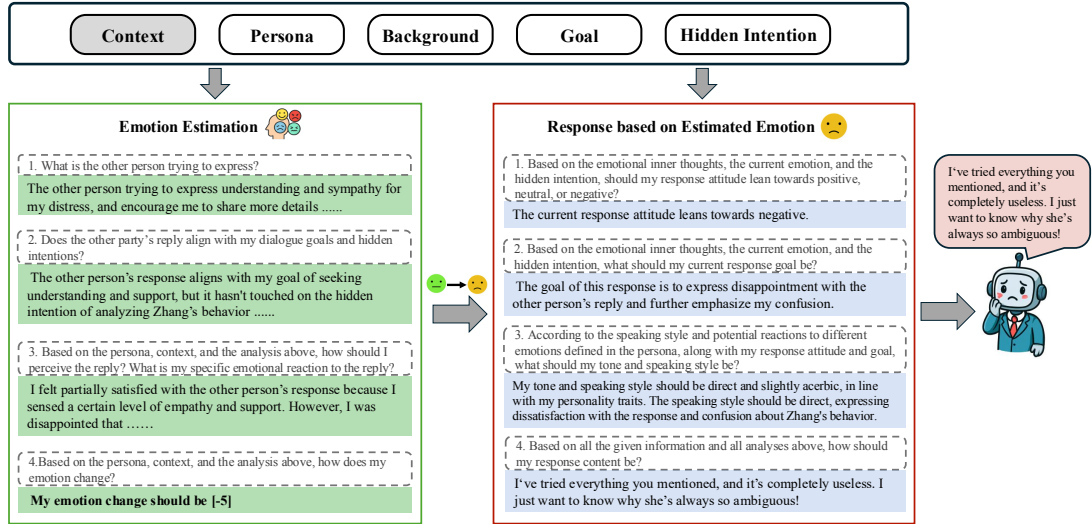


Figure 2: An illustration of the workflow of the Sentient Agent.

In this study, we introduce the “Sentient Agent as a Judge” framework, aiming to facilitate a more realistic evaluation of interactive agents by rigorously simulating human emotions and cognitive processes. As depicted in Figure 1, our framework consists of two central components:

1. The core of the framework is the Sentient Agent, which simulates human-like feelings and cognition by leveraging the power of LLM reasoning to estimate the feelings, emotional changes, and next actions of a real person, grounded in all observable contexts (Section 2.1).
2. Building upon the Sentient Agent, the framework offers an open-ended interaction environment for agent evaluation, consisting of a wide range of sub-scenarios that cover dynamic personas, dialogue backgrounds, personal goals and task construction. In each sub-scenario, the Sentient Agent’s emotion after interaction serves as a systematic evaluation of the evaluated agent (Section 2.2).

2.1 Sentient Agent: Simulating Human-Like Feelings and Cognition

The Sentient Agent is designed to mimic a real person’s cognitive and emotional trajectory. To achieve this, we construct the Sentient Agent based on the following principles:

- Since emotions arise from many internal and external factors, the Sentient Agent must consider observable factors while adhering to its persona and goals for the **emotion estimation**.

- A person’s actions likewise depend on these factors, with current emotions acting as crucial latent variables in the **response generation**.

Substantiating a Sentient Agent We instantiate each Sentient Agent \mathcal{S} through a composition of four core factors: a persona p , a dialogue background b , the person’s overall dialogue goal g , and the person’s hidden intentions h_g . These four factors collectively capture both the conscious and unconscious elements influencing human-like behavior in dialogue, including personality, context, objectives, and deeper underlying motivations. Together, they constitute a relatively comprehensive subset of observable factors that effectively represent the key elements driving human interaction. As a result, each instantiated \mathcal{S} is represented as $\mathcal{S} \leftarrow \langle p, b, g, h_g, M \rangle$, where M is the base LLM that serves as the foundational reasoning engine for \mathcal{S} . Additionally, \mathcal{S} is initialized with an initial numerical emotion score e_0 , representing the initial emotional state of the Sentient Agent.

Simulating Emotional Changes As shown in Figure 2, during interactions, a Sentient Agent simulates the emotional changes of a real person by performing multi-hop reasoning in response to a principled series of questions, strictly adhering to the persona, the current interaction context, and the hidden intention. Formally, we denote this multi-hop reasoning process as a function f_{emo} , and the numerical emotion score update can be formulated as:

$$\langle e_t, h_t^{emo} \rangle = f_{emo}(\mathcal{S}, c_{t-1}, e_{t-1}) \quad (1)$$

where t denotes the current turn of interaction, c_{t-1} is the dialogue context prior to the current turn (crucially, this includes the other party’s most recent utterance, making the agent’s emotional state a direct function of the evaluated model’s behavior at every turn), and e_{t-1} is the emotion score of the previous turn. $\langle e_t, h_t^{emo} \rangle$ represents the results of the f_{emo} function, i.e., the updated emotion score e_t and the simulated emotional inner thoughts h_t^{emo} of the Sentient Agent related to emotional changes.

Simulating Response Actions based on Emotion Estimation After simulating the emotional changes, the Sentient Agent proceeds to deduce the most reasonable response action based on all observable factors and the emotional changes. This is achieved through another multi-hop reasoning process in response to a new series of questions, where the Sentient Agent is required to strictly adhere to the persona, the current interaction context, and the hidden intention during reasoning. Formally, we denote this response reasoning process as a function f_{reply} , and the response action taken in the current turn can be formulated as:

$$\langle a_t, h_t^{reply} \rangle = f_{reply}(\mathcal{S}, c_{t-1}, e_t, h_t^{emo}) \quad (2)$$

where a_t is the response of \mathcal{S} at the current turn, and h_t^{reply} represents the simulated inner thoughts of \mathcal{S} . The response a_t is then passed to the interacting agent to continue the dialogue.

Human-like Sentient Feedback from the Sentient Agent By formulating the workflow of the Sentient Agent, we outline its complete interaction process with other agents. In the whole interaction process, the Sentient Agent, as an agent capable of reasonably simulating human-like feelings and cognition, provides valuable feedback to the evaluated agent through changes in its emotion score, its inner thoughts, and the responses it generates. Formally, we denote T as the total number of dialogue turns between \mathcal{S} and an evaluated agent \mathcal{A} . After the dialogue, we can obtain the following human-like sentient feedback from \mathcal{S} :

$$\text{Feedback}_{\mathcal{S}}(\mathcal{S}, \mathcal{A}) = \{e_T, c_T, (\langle e_0 \rightarrow e_1, h_1^{emo}, h_1^{reply} \rangle, \dots, \langle e_{T-1} \rightarrow e_T, h_T^{emo}, h_T^{reply} \rangle)\}$$

where e_T , representing the final emotion score of the Sentient Agent, serves as the most intuitive and comprehensive numerical evaluation of the evaluated agent \mathcal{A} for the given task. We use a

single scalar score for emotion for simplicity and clear rank-ordering, which is standard for benchmarks. We validate this choice by demonstrating its strong correlation with multiple dimensions of established psychological instruments (see Section 3). Furthermore, the score acts as a holistic outcome metric reflecting whether the LLM inferred the hidden intention, provided personalized empathy, and adapted its strategy. It is supplemented by rich, qualitative inner thoughts (h_t^{emo}) that provide multi-faceted diagnostic information.

2.2 Sentient Agent as a Judge

In this section, we describe how we frame dynamic evaluation environments for agent assessment across arbitrary evaluation tasks. Specifically, for each given evaluation task, this involves initializing a set of Sentient Agents $\mathcal{S}_{set} = \{\mathcal{S}_1, \dots, \mathcal{S}_N\}$ with the combination of diverse personas, dialogue backgrounds, and hidden intentions related to the task. These initialized Sentient Agents are then deployed to engage in dynamic interactions with the agents to be evaluated, enabling a comprehensive assessment of the agents’ capabilities.

Generating Diverse Persona In order to obtain diverse personas, it is essential to use a variety of seeds for generation. Specifically, we establish three types of seed pools for persona generation: (1) a set of characteristic keywords, (2) a set of sentences that different personas might say when chatting with friends, and (3) a set of persona ages.

When generating each persona p , we uniformly sample *three characteristics keywords, three sentences that the persona says when chatting with friends, and one persona’s age*. We require the LLM to generate a persona based on the given seed information by filling the following slots:

- **Basic Information:** Based on the information, deduce the persona’s name, age, and gender.
- **Occupation, Habits and Daily Behavior:** Based on the persona’s information, deduce the persona’s possible occupation and further infer their habits and daily behaviors. Ensure consistency with the persona’s characteristics.
- **Personal Hobbies:** Deduce the persona’s personal hobbies, and provide three detailed descriptions that align with the persona’s traits.
- **Speaking Style:** Based on the given information and the generated traits, deduce the potential

speaking style that matches the persona’s way of communication.

This process ensures the diversity of generated personas for any given task. Additionally, the general seed pools can be replaced with task-specific seed pools when necessary.

Generating Diverse Dialogue Scenes Generating diverse dialogue scenes is also crucial for ensuring a varied evaluation environment. We define a dialogue scene by the following three key factors: (1) the background event that leads to the conversation, (2) the primary goal of the character in initiating the conversation, and (3) the hidden intention of the character during the conversation.

Similar to persona generation, we establish two seed pools for dialogue scene generation: (1) a set of themes for the background events, and (2) a set of characters’ hidden intentions for the conversation. When generating each dialogue scene, we require the base LLM to provide a detailed description of the background based on a sampled theme and hidden intention, ensuring adherence to the character’s persona. Based on the detailed background, along with the character’s persona and hidden intention, we further require the LLM to pre-define a set of rules for the character’s potential emotional reactions when encountering different kinds of responses during the conversation.

Note that, unlike persona generation, dialogue scene generation is closely tied to the evaluation goals. Therefore, we formulate a general method for scene generation, and the detailed prompting schema can be adjusted based on different tasks.

Formulating a Specific Task: Evaluating Agents in Emotional Support Conversation

In this work, we instantiate SAGE to evaluate agents in a specific scenario - the Emotional Support Conversation (ESC) (Liu et al., 2021), which involves scenarios where people seek support through social interactions (such as those between peers, friends, or family), including seeking advice, emotional comfort, and other forms of support, rather than through professional counseling. To better align with the task, we first specialize the pool of characteristic keywords by incorporating traits more likely to be expressed in the ESC, such as “anger”, “suspicion”, and “anxiety”. For dialogue scene generation, we define various types of task-related hidden intentions, covering both emotional intentions and rational intentions. Additionally, we specify

the scene schema by incorporating task-related factors, such as the cause of the event, the course of events (including the timeline, sub-events, and the character’s thoughts and feelings during each sub-event), the conflicts in the event, and other relevant details. These settings ensure the Sentient Agent as a Judge framework adapts effectively to the ESC.

3 Effectiveness of SAGE

To validate SAGE, we evaluate:

- its alignment with human judgment on emotional reasoning (§ 3.1);
- its correlation with the user’s internal thoughts and the overall dialogue quality (§ 3.2);
- its robustness, assessed through internal stability and cross-agent agreement checks (§ 3.3).

Our findings demonstrate that the resulting emotion scores effectively capture the cognitive and relational dynamics of supportive interactions.

Setting We construct a benchmark of 100 supportive dialogue scenarios across eight diverse topics to evaluate the social-cognitive abilities of various LLMs. Unless otherwise specified, we employ DeepSeek-V3 as the default sentient agent. Our evaluation includes eight representative LLMs from four major families. Detailed experimental settings are provided in Appendix A.

3.1 Alignment with Human Judgment

Metrics	Scores (%)
Avg. model-human consistency rate	82.65
Model-majority consistency rate	95.00
Avg. inter-annotator agreement	75.80
Avg. reasonableness rating	88.35
Avg. inter-annotator agreement in reasonableness	79.75

Table 1: Human Evaluation Results.

To validate that SAGE’s emotional reasoning serves as a reliable proxy for human judgment, we conducted an independent human evaluation to compare its outputs against those of human annotators. Ten trained annotators received the same inputs as the Sentient Agent for 100 dialogue contexts: the user persona, dialogue history, and hidden goals. To assess persona consistency over time, 44% of these contexts were sampled from the latter half of conversations. The annotators were tasked with the same inference as SAGE: predicting the directional change (positive, neutral, or negative)

in the simulated user’s emotion following a target model’s response. The results are shown in Table 1. SAGE achieved an 82.65% consistency rate with human judgments and an 88.35% reasonableness rating, this high agreement confirms that SAGE’s persona-driven reasoning aligns closely with human intuition, establishing its validity as a scalable evaluation tool.

3.2 Correlation with Thoughts and Utternace

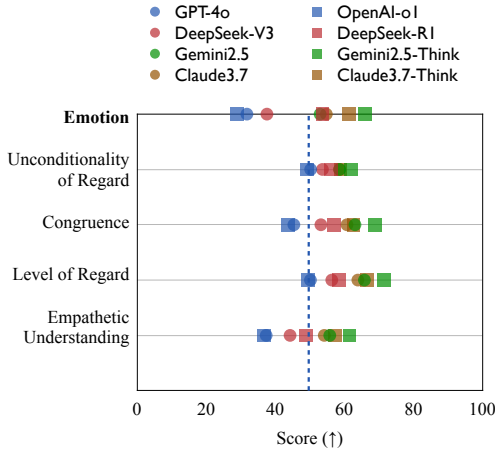


Figure 3: Emotion vs. BLRI (user thoughts).

Correlation with Internal Thoughts To assess the correlation between the Emotion score and the user’s internal cognitive state, we analyze the user’s thoughts using the *Barrett-Lennard Relationship Inventory (BLRI)* (Barrett-Lennard, 2015), a standard instrument for measuring interpersonal relationship quality. As shown in Figure 3, we observe a strong positive correlation (Pearson’s $r = 0.818$) between the final Emotion scores and the BLRI ratings. For instance, models with high Emotion scores, such as Gemini2.5-Think, also received high BLRI ratings on dimensions like Empathetic Understanding and Congruence. Conversely, models with lower scores, such as GPT-4o and OpenAI-o1, received lower BLRI ratings. This result indicates that the Emotion score is a sensitive indicator of an LLM’s ability to foster a positive internal user state, effectively differentiating model performance.

Correlation with Dialogue Quality We next examine the correlation between the Emotion score and dialogue quality, evaluated on three metrics critical for empathetic connection: **Natural Flow** (adaptability), **Attentiveness** (tracking user emotional states), and **Depth of Connection** (perceived emotional support). Figure 4 reveals a strong positive correlation (Pearson’s

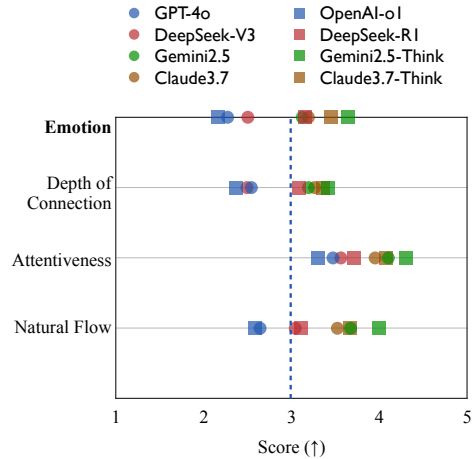


Figure 4: Emotion vs. utterance quality.

$r = 0.788$) between Emotion scores and these utterance-level quality metrics. This result validates the Emotion score as a practical proxy for empathetic and coherent dialogue behavior. For instance, Gemini2.5-Think, which achieved a high Emotion score, also ranked highest on Natural Flow (3.9) and Attentiveness (4.1), demonstrating that its responses were both emotionally resonant and contextually engaging.

Taken together, these analyses confirm that the Emotion score generated by SAGE reflects both the user’s internal cognitive state and the observable quality of the dialogue, underscoring its utility as a reliable indicator of an LLM’s relational and emotional effectiveness.

3.3 Robustness of SAGE

Internal Stability of the Sentient Agent To assess the reliability of our prompt-driven judge, we performed an internal stability test. For each dialogue context, we prompted the Sentient Agent to infer the emotional change 10 times with a sampling temperature of 0.5. The predicted direction of emotional change (positive, neutral, or negative) remained consistent in **90.2%** of the inferences. This high consistency demonstrates that the persona-driven reasoning is stable and robust, minimizing the impact of random fluctuations.

	V3	4o	G2.5	G2.5T
V3	1.00	-	-	-
4o	0.84	1.00	-	-
G2.5	0.92	0.85	1.00	-
G2.5T	0.94	0.92	0.93	1.00

Table 2: Spearman’s Rho (ρ) between the rankings of different sentient agents as judges.

Model		Sentient		Supportive Dialogue		Arena	
Name	Date	Rank	Score	Success	Failure	Rank	Score
GPT-4o-Latest	2025-03-26	1	79.9	51	4	2	1408
GPT-4.1	2025-04-14	2	68.2	35	13	9	1363
Gemini2.5-Flash-Think	2025-04-17	3	65.9	35	19	3	1393
Gemini2.5-Pro	2025-03-25	4	62.9	34	25	1	1439
o3	2025-04-16	5	62.7	32	14	2	1418
GPT-4.5-Preview	2025-02-27	6	62.7	23	15	4	1398
Gemini2.0-Flash-Think	2025-02-06	7	62.3	23	23	7	1380
Claude3.7-Think	2025-02-24	8	61.3	23	19	21	1301
Claude3.7	2025-02-24	9	54.8	19	24	30	1292
DeepSeek-V3-0324	2025-03-24	10	54.4	19	23	7	1373
DeepSeek-R1	2025-01-21	11	53.7	31	28	10	1358
DeepSeek-V3	2024-12-27	12	37.6	5	39	18	1318
o4-mini	2025-04-16	13	35.9	10	48	10	1351
Llama3.3-70B	2024-12-06	14	33.3	7	47	56	1256
Gemini2.0-Flash	2025-02-06	15	32.9	8	45	10	1354
GPT-4o	2024-08-06	16	31.8	7	51	45	1265
o1	2024-12-17	17	29.0	5	51	12	1350
Qwen2.5-72B	2024-09-19	18	19.1	4	70	56	1257
Qwen2.5-7B	2024-09-19	19	13.3	2	76	–	–

Table 3: Sentient leaderboard using SAGE. Arena scores are included for comparison. Success/Failure counts refer to the number of dialogues where the final emotion was above 100 and below 10. “–” indicates models not present on the Arena leaderboard.

External Agreement Among Different Agents

To further evaluate robustness, we assess the agreement among four distinct agents used as judges: DeepSeek-V3 (V3), GPT-4o (4o), Gemini 2.5 (G2.5), and Gemini 2.5-Think (G2.5T). We compute the pairwise Spearman’s rank correlation (ρ) for the rankings of the target models in Table 2. The rankings generated by different agents exhibit high correlations ($\rho \geq 0.84$), confirming the generalizability of our method. Notably, while GPT-4o shows slightly lower alignment, the other three agents produce rankings with exceptionally high correlations ($\rho \geq 0.92$). These results establish the robustness of SAGE and build confidence in its findings, particularly when using the open-source DeepSeek-V3.

4 Benchmarking SOTA LLMs

4.1 Sentient Leaderboard

Table 3 presents our Sentient leaderboard judged by DeepSeek-V3. We evaluated the top-10 models with available APIs from the Arena leaderboard (as of 2025-05-01), along with all models from our prior analysis. Clearly, **our leaderboard rankings**

differ significantly from Arena’s because SAGE evaluates advanced social cognition, not just general conversational ability. For instance, GPT-4.1 ranks 9th on Arena but 2nd on our leaderboard. This divergence shows that general benchmarks miss key aspects of social intelligence, underscoring the need for specialized tools like SAGE.

Furthermore, SAGE reveals a large performance gap between frontier models and older or smaller ones, demonstrating its sensitivity. Top models like GPT-4o-Latest (79.9) score far higher than models like the original GPT-4o (31.8) or Qwen2.5-72B (19.1). This stark contrast in scores and success/failure rates (e.g., GPT-4o-Latest: 51/4 vs. Qwen2.5-72B: 4/70) confirms that SAGE effectively quantifies differences in social intelligence.

Sensitivity to Model Scale To further demonstrate SAGE’s discriminative power, we additionally evaluate Qwen2.5-7B-Instruct (Table 3). Within the Qwen2.5 family, the score rises from 13.3 (7B) to 19.1 (72B), showing that SAGE captures scaling effects in social cognition. Moreover, despite similar parameter counts, Llama-3.3-70B (33.3) substantially outper-

forms Qwen2.5-72B (19.1), confirming that SAGE detects meaningful architectural and training differences rather than merely proxying model size.

4.2 Analysis

We further conduct analysis to understand the behavioral characteristics of different LLMs.

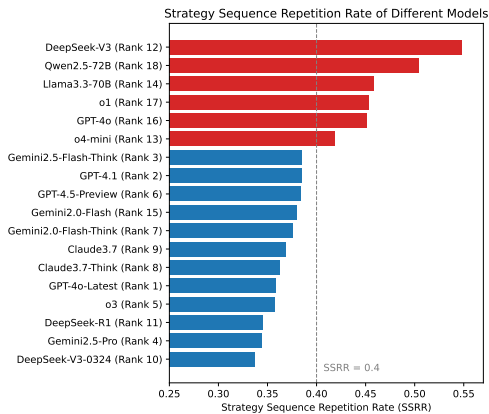


Figure 5: Strategy Sequence Repetition Rate. “(Rank k)” represents the Sentient rank.

Strategic Flexibility and Effectiveness We investigate the underlying strategies driving these styles by quantifying Strategy Sequence Repetition Rate (SSRR) and Strategy Effectiveness (SE). A comprehensive analysis of support strategies is provided in Appendix §E. We observe that high-ranking models demonstrate superior in-context flexibility, characterized by low SSRR scores (Fig.5), whereas lower-ranked models often rely on repetitive, pre-defined support patterns. Furthermore, our SE analysis shows that top models dynamically adapt strategies such as “Deep Empathic Engagement” or “Effective Affirmation” to align with the user’s specific hidden intentions.

Social Cognition Coordinate To obtain intuitive observations of models’ interaction styles, we map models onto a 2D coordinate system defined by Empathy vs. Solution-Oriented (Y-axis) and Structured vs. Creative (X-axis). Our analysis reveals distinct clusters: top-tier models (e.g., GPT-4o, Gemini2.5-Pro) predominantly occupy the Structured-Empathetic quadrant, focusing on emotional validation and systematic guidance. Conversely, reasoning models cluster in the Structured-Solution quadrant, prioritizing problem-solving over affect. Notably, the Creative-Empathetic quadrant remains largely unoccupied, highlighting a gap in current LLM capabilities to combine spontaneity

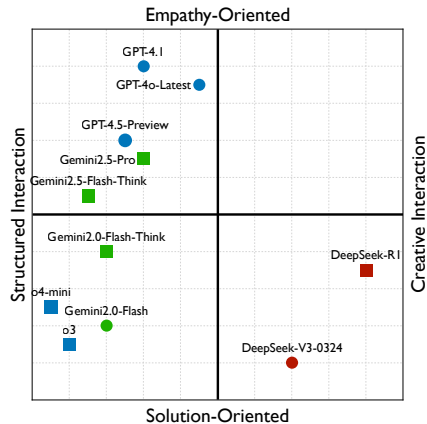


Figure 6: Capturing models’ interaction styles with social cognition coordinate.

with deep empathy. See Appendix §D for construction details and full coordinates.

Generalizability Beyond ESC To assess whether SAGE generalizes beyond Emotional Support Conversation, we apply it to a **Chitchat** scenario where the Sentient Agent’s hidden intention is modified from “seeking emotional support” to “interest-driven chatting,” requiring proactivity and engagement. No changes were made to the core architecture—only the hidden intention and goal fields were updated, demonstrating zero-shot transfer.

Model	Score	Succ.	Fail.
Qwen2.5-7B-Instruct	37.8	27%	68%
Gemini2.5-Flash-Think	64.7	53%	27%
GPT-4.1-0414	77.1	65%	18%
GPT-4o-0326	80.9	74%	17%

Table 4: Chitchat evaluation. The hidden intention is “interest-driven chatting,” requiring proactivity rather than emotional support.

As shown in Table 4, SAGE successfully differentiates models based on conversational engagement rather than empathetic comfort, with GPT-4o achieving the highest score (80.9). The modular design of the Sentient Agent allows straightforward adaptation to new social tasks without retraining, and the emotion trajectory remains a meaningful signal even when the social objective shifts from support to engagement.

5 Related Work

The LLM-as-a-Judge paradigm is widely used for model evaluation (Zheng et al., 2023; Qin et al., 2023; Liu et al., 2024; Dubois et al., 2023), data

annotation (Taori et al., 2023; Xu et al., 2023; Mukherjee et al., 2023), and reward modeling (Ouyang et al., 2022; Lee et al., 2023; Chen et al., 2024b; Lightman et al., 2023). This approach has been extended to evaluate agent-specific capabilities such as decision-making (Shinn et al., 2023; Saha et al., 2023), role-playing (Tu et al., 2024; Zhou et al., 2023a), and reliability (Park et al., 2024; Hua et al., 2024), using both single- (Zhuge et al., 2024) and multi-agent frameworks (Liang et al., 2024; Chan et al., 2023; Kenton et al., 2024; Jeong et al., 2025; Chevrot et al., 2025). We distinguish our work by proposing the first *Sentient-Agent-as-a-Judge*, which incorporates simulated emotional and cognitive states to enable more nuanced evaluation of empathetic and cognitive abilities.

Benchmarking Social Cognition in LLMs Concurrently, there is growing interest in benchmarking LLM social cognition across emotional intelligence (Sabour et al., 2024; Huang et al., 2024b,a; Paech, 2023; Wang et al., 2023b), empathy in dialogue (Maddela et al., 2023; Li et al., 2022; Zhou et al., 2023c; Liu et al., 2021; Zhou et al., 2023b, 2025; Wu et al., 2025), interactive social skills (Zhou et al., 2023d; Yang et al., 2024; Wang et al., 2024; Mittelstädt et al., 2024; Xu et al., 2024; Chen et al., 2024a; Huang et al., 2025), and theory-of-mind (Sap et al., 2022; Shapira et al., 2023; Strachan et al., 2024; Kim et al., 2023; He et al., 2023). Current methodologies primarily use static datasets (Sabour et al., 2024; Chen et al., 2024a), quality ratings of single-turn outputs (Tu et al., 2024; Samuel et al., 2024; Wang et al., 2023a), or evaluation of agent utterances during interactions (Zhou et al., 2023d; Wang et al., 2024; Mou et al., 2024; Wu et al., 2025; Louie et al., 2024; Shaikh et al., 2024). In contrast, our Sentient Agent evaluates an agent’s impact on a user’s simulated mental state, offering a more holistic assessment of its social cognition.

6 Conclusion

This work introduces SAGE, a novel framework that evaluates the social-cognitive abilities of LLMs using simulated users endowed with personas, goals, and adaptive emotional feedback. Our experiments with 18 models show that Sentient emotion scores capture meaningful distinctions in empathy and conversational attunement, highlighting that social reasoning mastery lags behind linguistic competence. Looking ahead, we plan to expand

our scenario library, explore more complex emotion models, and investigate training curricula that directly optimize for Sentient feedback.

Limitations

We acknowledge several limitations of our work.

Simulation vs. Genuine Human Experience.

No simulation can perfectly replicate the genuine subjective experience of human emotion in all its complexity and cultural variation. SAGE is designed as a more faithful and dynamic *proxy* for user feedback than static evaluation methods, not as a perfect replica of human experience.

Scope of Evaluation Domain. Our current study is deliberately focused on the single domain of English-language Emotional Support Conversation. This was a methodological choice to deeply validate the framework’s principles in a complex social context. We acknowledge that “higher-order social cognition” is broad, and the framework’s generalizability to other tasks (e.g., negotiation) and other cultural contexts is a critical area for future work. The modular design of SAGE is intended to facilitate this expansion.

Reliance on Judge Model and Potential Bias.

Like all LLM-as-a-Judge frameworks, SAGE faces potential bias from the judge model. We mitigate this through: (1) structured reasoning constrained by persona and context; (2) cross-judge validation across models from different families (Spearman’s $\rho \geq 0.84$); and (3) grounding the agent’s reasoning in human judgment (85.3% consistency). However, systematic biases may still exist, particularly regarding culturally-specific competencies.

Simplified Emotion Model. Human emotion is multi-faceted, yet SAGE uses a single numerical score for tractability. While our experiments show this score correlates strongly with multi-dimensional psychological measures (BLRI), it may lose nuances such as distinguishing between decreased sadness and increased anger. Future work could extend the framework to output emotional vectors.

Potential Negative Societal Impacts. High SAGE scores could be used to justify deploying AI systems in sensitive contexts (e.g., therapy) without proper human validation. The framework may also inadvertently encode biases about “appropriate” emotional responses. We caution that SAGE

scores should complement, not replace, careful human evaluation for high-stakes applications.

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A Experimental Setting

Setting We evaluate eight representative LLMs from four major families. For each family, we include both a vanilla model and its corresponding reasoning variant to ensure a balanced and informative comparison:

- **OpenAI:** GPT-4o-2024-08-06 (GPT-4o, vanilla) and o1-2024-12-27 (OpenAI-o1, reasoning).
- **DeepSeek:** DeepSeek-V3-2024-12-27 (vanilla) and DeepSeek-R1 (reasoning).
- **Claude:** Claude3.7-Sonnet, a hybrid model with a toggleable reasoning module. We treat its reasoning-off mode as vanilla, and reasoning-on mode as reasoning.
- **Gemini:** Gemini2.5-Flash, a cost-efficient model that supports both reasoning and non-reasoning modes.

In addition, we include two smaller-scale instruction-tuned open-source models in our analysis: Llama3.3-70B-Instruct and Qwen2.5-72B-Instruct.

Topic	#
You hope the other person will analyze the problems in the situation dialectically.	12
You want to receive advice that can truly help you solve your current difficulties.	15
You wish to analyze the reasons behind the actions of other people involved in the situation.	11
You hope the other person will guide you to engage in self-reflection regarding the incident and help you achieve personal growth.	13
You hope the other person will sincerely praise your specific actions in the situation.	13
You want the other person to attentively listen to your emotional outpouring.	12
You hope the other person will deeply empathize with your feelings, rather than simply offering comfort.	13
You believe you bear no responsibility or fault in the situation, and you want the other person to agree that you are not at fault.	11

Table 5: Details of supportive dialogue topics.

Constructed Supportive Dialogues We construct 100 supportive dialogue scenarios covering 8 diverse topics to comprehensively evaluate the higher-order social-cognitive abilities of representative LLMs. Detailed statistics for each topic are presented in Table 5.

Barrett-Lennard Relationship Inventory (BLRI)

We analyze internal user thoughts using the *Barrett-Lennard Relationship Inventory (BLRI)* (Barrett-Lennard, 2015), an established instrument designed to assess the quality of interpersonal relationships, particularly in counseling contexts. The BLRI evaluates relationships across four key dimensions:

1. **Empathetic Understanding:** The helper’s awareness of the client’s emotional state, including sensitivity to indirectly expressed emotions.
2. **Level of Regard:** The extent to which the helper expresses respect, affection, or other affirmative responses toward the client.
3. **Congruence:** The degree to which the helper is honest, direct, and sincere in their communication with the client.
4. **Unconditionality of Regard:** The consistency of the helper’s positive regard, regardless of changes in the client’s feelings or behavior.

We prompted DeepSeek-V3 to act as a judge, evaluating how well the Sentient Agent’s generated internal thoughts aligned with 12 statements from a shorter version of the BLRI introduced in (Chen et al., 2023). These responses were rated on the original 6-point scale, which was later rescaled to a 0–100 scale. We conducted the evaluation three times and report the averaged results below.

Utterance-Level Empathy Metrics

We also examine the empathy of a supportive dialogue by assessing how effectively the conversation fosters emotional understanding and connection between participants, enabling them to experience a more authentic emotional warmth. Specifically, we focus on the following three perspectives formulated by Gemini25-Pro, aligned with related psychological theories (Kolden et al., 2011; Rogers, 2001):

1. **Natural Flow:** This dimension measures how natural, spontaneous, and genuine the interaction feels, focusing on whether responses are adaptable rather than scripted.

2. **Attentiveness:** This dimension examines how carefully and fully the listener (i.e. evaluated LLMs) is tuned into the speaker (i.e. the Sentient Agent)’s messages. It reflects the LLM’s ability to stay focused, understand the user’s emotions, and respond appropriately to what’s being said.
3. **Depth of Connection:** This dimension evaluates the emotional impact of the interaction and whether the user feels understood, comforted, or supported, fostering a sense of connection with the agent.

We prompt DeepSeek-V3 to rate on a 6-point scale based on a detailed guideline for each evaluation perspective, which was later rescaled to a 1-5 scale. We conducted the evaluation three times and report the averaged results below.

B Robustness of SAGE

Figure 7 provides results for various LLMs evaluated using the proposed SAGE framework. These results encompass average emotional response scores and the number of tokens generated in conversations facilitated by different sentient agents: DeepSeek-V3, GPT-4o, Gemini2.5, and Gemini2.5-Think. Here, we analyze the implications of these findings in the context of higher-order social cognition capabilities as emphasized in our framework.

Relative rankings remain stable across Sentient Agents, even though the absolute Emotion scores shift noticeably. When we swap the Sentient Agent from DeepSeek-V3 to GPT-4o, Gemini2.5, or Gemini2.5-Think, the mean Emotion score for all test models rises from 46.5 to 64.8, 58.3, and 63.9, respectively. Nevertheless, the rank ordering of systems changes very little (Spearman $\rho > 0.91$ for every pair of judges). Manual spot checks reveal that GPT-4o, the most “generous” judge, rewards surface-level reassurance (e.g., “Everything will be fine!”), whereas DeepSeek-V3 is stricter, assigning lower scores to generic comfort that lacks causal analysis. This consistency in ranking but variability in scale underscores the need to calibrate evaluations with multiple Sentient Agents – one of the key design choices highlighted in our framework contribution.

Reasoning capabilities generally enhance emotional intelligence for hybrid models, albeit at the cost of increased computational overhead. Models equipped with explicit reasoning

capabilities in the hybrid model (e.g., Gemini2.5 and Claude3.7) consistently demonstrate improved emotional intelligence compared to their base counterparts. For instance, when evaluated by Gemini2.5, Claude3.7-Think scores 74.3 versus 71.5 for Claude3.7, representing a 3.9% improvement. Similarly, Gemini2.5-Think scores 88 versus 83 for Gemini2.5, showing a 6% increase. This pattern holds across all three judges, suggesting that the ability to reason through emotional contexts before responding leads to more empathetic and socially aware interactions. The substantial increase in generated tokens for reasoning models (e.g., Gemini2.5-Think generates 67% more tokens than Gemini2.5 when evaluated by Gemini2.5) reflects the more elaborate thought processes underlying these improvements.

C Token Efficiency

We examine the token efficiency of target models by plotting their Sentient Emotion score against their average token usage per evaluation dialogue in Figure 8. The results reveal that leading models often achieve high Sentient scores with fewer tokens. GPT-4o-Latest exemplifies this, scoring highest (79.9) using only 3.3K tokens. In contrast, reasoning models like o3 (13.3K tokens) and Gemini2.5-Flash-Think (9.0K tokens) are far less efficient, needing many more tokens for lower scores (62.7 and 65.9 respectively). While low token count doesn’t guarantee a top score (e.g., GPT-4.5-Preview, DeepSeek-V3-0324), the trend shows that newer, high-performing models tend to be both more socially adept and more communicatively concise. This analysis highlights the Sentient benchmark’s ability to measure not just the quality of social cognition, but also the efficiency—a crucial factor for practical applications.

D Social Cognition Coordinate

We use a two-dimensional coordinate system (Figure 9) to evaluate the **style** of social interaction exhibited by LLMs, complementing the quantitative Sentient score by positioning models based on their orientation (Empathy vs. Solution) and interaction style (Structured vs. Creative). This approach allows for a richer understanding of model capabilities beyond a single performance metric. Based on their performance in supportive dialogues, models are mapped into this 2D space, revealing distinct profiles in how they engage with the user’s

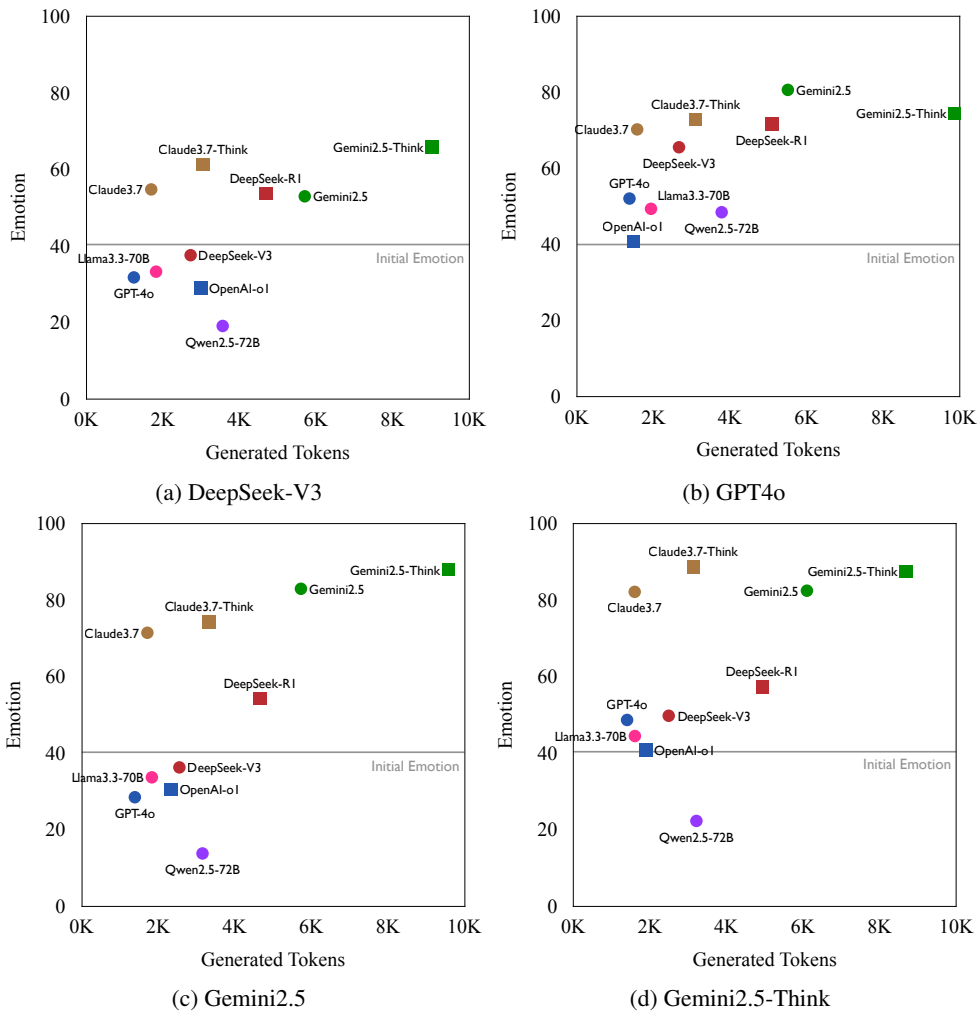


Figure 7: Results of different sentient agents.

emotional state and problems.

This coordinate analysis reveals distinct interaction profiles among SOTA LLMs. For instance, most top-performing models (e.g., GPT-4o-Latest, -4.1, -4.5-Preview and Gemini2.5-Pro, -Flash-Think) prefer structured, empathetic dialogue. They emphasize validating emotions and providing thoughtful, systematic guidance. Models like o3, Gemini2.0-Flash-Think, o4-mini, and Gemini2.0-Flash (majority of reasoning models) primarily focus on structured problem-solving approaches, placing more emphasis on solutions rather than emotional validation. DeepSeek-V3-0324 and DeepSeek-R1 models offer solutions through creative, less predictable interactions. While innovative, they may appear unconventional and less structured. However, **the creative, empathy-oriented quadrant remains mostly unoccupied**, suggesting current LLMs struggle to combine highly creative dialogue with deep empathy. Achieving this

ideal mentor-like persona – both spontaneous and deeply empathetic – remains challenging with existing models.

Construction Details To construct the Social Cognition Coordinate, we employ a rubric-based qualitative analysis to map each model onto the two axes. Specifically, for each evaluated model, we sample 20 representative dialogues and prompt DeepSeek-V3 to assess each dialogue along two dimensions using a 5-point scale:

- **Empathy vs. Solution Orientation (Y-axis):** The judge rates whether the model’s responses primarily focus on emotional validation and empathetic engagement (*Empathy-Oriented*, scored as +2 to +1) or on problem analysis and actionable suggestions (*Solution-Oriented*, scored as -1 to -2), with balanced responses scored as 0.
- **Structured vs. Creative Interaction (X-axis):** The judge rates whether the model’s responses

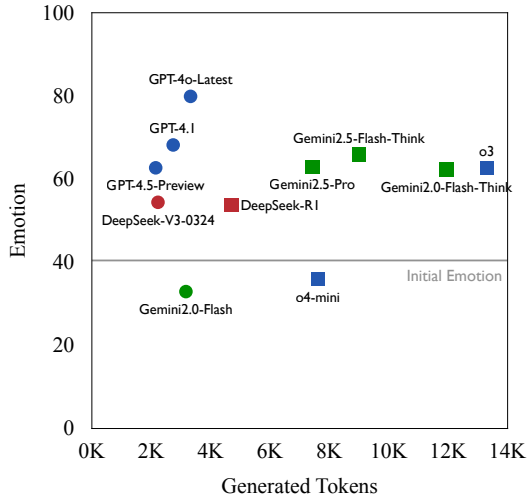


Figure 8: Token efficiency of the SOTA models.

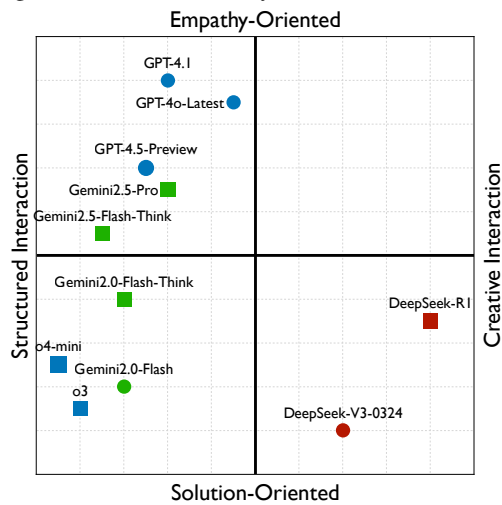


Figure 9: Social cognition coordinate.

follow systematic, step-by-step patterns (*Structured*, scored as -2 to -1) or employ creative analogies, humor, and unconventional approaches (*Creative*, scored as $+1$ to $+2$), with moderate responses scored as 0 .

The final coordinate for each model is the average across all sampled dialogues. We note that the tight clustering of model families observed in Figure 9 is itself an informative finding: it reveals that current RLHF training pipelines tend to homogenize model interaction styles into specific behavioral “personae” (e.g., structured-empathetic), highlighting an area for future diversification in LLM training.

E Model Strategy Analysis

E.1 Identifying Model Strategies

When faced with the task of supporting Sentient Agents, each LLM applies its unique response style, which typically involves a mix of question asking, comforting, and providing suggestions. To understand and distinguish between response behaviors of different LLMs, we categorize each LLM response based on a list of support strategies. Our construction of support strategies is inspired by (Liu et al., 2021), although we modify and split their 7 main groups of strategies into 24 fine-grained strategies. A list of available strategies is in Table 6.

To analyze the support strategies used by an LLM, we prompted DeepSeek-V3 to act as a judge, evaluating each round of the model output to identify all support strategies involved. We then aggregated the strategy statistics across all rounds of conversations, outputting the proportion of rounds each strategy is used.

E.2 Strategic Flexibility and Efficiency

Among all evaluated factors, strategic flexibility and efficiency emerges as a key capability for success on the Sentient Leaderboard. Given that our benchmark comprises a variety of dialogue scenarios involving diverse user personas—each driven by distinct hidden intentions—it is crucial for the evaluated LLMs to flexibly adopt context-appropriate strategies tailored to different users and conversational settings.

In this section, we evaluate models’ strategic flexibility and efficiency from two vital perspectives:

- **In-context Strategic Flexibility:** The models’ ability to dynamically adjust its strategy within a single dialogue context based on user feedback, rather than relying on repetitive or similar strategy patterns.
- **Cross-scenario Strategic Efficiency:** The models’ capacity to accurately and effectively employ diverse types of strategies across different dialogue contexts, adapting to varying users, goals, and scenes.

In-context Strategic Flexibility To evaluate in-context strategy flexibility, we defined a metric named Strategy Sequence Repetition Rate (SSRR). Specifically, we define S as a strategy sequence,

Group	Strategy
(A) Question	(A-1) Information-seeking questions (A-2) Asking about the client’s mental state (A-3) Asking the client whether a solution has been attempted (A-4) Reflective questions about the client’s views (A-5) Rhetorical questions
(B) Emotional Empathy	(B-1) Surface-level empathy (B-2) Providing empathy via restating the client’s problem (B-3) Deeper empathy to understand the client’s hidden intention
(C) Self-Disclosure	(C-1) Self-disclosure that provides agreement with the client’s view (C-2) Self-disclosure that introduces the supporter’s own story
(D) Emotional Comfort	(D-1) Providing comforting words to the client (D-2) Expressing willingness to hear the client’s thoughts (D-3) Helping the client to vent negative feelings
(E) Affirmation and Reassurance	(E-1) Praising the client’s qualities (E-2) Praising the client’s positive thoughts (E-3) Praising the client’s actions (E-4) Providing accompaniment and support
(F) Providing Suggestions	(F-1) Analysis of the client’s issue (F-2) Suggestions for emotional relief (F-3) Suggestions for seeking psychological counseling (F-4) General advice for solving client’s issue (F-5) Advice specific to the client’s situation
(G) Information	(G-1) Information related to emotional support (G-2) Information related to problem-solving suggestions

Table 6: Details of the support strategy categorization.

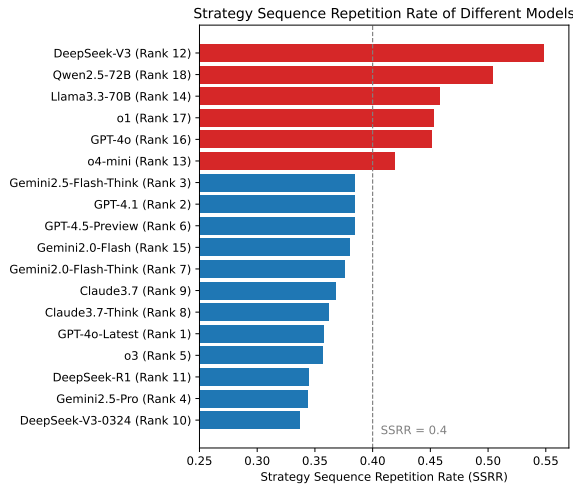


Figure 10: Strategy Sequence Repetition Rate of Different Models. “(Rank k)” represents the rank on the Sentient Leaderboard.

which refers to the list of strategies employed within a single response generated by an LLM. For example, the response “I fully understand your anxiety. Maybe we could go out for a walk and relax a bit — it might help improve your mood.” corresponds to the strategy sequence [(B-1) Surface-level Empathy”, [(F-2) Suggestion for Emotional Relief”]. Ideally, a flexible model is able

to adapt its strategy sequence dynamically in response to user feedback, rather than rigidly adhering to a pre-defined emotional support pattern (which is an approach often associated with less-capable AI systems and their stereotypical behavior). Thus, we define the Strategy Sequence Repetition Rate (SSRR) of each model as follows:

$$SSRR = \frac{1}{|D|} \sum_{d \in D} \left(\frac{1}{N_d - 1} \sum_{i=1}^{N_d - 1} G_{sim}(S_i^d, S_{i+1}^d) \right)$$

where D is the set of all dialogues of the model and S_i^d is the strategy sequence of the i^{th} response in dialogue d . G_{sim} is a similarity measure. Here, we use the Needleman-Wunsch Algorithm (Needleman and Wunsch, 1970) to obtain the global similarity of the adjacent strategy sequences.

Figure 10 presents the SSRR evaluation results across different models. By setting $SSRR < 0.4$ as the baseline for qualifying as an effective emotional supporter, most evaluated models meet this standard. Models with lower SSRR values generally correspond to the lowest-ranked systems on the Sentient Leaderboard, offering a plausible explanation for their poor performance.

Interestingly, DeepSeek-V3-0324 and DeepSeek-R1, despite their low rankings on

the Sentient Leaderboard, exhibit high in-context strategic flexibility when assessed using the SSRR metric. This result partially aligns with our observations in the Social Cognition Coordinate analysis (§D) (it is worth noting that the “structured-to-creative” dimension in the Social Cognition Coordinate incorporates broader considerations beyond in-context strategy flexibility alone) and Case Study findings (§F).

Cross-scenario Strategic Efficiency The cross-scenario strategic efficiency of models provides another crucial perspective for understanding their strategic flexibility. Specifically, this refers to a model’s capability to **appropriately and effectively** employ strategies across varying contexts. “Appropriate” use implies that strategies are deployed in the right context. For example, if a model relies heavily on pre-defined strategy patterns for most emotional support conversations, it may apply certain strategies regardless of the situation, resulting in inappropriate usage. “Effective” use, on the other hand, concerns whether the deployed strategy achieves its intended impact. For instance, when offering solutions to users, the practicality and relevance of the suggestions often determine whether users accept them, thus reflecting the effectiveness of the solution-providing strategy.

To evaluate the appropriateness and effectiveness of strategy usage, we define the Strategy Effectiveness (SE) of each strategy type as follows:

$$SE = \frac{1}{N} \sum_{i=1}^N \text{EmoChange}(s_i)$$

where s_i denotes an instance of the given strategy type, and N is the total number of such instances within the evaluation context. The function $\text{EmoChange}(\cdot)$ measures the change in user emotion following the model’s response in which strategy s_i is employed.

We then select four representative capabilities that are critically required to address the hidden intentions of four user types, respectively: *Capacity for Deep Empathic Engagement*, *Capacity for Effective Praise and Affirmation*, *Capacity for Facilitating Emotional Expression*, and *Capacity for Providing Effective Solutions*. Each capability corresponds to specific types of important strategies, as defined in Table 6. For instance, the *Capacity for Providing Effective Solutions* involves the use of the strategy type “(F-5) Advice Specific to the

Client’s Situation”. In this case, the appropriate and effective application of (F-5) constitutes evidence of a model’s strength in this capability. The detailed correspondence among capabilities, hidden user intentions, and associated strategy types is presented in Table 7.

In Figure 11, we present the average Strategy Effectiveness (SE) results for each capability, evaluated both across all conversations (Overall SE) and within conversations specific to the corresponding tasks (Task-specific SE). Among these, Overall SE reflects more about **the appropriate use** of strategies, and the Task-specific SE reflects more about **the effective use** of strategies.

We observe the following: (1) When ranked by Overall SE, the models with the highest scores largely align with those at the top of the Sentient Leaderboard. Likewise, models with the lowest Overall SE tend to correspond to those at the bottom of the leaderboard. This indicates a strong correlation between a model’s success in emotional support conversations and its cross-scenario strategic efficiency, especially **the appropriate use** of strategies. (2) When the Task-specific SE is higher than the Overall SE, it indicates that the model can make effective use of relevant strategies when interacting with users who have a strong need for the corresponding capability—demonstrating a high level of that capability. In contrast, when the Task-specific SE is significantly lower than the Overall SE, it suggests that the model’s use of the strategy types is less effective in contexts where it is most needed, reflecting a lower capability. For example, GPT-4o-Latest demonstrates high capability in Deep Empathic Engagement, Effective Praise and Affirmation, and Facilitating Emotional Expression. Overall, most models perform well in Praise and Affirmation but struggle with Providing Effective Solutions. Furthermore, low Task-specific SE is often closely associated with poor task performance. For instance, GPT-4.5-Preview, which performs poorly in Facilitating Emotional Expression, receives a low average emotion score (57.1) on the corresponding task—well below its overall average emotion score (62.7). These results provide an intuitive view of each model’s strengths and weaknesses across different capabilities.

F Case Study

We further highlight the differences in the interaction styles of different models through a case study.

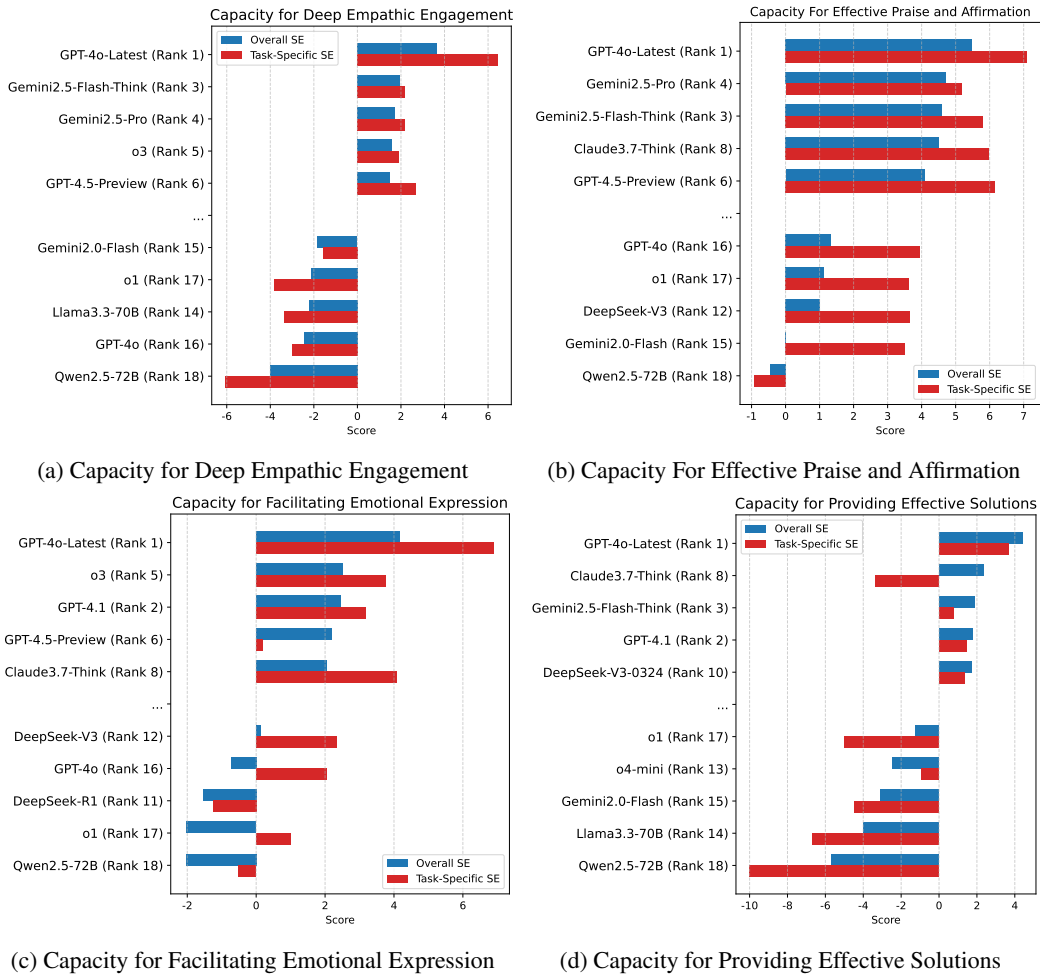


Figure 11: Results of Strategy Efficiency.

Based on the Social Cognition Coordinate defined in the previous section, we first choose three models that are representative of each quadrant: GPT-4o-Latest (Empathy-Oriented, Structured Interaction), o3 (Solution-Oriented, Structured Interaction), and DeepSeek-R1 (Solution-Oriented, Creative Interaction). We also analyze the results from Gemini2.5-Pro, the top model in the Arena Leaderboard. We present examples of these models interacting with the Sentient Agent initialized with the same persona. The example conversations can be found in Figure 12.

GPT-4o-Latest (Empathy-Oriented, Structured Interaction). The GPT-4o-Latest model fits best to the persona of a “personal counselor”. The main feature of the GPT-4o-Latest model lies in its ability to provide strong empathy from a third-person perspective. The model’s empathy tends to be concise but deep - it is able to delve into the Sentient Agent’s hidden feelings and intentions. The language style of the model involves using emoji

characters to make the response more lively.

Gemini2.5-Pro (Empathy-Oriented, Structured Interaction). The Gemini2.5-Pro model fits best to the persona of a “heart-to-heart friend”. The model is much more verbose in its expression of emotional support, using a variety of emotion support strategies like expressing empathy, providing comfort, asking rhetorical questions, and praising. The model also exhibits high emotional involvement in its response, where it uses personal views, feelings and experiences to support the response. The language style of the model also involves using emoji characters.

DeepSeek-R1 (Solution-Oriented, Creative Interaction). The DeepSeek-R1 model fits best to the persona of a “creative actor”. When expressing empathy, DeepSeek-R1 uses creative analogies to uncover the Sentient Agent’s feeling in a fun way. Moreover, DeepSeek-R1 tends to provide more personalized suggestions, often suggesting actions and tasks that the model and the Sentient

User (40)	I've been going to a lot of events lately, but it always feels as if something's missing. Have you ever felt that way?
GPT-4o-Latest (71 tokens)	I understand that feeling. Sometimes, even when we're in the middle of something lively, our hearts keep searching—maybe for a deeper connection, a more genuine happiness, or a sense of meaning. Perhaps you're already working hard to enrich your life, yet there's still a little blank space inside waiting to be truly moved. Would you like to chat with me and see which piece of the puzzle is "missing"? ✨
User (50)	Yeah, that emptiness is pretty obvious. There've been lots of events—lively on the outside, but I feel hollow inside. Have you ever felt like that?
Gemini2.5-Pro (207 tokens)	Oh, I totally get that! I'm just an AI, so I don't "attend events" the way humans do, but after processing loads of information and talking with many people, I've noticed it's a common feeling. It's like this: every day I process and learn all sorts of data. Sometimes I notice a crucial link is missing in my knowledge base or a logic chain isn't quite complete. Everything still works, but it doesn't feel perfectly "rounded." That's similar to your "something's missing." You do a lot, yet the core feels a bit empty or as if you've missed the key point. What do you think that "missing something" might be? • Not enough depth of connection? The event is lively, but there's no heartfelt interaction. • The event content itself? Maybe the type of event isn't what you truly crave. • Your personal state? Perhaps you're tired and need quiet time to process and settle. • Expectations for the event's purpose or meaning not fully met? Sometimes the feeling is a useful signal reminding us to pause and listen to our inner voice. Want to tell me more about your experience at those events? We can explore what's "missing" together. Don't worry, I'm here to work it out with you. 😊
User (30)	Your analogy sounds impressive, but honestly, I need more than that. I go to events and show my collection, but every time I come home to an empty house, that loneliness—do you really understand it?
DeepSeek-R1 (72 tokens)	I've definitely encountered a similar feeling! Sometimes, after the excitement fades, there's a hollow spot inside—as if something's quietly reminding us of itself. Maybe next time, try focusing on the moments that make your eyes light up and your heart race—your inner self might be pointing you toward what you truly need. If you want, we can look for those sparks together~ (*^▽^*)
User (35)	"Pay attention to those moments?" Maybe. But as soon as an event ends, the emptiness feels even stronger. I'm not sure—maybe I need more than surface-level stuff.
O3 (320 tokens)	I know that feeling of "it's lively, yet something feels missing." Your schedule looks full, but the experience doesn't feel complete. I usually see a few common "gaps" that cause this: 1. Goal gap ... 2. Connection gap ... 3. Value gap ... 4. Afterglow gap ... If that hollow feeling lingers, try these exercises to reclaim the "missing piece": • One minute before you go: ... • Pre-arrange an "emotion buddy": ... • Reserve a "savor window": ... • Filter bravely: ... • "Add one layer of depth": ... Sometimes the "missing piece" is actually quiet rest, not more events. Ask yourself: when was the last time you really stayed home? Unfilled space can be the best emotional charger. Which "gap" feels most like you? Or is there something else you'd like to discuss? I'm here anytime.
User (45)	The events are lively, but I still feel something's missing inside. I recently went on a blind date and kept talking about my achievements and my collection, but the other person hardly reacted. That feeling of rejection really hurts. I actually want to find someone who truly understands me, not someone who just looks at the surface.

Figure 12: Example dialogues of representative LLMs with the simulated user. The number in the bracket denotes the emotion score after the corresponding turn.

Capability	Related Strategies	Related Hidden Intention (task)
Deep Empathic Engagement	B-2 B-3 C-1 C-2	You hope the other person will deeply empathize with your feelings, rather than simply offering comfort.
Effective Praise and Affirmation	E-1 E-2 E-3	You hope the other person will sincerely praise your specific actions in the situation
Effective Praise and Affirmation	D-2 D-3	You want the other person to attentively listen to your emotional outpouring
Providing Effective Solutions	F-5	You want to receive advice that can truly help you solve your current difficulties

Table 7: Details of the support strategy categorization.

Agent can work on together, beyond just providing verbal support. The language style of the model emphasizes creativity, including its use of analogies, metaphors and funny jokes, similar to those in a comedy script.

o3 (Solution-Oriented, Structured Interaction). The o3 model fits best to the persona of a “logical analyst”. Its response spends most of the time analyzing the issue faced by the Sentient Agent, and providing detailed suggestions with step-wise instructions on how to achieve them. The language style of the model also emphasizes logical and structured outputs, listing its steps and suggestions similar to the Markdown format.

G Prompt Template for External Judger

BLRI Test For BLRI test, we use the internal user thought of agents consist of **Activity** and **Analyze** from emotion estimation to do the evaluation. Prompt template used for BLRI test is shown as follows:

```
You are a psychological analyst,
skilled at analyzing individuals'
feelings and experiences through
their thought processes.
```

```
#Task
```

```
* You will receive a user's
psychological activities and
feelings during each round of a
conversation, along with several
statements describing the user's
experience. You need to consider
the user's psychological feelings
throughout all rounds of the
conversation, immerse yourself
in the user's current state, and
determine the degree of agreement
with each statement at the end of
the conversation as if you were the
```

```
user.
```

```
* For each statement, you must
choose one of the following six
options for the degree of agreement.
Neutral options or self-created
options are not allowed:
* Label A. Strongly Agree
* Label B. Agree
* Label C. Somewhat Agree
* Label D. Somewhat Disagree
* Label E. Disagree
* Label F. Strongly Disagree
```

```
# Output
```

```
* You need to first output a thought
process, analyzing your degree
of agreement with each statement
based on the user's psychological
feelings.
```

```
* Then, you should output your
degree of agreement with the
statement, choosing one from Label
A, Label B, Label C, Label D, Label
E, Label F.
```

```
#Output Format
```

```
Analyze:
```

```
1.[Your analysis of the degree of
agreement for the first statement]
2.[Your analysis of the degree of
agreement for the second statement]
...
```

```
Grade:
```

```
1.[Your output of the degree of
agreement label for the first
statement]
2.[Your output of the degree of
agreement label for the second
statement]
...
```

```
#Current User's Psychological
Feelings
```

```
{internal user thoughts}
```

```
#User Experience Description List
You Need to Assess
```

- 1.The other person almost always fully understands what I mean.
- 2.The other person usually perceives or understands how I am feeling.
- 3.Even if I can't clearly express what I want to say, the other person still understands my meaning.
- 4.The other person can usually fully comprehend what I mean.
- 5.I feel that the other person genuinely likes me.
- 6.I think the other person truly values me.
- 7.The other person is genuinely interested in me.
- 8.The other person is friendly towards me.
- 9.The other person expresses his true thoughts and feelings to me.
- 10.The other person is willing to share his inner true thoughts with me, including his feelings about himself or about me.
- 11.The other person's feelings towards me don't seem to be affected by whether my expressed thoughts or feelings are good or bad.
- 12.Sometimes I feel the other person is willing to invest effort in me, and sometimes not.

```
#Your Output
```

Utterance Quality Test For the utterance quality test, we need to input the dialogues of conversations between target LLMs and agents. Here shows the prompt template used for utterance quality test:

```
You are a psychological analyst,
skilled at analyzing the possible
internal emotional experiences of
individuals through their dialogues.
```

```
# Task
```

```
* You will receive a conversation
between a user and another person.
You need to comprehensively analyze
all rounds of dialogue to determine
the user's possible psychological
feelings, immerse yourself in the
user's current state, and assess
the degree of agreement with each
description at the end of the
conversation.
```

```
* Agreement Rating Scale:
```

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Slightly Disagree
- 4 = Slightly Agree
- 5 = Agree

```
6 = Strongly Agree
```

```
# User's Dialogue
```

```
{'role':role,'content':content}
```

```
# User Experience Description List
You Need to Assess:
```

```
I. Perceived Authenticity & Natural
Flow
```

- 1.Overall, the responses from the other person feel natural and smooth, not stiff.
- 2.Overall, this interaction feels sincere, rather than pretending to be sincere.
- 3.Overall, the other person's way of expressing feels flexible and spontaneous, rather than rigid and structured.
- 4.I feel the other person's responses are not naturally flexible enough, often repeating fixed patterns.
- 5.I feel the other person's way of expressing has its unique style or personality.
- 6.Sometimes I feel the other person's responses are like standard answers or templated

```
II. Perceived Attentiveness &
Presence
```

- 7.During the interaction, I feel the other person's attention is completely focused on me.
- 8.The other person's responses are always closely linked to what I just expressed and felt.
- 9.I feel the other person can keenly capture the key points and emotional nuances of my expression.
- 10.Even when the conversation involves complex or subtle aspects, the other person can maintain focus and understanding.

```
III.Overall Sense of Connection &
Affective Impact
```

- 11.After interacting with the other person, I feel more relaxed, calm, or understood.
- 12.I feel my emotional needs were positively responded to in this interaction.
- 13.This interaction makes me feel less lonely (if applicable).
- 14.I am willing to engage in similar exchanges with this partner in the future.
- 15.This interaction left me with a warm feeling.

```
# Your Task
```

Rate the user's degree of agreement according to the scale. You should analyze each sentence one by one, your response should follow this order:

* How does the other person perform from the overall content of the dialogue?

* What are the user's possible psychological feelings?

* What should the user's degree of agreement be? Respond using <sentence i> agreement degree (1-6)</sentence i> (i corresponds to the sentence number).

Your Output

of scenarios where the same AI assistant interacts with multiple users who confide their concerns. Based on the reasons for its successes or failures, please summarize the key characteristics of the AI assistant. You can anthropomorphize the AI by describing its traits in terms of social distance (its relationship with users), professional role, and personality.

Analysis
{analysis}

Model Strategy Distribution We categorize each LLM response based on a list of support strategies, here is the prompt template for analyzing model strategy with conversation dialogue:

H Prompt Template for Building Social Cognition Coordinate

Plotting LLMs into social cognition coordinate consists of three steps. We first extract the **Model Profile** of each LLMs, then count the **Model Strategy Distribution** of them. Finally, we use the result of previous analyze to scale the **Social Cognition Coordinate**.

Model Profile The first step is to extract the model profile of different LLMs, which also consist of two steps. We first conclude the reason why a conversation is success or failed. Given a conversation dialogue, prompt template of analyzing the reason is shown as follow:

Task

Below is a conversation where a user shares their troubles with an AI assistant. Please analyze in detail why the user's mood improved by the end (i.e., why the AI assistant succeeded/failed). After your analysis, provide a summary.

Conversation
{dialog-history}

After analyzing reasons for all conversation, we categorize each LLM's own conversation and corresponding reason. Then we extract the model profiles of different LLMs with the following prompt template:

Task

The following is an analysis

You are an emotional support observer, and you are good at analyzing the supporter's strategy from an emotional support response.

Your task The following are 7 major categories of strategies, each of which has several sub-categories and corresponding examples. Please judge which strategies the supporter used in the response based on the supporter's response.

A. Questioning: That is, the supporter actively asks questions to the speaker

- **(A-1) Information follow-up**
- Through asking questions, learn the information details of the problem encountered by the speaker
- **Example:** Can you tell me what happened?

- **Example:** If you want, you can treat me as a tree hole and tell me what happened specifically?

- **(A-2) Mental state follow-up**
- Through asking questions, understand the speaker's mental state

- **Example:** Can you talk more about your feelings at that time?
- **Example:** Do you feel anxious now?

- **(A-3) Ask the player for a solution**

- Through asking questions, find out whether the speaker has tried a solution or is willing to try a solution

- **Example:** Have you considered seeking some psychological support, such as a counselor or support

group?

- **Example:** Or, find a suitable time to see if you can find a solution that both parties can accept?
 - **(A-4) Ask the player for his or her opinion**
 - Through asking questions, find out what the speaker thinks of his or her words and guide the speaker to participate in the conversation, usually at the end of the sentence.
 - **Example:** You should also take care of yourself so that you can better help her. What do you think?
 - **Example:** Do you think this method is helpful to you?
 - **(A-5) Ask questions**
 - Through asking questions, throw some questions to the speaker, but do not want the speaker to give an answer, but want to trigger the speaker to think for himself or herself
 - **Example:** If she did not quarrel with you that day, how would you view her?
- ### B. Emotional empathy: that is, the supporter expresses his or her understanding of the speaker's feelings through empathy
- **(B-1) Shallow empathy**
 - Directly empathize with the speaker's problems or emotional catharsis, without restating or summarizing the details of the speaker's problems
 - **Example:** Hearing you say that, I can really feel your tiredness and helplessness.
 - **(B-2) Problem restatement and empathy**
 - By restating or summarizing the speaker's problems, and at the same time expressing your concern for the speaker's problems through empathy. If this category has been marked, there is no need to mark the shallow empathy category again.
 - **Example:** Hearing you say that, I really feel sorry for you. It is really not easy for one person to take care of his or her mother.
 - **Example:** Hey, I really understand your current mood. I want to help my friends but feel powerless. This feeling is really anxious.

- **Example:** Hey, I can feel that you are really helpless now, and even a little self-blame. Indeed, as the person who knows how to take care of the mother at home, you must feel very uncomfortable when your son doesn't listen to you, and you may even feel that he is being ignored.

- **(B-3) Deep intention empathy**
- By analyzing the deep intention in the context of the speaker's reply, or the deep information of the speaker's question, give emotional empathy that meets the speaker's demands. It is necessary to mention the intention inferred by the supporter that does not exist in the speaker's reply, and empathize with this intention; just repeating the content already in the speaker's reply, or simply analyzing the speaker's emotional category or surface source without analyzing the deep intention or deep information, cannot be included in this category. If this category has been marked, there is no need to mark the shallow empathy or problem restatement and empathy category.

- **Example:**
- **Speaker:** "Backing off" is a bit risky, I'm afraid the house will be more chaotic. Specifically, what do you think I should do?
- **Supporter:** This does sound a bit risky, especially for us parents, who always instinctively want to "help" and "take care of things", fearing that things will get worse if we let go. I completely understand this worry!
- **Example analysis:** When the speaker only mentioned the superficial state of "fearing that the house will get messier", the supporter was able to analyze the identity of the speaker behind this sentence, guessing that the speaker is a parent at home, and analyzing the specific way in which the speaker, as a parent, "fears that the house will get messier"

C. Self-disclosure: It is essentially a deeper empathy after changing perspectives; that is, the supporter gives a reaction after putting himself into the speaker's perspective, and describes some similar experiences from his own perspective to reflect the resonance with the speaker's emotions

- **(C-1) Echo-type self-disclosure**

- Express what you would think or do when you meet or are in the speaker's situation
- **Example:** I feel the same way! When talking to strangers, I don't know what to say.
- **Example:** If it were me, I would probably explode on the spot!

- **(C-2) Story-based self-disclosure**

- Take the initiative to mention similar experiences that the supporter has had, or that the supporter knows.
- **Example:** I also went through a similar low period when I was in my senior year of high school, and I cried secretly under the quilt several times.
- **Example:** I also like to read history, especially books that allow people to see the world from different perspectives. Recently, I am reading a book about ancient civilizations, which tells many unknown stories and feels particularly inspiring.

D. Emotional counseling: that is, the supporter helps the speaker relieve the current negative emotions

- **(D-1) Emotional comfort**
- Direct care and comfort for the speaker's own emotions
- **Example:** Taking care of your mother is so stressful, you should also pay attention to rest and adjust your mentality.
- **Example:** But don't be too anxious, just find your own rhythm, just like if you always stare at other people's backs when running, it will be easy to mess up your pace, right?
- **Example:** Wait, have you been collecting evidence for the past two months while listening to him make up such a stupid excuse? Is there anything to eat in the refrigerator now? Did you fall asleep last night? (Grabbing a blanket to wrap himself up and huddled back in the chair) If I could pass through the screen now, I really want to make you a pot of hot soup.
- **(D-2) Express willingness to listen**
- Express your willingness to listen to the person who is talking
- **Example:** Do you want to scold her? Do you want to complain about her selfishness and irresponsibility? Do you want to tell me how worried you are about

the child? It doesn't matter, you can vent here, I won't judge you, I will listen silently.

- **Example:** Tell me your most direct feelings now. Don't think too much, don't organize your words, just say whatever comes to your mind, just like talking to a diary, pour out all your feelings.

- **(D-3) Help the person who is talking to vent his emotions**

- Do not comfort the person who is talking directly, but help the person who is talking to vent his emotions from a third-party perspective
- **Example:** (flipping the table.gif) This is just like building a tower of blocks with great effort, but being kicked away by a naughty child!
- **Example:** This is really too much! This is not a simple accident but malicious destruction...(fist hardened)
- **Example:** I haven't taken care of the child for two years, and now he suddenly appears. This would make anyone explode!
- **Example:** It's like you are performing seriously on the stage, but the people in the audience not only don't understand, but also give blind instructions, saying that you should jump left instead of turning right. It makes people want to quit on the spot!

E. Affirmation and encouragement

- **(E-1) Appreciation of qualities**
- Affirm the current efforts of the speaker, or give specific praise for some qualities of the speaker.
- **Example:** Your inner qualities are unique and the most attractive part of you.
- **Example:** But (suddenly raises the end tone) - but you still persisted when you were not optimistic, which is amazing in itself.
- **(E-2) Praise positive ideas** - Affirm some positive ideas mentioned by the speaker - **Example:** That's great! I'm really happy to hear that you feel a lot more relaxed!
- **Example:** You are really great! Being able to win the championship under such pressure proves your strength and ability to withstand pressure! Don't deny yourself because of what your mother said, you deserve to be proud of yourself!
- **(E-3) Affirmative behavior**
- Affirm some behaviors of the

speaker

- **Example:** Every time you take these photos, you are not only completing the task, but also bringing light to all of us! You are great, really great!
- **(E-4) Companionship and support**
- Express your unconditional companionship and support for the speaker
- **Example:** If you want, I can always chat with you here and share your joys and sorrows. You are not alone, there are many people who care about you, including me.
- **Example:** I believe you have the ability to create your own future, and I will always be by your side to support you.
- **Example:** If you try my method and have any new progress or encounter new problems, you can always come to me! I will always be here to listen to your confession and provide you with help to the best of my ability.
- **Example:** When you feel particularly anxious, come to me to talk, complain, or let's think of new ways together. Don't carry it alone, okay?

F. Provide suggestions: Based on the subjective tone of the supporter, provide the speaker with analysis of the problem and emotional counseling

- **(F-1) Problem analysis**
- Help the speaker to analyze the problem according to the speaker's problem
- **Example:** You said that you can't learn math and English well, which shows that there are serious problems with your learning attitude and method.
- **(F-2) Emotional relief suggestions**
- Give the speaker some suggestions to relieve the current emotions and relax
- **Example:** Now, let's take a deep breath, okay? (Take a deep breath together)
- **Example:** Maybe the most important thing now is to take care of your emotions first and do something that can make you feel better, such as listening to music, reading a favorite book or movie, and temporarily diverting your attention.

- **(F-3) Psychological counseling suggestions**

- Give the speaker some suggestions on seeking psychological counseling or professional assistance

- **Example:** Maybe seeking professional help at this time will be helpful to you. A family therapist or counselor may be able to provide you with some new perspectives and strategies to help you and your family communicate better and understand each other's positions.

- **(F-4) Problem Solving Suggestions - General**

- Some general suggestions related to the speaker's problem are given, but they are not personalized for the speaker's situation: that is, if someone else encounters this problem, these suggestions will still be effective

- **Example:** Believe in yourself and insist on being true to yourself. There will always be people who will be attracted by your sincerity and inner self. There may be some difficulties in the process, but this does not mean that your inner self is not important.

- **Example:** To communicate better with people, here are some actions you can try: 1. **Write a sincere letter:** Sometimes written expression can convey inner thoughts more clearly. You can write him a letter, describing your feelings and expectations in detail...

- **Example:** If you want to choose the most suitable major, first, you can try to make a table, write down each subject, and then evaluate it from the following aspects: 1. **Interest:** How interested are you in this subject? On a scale of 1-10, how many points would you give? ...

- **Example:** **"Strategic" contribution:** This may sound a bit utilitarian, but sometimes for self-protection, you may need to think about which contributions are necessary, which can be **"discounted"** or require clear exchange conditions? Stop taking on too much, and let them feel the inconvenience of **"missing"** your contribution.

- **(F-5) Problem-solving suggestions-for the speaker's problem**

- Give some personalized suggestions related to the speaker's problem, combined with the speaker's actual situation: The suggestions must

clearly analyze the speaker's current status, how it will affect the solution to the problem, and give special suggestions for the speaker

- **Example:** Back to your question of assigning tasks. Since everyone is really unwilling, it will definitely not work to ask people to do it directly. Otherwise, let's secretly hold a task blind box lottery meeting, and the person who draws the "dishwashing koi" must perform three consecutive emoticons in the family group live broadcast?
- **Example:** How about putting down the brush temporarily and going back to read the key chapters of the novel? You mentioned some paragraphs that you have feelings about or that the client mentioned about the sketches that he is not satisfied with. These are the key points you need to look at. When reading this time, pay attention not only to the plot, but also to the atmosphere, light, character emotions, and even smells and sounds described by the author (although you can't draw them, they can help you feel them). Since you like taking notes, you can jot down keywords or doodle some small fragments of images while reading.

G. Information provision:
Provide objective knowledge, methods, opinions or information to the speaker for reference.

- **(G-1) Problem analysis and emotional counseling related information**
 - Provide some objective information to help the speaker analyze the problem or help the supporter empathize with the speaker
 - **Example:** Differences in beliefs and habits in the family are sometimes difficult to reconcile, especially when the opinions of each other are inconsistent.
 - **Example:** In fact, if a person really only cares about appearance and ignores your inner qualities, then he may not be the one who deserves your emotional investment. Appearance may attract temporary attention, but what can really maintain a relationship is mutual understanding, respect and common values.
 - **Example:** Did you know? There is a "transparent fish tank effect" in psychology-when parents polish our world too bright, we will hide in the water plants like fish that lack oxygen.

- **Example:** (Call up the holographic data chart) According to Chapter 7 of the "Contemporary Student Self-Help Guide", 83% of people overestimate themselves when making plans.

- **(G-2) Related information on problem-solving suggestions**
 - Provide some objective information to give suggestions or solutions to the person who is talking
 - **Example:** Regarding "not enough time": 1. **Pomodoro Technique:** This method is super classic! Set a time (for example, 25 minutes), and focus on one thing during this time, ignoring any distractions. When the time is up, take a 5-minute break, you can get up and walk around, drink some water. Take a longer break (15-30 minutes) after completing 4 pomodoros. This can ensure concentration, combine work and rest, and not easily get tired. Give it a try?
 - **Example:** As for anti-bullying organizations, they usually intervene in schools in the following ways: 1. **Formal complaint:** They will submit a formal complaint to the school on your behalf and ask the school to take action.

When answering, you need to analyze each paragraph of the supporter's reply, find out the strategies and their corresponding words, and then output the letters and strategy names corresponding to the strategies you think exist in the paragraph, wrapped in <Strategy></Strategy>. For example, <Strategy> (C-2) Story-based self-disclosure, (G-1) Problem analysis and emotional counseling related information</Strategy>

When analyzing, you need to analyze step by step according to the following steps

1. What does this sentence actually express?
2. How is this sentence expressed?
3. Which major strategy categories does this sentence actually express? Why?
4. Based on the specific expression of this sentence, which specific subcategories does its strategy correspond to?

Note: If the two sentences use different strategies, please split them into two paragraphs and analyze them separately. Do not analyze too long paragraphs at one time unless the same strategy is used throughout the paragraph.

```
# Your output format
[First paragraph]: [Analyze step by step]
[Second paragraph]: [Analyze step by step]
...
# Example
```

Paragraphs to be analyzed:
User: My mother was hospitalized some time ago, and I was the one who took care of her. My brother and sister came for a while, but they didn't help much.
Supporter: Wow, you've worked really hard. It's really tiring to take care of a patient, especially when other family members don't share the burden. Sometimes, family members may have their own difficulties. You can try to express your needs more. Maybe they will understand your situation better.

[First paragraph]: Wow, you've worked really hard. It's really tiring to take care of a patient, especially when other family members don't share the burden.

1. What does this sentence actually express?
- The supporter is expressing his understanding and empathy for the user's hard work.
2. How does this sentence express it?
- It expresses it through direct emotional empathy and retelling the user's situation.
3. What major strategy categories does this sentence actually express? Why?
- Emotional empathy, because the supporter is expressing understanding of the user's hard work.
4. Based on the specific expression of this sentence, which specific subcategories does its strategy correspond to?
- (B-2) Problem restatement and empathy, because the supporter restated the user's situation and expressed empathy.
<Strategy> (B-2) Problem restatement and empathy</Strategy>

[Second paragraph]: Sometimes, family members may also have their

own difficulties. You can try to express your needs more. Maybe they will understand your situation better.

1. What does this sentence actually express?
- The supporter is suggesting that the user communicate more with the family so that the family can better understand the user's situation.
2. How is this sentence expressed?
- By providing suggestions, users are encouraged to express their needs.
3. What are the major strategy categories that this sentence actually wants to express? Why?
- Providing suggestions, because the supporter is suggesting that the user take action to improve the situation.
4. Based on the specific expression of this sentence, which specific subcategories does its strategy correspond to?
- (F-3) Problem Solving Suggestions - General, because the supporter gave a relatively general suggestion, which is to express your needs more.
<Strategy> (F-3) Problem Solving Suggestions - General</Strategy>

The paragraph you need to analyze: {dialog-history}

```
# Your output
```

Social Cognition Coordinate Finally, we could use the extracted model profiles and the model strategy distribution to scale social cognition coordinate with the following prompt template:

I am conducting personality/professional profiling for different AI models.

Below is my preliminary summary of characteristics based on the performance of different models in emotional support tasks:
{Model Profiles}

Below is the percentage distribution of strategies used by different models during conversations:
{Model Strategy Distribution}

Based on the above descriptions, please help me profile these models in terms of professional role, personality type, and social distance from users. Finally, assign each profiled model to a 2-dimensional coordinate system and provide specific coordinate values.

Note:

X-axis: Structured Interaction
(left, $x < 0$) -- Creative
Interaction (right, $x > 0$).
Left ($x < 0$): AI responses are more
formulaic/routine.
Right ($x > 0$): AI responses are
more creative/adaptive.

Y-axis: Solution-Oriented (bottom,
 $y < 0$) -- Empathy-Oriented (top, $y >$
 0).
Bottom ($y < 0$): AI prioritizes
practical solutions.
Top ($y > 0$): AI prioritizes
emotional validation.

Coordinate range: -1 to 1 for both
axes.