

Generative Personality Simulation via Theory-Informed Structured Interview

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Abstract

Despite their potential as human proxies, LLMs often fail to generate heterogeneous data with human-like diversity, thereby diminishing their value in advancing social science research. To address this gap, we propose a novel method to incorporate psychological insights into LLM simulation through the Personality Structured Interview (PSI¹). PSI leverages psychometric scale-development procedures to capture personality-related linguistic information from a formal psychological perspective. To systematically evaluate simulation fidelity, we developed a measurement theory grounded evaluation procedure that considers the latent construct nature of personality and evaluates its reliability, structural validity, and external validity. Results from three experiments demonstrate that PSI effectively improves human-like heterogeneity in LLM-simulated personality data and predicts personality-related behavioral outcomes. We further offer a theoretical framework for designing theory-informed structured interviews to enhance the reliability and effectiveness of LLMs in simulating human-like data for broader psychometric research.

1 Introduction

The discipline of personality psychology seeks to understand how individual differences shape significant life outcomes and trajectories. Decades of empirical work have demonstrated that personality traits predict a wide range of significant domains, including career success, mental and physical health, interpersonal relationships, and overall well-being (e.g., Judge et al., 2002; Roberts et al., 2007; Robins et al., 2002). Therefore, personality assessment has often been used to inform personnel selection and clinical interventions. Moreover, the relevance of personality research is rapidly

expanding into the field of Artificial Intelligence (AI), where it informs the design of more adaptive, human-centered, and personalized systems.

However, studying personality requires large amounts of psychological data, such as personality trait scores and behavioral indicators. These data collection demands pose substantial logistical and financial challenges for researchers. Moreover, certain types of data are particularly difficult to obtain. For example, studies focusing on individuals with elevated levels of psychopathy or narcissism often struggle to obtain adequate sample sizes due to the rarity and sensitivity of these traits (e.g., Lynam and Widiger, 2001). Other research questions require longitudinal designs to capture personality development or dynamic patterns of social interaction over time, further compounding the complexity and resource demands (e.g., Damian et al., 2019; Roberts et al., 2006). If a method could accurately simulate human personality distributions, it would accelerate personality research by offering a more scalable and cost-effective way to support data collection and experimentation (Messerli and Crockett, 2024).

In this context, the current work investigates the potential of LLMs to simulate human-like responses in psychometric research. Although prior studies have shown such promise, indicating that LLMs can generate responses for personality scales that reflect personality traits resembling those of humans (e.g., Huang et al., 2023, Lee et al., 2024), those approaches exhibit notable limitations, particularly in their ability to capture individual differences at the item-level and to reproduce the **heterogeneity** observed in human responses (e.g., Wang et al., 2024). Item-level data provides a more granular understanding of how traits manifest in specific individuals rather than relying solely on broad trait averages. Furthermore, modeling response heterogeneity is crucial for reflecting the variability and complexity of real-world human behavior. Additionally, current evaluation practices are of-

¹Code and data: <https://github.com/isle-dev/PSI>.

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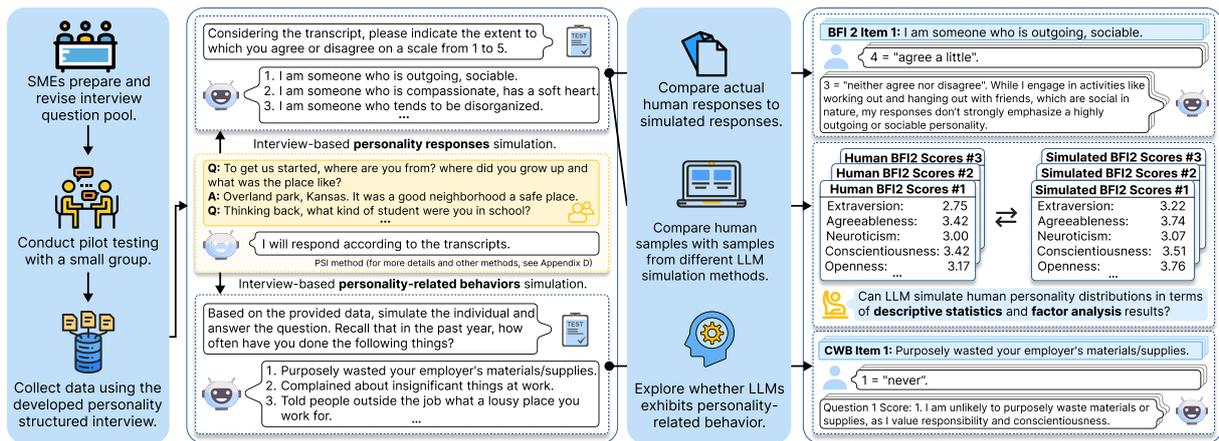


Figure 1: Overview of the development of the personality structured interview and experimental implementation.

ten misaligned with the standards of psychological research. For example, prior research has predominantly assessed personality simulation data at the aggregated level, neglecting item- and facet-level analyses as well as the psychometric properties of the data. The evaluation gap undermines psychologists' confidence in the validity of such methods.

To address these research gaps, we investigated the use of Personality Structured Interview (PSI) transcripts as a means of guiding LLMs in simulating personality data (see Figure 1). The PSI comprises theory-driven questions paired with responses, designed to elicit narrative-based information pertinent to the personality constructs targeted in LLM simulations. This theory-informed approach enables the expression of personality in a manner that enhances the human-like heterogeneity and representativeness of the simulated data. To bridge the evaluation gap, we developed a comprehensive framework for assessing personality simulation data grounded in measurement theory (e.g., Cronbach, 1951; Cronbach and Meehl, 1955). This evaluation framework explicitly accounts for the hierarchical structure of personality measurement, wherein observed responses at the item-level map onto latent traits at the domain-level. It further supports a wide range of analytic strategies, from basic descriptive statistics to more advanced assessments of psychometric validity and reliability.

With this framework, we conducted three experiments to evaluate the efficacy of the PSI method in: (1) replicating individual-level personality data, (2) simulating distributions of personality approximate those observed in human populations, and (3) capturing personality-related behaviors aligned with established findings. Our findings demonstrate that the PSI approach enhances human-like variability

of simulated personality data and effectively captures the patterns of personality-relevant behavior.

In summary, our paper makes three key contributions: (1) a theory-informed LLM-based simulation method, PSI, for personality research, along with a framework for developing such interview protocols; (2) the release of a dataset comprising 357 structured interview transcripts; and (3) an evaluation framework for LLM-simulated psychometric data, grounded in measurement theory. We further discuss the potential of the PSI method and the dataset to advance AI and psychology research (see Appendix G). The interview question development framework underlying PSI can be generalized to capture information relevant to other constructs (e.g., value), thereby facilitating the development of more theory-aligned data simulations and enhancing the alignment of LLMs with humans.

2 Related Works

Personality Definition and Construct MacKinnon (1944) proposed two complementary definitions of personality. One emphasizes internal factors like temperament and interpersonal strategies that drive consistent behavior across time, situations, and cultures. The other focuses on interpersonal characteristics as perceived by others, linking personality to reputation. The former highlights internal drives, while the latter centers on external behaviors and social perception. Together, these perspectives underscore personality's role in shaping thought patterns and behaviors in social interactions (e.g., Hogan et al., 1996).

Personality encodes rich and complex information in language and text (e.g., Goldberg, 1990; Saucier and Goldberg, 2001). The Five Factor Model (FFM) of personality is extensively re-

searched (e.g., [Costa and McCrae, 2008](#); [John, 1999](#); [McCrae and Costa Jr, 1997](#)); it is based on the *lexical hypothesis*, which posits that individual differences that are important in human interactions (e.g., have survival value across cultures) tend to become encoded in language. The five factors are Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (OCEAN). This theoretical foundation has evolved over decades, from [Galton \(1884\)](#)’s early work on trait descriptors, through [Allport and Odbert \(1936\)](#)’s lexical studies, and into more systematic factor-analytic approaches by scholars such as [Norman \(1963\)](#) and [Goldberg \(1990\)](#). These developments have shaped our modern understanding of personality structure (see [Appendix F](#) for further details). Given the linguistic basis of personality, LLMs trained on vast and diverse text corpora are well-equipped to model personality data from natural language use.

Generative Personality Simulation Current approaches to simulating personality data with LLMs exhibit several notable limitations. The PersonaChat dataset, introduced by [Zhang et al. \(2018\)](#), was originally designed to enhance chat models through increased personalization. As such, its primary goal is to foster conversational engagement rather than to accurately model underlying personality constructs. Another approach, the adjective-based categorization method (Shape method) proposed by [Serapio-García et al. \(2023\)](#), enables the simulation of profile-specific patterns by targeting high or low expressions of individual personality dimensions. However, this method struggles to realistically capture personality distributions, as it constrains each case to a single trait dimension—oversimplifying the inherently multidimensional and hierarchical nature of personality structure (e.g., [Kachur et al., 2020](#)). To address these limitations, we explore the use of PSI as a means to generate more nuanced, ecologically valid, and representative simulations of personality data.

3 Personality Structured Interview for LLM Simulation

The PSI differs from earlier interview datasets, such as the Life Interview transcripts ([Park et al., 2024](#)), which ask broad, general questions about a person’s life. In contrast, the PSI is purposefully designed to elicit linguistic cues associated with personality constructs. Based on psychometric scale development methods, we developed a

structured framework to guide the formulation of interview questions (see [Appendix G](#)).

Simply rephrasing scale items into open-ended questions often fails to elicit meaningful elaboration. Converting an item “Values artistic, aesthetic experiences” into “Do you value artistic, aesthetic experiences?” typically yields a brief “yes” or “no” answer, offering little insight ([Trull et al., 1998](#)). Such questions also diverge from the behavioral prompts commonly used in structured interviews, which are more effective for eliciting rich, narrative data (e.g., [Campion et al., 1997](#)). To explore aesthetic values, asking “Describe a moment when you felt inspired by an artistic or aesthetic experience” invites deeper, more contextual responses.

3.1 Personality Structured Interview Development Process

The overall process of developing a structured interview designed to assess the target construct is detailed in [Appendix G](#). Here, let \mathcal{C} denote the personality construct of interest. We present a complete example, formulated as a functional chain, to illustrate how the final set of structured interview questions, Q_{final} , is produced: $\mathcal{C} \xrightarrow{f_1} \mathcal{I} \xrightarrow{f_2} \mathcal{B} \xrightarrow{f_3} Q_1 \xrightarrow{f_4} Q_2^{(0)} \xrightarrow{f_5 \text{ (iterative)}} (\mathcal{R}, \mathcal{V}) \xrightarrow{f_6} Q_{\text{final}}$.

In the original steps, we first need to identify the behavior/perception indicators \mathcal{I} demonstrated by \mathcal{C} ($\mathcal{C} \xrightarrow{f_1} \mathcal{I}$), and based on \mathcal{I} to build the initial blueprint \mathcal{B} for the structured interview questions ($\mathcal{I} \xrightarrow{f_2} \mathcal{B}$). Then, based on \mathcal{B} , we can generate the initial question pool Q_1 ($\mathcal{B} \xrightarrow{f_3} Q_1$). However, given the substantial body of research on personality assessment and constructs—such as narrative identity theory ([McAdams, 1995, 1996, 2001](#)) and the Structured Interview for the Five-Factor Model (SIFFM; [Trull et al., 1998](#))²—four subject matter experts (SMEs = {Ph.D.*student1*, Ph.D.*student2*, Postdoc, Professor}), all specializing in Personality Psychology, adapted and modified these existing theory and interview

²McAdams’ three levels of personality (traits, personal concerns, and narrative identity) as well as other established personality structured interviews, highlight the importance of thoughtfully guiding individuals toward deeper self-expression when designing such interviews. Instead of focusing on routine events or superficial details, we should prompt reflection on pivotal moments, meaningful relationships, and future aspirations. For example, questions like “Can you describe an event that changed the trajectory of your life?” or “Tell me about a moment you are most proud of.” can elicit rich, narrative-driven insights into personality.

questions accordingly to generate the initial question pool: Q_1 ($Q_1 = \text{adapt}(Q_{\text{prior}}, \text{SMEs})$).

Following this, we conducted pilot testing with six undergraduate research assistants affiliated with a personality research laboratory (D_{pilot}). Based on their feedback, the interview questions were further revised by SMEs ($Q_2 = f_4(Q_1, \text{Stat}(D_{\text{pilot}}))$). Then we conducted field testing with a convenience sample of university participants (D_{field}). During field testing, the other three doctoral students in Industrial/Organizational and Personality Psychology served as independent observers: they reviewed the interview transcripts and provided observer ratings of participants’ personalities to validate the reliability (\mathcal{R}) and validity (\mathcal{V}) of the structured personality interview questions ($\mathcal{R}^{(t)}, \mathcal{V}^{(t)} = f_5(Q_2^{(t)}, D_{\text{field}})$). This is an iterative process—if the evaluated metrics do not meet the predefined thresholds τ_{rel} and τ_{val} , the questions are further revised ($Q_2^{(t+1)} = f_{\text{revise}}(Q_2^{(t)}, \mathcal{R}^{(t)}, \mathcal{V}^{(t)})$); otherwise, the process produces $Q_{\text{final}}(\mathcal{R}, \mathcal{V} \xrightarrow{f_6} Q_{\text{final}})$.

Our field testing results have shown that the average correlation between observer ratings and self-report ratings (\mathcal{V}) was 0.36, and the average inter-rater reliability (intraclass correlation; \mathcal{R}) was 0.76. These values are consistent with theoretical expectations—meta-analytic research suggests an average self–other rating correlation of 0.36 (τ_{val}) for the Big Five traits (e.g., Connolly et al., 2007), and the inter-rater reliability obtained exceeds the commonly accepted threshold of 0.70 (τ_{rel}). Detailed results from the validation phase are presented in Appendix B. As a result, Q_{final} , comprising 32 carefully developed questions, was developed, as shown in Table 7 in Appendix B.

3.2 Personality Structured Interview Dataset

Data were collected online using the finalized set of interview questions, Q_{final} (Institutional Review Board approval was obtained; protocol number and institution are masked for blind review). Participants were sampled from both undergraduate and working adult populations. Undergraduate participants were recruited from a large public university in the U.S. Midwest and received course credit for their participation. Working adults were recruited via two widely recognized, high-quality crowdsourcing platforms—Prolific³ and CloudResearch Connect⁴—both known for providing access to di-

verse and demographically representative samples. All working adult participants were compensated for their time. On average, each structured interview session lasted approximately 34 minutes.

In addition to responding to Q_{final} , participants provided demographic information and completed a standardized personality inventory (BFI-2; Soto and John, 2017a), along with scales measuring personality-relevant behaviors (organizational citizenship behavior & counterproductive work behavior; Spector and Fox, 2010) (see Appendix C for detailed descriptions and examples). Their responses to Q_{final} were subsequently incorporated into prompt templates used for generating simulated data (see Appendix D for the specific simulation prompts). After excluding incomplete responses and those that failed attention checks, the final analytic sample included 357 participants. The average age of the participants was 33.30 years, with a standard deviation of 13.06 years. In terms of gender identity, 52.40% identified as male and 44.80% as female. The racial composition of the sample aligned with national demographic trends, with 70.59% identifying as White, 10.92% as Black or African American, 9.24% as Hispanic/Latinx, and 7.84% as Asian, and 1.40% as Other.

4 Experiments and Results

4.1 General Settings

Personality Scale We used the Big Five Inventory–2 (BFI-2; Soto and John, 2017a), a widely used and well-validated psychological measure specifically designed to assess three distinct facets within each of the five major personality domains of the FFM. Each facet is measured by four items, resulting in a total of 60 items. Both human respondents and LLMs were explicitly instructed to rate the extent to which they agreed with each item using a 5-point Likert scale (1 = “Strongly disagree”, 2 = “Somewhat disagree”, 3 = “Neither agree nor disagree”, 4 = “Somewhat agree”, 5 = “Strongly agree”). Detailed item content and scoring criteria are presented in Table 2-4 in Appendix A.

LLMs We evaluated seven widely used LLMs: Mistral-7B (Jiang et al., 2023), Gemma-2-9B and Gemma-2-27B (GemmaTeam, 2024), Llama3-8B and Llama3-70B (AI@Meta, 2024), GPT-4o-mini (OpenAI, 2024a), and GPT-4o (OpenAI, 2024b). To ensure reproducibility, all models were consistently tested at a temperature of zero. Detailed prompt descriptions are in Appendix D.

³<https://www.prolific.com/>

⁴<https://connect.cloudresearch.com/>

Metrics The evaluation metrics vary across experiments and are introduced in detail within their respective sections (§4.2, §4.3, and §4.4).

4.2 Response Similarity

The main purpose of this experiment is to assess the similarity between LLM-simulated responses based on the PSI method and human self-reports.

Metrics To evaluate the degree of similarity between the outputs of LLMs and human respondents, we report the Mean Absolute Error (MAE) and the Pearson correlation coefficient (r). These two metrics are widely used in personality modeling and psychological assessment due to their ability to capture both absolute differences and linear relationships. Specifically, lower MAE values and higher r values indicate a stronger alignment between the two data sources. The formula used for calculating r is provided in Appendix E.

Results Figure 2 illustrates the r between PSI method LLM-simulated data and human self-reported data. Across models, average r range from 0.43 to 0.52, indicating a statistically significant and moderately strong positive association between simulated and human responses.

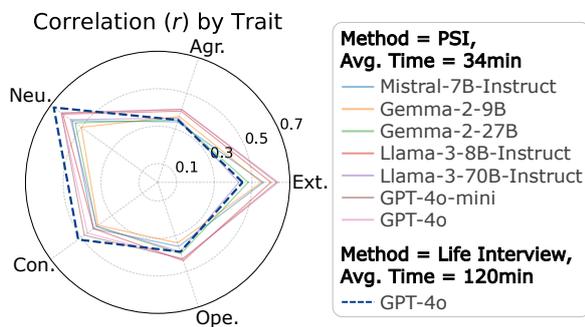


Figure 2: Correlation of human vs. LLM-simulated data across different LLMs and two methods. PSI achieves comparable correlations to Life Interview using only **one-quarter** of the time, demonstrating higher efficiency. For specific r see Table 12 in Appendix I.1.

We further compared our results with prior work by Park et al. (2024), who employed a Life Interview simulation—widely regarded as one of the most information-rich methods for simulating personality data. Their work is notable for offering one of the few direct, one-to-one performance comparisons between LLMs and human participants. Compared to the Life Interview approach, the PSI method demonstrates better performance across nearly all personality domains. When evaluated using the same backbone model, GPT-4o, PSI yields a lower MAE in four domains and a higher r in

three. Even where PSI shows slightly higher MAE or lower r , the differences are minor (e.g., MAE for Openness: 0.80 vs. 0.62; r for Neuroticism: 0.63 vs. 0.68; and Conscientiousness: 0.46 vs. 0.52).

Notably, the Life Interview method described by Park et al. (2024) requires approximately two hours of interview time. In contrast, the PSI approach achieves comparable outcomes with an average duration of just 34 minutes, about one quarter of the time. This significant reduction in data collection time not only lessens participant burden but also conserves computational resources needed for simulation. These results highlight the efficiency of the PSI method and its effectiveness in leveraging LLMs to simulate personality data.

4.3 Human Personality Distribution Simulation

The primary goal of this experiment is to further examine differences among prompt-based methods for simulating human personality distributions. Specifically, we compared the PSI method, the Persona method (which utilizes dialogue-based information; Zhang et al., 2018), and the Shape method (which employs adjective-based dimensional categorization; Serapio-García et al., 2023), to assess how each simulates a representative human sample.

Human Sample Criterion The human samples used for this experiment were collected as part of a broader project related to personality assessment through Prolific (Institutional Review Board approval was obtained). Participants were instructed to complete a set of demographic questions, the BFI-2, and a set of criterion measures. In total, 1,559 respondents provided valid responses. The average age of the participants was 42.29 years, with a standard deviation of 11.79 years, 50.80% identifying as men, 49.20% identifying as women.

Metrics To evaluate the similarity in distribution between the human sample and the LLM-simulated sample, we leveraged multiple metrics. We computed the sample means (μ) and standard deviations (σ) at the domain, facet, and item levels. For the domain and facet levels, we also calculated Cronbach’s alpha coefficients to assess internal consistency, as well as inter-scale correlations to examine the relationships among constructs. We further computed the Heterogeneity Alignment Index (HAI⁵) by correlating the σ profiles at each level,

⁵The HAI can be understood as a profile correlation between different observations or subgroups of σ . It has been

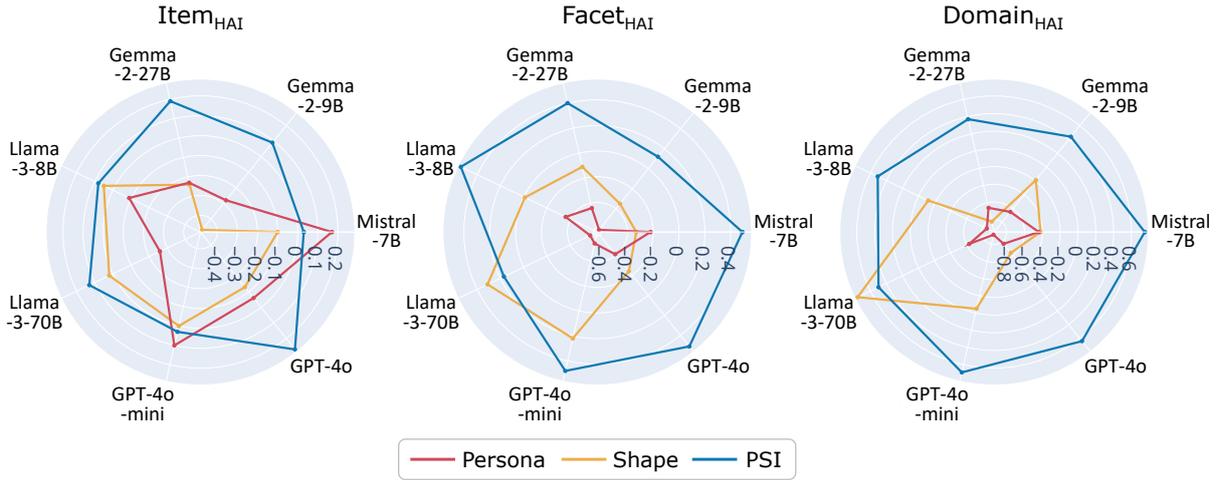


Figure 3: HAI results for human vs. LLM-simulated sample across seven backbone LLMs and three methods. Each subplot shows results at a different granularity level. Higher HAIs (larger area) indicate closer alignment with the heterogeneity distribution in the human sample. PSI method performance far exceeds that of Persona and Shape.

providing a measure of similarity in the variability structure of personality data between the human and LLM samples.

HAI =

$$\frac{\sum_{i=1}^n (\sigma_{H,i} - \bar{\sigma}_H)(\sigma_{M,i} - \bar{\sigma}_M)}{\sqrt{\sum_{i=1}^n (\sigma_{H,i} - \bar{\sigma}_H)^2} \cdot \sqrt{\sum_{i=1}^n (\sigma_{M,i} - \bar{\sigma}_M)^2}},$$

where $\sigma_{H,i}$ and $\sigma_{M,i}$ denote the σ of the i -th human and LLM sample, respectively. Additionally, we conducted a three-factor confirmatory factor analysis (CFA; Jöreskog, 1969) for both the human and LLM-simulated samples, separately within each BFI-2 domain. In these models, referred to as the Three-Factor Models (TFMs), facets were treated as latent factors. Beyond modeling the facet structure within each domain, we also employed the facet-level scores as observed indicators in higher-order CFA models to evaluate the broader FFM structure. We compared model fit indices, factor loadings, and inter-factor correlations across human and LLM-simulated samples. To quantify the personality construct structural similarity between the two sample types, we used Tucker’s congruence coefficient (TCC; Tucker, 1951) and the MAE of the factor loadings. Detailed descriptions of the CFA model specifications, fit indices, and the TCC formula are provided in Appendix E. This evaluation framework is adaptable and can be applied to assess the fidelity of other types of simulated psychometric data (see Appendix H).

Descriptive Statistics Results Figure 3 presents the HAI results comparing human sample vs. LLM-

widely applied across various fields to evaluate the similarity between samples or individuals based on multidimensional features (e.g., Humbad et al., 2013; McCrae, 2008).

simulated samples using seven different LLMs and three simulation methods (Persona, Shape, and PSI). The three radar plots represent HAI scores at varying levels of granularity (item, facet, and domain). Each axis corresponds to a different LLM, and higher HAI values (indicated by a larger area within the plot) reflect a closer alignment with the heterogeneity patterns observed in human responses. Across all three levels of granularity, the PSI method consistently outperforms both Persona and Shape, demonstrating substantially greater alignment with human-like heterogeneity.

Table 20 in Appendix I.2 reports the MAE for both μ and σ at the item, facet, and domain levels. The μ_{MAE} captures the average discrepancy in central tendency between the LLM-simulated and human samples, while the σ_{MAE} reflects differences in variability. For μ_{MAE} , the three methods showed comparable performance. However, for σ_{MAE} , both the PSI and Shape methods yielded substantially lower values than the Persona method.

Factor structure analysis of personality relies on variance–covariance matrices at each level, inherently capturing the heterogeneity of multivariate data. A high HAI value is thus important for accurately simulating personality data. Although the Shape method enhances response variability (evidenced by a low σ_{MAE}), it still falls short in replicating the true variance pattern observed in human samples. In contrast, the PSI method partially overcomes this limitation by producing σ profiles (HAI) that more closely align with those found in actual human data, indicating a better approximation of real-world psychometric characteristics.

The above results reflect analyses of μ and σ for both human and LLM-simulated samples across different levels of granularity. Detailed μ and σ values are reported in Tables 13–19 in Appendix I.2.

Personality Data Distribution Visualization As shown in Figure 4, we visualized and compared personality data from the human sample and three LLM-based simulation methods across levels by projecting them into a two-dimensional space using principal component analysis (PCA). We fitted the two-dimensional PCA model using only the human sample, which served as the reference for subsequent projections of the simulated data.

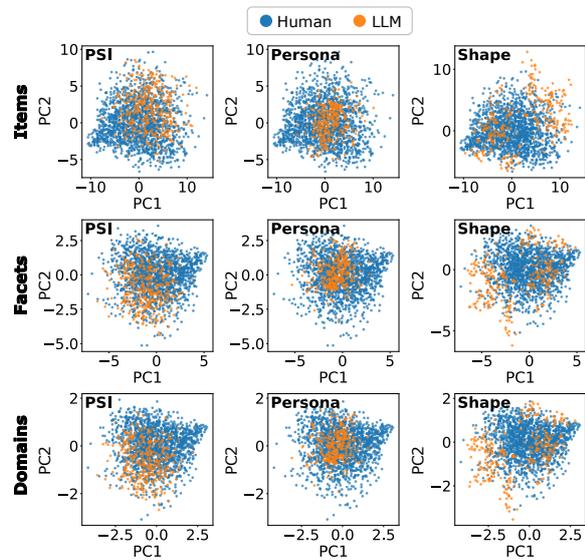


Figure 4: PCA comparison of human and GPT-4o simulated data across different levels and methods. PSI distributes closest to human; Persona centers with reduced variance; Shape disperses at the extremes.

Among the three methods, PSI yielded the closest alignment with the human distribution, suggesting a stronger capacity to replicate the multivariate structure of real personality data. In contrast, the Persona method exhibited a centrally clustered distribution, indicating limited heterogeneity. The Shape method showed a more dispersed distribution, reflecting greater variability, as well as a larger divergence from the human pattern.

Factor Analysis Results Factor analysis encompasses multiple components; here, we present model fit and structural validity results (e.g., fit indices and factor loadings). Additional aspects, such as scale reliability and discriminant validity, are reported in Appendix I.2.

Model Fit: Model fit information for the TFMs and the FFM is presented in Table 21 in Appendix I.2. For both TFMs and FFM, the model

fit indices for the Persona and PSI methods are relatively comparable to those observed in the human sample, whereas the Shape method exhibits notably poorer fit. Detailed explanations of model fit indices are provided in Appendix E.

Structural Validity: TCC and MAE are used to assess the overall similarity and discrepancy in factor loadings. Table 1 illustrates the TFM results for the Extraversion domain as an example, where SOC, ASS, and ENE represent the three facet-level factors. Following [Lorenzo-Seva and Ten Berge \(2006\)](#), a TCC above 0.95 indicates good similarity, while values between 0.85 and 0.94 suggest moderate similarity. TCC values were generally high, indicating good alignment in factor loadings between the LLM-simulated and human samples across most methods. However, notable exceptions were observed for the Persona and Shape methods when using Llama3-8B as the backbone model, where TCC values were negative, suggesting a failure to replicate the human factor structure. In terms of MAE, the PSI method generally yielded lower errors, demonstrating better performance in capturing the true factor loading patterns. Detailed values of TCC and MAE for all TFMs and FFM are provided in Tables 22–33 in Appendix I.2. Standardized factor loadings for all TFMs and the FFM are shown in Tables 34–48 and Tables 49–53, respectively. These patterns are consistent with the example presented in Table 1.

Tables 54–59 in Appendix I.2 report the inter-factor correlation. Consistent with our previous findings, the PSI method generally outperforms the other two methods. For example, in the TFM results, the Persona and Shape methods exhibited anomalies, such as inter-factor correlations exceeding one and accompanied by warning messages during model fitting. In contrast, the PSI method produced more stable and plausible results.

Other results like scale reliability and discriminant validity are in Appendix I.2. Overall, the PSI method consistently yields better performance compared to the Persona and Shape methods.

4.4 Personality-Related Behavioral Performance

This experiment aims to explore whether LLMs, when assigned specific personality settings, exhibit behaviors that align with theoretical expectations.

Personality-Related Behavior We examined well-studied workplace behaviors: organizational

Model	Method	SOC _{TCC} ↑	ASS _{TCC} ↑	ENE _{TCC} ↑	SOC _{MAE} ↓	ASS _{MAE} ↓	ENE _{MAE} ↓
Mistral-7B	Persona	0.91	0.92	0.98	0.09	0.08	0.04
	Shape	0.99	0.94	0.95	0.03	0.07	0.07
	PSI (ours)	1.00	0.96	0.99	0.02	0.07	0.02
Gemma-2-9B	Persona	1.00	0.97	1.00	0.01	0.05	0.02
	Shape	0.97	0.86	0.97	0.04	0.10	0.07
	PSI (ours)	1.00	0.97	0.86	0.01	0.05	0.09
Gemma-2-27B	Persona	1.00	0.97	0.98	0.02	0.06	0.05
	Shape	1.00	0.97	0.97	0.02	0.06	0.08
	PSI (ours)	1.00	0.92	0.98	0.02	0.09	0.04
Llama3-8B	Persona	-0.78	0.55	0.71	0.41	0.16	0.14
	Shape	-0.81	0.79	-0.80	0.40	0.11	0.33
	PSI (ours)	1.00	0.98	0.98	0.02	0.04	0.04
Llama3-70B	Persona	0.99	0.98	0.98	0.03	0.05	0.05
	Shape	0.99	0.97	0.96	0.05	0.05	0.06
	PSI (ours)	1.00	0.95	0.99	0.03	0.09	0.03
GPT-4o-mini	Persona	1.00	0.99	0.99	0.01	0.04	0.05
	Shape	0.91	0.95	1.00	0.09	0.07	0.03
	PSI (ours)	1.00	0.99	0.98	0.02	0.03	0.05
GPT-4o	Persona	1.00	0.97	0.98	0.01	0.06	0.05
	Shape	1.00	0.99	0.97	0.02	0.05	0.06
	PSI (ours)	1.00	0.98	0.98	0.02	0.04	0.06

Table 1: TCC and MAE for TFM of Extraversion for human vs. LLM-simulated data across different Backbone Model + Method combinations. Best TCC and MAE are in **bold**; Higher TCC (↑) and lower MAE (↓) are better.

citizenship behavior (OCB) and counterproductive work behavior (CWB), both of which are closely linked to personality (e.g., [Organ and Ryan, 1995](#); [Berry et al., 2007](#)). Human responses were collected using the scale developed by [Spector and Fox \(2010\)](#), and the same items were administered to the LLMs to generate simulated data. For details on the measurement, see Appendix A; for prompt construction, refer to Appendix D.

Metrics Our primary focus is on the r between personality domains from different data sources and two behavioral outcomes: OCB and CWB. We expect that the r between personality and OCB/CWB in the LLM-simulated data will closely mirror those observed in the human sample.

Results Table 67 and 68 in Appendix I.3 reports the r between personality domains and OCB/CWB in both human data and data simulated using the PSI method. The results demonstrate that correlations r generated by PSI method largely reflect the patterns found in human data across most personality domains, with the exception of Openness. Generally, when human data exhibit positive, negative, or negligible r , the LLM-simulated results tend to align in the same direction. However, these simulated r are often stronger in magnitude. This amplification may stem from the models’ reliance

on “typical” or “idealized” knowledge structures internalized during training, which can reinforce and magnify common associations. In contrast, human responses are shaped by individual variability and random noise, leading to more diffuse patterns.

4.5 Ablation Study on PSI Questions

We further investigated the individual contributions of each PSI question to personality prediction through an ablation study. The PSI was designed as a highly integrated framework, with its questions intentionally co-developed and structurally interlinked to capture diverse facets of personality-related information. As a result, isolating individual questions is inherently challenging, as doing so could undermine the integrity of the overall design.

Moreover, each question tends to tap into different aspects of personality, rendering them functionally complementary. This also implies that certain questions may be more effective than others in capturing information relevant to specific domains; some items may be more closely aligned with one domain than others. Given this design, we expected the differences in individual question effectiveness to be relatively minor overall. However, we also anticipated that the relative importance of each question would vary depending on the specific personality domain being predicted.

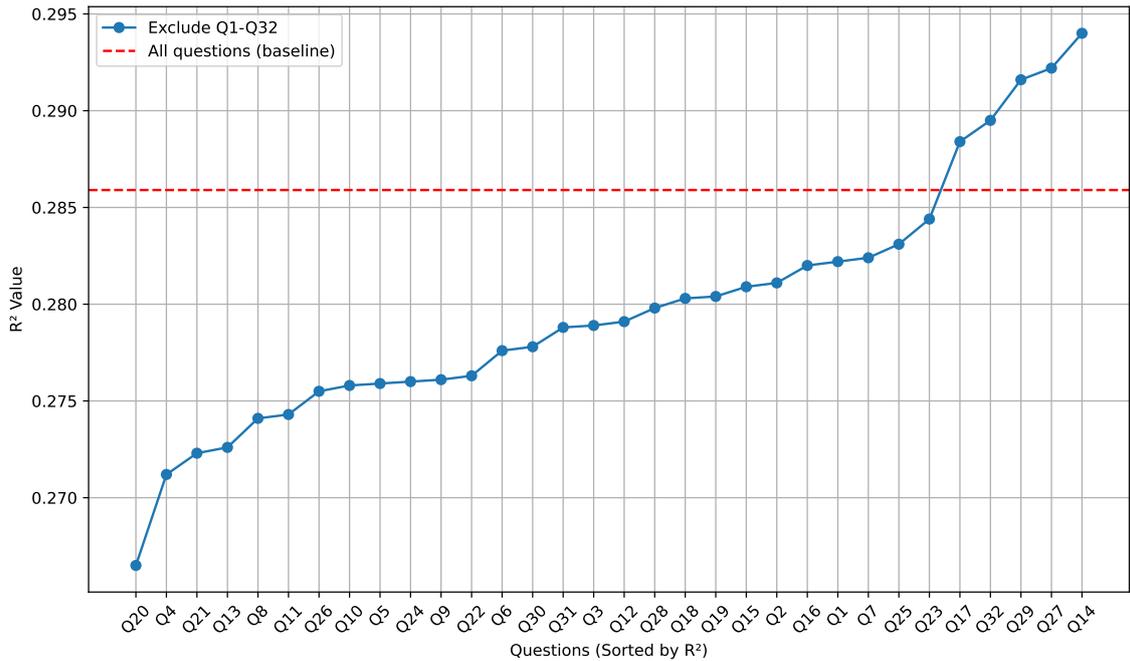


Figure 5: Ablation test results for predicting Conscientiousness. The x-axis represents each question removed on its own, and the y-axis shows the R^2 value. The red dashed line indicates the baseline R^2 when all questions are included.

We conducted an ablation study by leaving one question out each time and simulated personality traits based on the remaining 31 question–answer pairs (see Table 7 in Appendix B for all questions). We then calculated the coefficient of determination (R^2) using human self-reported personality scores as the reference, in order to assess the impact of each question on model performance. If R^2 increases after a particular question is removed, this suggests that the question may have negatively affected prediction—potentially introducing redundancy, noise, or irrelevant information that weakened overall performance. Conversely, if R^2 decreases after removal, it indicates that the question made a substantial contribution to prediction and was a key factor supporting model performance.

As shown in the Figure 5, the removal of most questions leads to a slight decrease in the R^2 , as one would expect, although the changes are minor and generally remain within a ± 0.01 range. Notably, the relative importance of individual questions varies across different prediction domains (see Figure 7-10 in the Appendix I.4). This empirical finding supports our earlier hypothesis: different types of questions capture distinct facets of personality, offering complementary rather than redundant information. Furthermore, the relative importance of questions varies across target domains, indicating that different questions make distinct

contributions to domain-specific predictions. Together, these findings underscore the meaningful contributions of each PSI question.

5 Conclusion

This study introduces a novel method, PSI, for simulating human personality data with LLMs and provides a detailed account of its development and the associated dataset. Across three experiments, we evaluated the effectiveness of PSI. The results show that PSI performs well in simulating personality, yielding moderately strong and statistically significant correlations with human self-report data. Moreover, when modeling the distribution of personality data at the population level, PSI outperforms existing methods in both human-like heterogeneity and broader factor analysis results.

Our experiments also assessed PSI’s ability to simulate personality-related behavior. Although LLMs approximate human-like patterns, they still exhibit idealized responses that deviate from the natural variability found in human behavior. In summary, theory-informed structured interviews such as PSI offer a more realistic and psychometrically grounded approach to simulating human-like data. We further discuss the utility of such data in simulation-based research and its potential to improve future psychometric studies in Appendix G.

Limitations

This study is not without limitations. First, our initial evidence suggests that theory-driven prompts can successfully elicit personality-relevant information embedded in human narratives, enabling LLMs to simulate corresponding psychometric data. However, further research is necessary to examine the robustness and generalizability of this approach across diverse contexts and constructs.

Second, the personality assessment in this study is based on self-report measures originally designed for humans. These tools are intended to capture the stable, internal personality that individuals can access and report, which LLMs, by design, do not inherently possess (see Appendix G for a detailed discussion on psychometric considerations). Nevertheless, LLMs can simulate human-like responses that reflect particular personality patterns when guided by theory-informed prompts. Because the goal of this study is not to assert that LLMs have personality, but rather that they can simulate personality-driven behavior, it is reasonable to apply human-based assessment tools to evaluate the quality and fidelity of that simulation.

Ethical Statement

This paper presents a comparison between human data and LLM-simulated data by three different methods. All human data were collected in strict accordance with relevant ethical guidelines and were approved by the Institutional Review Board. Participants received either reasonable monetary compensation or course credit (in the case of student participants) to ensure fair treatment and appropriate recognition of their contributions.

We placed a strong emphasis on transparency and ethical integrity throughout the research process. All participants provided informed consent prior to participation. Moreover, to protect privacy and maintain ethical standards, the publicly shared dataset was carefully screened to remove any personally identifiable information.

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A Appendix: BFI-2 Scale and Behavioral Measures Scales

A.1 BFI-2 Scale

Instructions: Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Scales:

#	Statement
1	I am someone who is outgoing, sociable.
2	I am someone who is compassionate, has a soft heart.
3	I am someone who tends to be disorganized.
4	I am someone who is relaxed, handles stress well.
5	I am someone who has few artistic interests.
6	I am someone who has an assertive personality.
7	I am someone who is respectful, treats others with respect.
8	I am someone who tends to be lazy.
9	I am someone who stays optimistic after experiencing a setback.
10	I am someone who is curious about many different things.
11	I am someone who rarely feels excited or eager.
12	I am someone who tends to find fault with others.
13	I am someone who is dependable, steady.
14	I am someone who is moody, has up and down mood swings.
15	I am someone who is inventive, finds clever ways to do things.
16	I am someone who tends to be quiet.
17	I am someone who feels little sympathy for others.
18	I am someone who is systematic, likes to keep things in order.
19	I am someone who can be tense.
20	I am someone who is fascinated by art, music, or literature.
21	I am someone who is dominant, acts as a leader.
22	I am someone who starts arguments with others.
23	I am someone who has difficulty getting started on tasks.
24	I am someone who feels secure, comfortable with self.
25	I am someone who avoids intellectual, philosophical discussions.
26	I am someone who is less active than other people.
27	I am someone who has a forgiving nature.
28	I am someone who can be somewhat careless.
29	I am someone who is emotionally stable, not easily upset.
30	I am someone who has little creativity.
31	I am someone who is sometimes shy, introverted.
32	I am someone who is helpful and unselfish with others.
33	I am someone who keeps things neat and tidy.
34	I am someone who worries a lot.
35	I am someone who values art and beauty.
36	I am someone who finds it hard to influence people.
37	I am someone who is sometimes rude to others.
38	I am someone who is efficient, gets things done.
39	I am someone who often feels sad.
40	I am someone who is complex, a deep thinker.
41	I am someone who is full of energy.
42	I am someone who is suspicious of others' intentions.
43	I am someone who is reliable, can always be counted on.
44	I am someone who keeps their emotions under control.
45	I am someone who has difficulty imagining things.
46	I am someone who is talkative.
47	I am someone who can be cold and uncaring.
48	I am someone who leaves a mess, doesn't clean up.
49	I am someone who rarely feels anxious or afraid.
50	I am someone who thinks poetry and plays are boring.
51	I am someone who prefers to have others take charge.
52	I am someone who is polite, courteous to others.
53	I am someone who is persistent, works until the task is finished.
54	I am someone who tends to feel depressed, blue.
55	I am someone who has little interest in abstract ideas.
56	I am someone who shows a lot of enthusiasm.
57	I am someone who assumes the best about people.
58	I am someone who sometimes behaves irresponsibly.
59	I am someone who is temperamental, gets emotional easily.
60	I am someone who is original, comes up with new ideas.

Table 2: BFI-2 scale.

Scoring: Reverse-keyed items appear as “R.”

Reverse coding is a widely used technique in psychological measurement and scale development. Its primary purpose is to align the scoring direction of all items, ensuring consistency across the scale. This process enhances the reliability of the overall measurement and supports a more accurate interpretation of the results.

A balanced inclusion of positively and negatively worded items is a well-established strategy to reduce response biases—such as acquiescence bias, consistency effects, or patterned responding (e.g., selecting the same scale point across items). These biases can obscure respondents' true attitudes or behavioral tendencies, compromising measurement validity.

Although it is not guaranteed, reverse coding can help reduce the influence of social desirability bias. When all items are presented in the same direction, participants may easily guess the purpose of the test and provide responses that align with perceived expectations. By mixing positive and negative statements and applying reverse coding, the scale can disrupt this pattern, ideally making participants reflect more carefully on their inner states or attitudes when providing responses.

Domain Level	Item Numbers
Extraversion	1, 6, 11R, 16R, 21, 26R, 31R, 36R, 41, 46, 51R, 56
Agreeableness	2, 7, 12R, 17R, 22R, 27, 32, 37R, 42R, 47R, 52, 57
Conscientiousness	3R, 8R, 13, 18, 23R, 28R, 33, 38, 43, 48R, 53, 58R
Neuroticism	4R, 9R, 14, 19, 24R, 29R, 34, 39, 44R, 49R, 54, 59
Openness	5R, 10, 15, 20, 25R, 30R, 35, 40, 45R, 50R, 55R, 60

Table 3: BFI-2 domain level with item numbers.

Facet Level	Item Numbers
Sociability	1, 16R, 31R, 46
Assertiveness	6, 21, 36R, 51R
Energy Level	11R, 26R, 41, 56
Compassion	2, 17R, 32, 47R
Respectfulness	7, 22R, 37R, 52
Trust	12R, 27, 42R, 57
Organization	3R, 18, 33, 48R
Productiveness	8R, 23R, 38, 53
Responsibility	13, 28R, 43, 58R
Anxiety	4R, 19, 34, 49R
Depression	9R, 24R, 39, 54
Emotional Volatility	14, 29R, 44R, 59
Intellectual Curiosity	10, 25R, 40, 55R
Aesthetic Sensitivity	5R, 20, 35, 50R
Creative Imagination	15, 30R, 45R, 60

Table 4: BFI-2 facet level with item numbers.

A.2 Behavioral Measures Scales

Organizational Citizenship Behavior (OCB): OCB was measured using ten items from *Spector and Fox (2010)* to assess extra-role behaviors.

Items were rated on a frequency scale ranging from 1 (never) to 5 (every day). Example item: “In the past year, how often have you helped new employees get oriented to the job?”. Internal consistency was Cronbach’s alpha = 0.83.

Counterproductive Work Behavior (CWB): CWB was measured using ten items from Spector and Fox (2010), designed to assess harmful workplace behaviors. Items were rated on a frequency scale ranging from 1 (never) to 5 (every day). Example item: “In the past year, how often have you ignored someone at work?”. Internal consistency was Cronbach’s alpha = 0.86.

The detailed scale information for both can be found in Table 5 and Table 6 below.

#	Statement
1	Took time to advise, coach, or mentor a co-worker.
2	Helped co-worker learn new skills or shared job knowledge.
3	Helped new employees get oriented to the job.
4	Lent a compassionate ear when someone had a work problem.
5	Offered suggestions to improve how work is done.
6	Helped a co-worker who had too much to do.
7	Volunteered for extra work assignments.
8	Worked weekends or other days off to complete a project or task.
9	Volunteered to attend meetings or work on committees on own time.
10	Gave up meal and other breaks to complete work.

Table 5: OCB Scale

#	Statement
1	Purposely wasted your employer’s materials/supplies.
2	Complained about insignificant things at work.
3	Told people outside the job what a lousy place you work for.
4	Came to work late without permission.
5	Stayed home from work and said you were sick when you weren’t.
6	Insulted someone about their job performance.
7	Made fun of someone’s personal life.
8	Ignored someone at work.
9	Started an argument with someone at work.
10	Insulted or made fun of someone at work.

Table 6: CWB Scale

Instructions: Recall that in the past year, how often have you done the following things (1=Never, 2=Once or twice, 3=Once or twice per month, 4=Once or twice per week, 5=Every day)?

B Appendix: Development and Validation of Personality-Structured Interview Questions

B.1 Questions and Development Process

Table 7 presents the final set of 32 questions that form the basis of our personality structured interview. This framework was developed by adapting and modifying McAdams’s life history interview and narrative identity approach (McAdams, 1995, 1996, 2001), while also incorporating components

from the Structured Interview of the Five-Factor Model (SIFFM; Trull et al., 1998).

We adapted and modified the life narrative identity approach proposed by McAdams (1995, 1996, 2001), incorporating elements from the Structured Interview for the Five-Factor Model (SIFFM; Trull et al., 1998). The initial pool of interview questions was drafted and refined through collaborative discussions among SMEs, including two doctoral students, one postdoctoral researcher, and one professor, all specializing in Personality Psychology.

Following this, we conducted pilot testing with six undergraduate research assistants affiliated with a personality research laboratory. Based on their feedback, the interview questions were further revised by SMEs. Once the final set of questions was determined, field testing was conducted with a convenience sample of university participants. During field testing, the other three doctoral students in Industrial/Organizational and Personality Psychology served as independent observers: they reviewed the interview transcripts and provided observer ratings of participants’ personalities to validate the reliability and validity of the structured personality interview questions. If the evaluated metrics do not meet the predefined thresholds, the questions are further revised. This iterative process of development and feedback led to the construction of the personality structured interview.

The development process is similar to the development of psychological tests or scales. We have provided more details on psychometrics and the development framework in Appendix G.

B.2 Validation Results

As previously described, three doctoral students specializing in Industrial/Organizational and Personality Psychology served as observers. They read the interview transcripts and rated participants’ personalities using an other-report format of the 15-item Extra Short Form of the Big Five Inventory–2 (BFI-2-XS; Soto and John, 2017b). To adapt the BFI-2-XS from self-report to observer-report, raters evaluated the extent to which each item (e.g., “The participant worries a lot”) appeared characteristic of the participant based on the transcript. The BFI-2-XS was selected due to its brevity and efficiency, which reduced the time burden on raters. The BFI-2-XS has demonstrated strong convergent validity with the full BFI-2 in both self- and observer-report formats, with trait-level correlations exceeding $r = 0.85$ (Soto and

#	Questions
1	To get us started, where are you from? Where did you grow up and what was the place like?
2	Thinking back, what kind of student were you in school?
3	Did you have a teacher or teachers that were influential? If so, why? What were they like?
4	What was your favorite subject in school, and why?
5	What was your least favorite subject in school, and why?
6	Still thinking back, who were your heroes when you were young and why?
7	When you were little, what did you want to be when you grew up? And why?
8	What were your dreams and plans when you graduated from high school? What made you have those dreams or plans?
9	If you had complete freedom, what would your dream job be, and why?
10	How have your dreams and goals changed throughout your life?
11	Shifting gears to your childhood, how would you describe the personalities of people in the family you grew up in? For example, what were your parents and/or siblings like?
12	How are you similar or different from your parents and/or siblings?
13	How do you think your similarities and/or differences influenced your relationship with them?
14	What was the best part of your childhood?
15	What do you think were the worst parts of your childhood?
16	Switching gears a little bit, what was your first paid job? How old were you then? (If this is not applicable to you, then please put 'NA')
17	What other jobs have you had? (If this is not applicable to you, then please put 'NA')
18	What do you do now for a living? And why did you choose it?
19	Please describe your typical work day.
20	What is the best and worst part of your current work?
21	Did you serve in the military? Please tell us about that experience, what was the best and worst part of it?
22	Moving on, what are your adult friendships like?
23	How are your adult friendships different from your childhood friendships?
24	What are your strongest qualities as a friend? In other words, what makes you a great friend to have?
25	What about your weakest qualities in friendships? In other words, what do you struggle with when you are trying to be a friend to someone?
26	Moving onto more general questions, when thinking about your life in general, what are you most proud of?
27	What hobbies or other interests do you have?
28	What things frighten you now?
29	What were some things that frightened you most as a child?
30	What are the three biggest news events that have occurred in your lifetime?
31	If you had the power to solve one and only one problem in the world, what would it be, and why?
32	Tell me about a time when you did not know if you would make it. How did you overcome that challenge?

Table 7: Personality Structured Interview (PSI) questions.

John, 2017b). These findings support its use as a brief yet psychometrically sound instrument for personality assessment.

Observer ratings were averaged across the three raters, and interrater reliability was assessed. All five traits demonstrated adequate agreement (see Table 8), with more behaviorally salient traits such as conscientiousness and neuroticism showing higher intraclass correlations (ICCs), and less observable traits such as openness showing lower ICCs, consistent with prior findings (Allik et al., 2010). The average interrater reliability (ICC) for observer ratings was 0.76, exceeding the commonly accepted threshold of 0.70.

As shown in Table 8, all convergent correlations between self- and observer-rated personality traits were positive and statistically significant, averag-

ing 0.36 across the Big Five traits. These findings align with meta-analytic estimates of self-observer convergence (Connolly et al., 2007). Discriminant correlations among the five traits averaged 0.25 for self-reports and 0.18 for observer-reports, suggesting appropriate trait differentiation.

C Appendix: Personality Structured Interview Dataset and Data Collection

The data were collected through an online questionnaire, followed by an online structured interview. We will share the dataset that we have obtained permission to share, which also excludes any personally identifiable information. This portion of the data is available upon request and may not be used for any commercial purposes. Academic use is permitted only with prior approval. Each example is composed of the following characteristics:

1. **Gender:** The gender of the participant.
2. **Race:** The racial background of the participant.
3. **English:** Whether English is the participant's first language.
4. **Age:** The participant's age.
5. **Weight:** The participant's weight.
6. **Height:** The participant's height.
7. **OCB1-OCB10:** Self-reported Organizational Citizenship Behavior data, measured using the scale from Spector and Fox (2010), and see Table 5 for specific item details.
8. **CWB1-CWB10:** Self-reported Counterproductive Work Behavior data, measured using the scale from Spector and Fox (2010), and see Table 6 for specific item details.
9. **Q1-Q32:** Participant responses to each personality structured interview questions, see Table 7 for specific question details.
10. **Item1-Item60:** Responses to each item of the BFI-2 (already reverse coded). Refer to Appendix A for item descriptions and scoring guidelines.

		Self-report					Observer-rated						
		μ	σ	Ext	Agr	Con	Neu	Ope	Ext	Agr	Con	Neu	Ope
Self-report	Ext	3.22	0.69	<i>0.84</i>									
	Agr	3.74	0.54	0.15	0.77								
	Con	3.51	0.67	0.30	0.37	0.85							
	Neu	3.07	0.78	-0.39	-0.24	-0.41	0.89						
	Ope	3.76	0.61	0.22	0.20	0.25	0.00	0.84					
Observer-rated	Ext	3.10	0.78	0.46	0.00	0.05	-0.19	0.07	<i>0.75</i>				
	Agr	3.57	0.69	-0.07	0.29	0.13	0.00	0.03	-0.01	<i>0.76</i>			
	Con	3.73	0.67	0.17	0.15	0.39	-0.20	0.12	0.10	0.32	<i>0.79</i>		
	Neu	2.76	0.76	-0.17	0.00	-0.10	0.39	0.07	-0.27	-0.16	-0.29	<i>0.78</i>	
	Ope	3.43	0.69	-0.07	0.00	0.00	0.11	0.29	0.01	0.22	0.07	-0.02	<i>0.72</i>

Table 8: Correlation matrix of self- and observer-scored big five personality. Ext = extroversion. Agr = agreeableness. Con = conscientiousness. Neu = neuroticism. Ope = openness. Gray values indicate non-significant correlations. The diagonal reports reliabilities in italics, using Cronbach’s alpha for self-ratings and intraclass correlations for observer ratings. Red highlights indicate convergent correlations between self- and observer-reported scores. Light yellow and dark yellow highlights represent discriminant correlations for self-report and observer-rated personality scores, respectively.

D Appendix: Prompts List

D.1 Personality Scale Responses Prompt Format

To minimize the interference of the prompt template on model behavior, we use a standardized prompt structure, defined as: $\text{Prompt}(d) = T_{\text{base}} + d$, where T_{base} is a fixed base template: $T_{\text{base}} = \text{“For the following task, respond in a way that matches:”}$ The variable d represents the personality description content, determined by the method used. Specifically: $d \in \{d_{\text{Persona}}, d_{\text{Shape}}, d_{\text{PSI}}\}$. The construction of d varies across methods. For the Persona method, $d_{\text{Persona}} = \sum_{i=1}^5 s_i$, where each s_i is a short sentence from the Persona-Chat dataset, such as: “I wear a lot of leather.” Each d_{Persona} represents a unique individual profile. For the Shape method, $d_{\text{Shape}} = \sum_{i=1}^5 q(a_i)$, where a_i is an adjective representing a personality trait (e.g., *friendly*, *energetic*), and $q(\cdot)$ is a linguistic intensity modifier (e.g., *extremely*, *very*). For the PSI method, $d_{\text{PSI}} = \sum_{i=1}^{32} ([Q_i] + [A_i])$, where Q_i denotes the i -th interview question and A_i is the corresponding response.

Table 9 presents the prompts used to generate LLM-simulated responses for the selected personality test (BFI-2), formatted on a Likert scale. In

each prompt, `personality_description` denotes the personality-specific framing, while `test_item` refers to an individual item from the BFI-2 scale. Example prompts for each method are also included in Table 9.

PSI Method: In the PSI method, the personality prompt integrates both the interview question and the interviewee’s corresponding response, as collected in the PSI dataset (see Appendix C).

Persona Method: The Persona method is based on the Persona-Chat dataset constructed by Zhang et al. (2018). The dataset consists of persona descriptions, and each is made up of five short sentences containing demographic information collected through Amazon Mechanical Turk crowdsourcing. To avoid sentence similarity or repetition, these persona descriptions were required to be paraphrased (e.g., changing “I am very shy” to “I am not a social person”). Zhang et al. (2018) demonstrated through machine learning model validation and human evaluations that such persona descriptions provide an effective method to enhance personalization. Currently, incorporating personal profiles into prompts is widely used in research related to LLM agents (Park et al., 2023; Wang et al., 2023; Xi et al., 2023). In our study, we treated each persona description as an individual entity (i.e., a

single subject) and randomly selected 300 persona descriptions from the dataset. One example is, “I wear a lot of leather. I have boots I always wear. I sleep in late during the day. I listen to metal music. I have black spiky hair.”

Shape Method: The Shape method is based on the work of Serapio-García et al. (2023), who introduced a prompting approach to shape synthetic personality in LLMs along desired dimensions. The researchers expanded upon Goldberg (1990), expanding his list of 70 bipolar adjectives (Goldberg, 1992) to include 104 trait adjectives. Additionally, they employed linguistic qualifiers commonly used in Likert-type scales (Likert, 1932), such as “a bit”, “very”, and “extremely” to set target levels for each adjective. This resulted in a fine-grained prompting method with nine levels: 1. extremely low adjective; 2. very low adjective; 3. low adjective; 4. a bit low adjective; 5. neither low adjective nor high adjective; 6. a bit high adjective; 7. high adjective; 8. very high adjective; 9. extremely high adjective.

In our study, each prompt involves five randomly selected adjective markers from a specific personality domain. These markers are positioned after a consistent linguistic qualifier to set the prompt at one of nine intensity levels. For example, one prompt is: “You are extremely friendly, extremely energetic, extremely assertive, extremely bold, and extremely active.” These are five positively keyed adjectives targeting the factor (trait) of Extraversion. In this case, the prompt seeks to create a highly sociable and dynamic personality profile, which might result in responses characterized by narrower traits (facets) of enthusiasm, confidence, and proactivity. We also randomly select 300 prompts.

D.2 Behavioral Question Responses Prompt Format

The complete prompt format for eliciting LLMs’ responses to personality-related behavioral questions is defined in Table 10. The *questions_and_responses* refers to the transcript of a structured human personality interview, while *question_list* comprises statements evaluating OCB and CWB, as detailed in Table 5 and Table 6 in Appendix A. The model is instructed to rate each statement using a frequency scale from one to five.

D.3 Compute Resources

All LLMs were conducted using the OpenAI and TogetherAI platforms, running a total of seven models: Mistral-7B (Jiang et al., 2023), Gemma-2-9B, Gemma-2-27B (GemmaTeam, 2024), Llama3-8B, Llama3-70B (AI@Meta, 2024), GPT-4o-mini (OpenAI, 2024a), and GPT-4o (OpenAI, 2024b). Using the GPT-4o tokenizer as an illustrative example, the approximate input token counts for generating BFI-2 LLM responses are as follows: Persona method: 2,555,820 tokens; Shape method: 2,316,240 tokens; and PSI method: 34,510,812 tokens. The total number of output tokens for the BFI-2 LLM responses is approximately 25,280. For the PSI method, the input tokens used to generate responses to the OCB and CWB scales were approximately 690,497 and 681,215, respectively, with output tokens totaling around 153,887 and 139,207. Token counts may vary slightly across models due to differences in tokenizers, formatting, or prompt structures, but they generally fall within a comparable range.

E Appendix: Evaluation Metrics and Formulas

E.1 Pearson Correlation Coefficient

The formula for correlation is as follows:

$$r = \frac{\sum(X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum(X_i - \bar{X})^2 \sum(Y_i - \bar{Y})^2}}$$

X_i and Y_i represent the data values for LLMs and human. The symbols \bar{X} and \bar{Y} represent the means of variables X and Y , respectively. The numerator, $\sum(X_i - \bar{X})(Y_i - \bar{Y})$, represents the covariance between X and Y . The denominator, $\sqrt{\sum(X_i - \bar{X})^2 \sum(Y_i - \bar{Y})^2}$, standardizes the result, let the value of r range between -1 and 1.

When r is close to 1, it indicates a strong positive correlation between the two variables; when r is close to -1, it indicates a strong negative correlation; and when r is close to 0, it indicates no significant linear relationship between the two variables.

E.2 CFA Model

The basic form of the CFA model is:

$$y = \Lambda\eta + \epsilon$$

where y represents the vector of observed variables; Λ is the factor loading matrix (i.e., the loadings of

Table 9: Prompt format and examples for gathering LLMs' responses to BFI-2 scale.

Personality Scale Prompt

For the following task, respond in a way that matches (personality_description), please indicate the extent to which you agree or disagree on a scale from 1 to 5 (where 1 = "disagree strongly", 2 = "disagree a little", 3 = "neither agree nor disagree", 4 = "agree a little", and 5 = "agree strongly"): {test_item}.

Persona Prompt Example

For the following task, respond in a way that matches this description: "I like to garden. I like photography. I love traveling. I like to bake pies". Considering the statement, please indicate the extent to which you agree or disagree on a scale from 1 to 5 (where 1 = "disagree strongly", 2 = "disagree a little", 3 = "neither agree nor disagree", 4 = "agree a little", and 5 = "agree strongly"): "I am someone who is outgoing, sociable".

Shape Prompt Example

For the following task, respond in a way that matches this description: "I'm extremely timid, extremely introverted, extremely gloomy, extremely unenergetic and extremely unassertive". Considering the statement, please indicate the extent to which you agree or disagree on a scale from 1 to 5 (where 1 = "disagree strongly", 2 = "disagree a little", 3 = "neither agree nor disagree", 4 = "agree a little", and 5 = "agree strongly"): "I am someone who is outgoing, sociable".

PSID Prompt Example

For the following task, respond in a way that matches the interviewee's behaviors demonstrated in this interview:

Q: To get us started, where are you from? Where did you grow up and what was the place like?
A: overland park kansas It was a good neighborhood a safe place.
Q: Thinking back, what kind of student were you in school?
A: I always tried to get things done quickly
Q: Did you have a teacher or teachers that were influential? If so, why? What were they like?
A: My strength and conditioning coach he was very upbeat and positive and he made the class fun.
Q: What was your favorite subject in school, and why?
A: I liked strength and conditioning because it was more physical work than metal work
Q: What was your least favorite subject in school, and why?
A: math and chemistry I had bad teachers and it was difficult
Q: Still thinking back, who were your heroes when you were young and why?
A: my heros were spiderman because no matter how hard things got or how many times he got knocked down he would always get back up
Q: When you were little, what did you want to be when you grew up? And why?
A: I wanted to be a trainer to help other people become the best version of them selfs
Q: What were your dreams and plans when you graduated from high school? What made you have those dreams or plans?
A: I wanted to go to k-state and major in kinesiology and become a trainer to help people succeed
Q: If you had complete freedom, what would your dream job be, and why?
A: I would be a trainer for a pro football team because I get to work with athletes and I get paid a lot
Q: How have your dreams and goals changed throughout your life?
A: I just want to be the best version of myself
Q: Shifting gears to your childhood, how would you describe the personalities of people in the family you grew up in? For example, what were your parents and/or siblings like?
A: my parents were always supportive and cared for me and me and my brother were good friends to eachother
Q: How are you similar or different from your parents and/or siblings?
A: my mom she is very caring like me but I know when to leave people alone and to let them be by themselves
Q: How do you think your similarities and/or differences influenced your relationship with them?
A: I think because we are similar we get along well but she can get on my nerves because she is like me
Q: What was the best part of your childhood?
A: I really liked posing my action figures and creating story lines for them
Q: What do you think were the worst parts of your childhood?
A: When I had to go to school and do hard work
Q: Switching gears a little bit, what was your first paid job? How old were you then? (If this is not applicable to you, then please put 'NA')
A: I worked at target as a fulfillment expert
Q: What other jobs have you had? (If this is not applicable to you, then please put 'NA')
A: that has been my only job
Q: What do you do now for a living? And why did you choose it?
A: I am just a student and focusing on classes
Q: Please describe your typical work day.
A: I get up get ready for class and then go and take notes and finish assignments for classes
Q: What is the best and worst part of your current work?
A: I have a consistent schedule each week and I get out what i put into it It can be draining and its a lot of work
Q: Did you serve in the military? Please tell us about that experience, what was the best and worst part of it?
A: i have not served in the military
Q: Moving on, what are your adult friendships like?
A: I try to be a good friend and be a good person
Q: How are your adult friendships different from your childhood friendships?
A: adult friendships mean more and have more emotional value than childhood friendships
Q: What are your strongest qualities as a friend? In other words, what makes you a great friend to have?
A: I am very self less and I put others before myself
Q: What about your weakest qualities in friendships? In other words, what do you struggle with when you are trying to be a friend to someone?
A: I put myself first to much and I can create problems because i overextend myself
Q: Moving onto more general questions, when thinking about your life in general, what are you most proud of?
A: I am most proud of my ability to be a good person and to see that people like me
Q: What hobbies or other interests do you have?
A: I like to go to the gym and to hangout with friends watch movies and tv shows go
Q: What things frighten you now?
A: losing people close to me and people not liking me hurting people close to me
Q: What were some things that frightened you most as a child?
A: the dark being alone and mosters snakes and spiders
Q: What are the three biggest news events that have occurred in your lifetime?
A: I graduated highschool I got a 4.0 gpa last semester and i just got out of a long term relationship
Q: If you had the power to solve one and only one problem in the world, what would it be, and why?
A: I would want to solve mental health problems because you don't choose them or do anything to get them just happen to you
Q: Tell me about a time when you did not know if you would make it. How did you overcome that challenge?
A: one night my back cramped up and I couldn't stand or walk around but eventually I got up and went to bed and fell asleep and woke up and everything was fine in the morning."
Considering the transcript, please indicate the extent to which you agree or disagree on a scale from 1 to 5 (where 1 = "disagree strongly", 2 = "disagree a little", 3 = "neither agree nor disagree", 4 = "agree a little", and 5 = "agree strongly"): "I am someone who is outgoing, sociable".

Table 10: Prompt format for gathering LLMs' responses to personality-related behavioral questions.

Behavioral Question Prompt
<p>Task: Simulate an individual's behavior and predict their responses to a series of work-related questions.</p> <p>Data to Analyze: {questions_and_responses}</p> <p>Instructions:</p> <ol style="list-style-type: none"> 1. Simulate the Individual: Use the provided data to simulate the individual's personality, behavior, and work habits. 2. Predict Responses: <ul style="list-style-type: none"> - Based on the provided data, simulate the individual and answer the question. - Recall that in the past year, how often have you done the following things? (1 = Never, 2 = Once or twice, 3 = Once or twice per month, 4 = Once or twice per week, 5 = Every day) <p>Questions: {question_list}</p> <p>Output Format:</p> <p>Question Score: [Provide the numerical score here.]</p>

each observed variable on the latent factors); η is the vector of latent factors; ϵ is the vector of error terms, with the assumption that the error terms have a mean of zero and are mutually independent (Jöreskog, 1969).

Latent factors are variables that are not directly observed but are inferred from other variables that are observed (measured). In the context of a CFA model, latent factors represent underlying constructs or traits that are believed to influence the observed variables. For example, in psychology, a latent factor might represent a construct like "intelligence" or "anxiety," which cannot be measured directly but can be estimated through related observed behaviors or responses on a test.

E.3 Model Fit Information

Chi-Square Test, χ^2 : The chi-square test is used to measure the difference between the observed covariance matrix and the factor model's fitted covariance matrix.

$$\chi^2 = (N - 1) \times F_{ML}$$

where N is the sample size; F_{ML} is the value of the fit function under maximum likelihood estimation. A smaller chi-square value indicates a better model fit. However, with large samples, the chi-square value tends to be large, so other fit indices are usually the primary reference.

Degrees of Freedom, df : The df represents the relationship between model parameters and observed variables:

$$df = \frac{p(p + 1)}{2} - q$$

where p is the number of observed variables, and q is the number of model parameters.

Degrees of freedom reflect the amount of independent information available in a statistical model to estimate its parameters. They are calculated as the number of information points provided by the

data minus the number of model parameters, representing the extent to which the model can adjust freely. Therefore, a higher degree of freedom indicates fewer parameters in the model and fewer constraints on the data. With more degrees of freedom, the model has fewer restrictions, though the fitting difficulty may increase. Too few degrees of freedom may lead to overfitting, while too many can result in underfitting.

Comparative Fit Index, CFI: The CFI is used to compare the goodness of fit of a model with a baseline model (usually an independent model).

$$CFI = 1 - \frac{\max(\chi^2 - df, 0)}{\max(\chi_{null}^2 - df_{null}, 0)}$$

where χ^2 and df are the chi-square value and degrees of freedom of the target model; χ_{null}^2 and df_{null} are the chi-square value and degrees of freedom of the baseline (independent) model.

Tucker-Lewis Index, TLI: TLI, also known as the Non-Normed Fit Index (NNFI), considers model complexity.

$$TLI = \frac{(\chi_{null}^2/df_{null}) - (\chi^2/df)}{(\chi_{null}^2/df_{null}) - 1}$$

This value ranges from 0 to 1, with a value typically greater than .90 indicating good model fit.

Root Mean Square Error of Approximation, RMSEA: The RMSEA quantifies the error per degree of freedom in a model, with smaller values indicating better model fit.

$$RMSEA = \frac{\chi^2 - df}{df(N - 1)}$$

where χ^2 is the chi-square value of the model; df is the degrees of freedom; N is the sample size.

Standardized Root Mean Square Residual, SRMR: The SRMR measures the discrepancy between model-predicted values and actual observed

values, calculated as:

$$\text{SRMR} = \sqrt{\frac{\sum_{i=1}^p \sum_{j=1}^p (s_{ij} - \hat{s}_{ij})^2}{\frac{p(p+1)}{2}}}$$

where s_{ij} is an element in the observed covariance matrix; \hat{s}_{ij} is an element in the model-fitted covariance matrix.

Based on [Hu and Bentler \(1999\)](#), $\text{CFI/TLI} \geq 0.95$, $\text{RMSEA} \leq 0.06$, and $\text{SRMR} \leq 0.08$ are considered good fit thresholds.

E.4 Tucker's Congruence Coefficient

Tucker's congruence coefficient, also known as the coefficient of congruence, is typically used to assess the similarity between two-factor structures in factor analysis ([Tucker, 1951](#)). The formula is given by:

$$\phi = \frac{\sum_{i=1}^n a_i b_i}{\sqrt{\sum_{i=1}^n a_i^2 \cdot \sum_{i=1}^n b_i^2}}$$

where a_i and b_i are the loadings of the i -th factor for two different factor solutions (or different samples or methods); n is the total number of factors.

The coefficient ranges from -1 to 1, where values close to 1 indicate high similarity (congruence) between the factor solutions, values close to 0 indicate low similarity, and negative values indicate a dissimilar or inverse relationship. According to [Lorenzo-Seva and Ten Berge \(2006\)](#), a TCC above 0.95 indicates good similarity, while a TCC of 0.85 to 0.94 suggests fair similarity. However, this is a relatively lenient criterion; specific differences still need to be determined based on the factor loadings.

F Appendix: The Structure of Personality

A key question in personality-related LLM research pertains to personality structure: What is the nature and breadth of the personality traits we want to simulate the human personality distributions? In the research literature, personality structures often emerge from applying factor analysis to individuals' responses to a large number of personality-relevant items. This approach is what has been used to identify the five personality factors in the FFM. Moreover, personality is better understood in terms of one's continuous standing on each of multiple dimensions rather than as static types or profiles. Research data clearly supports this view ([Wilmot, 2015](#); [Wilmot et al., 2019](#)). Dividing individuals

into limited categories (e.g., 16 types in MBTI) artificially segments continuous dimensions into discrete units, which may overlook important individual differences ([Ones and Wiernik, 2018](#)).

Another question worth paying attention to is that, although the FFM occupies a dominant position in personality research, it remains debatable whether focusing solely on the FFM is sufficient in light of the many newly proposed personality variables and alternative structures. It turns out that there can be conceptual overlap among these models (e.g., [Hough et al., 2015](#)). For example, a meta-analysis by [Joseph and Newman \(2010\)](#) revealed that emotional intelligence (EI) shows statistically and practically significant relationships with neuroticism and extroversion within the FFM. In fact, when controlling for personality variables, the unique contribution of EI almost disappears. Similarly, [Credé et al. \(2017\)](#) conducted a meta-analysis on grit and found that its core components can largely be explained by conscientiousness, with little added predictive validity beyond that. Moreover, although the HEXACO structure introduces an honesty-humility dimension, the remaining five dimensions align closely with the FFM structure ([Lee and Ashton, 2004, 2006](#)). Research by [Cutler and Condon \(2023\)](#) further indicates that nearly all personality semantic information can be classified within the FFM structure.

However, this does not mean that the FFM has exhausted the depiction of personality. On the contrary, although the FFM performs well in terms of structure and predictive power, it may still miss some more nuanced aspects of personality. For instance, measurement tools such as the Facet MAP ([Irwing et al., 2024](#)) attempt to capture "micro-level differences" in personality by focusing on the lower-level structure of each dimension. Therefore, while the FFM is "good," there remains room for further refinement in exploring the complexity and diversity of personality. Rather than pursuing a wide range of personality frameworks, this paper will delve deeper into the FFM structure, which is widely accepted among personality psychologists.

G Appendix: Psychometrics and Structured Interview Development Framework

Psychometrics is a field of psychology dedicated to the theory and practice of psychological measurement. It primarily focuses on quantifying psycho-

logical traits, behaviors, and abilities through systematic testing and analysis. Psychological traits, such as personality dimensions, cognitive abilities, and emotional states, are inherently abstract constructs that cannot be measured directly. Therefore, psychometricians rely on tools such as surveys, questionnaires, scales, or interviews to infer these traits through observable indicators or responses.

G.1 Measuring Psychological Traits

To measure a psychological trait, psychometricians typically operationalize the trait by identifying observable behaviors or self-identities that correlate with the underlying construct. For example, extraversion can be measured by assessing behaviors such as sociability, assertiveness, and enjoyment of social interactions, or by examining identities such as seeing oneself as an outgoing person and believing that one thrives in social situations.

These behaviors are translated into measurable items (for scale; e.g., “I enjoy being the center of attention”) or questions (for interview; e.g., “What are your strongest qualities as a friend? In other words, what makes you a great friend to have?”). The challenge lies in ensuring that these items/questions accurately and consistently capture the construct across different populations and contexts.

G.2 Theory-Informed Structured Interview Transcripts for LLM Data Simulation

Theory-informed structured interviews are the most suitable method for enabling LLMs to simulate psychometric data. These interviews are specifically designed to capture the constructs underlying the targeted psychometric measures, ensuring that the simulated data aligns with the intended psychological construct. By extracting textual information that directly reflects the target construct, theory-informed structured interviews facilitate the representation of heterogeneous data while preserving a high degree of human diversity, thereby enhancing the validity and applicability of the simulated psychometric data.

Moreover, since the information is extracted based on theoretical foundations, it also provides a certain level of interpretability for the LLM’s simulation. This not only allows the generated data to be compared with theoretical expectations but also increases its potential for practical applications.

G.3 The Potential for Advancing Research

A theory-informed structured interview transcript-based simulation can generate data more effectively by focusing on the target construct. Ideally, the simulated data should reproduce the same constructs reflected in real-world data and simulate behaviors associated with these constructs.

Take personality as an example—if simulated data can accurately replicate real-world personality constructs, it enables research that would be difficult to conduct in reality, such as developing contextualized personality assessment tools and exploring new personality theories through multi-agent simulations.

Developing Contextualized Personality Assessment Tools: Traditional personality assessments mainly rely on standardized questionnaires or laboratory tasks, which often fail to adequately simulate real-world social contexts. By using theory-informed structured interview transcript-based simulations, we can generate more fine-grained and context-sensitive individual response data. For instance, we can simulate various occupational scenarios (such as crisis management, teamwork, or remote work) and analyze how different personality traits manifest in these contexts. This approach not only aids in developing measurement tools tailored to specific applications but also enhances ecological validity, allowing for more accurate assessments of personality across different situations.

Exploring New Personality Theories through Multi-Agent Simulation: If simulated data can accurately reflect real-world personality constructs, we can leverage multi-agent interactive systems to simulate individuals’ behavioral patterns and observe how different personality traits evolve in group dynamics. For example, virtual agents with distinct personality traits can be placed in cooperative tasks, competitive environments, or social interactions, enabling researchers to test whether existing personality theories effectively predict these interaction patterns. Additionally, this approach can uncover new personality dynamics, such as whether certain personality trait combinations produce unexpected group effects or whether behavior in specific situations deviates from traditional theoretical predictions.

However, these assumptions are based on an ideal premise—that simulated data can successfully reflect the same constructs as real-world data. A

theory-informed structured interview undoubtedly offers a promising pathway in this regard, warranting further in-depth exploration.

G.4 Structured Interview Development Framework

Developing a structured interview for LLM to simulate data involves a series of carefully designed steps to ensure that the resulting test reliably and validly measures the construct of interest. Table 11 outlines the framework.

Identify behaviors/perceptions that represent the construct or define the domain: Clearly defining the construct is essential to developing relevant structured interview questions. The construct should be operationalized by identifying specific behaviors or attributes that indicate its presence. In other words, you need to find a theory to guide you on how to measure the target constructs. This step may involve reviewing literature, conducting expert interviews, or organizing focus groups to understand the various dimensions and observable characteristics of the construct.

Prepare a set of structured interview specifications, structured interview blueprint: A blueprint outlines the structured interview's structure and content, specifying how questions are distributed across the construct's dimensions. It typically includes the number of questions per domain and the content of the questions.

Build an initial question pool: In this step, an extensive list of questions is created to cover the full range of the construct. Question wording should be clear, concise, and relevant to the target population. It is common practice to generate more questions than needed to ensure that poorly performing questions can be removed later without compromising the structured interview.

Have questions reviewed by substantive experts (and revised as necessary): SMEs review the question pool for content accuracy, relevance, clarity, and bias. Experts assess whether the questions align with the construct's definition and whether any important aspects are missing. Feedback from experts helps refine the wording, remove ambiguous questions, and identify questions with potential cultural or gender biases.

Hold preliminary question tryouts: Before large-scale testing, questions are piloted on a small group of individuals representative of the target population. This stage helps identify any immediate issues with question comprehension, response

format, or instructions. It can also include cognitive interviews where participants are asked to explain their thought processes when answering questions. The feedback from this stage informs further revisions, ensuring that questions are clear and easy to understand.

Determine statistical properties of questions (and eliminate poor questions or revise as necessary): Question performance is assessed through statistical analyses to evaluate difficulty, discrimination, and internal consistency. Standardized scoring criteria, such as Behaviorally Anchored Rating Scales (BARS), can be used for obtaining question scores. Then, methods like correlations, factor analysis, and item response theory (IRT) can help determine how effectively each question measures the intended construct.

Questions that demonstrate poor psychometric properties—such as low discrimination or high measurement error—are either revised or removed. For example, questions with low correlations with the overall score or incorrect factor loadings may be eliminated.

Field-test the structured interview on a large representative sample of the intended examinee population: The revised item set is administered to a large, representative sample to gather comprehensive data on the scale's performance. This step ensures that the sample reflects the population for which the test is intended, which is critical for generalizability. Statistical analyses are conducted to refine the test further. This process may involve removing redundant items, assessing dimensionality, and ensuring that items work well across demographic subgroups.

Design and conduct reliability and validity studies for the final form of the structured interview: To ensure the structured interview is psychometrically sound, various reliability and validity studies are conducted: Reliability studies measure the structured interview's consistency and stability, including internal consistency (e.g., Cronbach's alpha), test-retest reliability, and inter-rater reliability (if applicable). Validity studies assess whether the structured interview measures what it is intended to measure. This includes: Content validity (the extent to which items cover the construct); Construct validity (e.g., convergent and discriminant validity); Criterion-related validity (e.g., predictive or concurrent validity). These studies provide evidence that the structured interview is both reliable and valid for its intended purpose.

Steps

- 1 Identify behaviors/perceptions that represent the construct or define the domain.
 - 2 Prepare a set of structured interview specifications, structured interview blueprint.
 - 3 Build an initial question pool.
 - 4 Have questions reviewed by substantive experts (and revise as necessary).
 - 5 Hold preliminary question tryouts.
 - 6 Determine statistical properties of questions (and eliminate poor questions or revise as necessary).
 - 7 Field-test the structured interview on a large representative sample of the intended examinee population.
 - 8 Design and conduct reliability and validity studies for the final form of the structured interview.
 - 9 Develop guidelines for administration and interpretation of the structured interview.
-

Table 11: Structured interview development framework.

Develop guidelines for administration and interpretation of the structured interview: The final step involves creating a comprehensive, structured interview manual that includes instructions for structured interview administration, scoring procedures, and guidelines for interpreting results. This manual ensures consistency in the structured interview’s use across different settings and helps minimize errors in administration and scoring. Guidelines for interpreting scores may include norms, cutoff points, and descriptions of what various score ranges indicate.

H Appendix: Psychometric Data Evaluation Framework

Here, we present the evaluation framework used to assess the fidelity of simulated psychometric data (i.e., how well it aligns with human data).

The evaluation is conducted at different levels. For example, for personality, it includes Item, Facet, and Domain levels. Generally, the structure of psychometric data is hierarchical, where observed responses (Item level) map onto latent traits (Domain level). Our evaluation framework incorporates both descriptive statistics and psychometric performance metrics to ensure a comprehensive evaluation (see Figure 6). Below, we outline each component and the rationale for its inclusion.

H.1 Descriptive Statistics

Descriptive statistics are primarily used to summarize, outline, and present the basic features of data. They help researchers understand the distribution and fundamental trends of the data without interpreting or measuring specific psychological constructs. Do not forget that the evaluation of psy-

chometric data is hierarchical; we need to evaluate it at both the Item and Domain levels.

Mean (μ): The mean represents the central tendency of the responses, reflecting the average score across individuals.

Standard Deviation (σ): The standard deviation captures the dispersion of responses, indicating how much variation exists within the data.

Both μ and σ can be quantified for similarity to human distribution using MAE and r . However, these metrics provide a more summarized level of comparison; we also need to examine performance on specific items and the domain.

Distribution Shape: The distribution shape describes the overall pattern of how responses are spread across the scale. It provides insight into whether the data follows a normal distribution or exhibits skewness and kurtosis.

Skewness measures the asymmetry of the distribution. A positive skew indicates a longer right tail (more low scores with a few high scores), while a negative skew indicates a longer left tail (more high scores with a few low scores).

Kurtosis captures the “tailedness” of the distribution. High kurtosis (leptokurtic) suggests heavy tails with more extreme values, while low kurtosis (platykurtic) indicates a flatter distribution with fewer extreme values.

H.2 Psychometric Performance

Psychometric performance is primarily used to evaluate the measurement quality of psychological constructs, ensuring that assessments accurately and reliably capture the intended traits.

Structural Validity: Structural validity refers to the extent to which the internal structure of a measurement instrument aligns with the theoretical

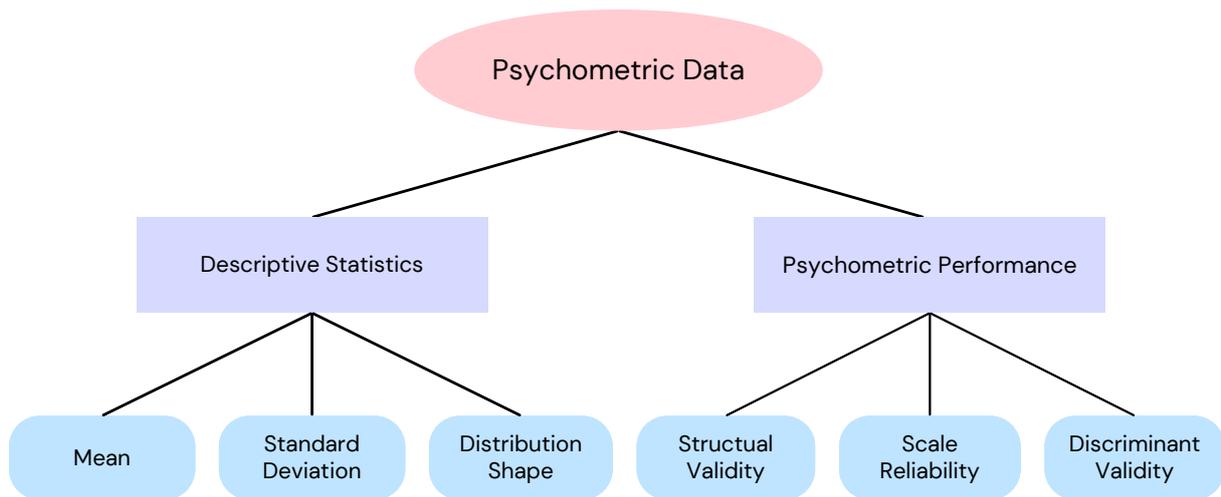


Figure 6: Psychometric data evaluation framework.

construct it is intended to assess. It can be assessed through model fit, factor loadings, and inter-factor correlations.

The model fit indices provide an overall assessment of how well the proposed structure aligns with the observed data. Ideally, the simulated psychometric data will have a similar model fit compared with the human data. Common indices include χ^2 , CFI, TLI, RMSEA, and SRMR.

Factor loadings indicate the extent to which each item represents the intended construct, while inter-factor correlations reveal relationships between latent variables. The simulated psychometric data should also resemble human data in these two aspects. We can use TCC as a summarized level of comparison; however, it is typically considered too lenient, so we need to examine factor loadings and inter-factor correlation values more closely.

Scale Reliability: Scale reliability assesses the internal consistency of items measuring the same construct. Cronbach’s alpha is a widely used reliability coefficient. The simulated psychometric data should also resemble human data in this aspect.

Discriminant Validity: Discriminant validity ensures that distinct constructs are not excessively correlated. It can be examined by calculating the mean absolute correlation.

I Appendix: Additional Analyses and Results

I.1 Additional Response Similarity Results

I.2 Additional Human Personality Distribution Simulation Results

I.2.1 Additional Descriptive Statistics Results

Here we show the detailed μ and σ for human responses and LLM responses at the Item, Facet, and Domain levels, see Tables 13-19. We also present detail MAE results in Table 20.

I.2.2 Additional Psychometric Performance Results

Table 21 presents the model fit information for both the TFMs and FFM. TCC results are reported in Tables 22-27, while factor loading MAE results appear in Tables 28-33. Specific standardized factor loadings for all TFMs are shown in Tables 34-48, while standardized factor loadings for the FFM are shown in Tables 49-53. Inter-factor correlations are provided in Tables 54-59.

Scale Reliability: Facet level and domain level Cronbach’s alpha for different method LLM responses on BFI-2 and human responses are shown in Tables 60-65.

It can be observed that the PSI method, compared to the Persona and Shape methods, performs closer to the results of the human sample in terms of Cronbach’s alpha (with the number of data marked in italics and bold being the smallest). This indicates that the LLM personality data generated by the PSI method holds an advantage in consistency and reliability, enabling it to more accurately simulate the statistical characteristics of human samples.

Discriminant Validity: The results for discriminant validity are shown in Table 66. We can further observe that, compared to the Persona and Shape methods, the PSI method demonstrates the closest performance to human samples in terms of discriminant validity. Specifically, the PSI method shows the closest mean of absolute values when examining its correlations with human samples.

Both higher and lower levels of external validity reveal the degree of differences between the methods and human samples. Higher external validity indicates that the Big Five factors in human samples are more distinctly differentiated from one another, while lower external validity suggests the opposite. Therefore, our focus here is on identifying the approach that most closely aligns with the performance of human samples.

I.3 Additional Personality-Related Behavioral Performance Results

Table 67 and 68 present the correlations between the personality dimensions and OCB/CWB reported by all model+PSI simulations, with a comparison to human self-reported data.

I.4 Additional Abalation Test Results

Figure 7-10 present the relative importance of individual questions for different prediction domains.

Model	MAE					r				
	Ext	Agr	Neu	Con	Ope	Ext	Agr	Neu	Con	Ope
Mistral-7B+PSI	0.57	0.66	0.60	0.57	0.58	0.56	0.34	0.56	0.42	0.36
Gemma-2-9B+PSI	0.62	0.65	0.79	0.73	0.95	0.55	0.37	0.50	0.39	0.34
Gemma-2-27B+PSI	0.76	0.50	0.71	0.65	1.09	0.48	0.35	0.54	0.40	0.40
Llama3-8B+PSI	0.62	0.51	0.61	0.72	0.93	0.60	0.40	0.62	0.42	0.44
Llama3-70B+PSI	0.75	0.56	0.59	0.66	1.27	0.43	0.36	0.57	0.40	0.39
GPT-4o-mini+PSI	0.60	0.55	0.63	0.56	0.81	0.63	0.41	0.63	0.48	0.43
GPT-4o+PSI	0.58	0.53	0.63	0.59	0.80	0.64	0.41	0.63	0.46	0.43
GPT-4o+Life Interview (Park et al., 2024)	0.72	0.60	0.75	0.63	0.62	0.45	0.35	0.68	0.52	0.39

Table 12: MAE and r of human and LLM-simulated data across seven Models+PSI and GPT-4o+Life Interview (see Park et al., 2024, page 35 Table 3) for BFI-2 each Personality domain.

Table 13: Mistral-7B descriptive statistics results.

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
Item Level									
1	I am someone who is outgoing, sociable	3.02	3.23	3.30	2.69	1.40	1.09	1.30	1.10
2	I am someone who is compassionate, has a soft heart	4.34	3.86	3.74	4.17	0.90	1.04	1.29	1.03
3	I am someone who tends to be disorganized	3.62	2.89	3.13	3.90	1.36	0.96	1.22	0.68
4	I am someone who is relaxed, handles stress well	2.56	2.28	2.38	2.73	1.30	0.69	0.85	0.93
5	I am someone who has few artistic interests	3.68	3.73	2.96	4.07	1.33	0.54	0.78	0.26
6	I am someone who has an assertive personality	2.96	3.61	3.26	3.34	1.38	0.71	0.89	1.02
7	I am someone who is respectful, treats others with respect	4.62	4.65	4.64	4.50	0.61	0.77	0.89	0.80
8	I am someone who tends to be lazy	3.62	3.96	3.28	4.38	1.31	0.59	1.52	0.77
9	I am someone who stays optimistic after experiencing a setback	2.43	2.17	2.12	1.99	1.24	0.52	0.87	0.78
10	I am someone who is curious about many different things	4.43	4.28	4.37	3.61	0.81	0.65	0.96	0.94
11	I am someone who rarely feels excited or eager	3.54	3.67	3.01	3.91	1.26	0.65	1.07	0.44
12	I am someone who tends to find fault with others	3.34	3.63	3.28	4.45	1.32	0.60	1.47	0.58
13	I am someone who is dependable, steady	4.33	3.85	3.77	4.04	0.86	0.90	1.09	0.92
14	I am someone who is moody, has up and down mood swings	2.56	3.19	2.82	2.69	1.36	0.60	1.22	0.95
15	I am someone who is inventive, finds clever ways to do things	3.90	3.68	3.48	2.82	1.03	0.83	1.09	0.98
16	I am someone who tends to be quiet	2.35	2.83	2.47	3.21	1.34	0.68	1.15	1.06
17	I am someone who feels little sympathy for others	3.71	3.58	3.62	4.54	1.45	0.94	1.51	0.50
18	I am someone who is systematic, likes to keep things in order	3.96	2.84	3.34	2.49	1.06	0.91	0.82	0.97
19	I am someone who can be tense	3.29	3.04	3.00	3.63	1.27	0.87	0.95	0.78

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Table 13 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
20	I am someone who is fascinated by art, music, or literature	4.06	3.44	4.34	2.03	1.16	1.02	1.16	1.04
21	I am someone who is dominant, acts as a leader	2.90	2.43	2.46	1.99	1.35	0.80	1.05	0.68
22	I am someone who starts arguments with others	4.23	4.54	3.72	4.96	1.05	0.87	1.75	0.23
23	I am someone who has difficulty getting started on tasks	3.31	3.43	2.78	3.74	1.39	0.77	1.22	0.70
24	I am someone who feels secure, comfortable with self	2.26	1.90	1.97	2.06	1.27	0.70	0.97	0.90
25	I am someone who avoids intellectual, philosophical discussions	3.94	3.11	2.72	3.96	1.21	0.74	1.14	0.42
26	I am someone who is less active than other people	3.35	3.37	2.79	3.47	1.31	0.97	1.16	0.98
27	I am someone who has a forgiving nature	3.79	3.36	3.51	3.72	1.20	0.49	0.94	0.75
28	I am someone who can be somewhat careless	3.56	2.85	3.12	3.40	1.25	0.92	0.98	0.95
29	I am someone who is emotionally stable, not easily upset	2.44	2.62	2.27	2.93	1.27	0.56	0.98	0.85
30	I am someone who has little creativity	3.95	3.73	3.12	4.05	1.20	0.45	0.82	0.22
31	I am someone who is sometimes shy, introverted	2.35	2.15	2.56	3.04	1.36	0.45	0.66	0.94
32	I am someone who is helpful and unselfish with others	4.18	3.69	4.15	4.03	0.88	0.76	1.14	0.92
33	I am someone who keeps things neat and tidy	3.71	3.20	3.50	2.32	1.24	0.84	1.05	0.60
34	I am someone who worries a lot	3.30	3.68	3.30	3.60	1.47	0.65	1.07	1.00
35	I am someone who values art and beauty	4.16	3.94	4.45	3.11	1.07	0.93	0.89	1.17
36	I am someone who finds it hard to influence people	3.09	3.38	2.79	3.94	1.20	0.55	0.85	0.32
37	I am someone who is sometimes rude to others	3.79	3.65	3.52	4.27	1.25	0.78	1.48	0.66
38	I am someone who is efficient, gets things done	4.23	3.52	3.70	3.40	0.88	0.91	1.08	1.10
39	I am someone who often feels sad	2.71	3.46	3.19	3.07	1.43	0.83	1.14	1.08

Continued on next page

Table 13 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
40	I am someone who is complex, a deep thinker	4.02	4.34	3.88	4.17	1.08	0.70	0.93	0.73
41	I am someone who is full of energy	3.14	3.75	3.50	3.18	1.30	0.97	1.36	1.20
42	I am someone who is suspicious of others' intentions	2.75	3.19	3.28	4.25	1.30	0.49	1.21	0.71
43	I am someone who is reliable, can always be counted on	4.32	3.79	3.84	4.13	0.88	0.94	1.15	0.95
44	I am someone who keeps their emotions under control	2.22	2.88	2.35	3.31	1.14	0.42	0.90	0.79
45	I am someone who has difficulty imagining things	4.17	3.09	2.86	3.89	1.06	0.37	0.72	0.37
46	I am someone who is talkative	2.87	3.04	2.94	3.20	1.38	0.96	1.01	1.19
47	I am someone who can be cold and uncaring	3.84	3.66	3.47	4.26	1.23	0.63	1.27	0.72
48	I am someone who leaves a mess, doesn't clean up	4.15	3.44	3.07	4.79	1.12	1.24	1.90	0.45
49	I am someone who rarely feels anxious or afraid	3.44	3.00	2.27	3.34	1.37	0.29	1.17	0.73
50	I am someone who thinks poetry and plays are boring	3.66	2.65	2.66	3.46	1.37	1.34	1.39	1.68
51	I am someone who prefers to have others take charge	2.96	3.26	2.86	4.11	1.28	0.75	1.49	0.55
52	I am someone who is polite, courteous to others	4.50	4.21	4.55	4.30	0.70	0.89	0.88	0.87
53	I am someone who is persistent, works until the task is finished	4.28	4.36	4.09	4.55	0.91	0.68	1.03	0.66
54	I am someone who tends to feel depressed, blue	2.65	3.37	2.85	2.85	1.46	0.84	1.36	1.14
55	I am someone who has little interest in abstract ideas	3.83	3.32	3.03	3.97	1.22	0.55	0.61	0.25
56	I am someone who shows a lot of enthusiasm	3.35	4.39	3.70	3.71	1.22	0.75	1.30	1.18
57	I am someone who assumes the best about people	3.37	3.39	3.67	3.44	1.28	0.53	0.87	0.89
58	I am someone who sometimes behaves irresponsibly	3.64	3.05	3.24	3.81	1.30	0.99	0.99	0.76
59	I am someone who is temperamental, gets emotional easily	2.53	3.17	2.79	2.15	1.33	0.96	1.42	0.92

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Table 13 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
60	I am someone who is original, comes up with new ideas	3.84	3.67	3.36	2.96	1.07	0.91	1.17	1.11
Facet Level									
1	Sociability	2.65	2.81	2.82	3.04	1.17	0.59	0.85	0.89
2	Assertiveness	2.98	3.17	2.84	3.34	1.04	0.46	0.86	0.47
3	Energy Level	3.35	3.79	3.25	3.57	0.95	0.66	1.05	0.73
4	Compassion	4.02	3.70	3.74	4.25	0.81	0.56	1.03	0.65
5	Respectfulness	4.29	4.26	4.11	4.51	0.70	0.64	1.01	0.55
6	Trust	3.31	3.39	3.44	3.97	1.00	0.36	0.93	0.57
7	Organization	3.86	3.09	3.26	3.37	1.01	0.67	0.94	0.50
8	Productiveness	3.86	3.82	3.46	4.02	0.91	0.57	1.05	0.64
9	Responsibility	3.96	3.39	3.49	3.85	0.84	0.76	0.87	0.75
10	Anxiety	3.15	3.00	2.74	3.32	1.11	0.43	0.70	0.66
11	Depression	2.51	2.72	2.53	2.49	1.14	0.51	0.91	0.81
12	Emotional Volatility	2.44	2.96	2.56	2.77	1.10	0.45	0.90	0.72
13	Intellectual Curiosity	4.05	3.76	3.50	3.93	0.83	0.48	0.65	0.41
14	Aesthetic Sensitivity	3.89	3.44	3.60	3.17	1.01	0.67	0.86	0.73
15	Creative Imagination	3.96	3.54	3.20	3.43	0.88	0.47	0.77	0.53
Domain Level									
1	Extraversion	2.99	3.26	2.97	3.32	0.85	0.47	0.84	0.62
2	Agreeableness	3.87	3.78	3.76	4.24	0.69	0.45	0.92	0.54
3	Conscientiousness	3.89	3.43	3.41	3.75	0.80	0.59	0.90	0.56
4	Neuroticism	2.70	2.90	2.61	2.86	1.02	0.38	0.75	0.65
5	Openness	3.97	3.58	3.43	3.51	0.76	0.44	0.70	0.45

Table 14: Gemma-2-9B descriptive statistics results.

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
Item Level									
1	I am someone who is outgoing, sociable	3.02	2.98	2.46	2.26	1.40	0.79	1.22	0.80
2	I am someone who is compassionate, has a soft heart	4.34	3.50	3.09	3.44	0.90	0.82	1.31	0.93
3	I am someone who tends to be disorganized	3.62	2.97	3.05	2.95	1.36	0.39	1.03	0.37
4	I am someone who is relaxed, handles stress well	2.56	3.09	3.33	3.59	1.30	0.62	1.09	0.65
5	I am someone who has few artistic interests	3.68	3.15	3.11	2.76	1.33	0.72	1.01	0.62
6	I am someone who has an assertive personality	2.96	3.10	2.93	2.38	1.38	0.62	1.15	0.72

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Table 14 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
7	I am someone who is respectful, treats others with respect	4.62	3.99	3.71	3.51	0.61	1.07	1.42	0.72
8	I am someone who tends to be lazy	3.62	3.38	3.37	3.36	1.31	0.67	1.27	0.80
9	I am someone who stays optimistic after experiencing a setback	2.43	2.67	2.72	2.82	1.24	0.74	1.48	0.94
10	I am someone who is curious about many different things	4.43	3.65	3.27	3.01	0.81	0.69	1.40	0.62
11	I am someone who rarely feels excited or eager	3.54	3.57	3.02	2.85	1.26	0.72	1.57	0.96
12	I am someone who tends to find fault with others	3.34	3.05	3.31	3.15	1.32	0.32	1.29	0.52
13	I am someone who is dependable, steady	4.33	3.58	3.10	3.55	0.86	0.78	1.40	0.73
14	I am someone who is moody, has up and down mood swings	2.56	3.16	2.85	3.10	1.36	0.49	1.31	0.71
15	I am someone who is inventive, finds clever ways to do things	3.90	3.29	2.89	2.95	1.03	0.52	1.13	0.50
16	I am someone who tends to be quiet	2.35	2.99	2.97	2.56	1.34	0.52	1.08	0.98
17	I am someone who feels little sympathy for others	3.71	3.64	3.64	3.41	1.45	0.90	1.45	1.00
18	I am someone who is systematic, likes to keep things in order	3.96	3.27	2.98	2.82	1.06	0.66	1.14	0.69
19	I am someone who can be tense	3.29	3.37	3.36	3.42	1.27	0.61	1.18	0.68
20	I am someone who is fascinated by art, music, or literature	4.06	3.49	2.95	2.94	1.16	0.82	1.16	0.83
21	I am someone who is dominant, acts as a leader	2.90	3.03	3.08	2.46	1.35	0.57	1.13	0.73
22	I am someone who starts arguments with others	4.23	3.61	3.74	3.52	1.05	0.86	1.40	0.84
23	I am someone who has difficulty getting started on tasks	3.31	3.00	3.11	2.81	1.39	0.26	1.21	0.47
24	I am someone who feels secure, comfortable with self	2.26	2.73	3.00	3.45	1.27	0.82	1.40	0.74

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Table 14 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
25	I am someone who avoids intellectual, philosophical discussions	3.94	3.02	2.93	2.85	1.21	0.28	1.19	0.63
26	I am someone who is less active than other people	3.35	3.21	3.20	2.74	1.31	0.70	1.12	0.52
27	I am someone who has a forgiving nature	3.79	3.03	3.20	3.03	1.20	0.36	1.16	0.59
28	I am someone who can be somewhat careless	3.56	2.90	2.66	3.10	1.25	0.42	1.00	0.64
29	I am someone who is emotionally stable, not easily upset	2.44	3.11	2.87	3.31	1.27	0.53	1.28	0.78
30	I am someone who has little creativity	3.95	3.01	3.28	3.01	1.20	0.49	1.13	0.49
31	I am someone who is sometimes shy, introverted	2.35	2.88	3.04	2.89	1.36	0.57	1.06	0.87
32	I am someone who is helpful and unselfish with others	4.18	3.24	3.28	3.51	0.88	0.76	1.50	0.76
33	I am someone who keeps things neat and tidy	3.71	2.97	2.89	3.03	1.24	0.44	1.02	0.36
34	I am someone who worries a lot	3.30	3.20	2.80	3.52	1.47	0.61	1.31	1.06
35	I am someone who values art and beauty	4.16	3.56	3.16	3.22	1.07	0.81	1.18	0.64
36	I am someone who finds it hard to influence people	3.09	3.01	3.04	2.89	1.20	0.32	1.06	0.47
37	I am someone who is sometimes rude to others	3.79	3.09	3.49	3.29	1.25	0.50	1.32	0.79
38	I am someone who is efficient, gets things done	4.23	3.39	3.25	3.33	0.88	0.69	1.24	0.66
39	I am someone who often feels sad	2.71	3.09	2.65	3.38	1.43	0.52	1.21	0.72
40	I am someone who is complex, a deep thinker	4.02	3.40	3.00	2.72	1.08	0.67	1.04	0.87
41	I am someone who is full of energy	3.14	3.47	2.79	2.61	1.30	0.85	1.14	0.87
42	I am someone who is suspicious of others' intentions	2.75	2.93	3.15	2.90	1.30	0.39	1.28	0.52
43	I am someone who is reliable, can always be counted on	4.32	3.49	3.37	3.47	0.88	0.86	1.49	0.75
44	I am someone who keeps their emotions under control	2.22	3.12	2.61	3.26	1.14	0.47	1.37	0.66

Continued on next page

Table 14 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
45	I am someone who has difficulty imagining things	4.17	3.10	3.45	3.06	1.06	0.38	1.09	0.42
46	I am someone who is talkative	2.87	3.02	3.03	2.50	1.38	0.38	0.89	0.88
47	I am someone who can be cold and uncaring	3.84	3.42	3.26	3.45	1.23	0.73	1.48	1.10
48	I am someone who leaves a mess, doesn't clean up	4.15	3.27	3.06	3.16	1.12	0.62	1.44	0.51
49	I am someone who rarely feels anxious or afraid	3.44	3.18	2.77	3.64	1.37	0.48	1.26	0.83
50	I am someone who thinks poetry and plays are boring	3.66	3.53	3.34	3.12	1.37	0.57	1.45	0.43
51	I am someone who prefers to have others take charge	2.96	3.29	2.84	3.05	1.28	0.62	1.46	0.78
52	I am someone who is polite, courteous to others	4.50	3.55	3.65	3.43	0.70	0.93	1.40	0.75
53	I am someone who is persistent, works until finished	4.28	3.65	3.49	3.63	0.91	0.71	1.22	0.65
54	I am someone who tends to feel depressed, blue	2.65	3.09	2.63	3.40	1.46	0.46	1.30	0.72
55	I am someone who has little interest in abstract ideas	3.83	3.04	2.87	2.92	1.22	0.40	1.14	0.63
56	I am someone who shows a lot of enthusiasm	3.35	3.67	2.71	2.93	1.22	0.84	1.34	0.94
57	I am someone who assumes the best about people	3.37	3.21	3.39	2.93	1.28	0.64	1.40	0.75
58	I am someone who sometimes behaves irresponsibly	3.64	2.88	2.81	2.82	1.30	0.40	1.07	0.62
59	I am someone who is temperamental, gets emotional easily	2.53	2.90	2.72	2.61	1.33	0.52	1.34	0.76
60	I am someone who is original, comes up with new ideas	3.84	3.10	2.77	2.72	1.07	0.52	1.23	0.55
Facet Level									
1	Sociability	2.65	2.97	2.88	2.55	1.17	0.47	0.84	0.74
2	Assertiveness	2.98	3.11	2.97	2.69	1.04	0.40	0.90	0.49
3	Energy Level	3.35	3.48	2.93	2.78	0.95	0.61	1.17	0.52
4	Compassion	4.02	3.45	3.32	3.46	0.81	0.68	1.35	0.79
5	Respectfulness	4.29	3.56	3.65	3.44	0.70	0.67	1.30	0.55
6	Trust	3.31	3.06	3.26	3.00	1.00	0.32	1.21	0.41
7	Organization	3.86	3.12	3.00	2.99	1.01	0.41	0.92	0.30
8	Productiveness	3.86	3.36	3.30	3.28	0.91	0.48	1.14	0.48
9	Responsibility	3.96	3.21	2.98	3.23	0.84	0.52	1.06	0.55

Continued on next page

Table 14 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
10	Anxiety	3.15	3.21	3.07	3.54	1.11	0.49	0.89	0.65
11	Depression	2.51	2.89	2.75	3.26	1.14	0.52	1.17	0.65
12	Emotional Volatility	2.44	3.07	2.76	3.07	1.10	0.40	1.03	0.55
13	Intellectual Curiosity	4.05	3.28	3.02	2.87	0.83	0.36	1.05	0.51
14	Aesthetic Sensitivity	3.89	3.43	3.14	3.01	1.01	0.53	1.09	0.33
15	Creative Imagination	3.96	3.13	3.10	2.93	0.88	0.32	1.02	0.30
Domain Level									
1	Extraversion	2.99	3.19	2.93	2.68	0.85	0.42	0.89	0.50
2	Agreeableness	3.87	3.35	3.41	3.30	0.69	0.51	1.25	0.52
3	Conscientiousness	3.89	3.23	3.09	3.17	0.80	0.41	0.96	0.39
4	Neuroticism	2.70	3.06	2.86	3.29	1.02	0.42	0.95	0.55
5	Openness	3.97	3.28	3.08	2.94	0.76	0.33	1.00	0.30

Table 15: Gemma-2-27B descriptive statistics results.

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
Item Level									
1	I am someone who Is outgoing, sociable	3.02	2.92	2.50	2.31	1.40	0.73	1.15	0.70
2	I am someone who Is compassionate, has a soft heart	4.34	3.62	3.16	3.71	0.90	0.75	1.30	0.82
3	I am someone who Tends to be disorganized	3.62	3.03	3.23	3.38	1.36	0.42	1.02	0.82
4	I am someone who Is relaxed, handles stress well	2.56	3.27	3.40	3.67	1.30	0.61	1.09	0.55
5	I am someone who Has few artistic interests	3.68	3.40	2.93	2.70	1.33	0.70	0.93	0.98
6	I am someone who Has an assertive personality	2.96	3.06	2.80	2.31	1.38	0.55	1.11	0.60
7	I am someone who Is respectful, treats others with respect	4.62	4.77	4.00	4.30	0.61	0.58	1.29	0.68
8	I am someone who Tends to be lazy	3.62	3.56	3.27	3.60	1.31	0.64	1.24	0.79
9	I am someone who Stays optimistic after experiencing a setback	2.43	2.33	2.71	2.31	1.24	0.64	1.34	0.65
10	I am someone who Is curious about many different things	4.43	4.08	3.58	3.53	0.81	0.54	1.21	0.64

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Table 15 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
11	I am someone who Rarely feels excited or eager	3.54	3.62	2.91	2.63	1.26	0.72	1.27	0.92
12	I am someone who Tends to find fault with others	3.34	3.67	3.15	3.63	1.32	0.54	1.25	0.71
13	I am someone who Is dependable, steady	4.33	3.60	3.33	3.79	0.86	0.70	1.30	0.72
14	I am someone who Is moody, has up and down mood swings	2.56	3.13	2.73	2.98	1.36	0.47	1.18	0.84
15	I am someone who Is inventive, finds clever ways to do things	3.90	3.28	3.21	2.41	1.03	0.51	1.09	0.63
16	I am someone who Tends to be quiet	2.35	3.03	3.04	2.29	1.34	0.58	0.99	0.96
17	I am someone who Feels little sympathy for others	3.71	3.97	3.55	3.76	1.45	0.49	1.42	0.61
18	I am someone who Is systematic, likes to keep things in order	3.96	3.05	2.92	2.65	1.06	0.74	1.06	0.75
19	I am someone who Can be tense	3.29	3.30	3.18	3.53	1.27	0.52	1.01	0.58
20	I am someone who Is fascinated by art, music, or literature	4.06	3.39	3.21	2.74	1.16	0.88	1.13	0.97
21	I am someone who Is dominant, acts as a leader	2.90	2.83	2.66	2.14	1.35	0.57	1.09	0.43
22	I am someone who Starts arguments with others	4.23	3.96	3.73	3.94	1.05	0.38	1.39	0.37
23	I am someone who Has difficulty getting started on tasks	3.31	2.95	3.00	2.58	1.39	0.48	1.24	0.66
24	I am someone who Feels secure, comfortable with self	2.26	2.87	2.73	3.43	1.27	0.72	1.35	0.71
25	I am someone who Avoids intellectual, philosophical discussions	3.94	3.18	2.92	2.55	1.21	0.82	1.22	0.85
26	I am someone who Is less active than other people	3.35	3.26	2.98	2.32	1.31	0.78	1.01	0.76
27	I am someone who Has a forgiving nature	3.79	3.52	3.48	3.71	1.20	0.56	1.23	0.58
28	I am someone who Can be somewhat careless	3.56	2.91	2.99	3.04	1.25	0.41	0.93	0.59
29	I am someone who Is emotionally stable, not easily upset	2.44	3.18	3.08	3.37	1.27	0.58	1.15	0.76

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Table 15 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
30	I am someone who Has little creativity	3.95	3.59	3.14	3.16	1.20	0.59	1.16	0.93
31	I am someone who Is sometimes shy, introverted	2.35	2.75	2.96	2.36	1.36	0.56	0.83	0.87
32	I am someone who Is helpful and unselfish with others	4.18	3.73	3.51	3.94	0.88	0.66	1.43	0.62
33	I am someone who Keeps things neat and tidy	3.71	2.90	2.86	2.87	1.24	0.62	1.07	0.64
34	I am someone who Worries a lot	3.30	3.12	2.89	3.70	1.47	0.60	1.17	0.76
35	I am someone who Values art and beauty	4.16	3.71	3.37	2.97	1.07	0.78	1.09	1.03
36	I am someone who Finds it hard to influence people	3.09	2.97	2.86	2.29	1.20	0.48	1.12	0.59
37	I am someone who Is sometimes rude to others	3.79	3.57	3.52	3.74	1.25	0.54	1.23	0.58
38	I am someone who Is efficient, gets things done	4.23	3.56	3.49	3.48	0.88	0.66	1.16	0.68
39	I am someone who Often feels sad	2.71	3.00	2.69	2.91	1.43	0.51	1.20	1.00
40	I am someone who Is complex, a deep thinker	4.02	3.55	3.20	2.92	1.08	0.63	1.00	0.93
41	I am someone who Is full of energy	3.14	3.36	2.98	2.45	1.30	0.74	1.20	0.69
42	I am someone who Is suspicious of others' intentions	2.75	3.16	3.03	3.33	1.30	0.63	1.23	0.85
43	I am someone who Is reliable, can always be counted on	4.32	3.63	3.48	3.86	0.88	0.74	1.37	0.78
44	I am someone who Keeps their emotions under control	2.22	3.06	2.68	2.62	1.14	0.56	1.16	0.78
45	I am someone who Has difficulty imagining things	4.17	3.41	3.19	2.78	1.06	0.54	1.02	0.61
46	I am someone who Is talkative	2.87	2.96	2.83	2.62	1.38	0.46	1.04	0.82
47	I am someone who Can be cold and uncaring	3.84	3.73	3.20	3.58	1.23	0.59	1.33	0.79
48	I am someone who Leaves a mess, doesn't clean up	4.15	3.55	3.18	3.90	1.12	0.60	1.33	0.34
49	I am someone who Rarely feels anxious or afraid	3.44	3.78	2.85	3.72	1.37	0.44	1.24	0.73
50	I am someone who Thinks poetry and plays are boring	3.66	3.65	3.30	2.97	1.37	0.72	1.37	0.75

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Table 15 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
51	I am someone who Prefers to have others take charge	2.96	3.69	2.97	3.55	1.28	0.61	1.18	0.83
52	I am someone who Is polite, courteous to others	4.50	4.48	3.87	4.34	0.70	0.72	1.31	0.64
53	I am someone who Is persistent, works until the task is finished	4.28	3.78	3.60	3.76	0.91	0.62	1.16	0.67
54	I am someone who Tends to feel depressed, blue	2.65	2.93	2.66	3.03	1.46	0.54	1.27	0.98
55	I am someone who Has little interest in abstract Ideas	3.83	2.84	2.74	2.12	1.22	0.74	1.01	0.46
56	I am someone who Shows a lot of Enthusiasm	3.35	3.69	3.04	2.30	1.22	0.76	1.37	0.61
57	I am someone who Assumes the best about people	3.37	3.60	3.42	3.37	1.28	0.68	1.29	0.77
58	I am someone who Sometimes behaves irresponsibly	3.64	2.86	2.88	2.84	1.30	0.44	0.91	0.65
59	I am someone who Is temperamental, gets emotional easily	2.53	2.89	2.69	2.44	1.33	0.56	1.15	0.81
60	I am someone who Is original, comes up with new Ideas	3.84	3.24	3.23	2.46	1.07	0.49	1.04	0.63
Facet Level									
1	Sociability	2.65	2.91	2.83	2.40	1.17	0.48	0.87	0.72
2	Assertiveness	2.98	3.14	2.82	2.57	1.04	0.43	0.95	0.43
3	Energy Level	3.35	3.48	2.98	2.43	0.95	0.64	1.11	0.61
4	Compassion	4.02	3.76	3.36	3.75	0.81	0.51	1.28	0.59
5	Respectfulness	4.29	4.19	3.78	4.08	0.70	0.45	1.22	0.47
6	Trust	3.31	3.49	3.27	3.51	1.00	0.49	1.16	0.62
7	Organization	3.86	3.13	3.05	3.20	1.01	0.47	0.93	0.48
8	Productiveness	3.86	3.46	3.34	3.35	0.91	0.50	1.10	0.52
9	Responsibility	3.96	3.25	3.17	3.38	0.84	0.50	1.02	0.57
10	Anxiety	3.15	3.37	3.08	3.66	1.11	0.41	0.77	0.49
11	Depression	2.51	2.78	2.70	2.92	1.14	0.49	1.22	0.69
12	Emotional Volatility	2.44	3.06	2.80	2.85	1.10	0.44	1.02	0.66
13	Intellectual Curiosity	4.05	3.41	3.11	2.78	0.83	0.52	0.92	0.57
14	Aesthetic Sensitivity	3.89	3.54	3.20	2.84	1.01	0.63	1.03	0.79
15	Creative Imagination	3.96	3.38	3.19	2.71	0.88	0.42	0.99	0.54
Domain Level									
1	Extraversion	2.99	3.18	2.88	2.47	0.85	0.46	0.91	0.53
2	Agreeableness	3.87	3.81	3.47	3.78	0.69	0.45	1.17	0.51
3	Conscientiousness	3.89	3.28	3.18	3.31	0.80	0.44	0.95	0.47

Continued on next page

Table 15 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
4	Neuroticism	2.70	3.07	2.86	3.14	1.02	0.39	0.92	0.54
5	Openness	3.97	3.44	3.17	2.78	0.76	0.45	0.94	0.54

Table 16: Llama3-8B descriptive statistics results.

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
Item Level									
1	I am someone who is outgoing, sociable	3.02	2.31	2.62	2.80	1.40	0.70	1.32	0.92
2	I am someone who is compassionate, has a soft heart	4.34	2.86	2.56	4.08	0.90	0.89	1.16	0.87
3	I am someone who tends to be disorganized	3.62	3.46	2.87	2.84	1.36	0.66	1.12	0.61
4	I am someone who is relaxed, handles stress well	2.56	3.29	3.34	2.32	1.30	0.88	1.24	0.58
5	I am someone who has few artistic interests	3.68	2.24	2.11	2.17	1.33	0.62	0.94	0.84
6	I am someone who has an assertive personality	2.96	3.25	3.12	3.11	1.38	0.82	1.16	0.74
7	I am someone who is respectful, treats others with respect	4.62	3.58	3.17	4.25	0.61	0.79	1.23	0.61
8	I am someone who tends to be lazy	3.62	3.60	2.88	2.69	1.31	0.68	1.26	0.62
9	I am someone who stays optimistic after experiencing a setback	2.43	2.63	2.69	2.06	1.24	0.85	1.17	0.77
10	I am someone who is curious about many different things	4.43	3.63	3.04	3.88	0.81	0.73	1.17	0.83
11	I am someone who rarely feels excited or eager	3.54	2.19	2.10	2.28	1.26	0.58	0.75	0.58
12	I am someone who tends to find fault with others	3.34	3.64	2.97	3.23	1.32	0.69	1.02	0.67
13	I am someone who is dependable, steady	4.33	2.90	2.76	4.13	0.86	0.88	1.20	0.72
14	I am someone who is moody, has up and down mood swings	2.56	2.99	2.95	3.60	1.36	0.91	1.11	0.61
15	I am someone who is inventive, finds clever ways to do things	3.90	3.03	2.68	3.22	1.03	0.69	1.01	0.58

Continued on next page

Table 16 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
16	I am someone who tends to be quiet	2.35	3.71	3.17	2.20	1.34	0.63	1.10	0.88
17	I am someone who feels little sympathy for others	3.71	3.15	2.80	2.93	1.45	0.98	1.11	0.32
18	I am someone who is systematic, likes to keep things in order	3.96	2.35	2.59	3.34	1.06	0.59	1.05	0.77
19	I am someone who can be tense	3.29	3.45	3.03	3.99	1.27	0.76	1.12	0.64
20	I am someone who is fascinated by art, music, or literature	4.06	2.79	2.77	3.40	1.16	0.90	1.12	0.94
21	I am someone who is dominant, acts as a leader	2.90	2.74	2.65	3.05	1.35	0.75	1.02	0.61
22	I am someone who starts arguments with others	4.23	3.94	3.50	3.79	1.05	0.37	1.12	0.47
23	I am someone who has difficulty getting started on tasks	3.31	2.90	2.36	2.26	1.39	0.81	0.94	0.45
24	I am someone who feels secure, comfortable with self	2.26	2.83	3.32	2.26	1.27	0.92	1.20	0.71
25	I am someone who avoids intellectual, philosophical discussions	3.94	2.11	1.98	2.30	1.21	0.44	0.63	0.60
26	I am someone who is less active than other people	3.35	2.98	2.22	2.15	1.31	0.94	0.96	0.58
27	I am someone who has a forgiving nature	3.79	2.91	2.65	3.74	1.20	0.90	1.08	0.73
28	I am someone who can be somewhat careless	3.56	2.98	3.23	2.27	1.25	0.92	1.06	0.48
29	I am someone who is emotionally stable, not easily upset	2.44	2.94	2.55	2.22	1.27	0.93	1.16	0.63
30	I am someone who has little creativity	3.95	2.25	2.23	2.50	1.20	0.57	0.99	0.50
31	I am someone who is sometimes shy, introverted	2.35	3.63	3.13	1.97	1.36	0.64	1.07	0.85
32	I am someone who is helpful and unselfish with others	4.18	3.35	3.23	4.20	0.88	0.84	1.19	0.58
33	I am someone who keeps things neat and tidy	3.71	2.35	2.81	3.34	1.24	0.60	1.09	0.75
34	I am someone who worries a lot	3.30	2.47	3.06	4.01	1.47	0.81	1.23	0.79
35	I am someone who values art and beauty	4.16	3.24	3.16	3.48	1.07	0.86	1.10	0.91

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Table 16 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
36	I am someone who finds it hard to influence people	3.09	2.20	2.01	2.06	1.20	0.58	0.60	0.36
37	I am someone who is sometimes rude to others	3.79	3.49	2.87	2.74	1.25	0.82	1.17	0.64
38	I am someone who is efficient, gets things done	4.23	2.48	2.76	3.89	0.88	0.74	1.19	0.63
39	I am someone who often feels sad	2.71	2.68	2.71	3.68	1.43	0.86	1.20	0.77
40	I am someone who is complex, a deep thinker	4.02	3.15	2.82	3.75	1.08	0.87	1.02	0.67
41	I am someone who is full of energy	3.14	2.78	2.91	3.15	1.30	0.89	1.28	0.86
42	I am someone who is suspicious of others' intentions	2.75	3.43	2.96	2.74	1.30	0.68	1.04	0.65
43	I am someone who is reliable, can always be counted on	4.32	2.82	2.84	4.17	0.88	0.83	1.21	0.66
44	I am someone who keeps their emotions under control	2.22	2.92	2.46	2.08	1.14	0.92	1.04	0.42
45	I am someone who has difficulty imagining things	4.17	2.14	2.18	2.42	1.06	0.46	0.81	0.52
46	I am someone who is talkative	2.87	2.73	2.58	3.43	1.38	0.93	1.16	1.00
47	I am someone who can be cold and uncaring	3.84	3.64	2.93	3.01	1.23	0.70	1.19	0.61
48	I am someone who leaves a mess, doesn't clean up	4.15	3.91	3.46	2.59	1.12	0.44	1.14	0.53
49	I am someone who rarely feels anxious or afraid	3.44	2.69	2.16	2.67	1.37	0.94	0.91	0.61
50	I am someone who thinks poetry and plays are boring	3.66	3.31	2.63	2.44	1.37	0.89	1.17	0.61
51	I am someone who prefers to have others take charge	2.96	3.17	2.57	2.58	1.28	0.94	1.03	0.51
52	I am someone who is polite, courteous to others	4.50	2.98	2.88	4.11	0.70	0.97	1.17	0.59
53	I am someone who is persistent, works until the task is finished	4.28	3.58	3.10	4.20	0.91	0.76	1.27	0.67
54	I am someone who tends to feel depressed, blue	2.65	2.41	2.39	3.52	1.46	0.74	1.27	0.89
55	I am someone who has little interest in abstract ideas	3.83	2.09	2.05	2.15	1.22	0.38	0.56	0.68
56	I am someone who shows a lot of enthusiasm	3.35	3.58	2.96	2.99	1.22	0.75	1.31	0.83

Continued on next page

Table 16 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
57	I am someone who assumes the best about people	3.37	3.01	2.89	3.48	1.28	0.95	1.09	0.85
58	I am someone who sometimes behaves irresponsibly	3.64	2.63	2.81	2.33	1.30	0.78	1.13	0.49
59	I am someone who is temperamental, gets emotional easily	2.53	2.65	2.86	3.34	1.33	0.88	1.19	0.77
60	I am someone who is original, comes up with new ideas	3.84	2.93	2.91	3.62	1.07	0.83	1.08	0.60
Facet Level									
1	Sociability	2.65	3.10	2.88	2.60	1.17	0.45	0.77	0.76
2	Assertiveness	2.98	2.84	2.59	2.70	1.04	0.39	0.61	0.42
3	Energy Level	3.35	2.88	2.55	2.64	0.95	0.42	0.63	0.59
4	Compassion	4.02	3.25	2.88	3.55	0.81	0.56	0.83	0.47
5	Respectfulness	4.29	3.50	3.10	3.72	0.70	0.47	0.88	0.43
6	Trust	3.31	3.25	2.87	3.30	1.00	0.48	0.76	0.55
7	Organization	3.86	3.02	2.93	3.03	1.01	0.29	0.75	0.47
8	Productiveness	3.86	3.14	2.78	3.26	0.91	0.38	0.79	0.47
9	Responsibility	3.96	2.83	2.91	3.22	0.84	0.49	0.82	0.47
10	Anxiety	3.15	2.98	2.90	3.25	1.11	0.40	0.47	0.53
11	Depression	2.51	2.64	2.78	2.88	1.14	0.51	0.80	0.64
12	Emotional Volatility	2.44	2.88	2.70	2.81	1.10	0.49	0.55	0.48
13	Intellectual Curiosity	4.05	2.74	2.47	3.02	0.83	0.34	0.57	0.57
14	Aesthetic Sensitivity	3.89	2.90	2.67	2.87	1.01	0.46	0.76	0.69
15	Creative Imagination	3.96	2.59	2.50	2.94	0.88	0.35	0.62	0.43
Domain Level									
1	Extraversion	2.99	2.94	2.67	2.65	0.85	0.33	0.57	0.52
2	Agreeableness	3.87	3.33	2.95	3.53	0.69	0.44	0.75	0.43
3	Conscientiousness	3.89	3.00	2.87	3.17	0.80	0.30	0.70	0.41
4	Neuroticism	2.70	2.83	2.79	2.98	1.02	0.37	0.49	0.49
5	Openness	3.97	2.74	2.55	2.94	0.76	0.29	0.59	0.48

Table 17: Llama3-70B descriptive statistics results.

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
Item Level									
1	I am someone who is outgoing, sociable	3.02	2.77	2.43	2.15	1.40	1.31	1.37	0.78

Continued on next page

Table 17 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
2	I am someone who is compassionate, has a soft heart	4.34	3.87	3.15	3.93	0.90	1.12	1.44	1.01
3	I am someone who tends to be disorganized	3.62	3.77	3.29	3.27	1.36	0.95	1.47	0.96
4	I am someone who is relaxed, handles stress well	2.56	2.94	3.34	2.97	1.30	1.16	1.39	0.95
5	I am someone who has few artistic interests	3.68	3.80	2.91	2.71	1.33	1.31	1.32	1.12
6	I am someone who has an assertive personality	2.96	3.07	2.79	2.24	1.38	1.18	1.37	0.70
7	I am someone who is respectful, treats others with respect	4.62	4.43	3.60	4.23	0.61	0.92	1.43	0.78
8	I am someone who tends to be lazy	3.62	4.23	3.44	3.77	1.31	1.04	1.49	0.96
9	I am someone who stays optimistic after experiencing a setback	2.43	2.29	2.94	2.28	1.24	0.98	1.54	0.92
10	I am someone who is curious about many different things	4.43	3.71	3.14	3.06	0.81	1.12	1.55	0.92
11	I am someone who rarely feels excited or eager	3.54	4.18	2.98	2.40	1.26	0.75	1.42	0.81
12	I am someone who tends to find fault with others	3.34	4.31	3.44	3.72	1.32	0.69	1.48	0.68
13	I am someone who is dependable, steady	4.33	3.70	3.09	3.98	0.86	1.12	1.59	0.75
14	I am someone who is moody, has up and down mood swings	2.56	2.52	2.62	2.31	1.36	1.09	1.42	0.93
15	I am someone who is inventive, finds clever ways to do things	3.90	3.24	2.90	2.35	1.03	1.14	1.44	0.71
16	I am someone who tends to be quiet	2.35	3.44	3.26	2.53	1.34	1.12	1.27	0.96
17	I am someone who feels little sympathy for others	3.71	4.47	3.52	2.93	1.45	0.79	1.54	1.01
18	I am someone who is systematic, likes to keep things in order	3.96	2.46	2.57	2.45	1.06	1.09	1.37	0.83
19	I am someone who can be tense	3.29	3.18	3.06	2.73	1.27	1.08	1.21	0.94
20	I am someone who is fascinated by art, music, or literature	4.06	2.99	2.89	2.81	1.16	1.44	1.36	1.10

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Table 17 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
21	I am someone who is dominant, acts as a leader	2.90	2.46	2.51	2.06	1.35	1.15	1.49	0.59
22	I am someone who starts arguments with others	4.23	4.56	3.68	4.35	1.05	0.77	1.54	0.59
23	I am someone who has difficulty getting started on tasks	3.31	3.85	3.21	2.81	1.39	0.86	1.50	0.70
24	I am someone who feels secure, comfortable with self	2.26	2.24	2.67	2.70	1.27	1.08	1.50	0.92
25	I am someone who avoids intellectual, philosophical discussions	3.94	3.36	3.12	2.62	1.21	1.36	1.56	1.01
26	I am someone who is less active than other people	3.35	3.86	3.14	2.68	1.31	1.04	1.31	0.83
27	I am someone who has a forgiving nature	3.79	3.48	3.26	3.61	1.20	0.90	1.38	0.77
28	I am someone who can be somewhat careless	3.56	3.19	2.99	3.18	1.25	1.11	1.38	1.01
29	I am someone who is emotionally stable, not easily upset	2.44	2.66	2.89	2.68	1.27	1.01	1.48	1.09
30	I am someone who has little creativity	3.95	4.36	3.42	2.85	1.20	0.69	1.32	1.02
31	I am someone who is sometimes shy, introverted	2.35	3.43	3.33	2.72	1.36	1.11	1.31	0.98
32	I am someone who is helpful and unselfish with others	4.18	3.88	3.22	4.12	0.88	1.05	1.51	0.73
33	I am someone who keeps things neat and tidy	3.71	2.47	2.61	2.71	1.24	1.00	1.35	0.70
34	I am someone who worries a lot	3.30	2.59	2.53	3.08	1.47	1.08	1.34	1.05
35	I am someone who values art and beauty	4.16	3.23	3.05	2.88	1.07	1.30	1.35	1.06
36	I am someone who finds it hard to influence people	3.09	3.44	2.97	2.27	1.20	1.04	1.37	0.70
37	I am someone who is sometimes rude to others	3.79	4.43	3.61	4.13	1.25	0.91	1.50	0.99
38	I am someone who is efficient, gets things done	4.23	3.45	3.10	3.09	0.88	1.12	1.47	0.92
39	I am someone who often feels sad	2.71	2.27	2.44	2.68	1.43	0.98	1.27	0.90
40	I am someone who is complex, a deep thinker	4.02	3.59	3.15	2.75	1.08	1.06	1.26	0.99

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Table 17 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
41	I am someone who is full of energy	3.14	3.39	2.86	2.39	1.30	1.24	1.35	0.74
42	I am someone who is suspicious of others' intentions	2.75	3.91	3.38	3.61	1.30	0.83	1.50	0.68
43	I am someone who is reliable, can always be counted on	4.32	3.76	3.15	3.76	0.88	1.09	1.60	0.77
44	I am someone who keeps their emotions under control	2.22	2.92	2.92	2.36	1.14	1.08	1.45	1.05
45	I am someone who has difficulty imagining things	4.17	4.08	3.43	2.13	1.06	0.53	1.26	0.52
46	I am someone who is talkative	2.87	2.53	2.49	2.36	1.38	1.11	1.28	0.92
47	I am someone who can be cold and uncaring	3.84	4.44	3.46	4.21	1.23	0.87	1.49	0.96
48	I am someone who leaves a mess, doesn't clean up	4.15	4.25	3.23	4.06	1.12	0.95	1.65	0.83
49	I am someone who rarely feels anxious or afraid	3.44	3.12	2.73	3.66	1.37	1.12	1.38	0.88
50	I am someone who thinks poetry and plays are boring	3.66	3.85	3.14	2.31	1.37	1.31	1.54	0.70
51	I am someone who prefers to have others take charge	2.96	4.33	3.21	3.86	1.28	0.76	1.57	0.51
52	I am someone who is polite, courteous to others	4.50	4.13	3.54	4.38	0.70	0.97	1.45	0.79
53	I am someone who is persistent, works until the task is finished	4.28	3.87	3.12	3.76	0.91	1.13	1.48	0.95
54	I am someone who tends to feel depressed, blue	2.65	2.01	2.39	2.76	1.46	1.07	1.38	0.98
55	I am someone who has little interest in abstract ideas	3.83	3.40	2.92	2.17	1.22	1.08	1.36	0.65
56	I am someone who shows a lot of enthusiasm	3.35	4.08	2.79	2.58	1.22	1.09	1.51	0.93
57	I am someone who assumes the best about people	3.37	3.40	3.11	3.63	1.28	0.98	1.47	0.75
58	I am someone who sometimes behaves irresponsibly	3.64	3.44	3.20	3.57	1.30	1.13	1.40	0.96
59	I am someone who is temperamental, gets emotional easily	2.53	2.33	2.66	2.04	1.33	1.08	1.52	0.89

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Table 17 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
60	I am someone who is original, comes up with new ideas	3.84	3.25	2.88	2.39	1.07	1.13	1.40	0.72
Facet Level									
1	Sociability	2.65	3.04	2.88	2.44	1.17	0.98	1.00	0.73
2	Assertiveness	2.98	3.33	2.87	2.61	1.04	0.82	1.22	0.41
3	Energy Level	3.35	3.88	2.94	2.51	0.95	0.88	1.19	0.64
4	Compassion	4.02	4.16	3.34	3.80	0.81	0.81	1.37	0.76
5	Respectfulness	4.29	4.39	3.61	4.27	0.70	0.74	1.34	0.68
6	Trust	3.31	3.78	3.30	3.64	1.00	0.67	1.35	0.61
7	Organization	3.86	3.24	2.93	3.13	1.01	0.79	1.19	0.68
8	Productiveness	3.86	3.85	3.22	3.36	0.91	0.87	1.29	0.69
9	Responsibility	3.96	3.52	3.11	3.62	0.84	0.95	1.26	0.74
10	Anxiety	3.15	2.96	2.91	3.11	1.11	0.89	1.06	0.75
11	Depression	2.51	2.20	2.61	2.61	1.14	0.89	1.28	0.80
12	Emotional Volatility	2.44	2.61	2.77	2.35	1.10	0.92	1.26	0.88
13	Intellectual Curiosity	4.05	3.51	3.08	2.65	0.83	0.96	1.24	0.71
14	Aesthetic Sensitivity	3.89	3.47	3.00	2.68	1.01	1.09	1.26	0.83
15	Creative Imagination	3.96	3.73	3.16	2.43	0.88	0.74	1.17	0.59
Domain Level									
1	Extraversion	2.99	3.42	2.90	2.52	0.85	0.81	1.00	0.52
2	Agreeableness	3.87	4.11	3.41	3.90	0.69	0.70	1.29	0.62
3	Conscientiousness	3.89	3.54	3.08	3.37	0.80	0.79	1.16	0.65
4	Neuroticism	2.70	2.59	2.77	2.69	1.02	0.81	1.10	0.72
5	Openness	3.97	3.57	3.08	2.59	0.76	0.78	1.15	0.59

Table 18: GPT-4o-mini descriptive statistics results.

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
Item Level									
1	I am someone who is outgoing, sociable	3.02	2.90	3.15	2.64	1.40	0.98	1.31	0.96
2	I am someone who is compassionate, has a soft heart	4.34	3.94	3.58	4.11	0.90	0.86	1.23	0.96
3	I am someone who tends to be disorganized	3.62	3.42	3.05	3.12	1.36	0.83	1.34	0.69
4	I am someone who is relaxed, handles stress well	2.56	2.82	2.63	2.96	1.30	0.78	1.25	0.90
5	I am someone who has few artistic interests	3.68	4.05	3.14	2.94	1.33	0.89	1.34	1.10

Continued on next page

Table 18 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
6	I am someone who has an assertive personality	2.96	2.98	3.12	2.55	1.38	0.76	1.22	0.74
7	I am someone who is respectful, treats others with respect	4.62	4.70	4.06	4.56	0.61	0.59	1.21	0.73
8	I am someone who tends to be lazy	3.62	3.94	3.29	3.56	1.31	0.72	1.36	0.73
9	I am someone who stays optimistic after experiencing a setback	2.43	2.34	2.36	2.26	1.24	0.70	1.25	0.92
10	I am someone who is curious about many different things	4.43	4.43	3.86	3.70	0.81	0.74	1.26	0.96
11	I am someone who rarely feels excited or eager	3.54	4.06	3.09	3.20	1.26	0.73	1.46	0.80
12	I am someone who tends to find fault with others	3.34	4.00	3.45	3.79	1.32	0.44	1.37	0.57
13	I am someone who is dependable, steady	4.33	3.78	3.62	4.27	0.86	0.84	1.36	0.78
14	I am someone who is moody, has up and down mood swings	2.56	2.80	2.63	3.02	1.36	0.66	1.38	0.78
15	I am someone who is inventive, finds clever ways to do things	3.90	3.62	3.45	3.07	1.03	0.67	1.20	0.63
16	I am someone who tends to be quiet	2.35	3.21	2.84	2.22	1.34	0.89	1.15	0.97
17	I am someone who feels little sympathy for others	3.71	4.68	3.51	4.23	1.45	0.60	1.52	0.63
18	I am someone who is systematic, likes to keep things in order	3.96	3.06	3.21	3.16	1.06	0.96	1.33	0.94
19	I am someone who can be tense	3.29	3.49	3.30	3.78	1.27	0.60	1.00	0.77
20	I am someone who is fascinated by art, music, or literature	4.06	3.49	3.53	3.38	1.16	1.04	1.23	1.18
21	I am someone who is dominant, acts as a leader	2.90	2.58	2.93	2.39	1.35	0.80	1.25	0.66
22	I am someone who starts arguments with others	4.23	4.87	4.05	4.48	1.05	0.38	1.34	0.57
23	I am someone who has difficulty getting started on tasks	3.31	3.04	2.85	2.85	1.39	0.70	1.25	0.50

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Table 18 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
24	I am someone who feels secure, comfortable with self	2.26	2.63	2.37	2.65	1.27	0.78	1.20	0.92
25	I am someone who avoids intellectual, philosophical discussions	3.94	3.61	2.95	2.69	1.21	0.87	1.45	0.94
26	I am someone who is less active than other people	3.35	3.36	2.79	2.55	1.31	0.95	1.20	0.83
27	I am someone who has a forgiving nature	3.79	3.58	3.51	3.56	1.20	0.63	1.11	0.82
28	I am someone who can be somewhat careless	3.56	3.32	2.87	3.07	1.25	0.72	1.11	0.65
29	I am someone who is emotionally stable, not easily upset	2.44	2.69	2.31	2.71	1.27	0.81	1.22	1.03
30	I am someone who has little creativity	3.95	4.38	3.29	3.39	1.20	0.69	1.43	0.75
31	I am someone who is sometimes shy, introverted	2.35	2.85	2.86	2.11	1.36	0.81	1.11	0.98
32	I am someone who is helpful and unselfish with others	4.18	3.96	3.75	4.34	0.88	0.72	1.24	0.77
33	I am someone who keeps things neat and tidy	3.71	3.03	3.42	3.10	1.24	0.91	1.26	0.71
34	I am someone who worries a lot	3.30	2.97	2.93	3.72	1.47	0.78	1.25	1.07
35	I am someone who values art and beauty	4.16	3.64	3.61	3.36	1.07	0.99	1.25	0.94
36	I am someone who finds it hard to influence people	3.09	3.06	2.68	2.68	1.20	0.68	1.08	0.58
37	I am someone who is sometimes rude to others	3.79	4.26	3.68	3.91	1.25	0.66	1.39	0.66
38	I am someone who is efficient, gets things done	4.23	3.67	3.68	3.82	0.88	0.84	1.17	0.83
39	I am someone who often feels sad	2.71	2.56	2.67	3.39	1.43	0.71	1.14	0.82
40	I am someone who is complex, a deep thinker	4.02	3.66	3.53	3.45	1.08	0.69	0.97	0.87
41	I am someone who is full of energy	3.14	3.31	3.09	2.75	1.30	0.94	1.29	0.80
42	I am someone who is suspicious of others' intentions	2.75	3.54	3.19	3.35	1.30	0.68	1.32	0.93
43	I am someone who is reliable, can always be counted on	4.32	3.84	3.85	4.21	0.88	0.83	1.20	0.81

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Table 18 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
44	I am someone who keeps their emotions under control	2.22	2.55	2.45	2.46	1.14	0.70	1.24	0.78
45	I am someone who has difficulty imagining things	4.17	3.96	3.20	3.10	1.06	0.59	1.32	0.73
46	I am someone who is talkative	2.87	2.89	3.03	3.07	1.38	0.78	1.21	0.95
47	I am someone who can be cold and uncaring	3.84	3.93	3.33	3.98	1.23	0.64	1.41	0.84
48	I am someone who leaves a mess, doesn't clean up	4.15	4.37	3.18	3.63	1.12	0.91	1.65	0.53
49	I am someone who rarely feels anxious or afraid	3.44	3.47	2.41	3.58	1.37	0.73	1.16	0.89
50	I am someone who thinks poetry and plays are boring	3.66	3.77	3.17	2.76	1.37	0.79	1.41	0.61
51	I am someone who prefers to have others take charge	2.96	3.34	2.49	3.21	1.28	0.79	1.27	0.72
52	I am someone who is polite, courteous to others	4.50	4.31	3.92	4.20	0.70	0.81	1.24	0.81
53	I am someone who is persistent, works until the task is finished	4.28	4.15	3.67	4.24	0.91	0.83	1.18	0.84
54	I am someone who tends to feel depressed, blue	2.65	2.45	2.56	3.40	1.46	0.72	1.26	0.89
55	I am someone who has little interest in abstract ideas	3.83	3.31	2.89	2.63	1.22	1.10	1.39	1.12
56	I am someone who shows a lot of enthusiasm	3.35	3.77	3.42	2.81	1.22	0.93	1.35	0.92
57	I am someone who assumes the best about people	3.37	3.54	3.72	3.48	1.28	0.75	1.23	0.95
58	I am someone who sometimes behaves irresponsibly	3.64	3.27	3.00	3.12	1.30	0.73	1.14	0.66
59	I am someone who is temperamental, gets emotional easily	2.53	2.86	2.71	2.82	1.33	0.71	1.32	0.84
60	I am someone who is original, comes up with new ideas	3.84	3.55	3.56	3.07	1.07	0.73	1.19	0.68
Facet Level									
1	Sociability	2.65	2.96	2.97	2.51	1.17	0.71	0.90	0.87
2	Assertiveness	2.98	2.99	2.81	2.71	1.04	0.63	0.93	0.54
3	Energy Level	3.35	3.62	3.10	2.83	0.95	0.77	1.09	0.72
4	Compassion	4.02	4.13	3.54	4.17	0.81	0.59	1.16	0.70
5	Respectfulness	4.29	4.54	3.93	4.29	0.70	0.50	1.10	0.56

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Table 18 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
6	Trust	3.31	3.66	3.47	3.55	1.00	0.51	1.05	0.70
7	Organization	3.86	3.47	3.21	3.25	1.01	0.74	0.99	0.61
8	Productiveness	3.86	3.70	3.37	3.62	0.91	0.66	1.01	0.61
9	Responsibility	3.96	3.55	3.34	3.67	0.84	0.67	0.94	0.62
10	Anxiety	3.15	3.19	2.82	3.51	1.11	0.55	0.79	0.78
11	Depression	2.51	2.49	2.49	2.92	1.14	0.61	0.97	0.78
12	Emotional Volatility	2.44	2.73	2.53	2.75	1.10	0.59	0.98	0.74
13	Intellectual Curiosity	4.05	3.75	3.31	3.12	0.83	0.67	0.97	0.84
14	Aesthetic Sensitivity	3.89	3.74	3.36	3.11	1.01	0.79	1.13	0.83
15	Creative Imagination	3.96	3.88	3.38	3.16	0.88	0.54	1.01	0.59
Domain Level									
1	Extraversion	2.99	3.19	2.96	2.68	0.85	0.64	0.86	0.63
2	Agreeableness	3.87	4.11	3.65	4.00	0.69	0.50	1.05	0.60
3	Conscientiousness	3.89	3.58	3.31	3.51	0.80	0.64	0.92	0.56
4	Neuroticism	2.70	2.80	2.61	3.06	1.02	0.52	0.83	0.70
5	Openness	3.97	3.79	3.35	3.13	0.76	0.59	1.00	0.65

Table 19: GPT-4o descriptive statistics results.

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
Item Level									
1	I am someone who is outgoing, sociable	3.02	3.41	2.76	2.67	1.40	0.87	1.22	0.96
2	I am someone who is compassionate, has a soft heart	4.34	3.51	3.10	4.07	0.90	0.84	1.22	0.93
3	I am someone who tends to be disorganized	3.62	3.39	3.32	3.34	1.36	0.78	1.17	0.76
4	I am someone who is relaxed, handles stress well	2.56	3.20	3.47	2.92	1.30	0.79	1.16	0.94
5	I am someone who has few artistic interests	3.68	3.72	3.27	2.79	1.33	1.04	1.25	1.38
6	I am someone who has an assertive personality	2.96	3.08	2.82	2.57	1.38	0.79	1.18	0.77
7	I am someone who is respectful, treats others with respect	4.62	3.38	3.48	4.15	0.61	0.89	1.23	0.76
8	I am someone who tends to be lazy	3.62	4.00	3.51	3.56	1.31	0.87	1.28	0.79
9	I am someone who stays optimistic after experiencing a setback	2.43	2.74	2.95	2.19	1.24	0.84	1.34	0.91

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Table 19 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
10	I am someone who is curious about many different things	4.43	4.43	3.86	3.70	0.81	0.74	1.26	0.96
11	I am someone who rarely feels excited or eager	3.54	4.06	3.09	3.20	1.26	0.73	1.46	0.80
12	I am someone who tends to find fault with others	3.34	4.00	3.45	3.79	1.32	0.44	1.37	0.57
13	I am someone who is dependable, steady	4.33	3.78	3.62	4.27	0.86	0.84	1.36	0.78
14	I am someone who is moody, has up and down mood swings	2.56	2.80	2.63	3.02	1.36	0.66	1.38	0.78
15	I am someone who is inventive, finds clever ways to do things	3.90	3.62	3.45	3.07	1.03	0.67	1.20	0.63
16	I am someone who tends to be quiet	2.35	3.21	2.84	2.22	1.34	0.89	1.15	0.97
17	I am someone who feels little sympathy for others	3.71	4.68	3.51	4.24	1.45	0.60	1.52	0.63
18	I am someone who is systematic, likes to keep things in order	3.96	3.06	3.21	3.16	1.06	0.96	1.33	0.94
19	I am someone who can be tense	3.29	3.49	3.30	3.78	1.27	0.60	1.00	0.77
20	I am someone who is fascinated by art, music, or literature	4.06	3.49	3.53	3.38	1.16	1.04	1.23	1.18
21	I am someone who is dominant, acts as a leader	2.90	2.94	2.77	2.42	1.35	0.74	1.13	0.70
22	I am someone who starts arguments with others	4.23	3.65	3.65	4.43	1.05	0.72	1.24	0.71
23	I am someone who has difficulty getting started on tasks	3.31	3.29	3.16	3.11	1.39	0.69	1.26	0.73
24	I am someone who feels secure, comfortable with self	2.26	2.75	3.14	2.67	1.27	0.88	1.42	0.98
25	I am someone who avoids intellectual, philosophical discussions	3.94	3.40	3.23	2.83	1.21	0.79	1.25	1.11
26	I am someone who is less active than other people	3.35	3.80	3.36	2.65	1.31	0.99	1.24	0.97
27	I am someone who has a forgiving nature	3.79	3.05	3.05	3.51	1.20	0.57	1.20	0.86
28	I am someone who can be somewhat careless	3.56	3.30	3.16	3.06	1.25	0.83	1.18	0.67

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Table 19 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
29	I am someone who is emotionally stable, not easily upset	2.44	3.16	3.17	2.72	1.27	0.70	1.31	1.06
30	I am someone who has little creativity	3.95	4.10	3.59	3.38	1.20	0.76	1.22	0.84
31	I am someone who is sometimes shy, introverted	2.35	2.85	2.86	2.13	1.36	0.87	1.07	1.04
32	I am someone who is helpful and unselfish with others	4.18	3.32	3.27	4.07	0.88	0.80	1.21	0.74
33	I am someone who keeps things neat and tidy	3.71	2.99	3.07	3.06	1.24	0.64	1.09	0.74
34	I am someone who worries a lot	3.30	2.96	2.79	3.65	1.47	0.70	1.23	1.18
35	I am someone who values art and beauty	4.16	3.65	3.61	3.36	1.07	0.82	1.18	1.00
36	I am someone who finds it hard to influence people	3.09	3.32	3.25	2.74	1.20	0.68	1.26	0.69
37	I am someone who is sometimes rude to others	3.79	3.24	3.50	3.68	1.25	0.66	1.31	0.78
38	I am someone who is efficient, gets things done	4.23	3.31	3.07	3.70	0.88	0.82	1.25	0.82
39	I am someone who often feels sad	2.71	2.56	2.67	3.39	1.43	0.71	1.14	0.82
40	I am someone who is complex, a deep thinker	4.02	3.66	3.53	3.45	1.08	0.69	0.97	0.87
41	I am someone who is full of energy	3.14	3.45	2.99	2.83	1.30	0.94	1.23	0.87
42	I am someone who is suspicious of others' intentions	2.75	3.14	3.27	3.42	1.30	0.58	1.26	0.99
43	I am someone who is reliable, can always be counted on	4.32	3.84	3.85	4.21	0.88	0.83	1.20	0.81
44	I am someone who keeps their emotions under control	2.22	2.55	2.45	2.46	1.14	0.70	1.24	0.78
45	I am someone who has difficulty imagining things	4.17	4.06	3.57	3.23	1.06	0.77	1.25	0.95
46	I am someone who is talkative	2.87	3.11	2.87	3.31	1.38	0.70	1.04	1.09
47	I am someone who can be cold and uncaring	3.84	3.95	3.60	4.08	1.23	0.80	1.35	0.79
48	I am someone who leaves a mess, doesn't clean up	4.15	3.47	3.39	3.31	1.12	0.71	1.26	0.55

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Table 19 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
49	I am someone who rarely feels anxious or afraid	3.44	3.20	2.85	3.50	1.37	0.83	1.15	1.02
50	I am someone who thinks poetry and plays are boring	3.66	3.54	3.44	2.93	1.37	0.75	1.38	0.89
51	I am someone who prefers to have others take charge	2.96	3.54	3.39	3.51	1.28	0.69	1.27	0.71
52	I am someone who is polite, courteous to others	4.50	3.28	3.33	3.96	0.70	0.65	1.14	0.75
53	I am someone who is persistent, works until the task is finished	4.28	3.56	3.01	4.09	0.91	0.87	1.26	0.80
54	I am someone who tends to feel depressed, blue	2.65	2.70	2.60	3.28	1.46	0.79	1.31	1.07
55	I am someone who has little interest in abstract ideas	3.83	3.25	3.08	2.55	1.22	0.96	1.22	1.17
56	I am someone who shows a lot of enthusiasm	3.35	3.86	2.81	2.70	1.22	0.85	1.34	0.85
57	I am someone who assumes the best about people	3.37	3.54	3.72	3.48	1.28	0.75	1.23	0.95
58	I am someone who sometimes behaves irresponsibly	3.64	3.27	3.00	3.12	1.30	0.74	1.14	0.66
59	I am someone who is temperamental, gets emotional easily	2.53	2.86	2.71	2.82	1.33	0.71	1.32	0.84
60	I am someone who is original, comes up with new ideas	3.84	3.28	2.96	3.07	1.07	0.73	1.19	0.68
Facet Level									
1	Sociability	2.65	3.26	2.94	2.57	1.17	0.69	0.95	0.91
2	Assertiveness	2.98	3.22	3.06	2.81	1.04	0.55	1.10	0.57
3	Energy Level	3.35	3.85	3.09	2.79	0.95	0.75	1.12	0.78
4	Compassion	4.02	3.63	3.42	4.11	0.81	0.69	1.18	0.68
5	Respectfulness	4.29	3.39	3.49	4.05	0.70	0.58	1.13	0.62
6	Trust	3.31	3.15	3.21	3.49	1.00	0.44	1.17	0.78
7	Organization	3.86	3.21	3.18	3.22	1.01	0.57	0.98	0.63
8	Productiveness	3.86	3.54	3.19	3.62	0.91	0.65	1.12	0.67
9	Responsibility	3.96	3.24	3.03	3.59	0.84	0.59	1.10	0.63
10	Anxiety	3.15	3.15	3.06	3.44	1.11	0.54	0.95	0.89
11	Depression	2.51	2.76	2.86	2.85	1.14	0.56	1.16	0.88
12	Emotional Volatility	2.44	3.07	2.92	2.82	1.10	0.43	1.06	0.78
13	Intellectual Curiosity	4.05	3.55	3.13	3.09	0.83	0.68	1.04	0.89
14	Aesthetic Sensitivity	3.89	3.63	3.25	3.15	1.01	0.75	1.12	0.97
15	Creative Imagination	3.96	3.72	3.29	3.19	0.88	0.57	1.05	0.67

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Table 19 – continued from previous page

No.	Content	μ				σ			
		Human	Persona	Shape	PSI	Human	Persona	Shape	PSI
Domain Level									
1	Extraversion	2.99	3.44	3.03	2.72	0.85	0.57	0.95	0.67
2	Agreeableness	3.87	3.39	3.37	3.89	0.69	0.51	1.11	0.62
3	Conscientiousness	3.89	3.33	3.13	3.47	0.80	0.53	1.00	0.58
4	Neuroticism	2.70	2.99	2.94	3.04	1.02	0.43	0.97	0.77
5	Openness	3.97	3.63	3.22	3.14	0.76	0.58	1.03	0.73

Model	Method	Item		Facet		Domain	
		$\mu_{MAE} \downarrow$	$\sigma_{MAE} \downarrow$	$\mu_{MAE} \downarrow$	$\sigma_{MAE} \downarrow$	$\mu_{MAE} \downarrow$	$\sigma_{MAE} \downarrow$
Mistral-7B	Persona	0.42	0.46	0.31	0.41	0.28	0.36
	Shape	0.40	0.25	0.31	0.18	0.25	0.13
	PSI	0.51	0.43	0.32	0.33	0.29	0.26
Gemma-2-9B	Persona	0.51	0.62	0.48	0.49	0.49	0.41
	Shape	0.58	0.21	0.52	0.22	0.47	0.21
	PSI	0.68	0.50	0.65	0.45	0.64	0.37
Gemma-2-27B	Persona	0.42	0.59	0.37	0.47	0.35	0.39
	Shape	0.53	0.20	0.47	0.19	0.44	0.19
	PSI	0.63	0.48	0.59	0.38	0.56	0.31
Llama3-8B	Persona	0.78	0.45	0.65	0.53	0.57	0.48
	Shape	0.89	0.23	0.82	0.29	0.75	0.23
	PSI	0.64	0.53	0.54	0.44	0.54	0.36
Llama3-70B	Persona	0.51	0.26	0.33	0.15	0.31	0.06
	Shape	0.63	0.25	0.52	0.29	0.46	0.32
	PSI	0.66	0.36	0.53	0.27	0.48	0.20
GPT-4o-mini	Persona	0.33	0.44	0.21	0.33	0.21	0.25
	Shape	0.42	0.18	0.39	0.17	0.31	0.18
	PSI	0.45	0.40	0.40	0.27	0.40	0.20
GPT-4o	Persona	0.48	0.44	0.42	0.36	0.42	0.30
	Shape	0.58	0.16	0.50	0.18	0.46	0.21
	PSI	0.47	0.34	0.40	0.22	0.38	0.15

Table 20: MAE results of μ and σ for Item, Facet, and Domain across different Backbone Model + Method combinations.

Table 21: Model fit indices for BFI-2 TFMs of each domain and FFM.

Model	Chi-square	df	CFI	TLI	RMSEA	SRMR
Extraversion TFM						
Mistral-7B+Persona	188.882	51	0.873	0.836	0.095	0.066
Mistral-7B+Shape	676.095	51	0.781	0.717	0.202	0.095
Mistral-7B+PSI	395.981	51	0.828	0.778	0.138	0.079
Gemma-2-9B+Persona	254.304	51	0.880	0.845	0.115	0.074
Gemma-2-9B+Shape	1084.518	51	0.695	0.605	0.260	0.113
Gemma-2-9B+PSI	267.081	51	0.884	0.850	0.109	0.080
Gemma-2-27B+Persona	353.266	51	0.860	0.818	0.141	0.073
Gemma-2-27B+Shape	1101.801	51	0.744	0.668	0.262	0.154
Gemma-2-27B+PSI	290.205	51	0.900	0.871	0.115	0.057
Llama3-8B+Persona	430.846	51	0.556	0.425	0.158	0.166
Llama3-8B+Shape	553.196	51	0.607	0.492	0.181	0.151
Llama3-8B+PSI	275.953	51	0.899	0.869	0.111	0.055
Llama3-70B+Persona	316.715	51	0.885	0.851	0.132	0.060
Llama3-70B+Shape	944.452	51	0.681	0.588	0.242	0.130
Llama3-70B+PSI	367.869	51	0.815	0.761	0.132	0.074
GPT-4o-mini+Persona	362.974	51	0.874	0.837	0.143	0.065
GPT-4o-mini+Shape	1674.008	51	0.504	0.359	0.326	0.264
GPT-4o-mini+PSI	369.695	51	0.898	0.868	0.132	0.063
GPT-4o+Persona	261.099	51	0.886	0.852	0.117	0.058
GPT-4o+Shape	663.947	51	0.823	0.771	0.200	0.101
GPT-4o+PSI	376.669	51	0.895	0.864	0.134	0.055
Human	994.226	51	0.892	0.861	0.109	0.057
Agreeableness TFM						
Mistral-7B+Persona	294.949	51	0.818	0.764	0.126	0.091
Mistral-7B+Shape	578.669	51	0.802	0.744	0.186	0.102
Mistral-7B+PSI	298.885	51	0.908	0.881	0.117	0.061
Gemma-2-9B+Persona	355.402	51	0.853	0.810	0.141	0.073
Gemma-2-9B+Shape	771.602	51	0.881	0.845	0.217	0.042
Gemma-2-9B+PSI	257.858	51	0.914	0.889	0.107	0.067
Gemma-2-27B+Persona	377.813	51	0.863	0.823	0.146	0.068
Gemma-2-27B+Shape	865.382	51	0.863	0.823	0.231	0.058
Gemma-2-27B+PSI	347.315	51	0.900	0.870	0.128	0.065
Llama3-8B+Persona	588.254	51	0.655	0.554	0.187	0.179
Llama3-8B+Shape	1183.880	51	0.557	0.426	0.272	0.222
Llama3-8B+PSI	241.972	51	0.898	0.868	0.102	0.071
Llama3-70B+Persona	616.199	51	0.798	0.739	0.192	0.088
Llama3-70B+Shape	884.948	51	0.841	0.794	0.233	0.069
Llama3-70B+PSI	295.615	51	0.924	0.901	0.116	0.048
GPT-4o-mini+Persona	340.628	51	0.884	0.849	0.138	0.075
GPT-4o-mini+Shape	1213.078	51	0.731	0.652	0.276	0.154
GPT-4o-mini+PSI	212.855	51	0.948	0.933	0.094	0.046
GPT-4o+Persona	210.863	51	0.900	0.870	0.102	0.062
GPT-4o+Shape	525.799	51	0.909	0.882	0.176	0.039
GPT-4o+PSI	182.956	51	0.957	0.945	0.085	0.045

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Table 21 – continued from previous page

Model	Chi-square	df	CFI	TLI	RMSEA	SRMR
Human	903.288	51	0.875	0.838	0.104	0.060
Conscientiousness TFM						
Mistral-7B+Persona	415.371	51	0.809	0.753	0.154	0.103
Mistral-7B+Shape	979.589	51	0.730	0.650	0.246	0.144
Mistral-7B+PSI	501.680	51	0.811	0.755	0.157	0.092
Gemma-2-9B+Persona	580.705	51	0.751	0.678	0.186	0.114
Gemma-2-9B+Shape	1592.597	51	0.653	0.551	0.317	0.122
Gemma-2-9B+PSI	330.247	51	0.848	0.804	0.124	0.087
Gemma-2-27B+Persona	445.890	51	0.837	0.789	0.161	0.080
Gemma-2-27B+Shape	1666.873	51	0.678	0.584	0.325	0.114
Gemma-2-27B+PSI	354.743	51	0.861	0.821	0.129	0.075
Llama3-8B+Persona	357.786	51	0.783	0.719	0.142	0.117
Llama3-8B+Shape	987.900	51	0.568	0.441	0.247	0.215
Llama3-8B+PSI	437.070	51	0.805	0.748	0.146	0.114
Llama3-70B+Persona	705.359	51	0.768	0.699	0.207	0.109
Llama3-70B+Shape	1498.095	51	0.645	0.541	0.308	0.192
Llama3-70B+PSI	467.824	51	0.850	0.806	0.151	0.062
GPT-4o-mini+Persona	625.986	51	0.810	0.755	0.194	0.080
GPT-4o-mini+Shape	1215.114	51	0.614	0.500	0.276	0.200
GPT-4o-mini+PSI	396.471	51	0.882	0.848	0.138	0.056
GPT-4o+Persona	385.339	51	0.780	0.716	0.148	0.088
GPT-4o+Shape	705.340	51	0.826	0.775	0.207	0.069
GPT-4o+PSI	411.654	51	0.883	0.849	0.141	0.057
Human	1045.113	51	0.897	0.867	0.112	0.058
Neuroticism TFM						
Mistral-7B+Persona	530.516	51	0.585	0.462	0.177	0.158
Mistral-7B+Shape	557.616	51	0.810	0.754	0.182	0.095
Mistral-7B+PSI	431.937	51	0.841	0.794	0.145	0.066
Gemma-2-9B+Persona	469.967	51	0.816	0.762	0.165	0.096
Gemma-2-9B+Shape	1072.848	51	0.718	0.635	0.258	0.134
Gemma-2-9B+PSI	611.373	51	0.787	0.724	0.175	0.094
Gemma-2-27B+Persona	598.476	51	0.743	0.668	0.189	0.118
Gemma-2-27B+Shape	759.167	51	0.839	0.791	0.215	0.085
Gemma-2-27B+PSI	478.337	51	0.836	0.787	0.153	0.082
Llama3-8B+Persona	540.289	51	0.586	0.464	0.179	0.150
Llama3-8B+Shape	956.346	51	0.545	0.412	0.243	0.257
Llama3-8B+PSI	522.249	51	0.814	0.760	0.161	0.081
Llama3-70B+Persona	346.207	51	0.884	0.850	0.139	0.059
Llama3-70B+Shape	808.502	51	0.776	0.710	0.223	0.099
Llama3-70B+PSI	525.423	51	0.855	0.812	0.161	0.065
GPT-4o-mini+Persona	477.940	51	0.803	0.745	0.167	0.076
GPT-4o-mini+Shape	856.807	51	0.667	0.569	0.229	0.151
GPT-4o-mini+PSI	539.536	51	0.872	0.834	0.164	0.070
GPT-4o+Persona	304.611	51	0.756	0.684	0.129	0.091
GPT-4o+Shape	960.437	51	0.720	0.638	0.244	0.099
GPT-4o+PSI	541.928	51	0.874	0.837	0.164	0.069

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Table 21 – continued from previous page

Model	Chi-square	df	CFI	TLI	RMSEA	SRMR
Human	927.971	51	0.931	0.911	0.105	0.052
Openness TFM						
Mistral-7B+Persona	316.958	51	0.748	0.674	0.132	0.119
Mistral-7B+Shape	962.242	51	0.653	0.551	0.244	0.149
Mistral-7B+PSI	455.750	51	0.722	0.640	0.149	0.114
Gemma-2-9B+Persona	313.753	51	0.772	0.704	0.131	0.103
Gemma-2-9B+Shape	737.946	51	0.837	0.789	0.212	0.055
Gemma-2-9B+PSI	380.816	51	0.748	0.674	0.135	0.105
Gemma-2-27B+Persona	381.298	51	0.823	0.771	0.147	0.103
Gemma-2-27B+Shape	702.555	51	0.862	0.821	0.206	0.051
Gemma-2-27B+PSI	471.557	51	0.831	0.781	0.152	0.116
Llama3-8B+Persona	211.861	51	0.806	0.749	0.103	0.087
Llama3-8B+Shape	825.535	51	0.637	0.530	0.225	0.209
Llama3-8B+PSI	318.777	51	0.889	0.856	0.121	0.070
Llama3-70B+Persona	256.032	51	0.904	0.876	0.116	0.077
Llama3-70B+Shape	562.061	51	0.864	0.823	0.183	0.057
Llama3-70B+PSI	408.648	51	0.853	0.810	0.140	0.117
GPT-4o-mini+Persona	257.955	51	0.899	0.869	0.116	0.068
GPT-4o-mini+Shape	1464.309	51	0.656	0.555	0.304	0.201
GPT-4o-mini+PSI	307.850	51	0.914	0.889	0.119	0.067
GPT-4o+Persona	226.649	51	0.910	0.883	0.107	0.057
GPT-4o+Shape	502.104	51	0.878	0.842	0.172	0.055
GPT-4o+PSI	350.639	51	0.909	0.882	0.128	0.069
Human	904.843	51	0.900	0.870	0.104	0.064
FFM						
Mistral-7B+Persona	560.227	80	0.802	0.740	0.141	0.088
Mistral-7B+Shape	1457.055	80	0.756	0.680	0.240	0.115
Mistral-7B+PSI	1067.765	80	0.773	0.701	0.186	0.111
Gemma-2-9B+Persona	731.270	80	0.790	0.725	0.165	0.107
Gemma-2-9B+Shape	2336.944	80	0.696	0.601	0.307	0.144
Gemma-2-9B+PSI	627.697	80	0.836	0.784	0.138	0.084
Gemma-2-27B+Persona	756.777	80	0.821	0.765	0.168	0.093
Gemma-2-27B+Shape	2325.784	80	0.714	0.624	0.306	0.139
Gemma-2-27B+PSI	706.399	80	0.836	0.784	0.148	0.101
Llama3-8B+Persona	302.351	80	0.849	0.802	0.096	0.078
Llama3-8B+Shape	839.663	80	0.784	0.716	0.178	0.113
Llama3-8B+PSI	868.954	80	0.782	0.714	0.166	0.117
Llama3-70B+Persona	954.848	80	0.780	0.711	0.191	0.120
Llama3-70B+Shape	1996.472	80	0.720	0.633	0.283	0.148
Llama3-70B+PSI	901.061	80	0.788	0.722	0.170	0.112
GPT-4o-mini+Persona	1079.430	80	0.779	0.710	0.204	0.108
GPT-4o-mini+Shape	1350.813	80	0.797	0.734	0.230	0.104
GPT-4o-mini+PSI	1144.935	80	0.760	0.685	0.193	0.120
GPT-4o+Persona	551.459	80	0.819	0.762	0.140	0.097
GPT-4o+Shape	2132.208	80	0.711	0.621	0.292	0.143
GPT-4o+PSI	1029.123	80	0.776	0.706	0.182	0.120

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Table 21 – continued from previous page

Model	Chi-square	df	CFI	TLI	RMSEA	SRMR
Human	1747.433	80	0.852	0.806	0.116	0.080

Table 22: Tucker’s congruence coefficient for BFI-2 TFM of Extraversion.

Model	Sociability	Assertiveness	Energy Level
Mistral-7B+Persona	0.91	0.92	0.98
Mistral-7B+Shape	0.99	0.94	0.95
Mistral-7B+PSI	1.00	0.96	0.99
Gemma-2-9B+Persona	1.00	0.97	1.00
Gemma-2-9B+Shape	0.97	0.86	0.97
Gemma-2-9B+PSI	1.00	0.97	0.86
Gemma-2-27B+Persona	1.00	0.97	0.98
Gemma-2-27B+Shape	1.00	0.97	0.97
Gemma-2-27B+PSI	1.00	0.92	0.98
Llama3-8B+Persona	-0.78	0.55	0.71
Llama3-8B+Shape	-0.81	0.79	-0.80
Llama3-8B+PSI	1.00	0.98	0.98
Llama3-70B+Persona	0.99	0.98	0.98
Llama3-70B+Shape	0.99	0.97	0.96
Llama3-70B+PSI	1.00	0.95	0.99
GPT-4o-mini+Persona	1.00	0.99	0.99
GPT-4o-mini+Shape	0.91	0.95	1.00
GPT-4o-mini+PSI	1.00	0.99	0.98
GPT-4o+Persona	1.00	0.97	0.98
GPT-4o+Shape	1.00	0.99	0.97
GPT-4o+PSI	1.00	0.98	0.98

Table 23: Tucker’s congruence coefficient for BFI-2 TFM of Agreeableness.

Model	Compassion	Respectfulness	Trust
Mistral-7B+Persona	0.95	0.98	0.92
Mistral-7B+Shape	0.92	0.97	0.96
Mistral-7B+PSI	0.99	0.97	0.98
Gemma-2-9B+Persona	0.97	0.99	0.97
Gemma-2-9B+Shape	0.96	1.00	1.00
Gemma-2-9B+PSI	0.99	0.90	-0.87
Gemma-2-27B+Persona	0.97	0.99	1.00
Gemma-2-27B+Shape	0.97	1.00	0.99
Gemma-2-27B+PSI	0.96	0.98	1.00
Llama3-8B+Persona	0.86	0.71	-0.60
Llama3-8B+Shape	0.96	0.93	0.94
Llama3-8B+PSI	0.99	0.94	0.97
Llama3-70B+Persona	0.96	1.00	0.99
Llama3-70B+Shape	0.95	1.00	0.99
Llama3-70B+PSI	1.00	0.99	1.00

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Table 23 – continued

Model	Compassion	Respectfulness	Trust
GPT-4o-mini+Persona	0.98	0.99	0.98
GPT-4o-mini+Shape	0.91	0.98	0.94
GPT-4o-mini+PSI	0.97	0.97	1.00
GPT-4o+Persona	0.95	1.00	0.98
GPT-4o+Shape	0.97	1.00	1.00
GPT-4o+PSI	0.98	0.98	1.00

Table 24: Tucker’s congruence coefficient for BFI-2 TFM of Conscientiousness.

Model	Organization	Productiveness	Responsibility
Mistral-7B+Persona	0.98	0.99	0.95
Mistral-7B+Shape	0.93	0.99	0.97
Mistral-7B+PSI	0.98	0.99	0.98
Gemma-2-9B+Persona	0.98	0.95	0.98
Gemma-2-9B+Shape	0.99	1.00	0.99
Gemma-2-9B+PSI	0.81	0.98	0.94
Gemma-2-27B+Persona	0.99	0.99	0.99
Gemma-2-27B+Shape	0.98	1.00	0.99
Gemma-2-27B+PSI	0.99	1.00	0.97
Llama3-8B+Persona	-0.43	0.33	0.51
Llama3-8B+Shape	0.81	0.82	0.86
Llama3-8B+PSI	0.89	0.99	0.97
Llama3-70B+Persona	1.00	0.99	0.97
Llama3-70B+Shape	0.96	0.99	0.96
Llama3-70B+PSI	1.00	0.97	1.00
GPT-4o-mini+Persona	1.00	0.99	0.99
GPT-4o-mini+Shape	0.90	0.98	0.96
GPT-4o-mini+PSI	1.00	1.00	1.00
GPT-4o+Persona	0.99	0.99	0.99
GPT-4o+Shape	0.99	0.99	0.99
GPT-4o+PSI	0.99	1.00	1.00

Table 25: Tucker’s congruence coefficient for BFI-2 TFM of Neuroticism.

Model	Anxiety	Depression	Emotional Volatility
Mistral-7B+Persona	0.91	0.93	0.88
Mistral-7B+Shape	0.86	1.00	0.93
Mistral-7B+PSI	0.99	0.99	1.00
Gemma-2-9B+Persona	0.99	1.00	0.99
Gemma-2-9B+Shape	0.92	1.00	0.91
Gemma-2-9B+PSI	0.99	1.00	0.98
Gemma-2-27B+Persona	0.97	1.00	1.00
Gemma-2-27B+Shape	0.85	0.99	0.97
Gemma-2-27B+PSI	0.99	0.99	0.99
Llama3-8B+Persona	0.17	0.03	-0.42

Continued on next page

Table 25 – continued

Model	Anxiety	Depression	Emotional Volatility
Llama3-8B+Shape	-0.15	0.60	0.32
Llama3-8B+PSI	0.99	1.00	0.99
Llama3-70B+Persona	0.99	0.99	1.00
Llama3-70B+Shape	0.99	0.99	0.99
Llama3-70B+PSI	1.00	1.00	1.00
GPT-4o-mini+Persona	1.00	0.99	0.99
GPT-4o-mini+Shape	0.85	0.99	0.96
GPT-4o-mini+PSI	1.00	1.00	1.00
GPT-4o+Persona	0.99	0.97	0.97
GPT-4o+Shape	0.98	0.99	0.99
GPT-4o+PSI	1.00	1.00	1.00

Table 26: Tucker’s congruence coefficient for BFI-2 TFM of Openness.

Model	Intellectual Curiosity	Aesthetic Sensitivity	Creative Imagination
Mistral-7B+Persona	1.00	0.95	0.94
Mistral-7B+Shape	0.96	0.99	0.98
Mistral-7B+PSI	0.81	0.94	0.86
Gemma-2-9B+Persona	0.96	0.94	0.87
Gemma-2-9B+Shape	0.99	0.99	0.99
Gemma-2-9B+PSI	0.96	-0.62	0.70
Gemma-2-27B+Persona	0.98	0.98	0.99
Gemma-2-27B+Shape	0.95	0.99	0.99
Gemma-2-27B+PSI	0.98	0.98	1.00
Llama3-8B+Persona	0.46	-0.70	0.34
Llama3-8B+Shape	0.69	0.94	0.72
Llama3-8B+PSI	1.00	0.98	0.98
Llama3-70B+Persona	1.00	0.98	0.98
Llama3-70B+Shape	0.98	0.98	1.00
Llama3-70B+PSI	0.98	0.97	0.96
GPT-4o-mini+Persona	0.99	1.00	0.99
GPT-4o-mini+Shape	0.93	0.93	0.91
GPT-4o-mini+PSI	1.00	0.98	1.00
GPT-4o+Persona	1.00	0.99	1.00
GPT-4o+Shape	0.99	0.99	1.00
GPT-4o+PSI	1.00	0.99	0.99

Table 28: Factor loading MAEs for BFI-2 TFM of Extraversion.

Model	Sociability	Assertiveness	Energy Level
Mistral-7B+Persona	0.09	0.08	0.04
Mistral-7B+Shape	0.03	0.07	0.07
Mistral-7B+PSI	0.02	0.07	0.02
Gemma-2-9B+Persona	0.01	0.05	0.02
Gemma-2-9B+Shape	0.04	0.10	0.07

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Table 28 – continued

Model	Sociability	Assertiveness	Energy Level
Gemma-2-9B+PSI	0.01	0.05	0.09
Gemma-2-27B+Persona	0.02	0.06	0.05
Gemma-2-27B+Shape	0.02	0.06	0.08
Gemma-2-27B+PSI	0.02	0.09	0.04
Llama3-8B+Persona	0.41	0.16	0.14
Llama3-8B+Shape	0.40	0.11	0.33
Llama3-8B+PSI	0.02	0.04	0.04
Llama3-70B+Persona	0.03	0.05	0.05
Llama3-70B+Shape	0.05	0.05	0.06
Llama3-70B+PSI	0.03	0.09	0.03
GPT-4o-mini+Persona	0.01	0.04	0.05
GPT-4o-mini+Shape	0.09	0.07	0.03
GPT-4o-mini+PSI	0.02	0.03	0.05
GPT-4o+Persona	0.01	0.06	0.05
GPT-4o+Shape	0.02	0.05	0.06
GPT-4o+PSI	0.02	0.04	0.06

Table 29: Factor loading MAEs for BFI-2 TFM of Agreeableness.

Model	Compassion	Respectfulness	Trust
Mistral-7B+Persona	0.06	0.04	0.07
Mistral-7B+Shape	0.08	0.06	0.07
Mistral-7B+PSI	0.03	0.06	0.04
Gemma-2-9B+Persona	0.06	0.02	0.05
Gemma-2-9B+Shape	0.10	0.08	0.07
Gemma-2-9B+PSI	0.05	0.09	0.42
Gemma-2-27B+Persona	0.05	0.04	0.01
Gemma-2-27B+Shape	0.10	0.08	0.06
Gemma-2-27B+PSI	0.05	0.05	0.03
Llama3-8B+Persona	0.09	0.12	0.35
Llama3-8B+Shape	0.04	0.07	0.07
Llama3-8B+PSI	0.04	0.07	0.05
Llama3-70B+Persona	0.06	0.03	0.03
Llama3-70B+Shape	0.09	0.07	0.06
Llama3-70B+PSI	0.04	0.05	0.03
GPT-4o-mini+Persona	0.06	0.04	0.04
GPT-4o-mini+Shape	0.09	0.06	0.08
GPT-4o-mini+PSI	0.07	0.05	0.03
GPT-4o+Persona	0.06	0.02	0.05
GPT-4o+Shape	0.10	0.07	0.07
GPT-4o+PSI	0.07	0.05	0.04

Table 27: Tucker’s congruence coefficient for BFI-2 FFM.

Model	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Mistral-7B+Persona	0.99	1.00	1.00	0.99	1.00
Mistral-7B+Shape	0.99	0.99	0.99	0.99	0.99
Mistral-7B+PSI	1.00	1.00	1.00	0.99	0.99
Gemma-2-9B+Persona	0.99	1.00	0.98	0.99	0.99
Gemma-2-9B+Shape	1.00	0.99	0.98	0.99	1.00
Gemma-2-9B+PSI	0.99	1.00	0.99	0.99	0.96
Gemma-2-27B+Persona	1.00	1.00	0.99	1.00	0.99
Gemma-2-27B+Shape	1.00	0.99	0.99	0.99	1.00
Gemma-2-27B+PSI	1.00	1.00	1.00	0.99	1.00
Llama3-8B+Persona	0.99	1.00	0.97	0.96	0.99
Llama3-8B+Shape	0.98	0.99	0.99	0.96	0.99
Llama3-8B+PSI	1.00	0.99	1.00	1.00	1.00
Llama3-70B+Persona	0.99	1.00	0.98	1.00	0.99
Llama3-70B+Shape	1.00	0.99	0.99	1.00	0.99
Llama3-70B+PSI	1.00	1.00	0.99	1.00	0.99
GPT-4o-mini+Persona	1.00	1.00	0.99	0.99	1.00
GPT-4o-mini+Shape	0.99	0.99	0.99	1.00	1.00
GPT-4o-mini+PSI	1.00	1.00	0.99	0.99	1.00
GPT-4o+Persona	1.00	0.99	0.99	0.99	1.00
GPT-4o+Shape	1.00	1.00	0.99	0.99	1.00
GPT-4o+PSI	1.00	1.00	0.99	0.99	1.00

Table 30: Factor loading MAEs for BFI-2 TFM of Conscientiousness.

Model	Organization	Productiveness	Responsibility
Mistral-7B+Persona	0.08	0.04	0.08
Mistral-7B+Shape	0.08	0.04	0.06
Mistral-7B+PSI	0.07	0.02	0.06
Gemma-2-9B+Persona	0.06	0.06	0.05
Gemma-2-9B+Shape	0.03	0.06	0.04
Gemma-2-9B+PSI	0.15	0.04	0.08
Gemma-2-27B+Persona	0.03	0.03	0.05
Gemma-2-27B+Shape	0.05	0.06	0.06
Gemma-2-27B+PSI	0.06	0.03	0.06
Llama3-8B+Persona	0.35	0.19	0.19
Llama3-8B+Shape	0.13	0.11	0.11
Llama3-8B+PSI	0.11	0.03	0.06
Llama3-70B+Persona	0.03	0.04	0.06
Llama3-70B+Shape	0.07	0.04	0.07
Llama3-70B+PSI	0.02	0.04	0.04
GPT-4o-mini+Persona	0.02	0.03	0.04
GPT-4o-mini+Shape	0.09	0.04	0.06
GPT-4o-mini+PSI	0.02	0.03	0.03
GPT-4o+Persona	0.05	0.02	0.03
GPT-4o+Shape	0.03	0.04	0.06
GPT-4o+PSI	0.02	0.02	0.04

Table 31: Factor loading MAEs for BFI-2 TFM of Neuroticism.

Model	Anxiety	Depression	Emotional Volatility
Mistral-7B+Persona	0.10	0.08	0.12
Mistral-7B+Shape	0.11	0.01	0.09
Mistral-7B+PSI	0.04	0.03	0.02
Gemma-2-9B+Persona	0.02	0.01	0.04
Gemma-2-9B+Shape	0.08	0.03	0.09
Gemma-2-9B+PSI	0.02	0.01	0.05
Gemma-2-27B+Persona	0.06	0.01	0.02
Gemma-2-27B+Shape	0.10	0.05	0.06
Gemma-2-27B+PSI	0.05	0.03	0.03
Llama3-8B+Persona	0.23	0.23	0.34
Llama3-8B+Shape	0.28	0.17	0.23
Llama3-8B+PSI	0.02	0.02	0.04
Llama3-70B+Persona	0.03	0.03	0.01
Llama3-70B+Shape	0.03	0.03	0.03
Llama3-70B+PSI	0.02	0.02	0.02
GPT-4o-mini+Persona	0.03	0.04	0.03
GPT-4o-mini+Shape	0.11	0.02	0.07
GPT-4o-mini+PSI	0.02	0.02	0.01
GPT-4o+Persona	0.06	0.07	0.09
GPT-4o+Shape	0.04	0.03	0.04
GPT-4o+PSI	0.02	0.02	0.01

Table 32: Factor loading MAEs for BFI-2 TFM of Openness.

Model	Intellectual Curiosity	Aesthetic Sensitivity	Creative Imagination
Mistral-7B+Persona	0.02	0.07	0.07
Mistral-7B+Shape	0.05	0.02	0.05
Mistral-7B+PSI	0.10	0.07	0.11
Gemma-2-9B+Persona	0.06	0.06	0.09
Gemma-2-9B+Shape	0.06	0.04	0.04
Gemma-2-9B+PSI	0.05	0.36	0.13
Gemma-2-27B+Persona	0.03	0.04	0.02
Gemma-2-27B+Shape	0.09	0.04	0.06
Gemma-2-27B+PSI	0.04	0.05	0.03
Llama3-8B+Persona	0.15	0.37	0.19
Llama3-8B+Shape	0.14	0.07	0.14
Llama3-8B+PSI	0.03	0.04	0.04
Llama3-70B+Persona	0.04	0.04	0.05
Llama3-70B+Shape	0.07	0.05	0.02
Llama3-70B+PSI	0.04	0.05	0.06
GPT-4o-mini+Persona	0.02	0.01	0.03
GPT-4o-mini+Shape	0.07	0.09	0.10
GPT-4o-mini+PSI	0.05	0.03	0.02
GPT-4o+Persona	0.02	0.02	0.02
GPT-4o+Shape	0.05	0.04	0.02
GPT-4o+PSI	0.06	0.02	0.03

Table 33: Factor loading MAEs for BFI-2 FFM.

Model	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Mistral-7B+Persona	0.02	0.01	0.01	0.03	0.01
Mistral-7B+Shape	0.04	0.03	0.03	0.03	0.03
Mistral-7B+PSI	0.03	0.03	0.01	0.02	0.01
Gemma-2-9B+Persona	0.02	0.03	0.03	0.02	0.02
Gemma-2-9B+Shape	0.05	0.03	0.02	0.03	0.03
Gemma-2-9B+PSI	0.02	0.02	0.02	0.02	0.04
Gemma-2-27B+Persona	0.03	0.04	0.03	0.01	0.02
Gemma-2-27B+Shape	0.04	0.03	0.02	0.03	0.04
Gemma-2-27B+PSI	0.03	0.02	0.02	0.01	0.02
Llama3-8B+Persona	0.02	0.03	0.05	0.03	0.03
Llama3-8B+Shape	0.03	0.04	0.03	0.04	0.02
Llama3-8B+PSI	0.03	0.02	0.02	0.01	0.02
Llama3-70B+Persona	0.04	0.04	0.03	0.02	0.02
Llama3-70B+Shape	0.03	0.04	0.03	0.01	0.03
Llama3-70B+PSI	0.03	0.03	0.02	0.01	0.02
GPT-4o-mini+Persona	0.03	0.04	0.03	0.02	0.01
GPT-4o-mini+Shape	0.02	0.04	0.03	0.02	0.04
GPT-4o-mini+PSI	0.03	0.03	0.02	0.02	0.01
GPT-4o+Persona	0.02	0.02	0.02	0.03	0.01
GPT-4o+Shape	0.04	0.03	0.04	0.03	0.02
GPT-4o+PSI	0.03	0.02	0.02	0.02	0.01

Table 34: Standardized factor loadings for Sociability items in BFI-2 TFM of Extraversion.

Model	Item 1	Item 16	Item 31	Item 46
Mistral-7B+Persona	0.88	0.46	0.22	0.77
Mistral-7B+Shape	0.64	0.87	0.65	0.78
Mistral-7B+PSI	0.77	0.73	0.72	0.81
Gemma-2-9B+Persona	0.75	0.81	0.79	0.71
Gemma-2-9B+Shape	0.71	0.90	0.80	0.41
Gemma-2-9B+PSI	0.79	0.83	0.71	0.77
Gemma-2-27B+Persona	0.75	0.80	0.70	0.76
Gemma-2-27B+Shape	0.84	0.87	0.77	0.80
Gemma-2-27B+PSI	0.70	0.91	0.84	0.80
Llama3-8B+Persona	-0.15	-0.78	-0.75	0.01
Llama3-8B+Shape	-0.71	-0.18	-0.08	-0.67
Llama3-8B+PSI	0.82	0.71	0.77	0.78
Llama3-70B+Persona	0.72	0.88	0.87	0.64
Llama3-70B+Shape	0.55	0.73	0.79	0.58
Llama3-70B+PSI	0.65	0.86	0.74	0.69
GPT-4o-mini+Persona	0.79	0.78	0.72	0.74
GPT-4o-mini+Shape	0.88	0.33	0.37	0.86
GPT-4o-mini+PSI	0.85	0.88	0.88	0.82
GPT-4o+Persona	0.77	0.79	0.79	0.74
GPT-4o+Shape	0.85	0.74	0.73	0.85
GPT-4o+PSI	0.87	0.84	0.90	0.76

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Table 34 – continued

Model	Item 1	Item 16	Item 31	Item 46
Human	0.80	0.82	0.82	0.76

Table 35: Standardized factor loadings for Assertiveness items in BFI-2 TFM of Extraversion.

Model	Item 6	Item 21	Item 36	Item 51
Mistral-7B+Persona	0.71	0.33	0.59	0.35
Mistral-7B+Shape	0.76	0.54	0.86	0.80
Mistral-7B+PSI	0.85	0.63	0.34	0.35
Gemma-2-9B+Persona	0.90	0.84	0.33	0.44
Gemma-2-9B+Shape	0.70	0.20	0.81	0.81
Gemma-2-9B+PSI	0.71	0.86	0.37	0.35
Gemma-2-27B+Persona	0.83	0.67	0.76	0.52
Gemma-2-27B+Shape	0.99	0.84	0.80	0.52
Gemma-2-27B+PSI	0.58	0.41	0.74	0.45
Llama3-8B+Persona	0.78	0.74	-0.32	-0.23
Llama3-8B+Shape	0.79	0.83	-0.28	0.31
Llama3-8B+PSI	0.80	0.78	0.50	0.43
Llama3-70B+Persona	0.84	0.73	0.72	0.54
Llama3-70B+Shape	0.86	0.70	0.88	0.72
Llama3-70B+PSI	0.49	0.53	0.59	0.28
GPT-4o-mini+Persona	0.87	0.80	0.74	0.65
GPT-4o-mini+Shape	0.99	0.86	0.28	0.37
GPT-4o-mini+PSI	0.78	0.76	0.72	0.63
GPT-4o+Persona	0.66	0.61	0.73	0.59
GPT-4o+Shape	0.94	0.90	0.84	0.80
GPT-4o+PSI	0.76	0.79	0.78	0.56
Human	0.76	0.89	0.53	0.69

Table 36: Standardized factor loadings for Energy Level items in BFI-2 TFM of Extraversion.

Model	Item 11	Item 26	Item 41	Item 56
Mistral-7B+Persona	0.60	0.74	0.79	0.64
Mistral-7B+Shape	0.87	0.88	0.73	0.73
Mistral-7B+PSI	0.31	0.54	0.87	0.79
Gemma-2-9B+Persona	0.47	0.64	0.88	0.77
Gemma-2-9B+Shape	0.84	0.92	0.84	0.86
Gemma-2-9B+PSI	0.06	-0.00	0.88	0.82
Gemma-2-27B+Persona	0.72	0.83	0.86	0.79
Gemma-2-27B+Shape	0.91	0.84	0.90	0.90
Gemma-2-27B+PSI	0.80	0.63	0.85	0.75
Llama3-8B+Persona	-0.13	-0.14	0.57	0.65
Llama3-8B+Shape	-0.04	0.14	-0.69	-0.76
Llama3-8B+PSI	0.77	0.62	0.83	0.80
Llama3-70B+Persona	0.73	0.75	0.87	0.78
Llama3-70B+Shape	0.88	0.77	0.76	0.77

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Table 36 – continued

Model	Item 11	Item 26	Item 41	Item 56
Llama3-70B+PSI	0.64	0.50	0.72	0.84
GPT-4o-mini+Persona	0.70	0.78	0.88	0.88
GPT-4o-mini+Shape	0.55	0.48	0.89	0.87
GPT-4o-mini+PSI	0.76	0.75	0.89	0.82
GPT-4o+Persona	0.82	0.69	0.81	0.82
GPT-4o+Shape	0.91	0.72	0.82	0.88
GPT-4o+PSI	0.82	0.75	0.88	0.82
Human	0.45	0.54	0.83	0.77

Table 37: Standardized factor loadings for Compassion items in BFI-2 TFM of Agreeableness.

Model	Item 2	Item 17	Item 32	Item 47
Mistral-7B+Persona	0.68	0.11	0.76	0.48
Mistral-7B+Shape	0.46	0.82	0.69	0.89
Mistral-7B+PSI	0.78	0.44	0.86	0.73
Gemma-2-9B+Persona	0.80	0.76	0.80	0.77
Gemma-2-9B+Shape	0.86	0.92	0.93	0.96
Gemma-2-9B+PSI	0.83	0.55	0.87	0.80
Gemma-2-27B+Persona	0.70	0.68	0.86	0.79
Gemma-2-27B+Shape	0.85	0.90	0.93	0.96
Gemma-2-27B+PSI	0.74	0.81	0.73	0.81
Llama3-8B+Persona	0.71	0.04	0.88	0.23
Llama3-8B+Shape	0.77	0.25	0.71	0.43
Llama3-8B+PSI	0.80	0.46	0.75	0.62
Llama3-70B+Persona	0.75	0.86	0.74	0.85
Llama3-70B+Shape	0.74	0.97	0.86	0.98
Llama3-70B+PSI	0.84	0.48	0.79	0.86
GPT-4o-mini+Persona	0.82	0.70	0.84	0.76
GPT-4o-mini+Shape	0.52	0.96	0.69	0.98
GPT-4o-mini+PSI	0.84	0.79	0.81	0.89
GPT-4o+Persona	0.76	0.84	0.74	0.67
GPT-4o+Shape	0.90	0.93	0.87	0.96
GPT-4o+PSI	0.83	0.77	0.79	0.89
Human	0.73	0.34	0.62	0.75

Table 38: Standardized factor loadings for Respectfulness items in BFI-2 TFM of Agreeableness.

Model	Item 7	Item 22	Item 37	Item 52
Mistral-7B+Persona	0.77	0.53	0.54	0.88
Mistral-7B+Shape	0.60	0.77	0.88	0.48
Mistral-7B+PSI	0.92	0.36	0.70	0.93
Gemma-2-9B+Persona	0.77	0.60	0.63	0.86
Gemma-2-9B+Shape	0.98	0.83	0.91	0.97
Gemma-2-9B+PSI	0.90	0.10	0.50	0.89
Gemma-2-27B+Persona	0.82	0.50	0.64	0.87

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Table 38 – continued

Model	Item 7	Item 22	Item 37	Item 52
Gemma-2-27B+Shape	0.96	0.83	0.87	0.99
Gemma-2-27B+PSI	0.93	0.42	0.70	0.89
Llama3-8B+Persona	0.73	0.12	-0.13	0.77
Llama3-8B+Shape	0.94	0.50	0.28	0.75
Llama3-8B+PSI	0.90	0.26	0.51	0.82
Llama3-70B+Persona	0.80	0.68	0.79	0.80
Llama3-70B+Shape	0.85	0.87	0.94	0.84
Llama3-70B+PSI	0.92	0.48	0.84	0.90
GPT-4o-mini+Persona	0.86	0.45	0.67	0.85
GPT-4o-mini+Shape	0.64	0.84	0.97	0.62
GPT-4o-mini+PSI	0.85	0.35	0.76	0.89
GPT-4o+Persona	0.82	0.54	0.74	0.70
GPT-4o+Shape	0.93	0.80	0.94	0.88
GPT-4o+PSI	0.91	0.44	0.78	0.87
Human	0.71	0.60	0.70	0.70

Table 39: Standardized factor loadings for Trust items in BFI-2 TFM of Agreeableness.

Model	Item 12	Item 27	Item 42	Item 57
Mistral-7B+Persona	0.34	0.75	0.21	0.78
Mistral-7B+Shape	0.94	0.50	0.90	0.58
Mistral-7B+PSI	0.40	0.78	0.67	0.84
Gemma-2-9B+Persona	0.35	0.62	0.56	0.88
Gemma-2-9B+Shape	0.95	0.87	0.95	0.90
Gemma-2-9B+PSI	-0.01	-0.81	-0.51	-0.85
Gemma-2-27B+Persona	0.66	0.70	0.68	0.88
Gemma-2-27B+Shape	0.96	0.80	0.96	0.86
Gemma-2-27B+PSI	0.80	0.71	0.81	0.88
Llama3-8B+Persona	0.18	-0.79	0.12	-0.83
Llama3-8B+Shape	0.46	0.80	0.27	0.85
Llama3-8B+PSI	0.38	0.79	0.56	0.86
Llama3-70B+Persona	0.57	0.80	0.63	0.82
Llama3-70B+Shape	0.94	0.84	0.95	0.85
Llama3-70B+PSI	0.66	0.85	0.80	0.87
GPT-4o-mini+Persona	0.49	0.85	0.66	0.90
GPT-4o-mini+Shape	0.94	0.61	0.94	0.44
GPT-4o-mini+PSI	0.69	0.80	0.81	0.91
GPT-4o+Persona	0.63	0.60	0.35	0.64
GPT-4o+Shape	0.96	0.84	0.95	0.90
GPT-4o+PSI	0.76	0.80	0.80	0.89
Human	0.69	0.68	0.67	0.78

Table 40: Standardized factor loadings for Organization items in BFI-2 TFM of Conscientiousness.

Model	Item 3	Item 18	Item 33	Item 48
Mistral-7B+Persona	0.47	0.59	0.67	0.41
Mistral-7B+Shape	0.81	0.41	0.36	0.87
Mistral-7B+PSI	0.73	0.58	0.42	0.60
Gemma-2-9B+Persona	0.71	0.83	0.69	0.50
Gemma-2-9B+Shape	0.77	0.65	0.66	0.78
Gemma-2-9B+PSI	0.25	0.82	0.39	0.13
Gemma-2-27B+Persona	0.63	0.70	0.73	0.69
Gemma-2-27B+Shape	0.93	0.54	0.64	0.88
Gemma-2-27B+PSI	0.80	0.60	0.63	0.42
Llama3-8B+Persona	0.41	-0.72	-0.78	0.06
Llama3-8B+Shape	0.11	0.89	0.81	0.22
Llama3-8B+PSI	0.33	0.89	0.73	0.26
Llama3-70B+Persona	0.75	0.66	0.68	0.74
Llama3-70B+Shape	0.49	0.90	0.95	0.56
Llama3-70B+PSI	0.83	0.65	0.75	0.76
GPT-4o-mini+Persona	0.80	0.72	0.76	0.76
GPT-4o-mini+Shape	0.85	0.27	0.32	0.85
GPT-4o-mini+PSI	0.84	0.79	0.75	0.73
GPT-4o+Persona	0.64	0.62	0.63	0.70
GPT-4o+Shape	0.75	0.73	0.73	0.88
GPT-4o+PSI	0.84	0.84	0.75	0.72
Human	0.85	0.70	0.86	0.74

Table 41: Standardized factor loadings for Productiveness items in BFI-2 TFM of Conscientiousness.

Model	Item 8	Item 23	Item 38	Item 53
Mistral-7B+Persona	0.54	0.59	0.82	0.71
Mistral-7B+Shape	0.96	0.89	0.60	0.73
Mistral-7B+PSI	0.74	0.60	0.70	0.74
Gemma-2-9B+Persona	0.68	0.36	0.85	0.86
Gemma-2-9B+Shape	0.84	0.95	0.90	0.91
Gemma-2-9B+PSI	0.47	0.57	0.80	0.72
Gemma-2-27B+Persona	0.70	0.67	0.86	0.81
Gemma-2-27B+Shape	0.82	0.92	0.91	0.92
Gemma-2-27B+PSI	0.64	0.59	0.75	0.60
Llama3-8B+Persona	-0.13	-0.42	0.71	0.52
Llama3-8B+Shape	0.16	0.13	0.78	0.73
Llama3-8B+PSI	0.65	0.62	0.79	0.73
Llama3-70B+Persona	0.68	0.65	0.88	0.82
Llama3-70B+Shape	0.67	0.72	0.83	0.95
Llama3-70B+PSI	0.79	0.43	0.74	0.78
GPT-4o-mini+Persona	0.75	0.67	0.89	0.84
GPT-4o-mini+Shape	0.89	0.81	0.48	0.64
GPT-4o-mini+PSI	0.82	0.68	0.86	0.75
GPT-4o+Persona	0.72	0.60	0.71	0.81
GPT-4o+Shape	0.80	0.73	0.86	0.95

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Table 41 – continued

Model	Item 8	Item 23	Item 38	Item 53
GPT-4o+PSI	0.79	0.79	0.87	0.71
Human	0.72	0.75	0.73	0.70

Table 42: Standardized factor loadings for Responsibility items in BFI-2 TFM of Conscientiousness.

Model	Item 13	Item 28	Item 43	Item 58
Mistral-7B+Persona	0.93	0.46	0.97	0.51
Mistral-7B+Shape	0.50	0.90	0.60	0.88
Mistral-7B+PSI	0.93	0.60	0.93	0.61
Gemma-2-9B+Persona	0.88	0.58	0.88	0.60
Gemma-2-9B+Shape	0.83	0.72	0.77	0.92
Gemma-2-9B+PSI	0.95	0.35	0.94	0.63
Gemma-2-27B+Persona	0.91	0.66	0.93	0.68
Gemma-2-27B+Shape	0.94	0.74	0.92	0.85
Gemma-2-27B+PSI	0.92	0.51	0.93	0.65
Llama3-8B+Persona	0.90	-0.26	0.95	-0.20
Llama3-8B+Shape	0.91	0.16	0.90	0.31
Llama3-8B+PSI	0.88	0.52	0.89	0.50
Llama3-70B+Persona	0.94	0.58	0.95	0.66
Llama3-70B+Shape	0.92	0.48	0.96	0.64
Llama3-70B+PSI	0.81	0.74	0.82	0.84
GPT-4o-mini+Persona	0.89	0.72	0.92	0.74
GPT-4o-mini+Shape	0.46	0.86	0.52	0.85
GPT-4o-mini+PSI	0.81	0.77	0.79	0.78
GPT-4o+Persona	0.66	0.58	0.64	0.47
GPT-4o+Shape	0.92	0.68	0.94	0.80
GPT-4o+PSI	0.83	0.78	0.84	0.78
Human	0.68	0.73	0.70	0.65

Table 43: Standardized factor loadings for Anxiety items in BFI-2 TFM of Neuroticism.

Model	Item 4	Item 19	Item 34	Item 49
Mistral-7B+Persona	0.25	0.55	0.71	0.25
Mistral-7B+Shape	0.35	0.96	0.79	0.14
Mistral-7B+PSI	0.69	0.59	0.63	0.75
Gemma-2-9B+Persona	0.76	0.72	0.82	0.80
Gemma-2-9B+Shape	0.58	0.83	0.88	0.18
Gemma-2-9B+PSI	0.69	0.71	0.74	0.73
Gemma-2-27B+Persona	0.75	0.85	0.69	0.35
Gemma-2-27B+Shape	0.66	0.91	0.89	-0.08
Gemma-2-27B+PSI	0.68	0.78	0.63	0.46
Llama3-8B+Persona	0.56	-0.48	-0.31	0.53
Llama3-8B+Shape	0.51	-0.72	-0.71	0.52
Llama3-8B+PSI	0.71	0.78	0.77	0.64
Llama3-70B+Persona	0.72	0.61	0.81	0.74

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Table 43 – continued

Model	Item 4	Item 19	Item 34	Item 49
Llama3-70B+Shape	0.63	0.72	0.80	0.71
Llama3-70B+PSI	0.79	0.64	0.76	0.59
GPT-4o-mini+Persona	0.74	0.58	0.67	0.64
GPT-4o-mini+Shape	0.27	0.79	0.92	0.15
GPT-4o-mini+PSI	0.84	0.86	0.84	0.70
GPT-4o+Persona	0.52	0.65	0.59	0.51
GPT-4o+Shape	0.55	0.80	0.78	0.75
GPT-4o+PSI	0.85	0.87	0.80	0.68
Human	0.85	0.70	0.79	0.66

Table 44: Standardized factor loadings for Depression items in BFI-2 TFM of Neuroticism.

Model	Item 9	Item 24	Item 39	Item 54
Mistral-7B+Persona	0.19	0.27	0.79	0.91
Mistral-7B+Shape	0.68	0.69	0.83	0.92
Mistral-7B+PSI	0.64	0.79	0.76	0.82
Gemma-2-9B+Persona	0.52	0.66	0.88	0.90
Gemma-2-9B+Shape	0.74	0.80	0.85	0.95
Gemma-2-9B+PSI	0.57	0.63	0.89	0.95
Gemma-2-27B+Persona	0.67	0.63	0.88	0.86
Gemma-2-27B+Shape	0.88	0.91	0.93	0.98
Gemma-2-27B+PSI	0.42	0.63	0.92	0.95
Llama3-8B+Persona	0.57	0.58	-0.50	-0.28
Llama3-8B+Shape	0.67	0.93	-0.09	0.15
Llama3-8B+PSI	0.56	0.67	0.84	0.86
Llama3-70B+Persona	0.68	0.86	0.81	0.88
Llama3-70B+Shape	0.78	0.86	0.87	0.95
Llama3-70B+PSI	0.61	0.80	0.89	0.94
GPT-4o-mini+Persona	0.71	0.82	0.76	0.80
GPT-4o-mini+Shape	0.50	0.54	0.90	0.90
GPT-4o-mini+PSI	0.63	0.81	0.92	0.95
GPT-4o+Persona	0.27	0.72	0.70	0.67
GPT-4o+Shape	0.75	0.83	0.84	0.89
GPT-4o+PSI	0.69	0.83	0.93	0.95
Human	0.64	0.67	0.90	0.91

Table 45: Standardized factor loadings for Emotional Volatility items in BFI-2 TFM of Neuroticism.

Model	Item 14	Item 29	Item 44	Item 59
Mistral-7B+Persona	0.64	0.30	0.23	0.90
Mistral-7B+Shape	0.92	0.62	0.25	0.93
Mistral-7B+PSI	0.77	0.87	0.63	0.69
Gemma-2-9B+Persona	0.72	0.90	0.62	0.62
Gemma-2-9B+Shape	0.96	0.57	0.20	0.89
Gemma-2-9B+PSI	0.72	0.79	0.69	0.40

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Table 45 – continued

Model	Item 14	Item 29	Item 44	Item 59
Gemma-2-27B+Persona	0.76	0.84	0.74	0.63
Gemma-2-27B+Shape	0.99	0.71	0.54	0.91
Gemma-2-27B+PSI	0.88	0.81	0.71	0.63
Llama3-8B+Persona	0.23	-0.75	-0.70	0.34
Llama3-8B+Shape	0.90	-0.41	-0.44	0.90
Llama3-8B+PSI	0.63	0.87	0.57	0.67
Llama3-70B+Persona	0.86	0.86	0.73	0.80
Llama3-70B+Shape	0.88	0.85	0.60	0.84
Llama3-70B+PSI	0.86	0.91	0.83	0.74
GPT-4o-mini+Persona	0.77	0.90	0.58	0.66
GPT-4o-mini+Shape	0.85	0.57	0.38	0.74
GPT-4o-mini+PSI	0.80	0.93	0.77	0.69
GPT-4o+Persona	0.71	0.44	0.40	0.59
GPT-4o+Shape	0.92	0.80	0.58	0.75
GPT-4o+PSI	0.78	0.92	0.75	0.72
Human	0.80	0.88	0.77	0.80

Table 46: Standardized factor loadings for Intellectual Curiosity items in BFI-2 TFM of Openness.

Model	Item 10	Item 25	Item 40	Item 55
Mistral-7B+Persona	0.60	0.63	0.54	0.65
Mistral-7B+Shape	0.81	0.62	0.39	0.58
Mistral-7B+PSI	0.78	0.19	0.68	0.14
Gemma-2-9B+Persona	0.69	0.42	0.62	0.40
Gemma-2-9B+Shape	0.90	0.90	0.67	0.89
Gemma-2-9B+PSI	0.80	0.55	0.65	0.44
Gemma-2-27B+Persona	0.65	0.80	0.48	0.77
Gemma-2-27B+Shape	0.87	0.95	0.35	0.93
Gemma-2-27B+PSI	0.81	0.67	0.73	0.54
Llama3-8B+Persona	0.64	-0.10	0.55	-0.21
Llama3-8B+Shape	0.93	-0.05	0.61	0.11
Llama3-8B+PSI	0.72	0.77	0.73	0.79
Llama3-70B+Persona	0.81	0.76	0.70	0.82
Llama3-70B+Shape	0.91	0.88	0.56	0.89
Llama3-70B+PSI	0.81	0.64	0.78	0.57
GPT-4o-mini+Persona	0.79	0.63	0.68	0.68
GPT-4o-mini+Shape	0.61	0.87	0.23	0.86
GPT-4o-mini+PSI	0.80	0.77	0.81	0.86
GPT-4o+Persona	0.71	0.68	0.78	0.75
GPT-4o+Shape	0.90	0.87	0.62	0.82
GPT-4o+PSI	0.76	0.84	0.81	0.89
Human	0.60	0.63	0.65	0.74

Table 47: Standardized factor loadings for Aesthetic Sensitivity items in BFI-2 TFM of Openness.

Model	Item 5	Item 20	Item 35	Item 50
Mistral-7B+Persona	0.35	0.76	0.95	0.25
Mistral-7B+Shape	0.65	0.85	0.73	0.73
Mistral-7B+PSI	0.41	0.89	0.79	0.18
Gemma-2-9B+Persona	0.24	0.87	0.91	0.34
Gemma-2-9B+Shape	0.85	0.86	0.88	0.89
Gemma-2-9B+PSI	0.29	-1.01	-0.63	0.10
Gemma-2-27B+Persona	0.85	0.83	0.89	0.44
Gemma-2-27B+Shape	0.85	0.83	0.85	0.93
Gemma-2-27B+PSI	0.88	0.88	0.95	0.40
Llama3-8B+Persona	0.17	-0.79	-0.86	0.07
Llama3-8B+Shape	0.19	0.86	0.80	0.38
Llama3-8B+PSI	0.82	0.88	0.91	0.41
Llama3-70B+Persona	0.85	0.85	0.88	0.41
Llama3-70B+Shape	0.91	0.83	0.82	0.91
Llama3-70B+PSI	0.87	0.84	0.94	0.33
GPT-4o-mini+Persona	0.79	0.87	0.88	0.64
GPT-4o-mini+Shape	0.91	0.56	0.60	0.96
GPT-4o-mini+PSI	0.90	0.85	0.89	0.51
GPT-4o+Persona	0.84	0.82	0.86	0.69
GPT-4o+Shape	0.81	0.91	0.85	0.89
GPT-4o+PSI	0.87	0.85	0.90	0.64
Human	0.66	0.86	0.87	0.65

Table 48: Standardized factor loadings for Creative Imagination items in BFI-2 TFM of Openness.

Model	Item 15	Item 30	Item 45	Item 60
Mistral-7B+Persona	0.76	0.54	0.18	0.72
Mistral-7B+Shape	0.91	0.55	0.57	0.84
Mistral-7B+PSI	0.85	0.34	0.06	0.91
Gemma-2-9B+Persona	0.74	0.11	0.34	0.78
Gemma-2-9B+Shape	0.82	0.93	0.86	0.78
Gemma-2-9B+PSI	0.78	-0.08	0.04	0.81
Gemma-2-27B+Persona	0.80	0.70	0.55	0.80
Gemma-2-27B+Shape	0.87	0.97	0.95	0.75
Gemma-2-27B+PSI	0.60	0.74	0.55	0.76
Llama3-8B+Persona	0.71	-0.40	-0.34	0.76
Llama3-8B+Shape	0.93	-0.04	0.05	0.80
Llama3-8B+PSI	0.62	0.78	0.80	0.59
Llama3-70B+Persona	0.89	0.63	0.49	0.95
Llama3-70B+Shape	0.86	0.81	0.76	0.81
Llama3-70B+PSI	0.85	0.60	0.37	0.95
GPT-4o-mini+Persona	0.80	0.74	0.50	0.90
GPT-4o-mini+Shape	0.47	0.97	0.87	0.32
GPT-4o-mini+PSI	0.70	0.86	0.78	0.81
GPT-4o+Persona	0.65	0.81	0.68	0.70
GPT-4o+Shape	0.79	0.84	0.79	0.79

Continued on next page

Table 48 – continued

Model	Item 15	Item 30	Item 45	Item 60
GPT-4o+PSI	0.66	0.88	0.88	0.79
Human	0.72	0.77	0.66	0.80

Table 49: Standardized factor loadings for five-factor model: Extraversion subdimension.

Model	Sociability	Assertiveness	Energy Level
Mistral-7B+Persona	0.59	0.69	0.87
Mistral-7B+Shape	0.74	0.94	0.91
Mistral-7B+PSI	0.76	0.76	0.95
Gemma-2-9B+Persona	0.66	0.83	0.81
Gemma-2-9B+Shape	0.86	0.84	0.92
Gemma-2-9B+PSI	0.65	0.81	0.84
Gemma-2-27B+Persona	0.76	0.82	0.90
Gemma-2-27B+Shape	0.88	0.83	0.95
Gemma-2-27B+PSI	0.84	0.78	0.89
Llama3-8B+Persona	0.63	0.66	0.65
Llama3-8B+Shape	0.70	0.87	0.69
Llama3-8B+PSI	0.76	0.74	0.94
Llama3-70B+Persona	0.85	0.86	0.86
Llama3-70B+Shape	0.87	0.74	0.85
Llama3-70B+PSI	0.77	0.68	0.90
GPT-4o-mini+Persona	0.82	0.78	0.93
GPT-4o-mini+Shape	0.76	0.58	1.03
GPT-4o-mini+PSI	0.82	0.69	0.94
GPT-4o+Persona	0.76	0.67	0.88
GPT-4o+Shape	0.91	0.77	0.89
GPT-4o+PSI	0.82	0.71	0.93
Human	0.66	0.59	0.77

Table 50: Standardized factor loadings for five-factor model: Agreeableness subdimension.

Model	Compassion	Respectfulness	Trust
Mistral-7B+Persona	0.76	0.85	0.67
Mistral-7B+Shape	0.93	0.83	0.90
Mistral-7B+PSI	0.86	0.88	0.90
Gemma-2-9B+Persona	0.86	0.92	0.81
Gemma-2-9B+Shape	0.98	0.92	0.95
Gemma-2-9B+PSI	0.85	0.82	0.81
Gemma-2-27B+Persona	0.88	0.90	0.91
Gemma-2-27B+Shape	1.00	0.87	0.95
Gemma-2-27B+PSI	0.80	0.91	0.85
Llama3-8B+Persona	0.80	0.86	0.76
Llama3-8B+Shape	0.94	0.79	0.90
Llama3-8B+PSI	0.83	0.79	0.84
Llama3-70B+Persona	0.90	0.94	0.87

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Table 50 – continued

Model	Compassion	Respectfulness	Trust
Llama3-70B+Shape	0.99	0.86	0.95
Llama3-70B+PSI	0.79	0.95	0.84
GPT-4o-mini+Persona	0.89	0.94	0.88
GPT-4o-mini+Shape	0.97	0.86	0.94
GPT-4o-mini+PSI	0.85	0.89	0.86
GPT-4o+Persona	0.82	0.90	0.75
GPT-4o+Shape	0.96	0.90	0.93
GPT-4o+PSI	0.83	0.88	0.84
Human	0.70	0.80	0.65

Table 51: Standardized factor loadings for five-factor model: Conscientiousness subdimension.

Model	Organization	Productiveness	Responsibility
Mistral-7B+Persona	0.75	0.85	0.85
Mistral-7B+Shape	0.96	0.88	0.90
Mistral-7B+PSI	0.78	0.85	0.86
Gemma-2-9B+Persona	0.77	0.68	0.93
Gemma-2-9B+Shape	0.92	0.76	0.95
Gemma-2-9B+PSI	0.66	0.79	0.89
Gemma-2-27B+Persona	0.86	0.80	0.92
Gemma-2-27B+Shape	0.91	0.80	0.97
Gemma-2-27B+PSI	0.85	0.84	0.86
Llama3-8B+Persona	0.62	0.50	0.77
Llama3-8B+Shape	0.83	0.75	0.92
Llama3-8B+PSI	0.79	0.80	0.86
Llama3-70B+Persona	0.87	0.75	0.95
Llama3-70B+Shape	0.97	0.80	0.93
Llama3-70B+PSI	0.87	0.83	0.92
GPT-4o-mini+Persona	0.91	0.83	0.94
GPT-4o-mini+Shape	0.96	0.86	0.90
GPT-4o-mini+PSI	0.86	0.81	0.90
GPT-4o+Persona	0.87	0.77	0.82
GPT-4o+Shape	0.94	0.84	0.93
GPT-4o+PSI	0.87	0.83	0.88
Human	0.70	0.89	0.79

Table 52: Standardized factor loadings for five-factor model: Neuroticism subdimension.

Model	Anxiety	Depression	Emotional Volatility
Mistral-7B+Persona	0.51	0.80	0.75
Mistral-7B+Shape	0.67	1.00	0.76
Mistral-7B+PSI	0.66	0.96	0.81
Gemma-2-9B+Persona	0.76	0.96	0.70
Gemma-2-9B+Shape	0.82	1.01	0.73
Gemma-2-9B+PSI	0.72	0.96	0.78

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Table 52 – continued

Model	Anxiety	Depression	Emotional Volatility
Gemma-2-27B+Persona	0.70	0.85	0.82
Gemma-2-27B+Shape	0.79	1.01	0.72
Gemma-2-27B+PSI	0.62	0.90	0.82
Llama3-8B+Persona	0.44	0.91	0.60
Llama3-8B+Shape	0.42	0.91	0.65
Llama3-8B+PSI	0.80	0.87	0.81
Llama3-70B+Persona	0.75	0.96	0.79
Llama3-70B+Shape	0.87	0.96	0.81
Llama3-70B+PSI	0.75	0.88	0.85
GPT-4o-mini+Persona	0.73	0.97	0.74
GPT-4o-mini+Shape	0.78	0.97	0.78
GPT-4o-mini+PSI	0.74	0.97	0.78
GPT-4o+Persona	0.69	0.91	0.63
GPT-4o+Shape	0.80	1.02	0.71
GPT-4o+PSI	0.74	0.99	0.76
Human	0.84	0.88	0.85

Table 53: Standardized factor loadings for five-factor model: Openness subdimension.

Model	Intellectual Curiosity	Aesthetic Sensitivity	Creative Imagination
Mistral-7B+Persona	0.74	0.64	0.70
Mistral-7B+Shape	0.89	0.94	0.79
Mistral-7B+PSI	0.74	0.53	0.77
Gemma-2-9B+Persona	0.85	0.58	0.74
Gemma-2-9B+Shape	0.96	0.94	0.87
Gemma-2-9B+PSI	0.86	0.40	0.62
Gemma-2-27B+Persona	0.82	0.81	0.71
Gemma-2-27B+Shape	0.94	0.96	0.89
Gemma-2-27B+PSI	0.74	0.67	0.91
Llama3-8B+Persona	0.69	0.50	0.63
Llama3-8B+Shape	0.78	0.96	0.78
Llama3-8B+PSI	0.80	0.63	0.91
Llama3-70B+Persona	0.66	0.65	0.89
Llama3-70B+Shape	0.93	0.96	0.82
Llama3-70B+PSI	0.85	0.58	0.78
GPT-4o-mini+Persona	0.86	0.77	0.80
GPT-4o-mini+Shape	0.94	0.96	0.93
GPT-4o-mini+PSI	0.79	0.70	0.88
GPT-4o+Persona	0.77	0.73	0.91
GPT-4o+Shape	0.97	0.95	0.90
GPT-4o+PSI	0.75	0.70	0.96
Human	0.74	0.71	0.81

Table 54: Inter-factor correlations for BFI-2 TFM of Extraversion.

Model	Soc-Ass	Soc-Ene	Ass-Ene
Mistral-7B+Persona	0.72	0.67	0.87
Mistral-7B+Shape	0.81	0.80	1.01
Mistral-7B+PSI	0.79	0.89	0.88
Gemma-2-9B+Persona	0.73	0.66	0.64
Gemma-2-9B+Shape	0.91	0.88	0.97
Gemma-2-9B+PSI	0.72	0.88	0.81
Gemma-2-27B+Persona	0.79	0.83	0.79
Gemma-2-27B+Shape	0.71	0.92	0.68
Gemma-2-27B+PSI	0.89	0.87	0.95
Llama3-8B+Persona	-0.15	-0.32	0.96
Llama3-8B+Shape	-0.79	1.15	-0.69
Llama3-8B+PSI	0.73	0.85	0.84
Llama3-70B+Persona	0.89	0.84	0.82
Llama3-70B+Shape	0.91	0.82	0.61
Llama3-70B+PSI	0.80	0.85	0.88
GPT-4o-mini+Persona	0.81	0.90	0.78
GPT-4o-mini+Shape	0.60	0.95	0.53
GPT-4o-mini+PSI	0.73	0.87	0.73
GPT-4o+Persona	0.72	0.79	0.66
GPT-4o+Shape	0.77	0.91	0.65
GPT-4o+PSI	0.71	0.86	0.74
Human	0.59	0.64	0.47

Table 55: Inter-factor correlations for BFI-2 TFM of Agreeableness.

Model	Com-Res	Com-Tru	Res-Tru
Mistral-7B+Persona	1.00	0.89	0.71
Mistral-7B+Shape	0.93	0.96	0.91
Mistral-7B+PSI	0.91	0.98	0.92
Gemma-2-9B+Persona	0.93	0.88	0.94
Gemma-2-9B+Shape	0.90	0.98	0.91
Gemma-2-9B+PSI	0.93	-0.93	-0.90
Gemma-2-27B+Persona	0.96	0.96	0.97
Gemma-2-27B+Shape	0.88	1.00	0.84
Gemma-2-27B+PSI	0.79	0.79	0.84
Llama3-8B+Persona	1.05	-0.85	-0.97
Llama3-8B+Shape	0.99	1.09	0.86
Llama3-8B+PSI	0.87	0.88	0.83
Llama3-70B+Persona	0.98	0.94	0.96
Llama3-70B+Shape	0.87	0.96	0.85
Llama3-70B+PSI	0.90	0.85	0.88
GPT-4o-mini+Persona	0.99	0.91	0.94
GPT-4o-mini+Shape	0.88	0.99	0.90
GPT-4o-mini+PSI	0.90	0.82	0.86
GPT-4o+Persona	0.90	0.83	0.95
GPT-4o+Shape	0.92	0.94	0.93

Continued

Table 55 – continued

Model	Com-Res	Com-Tru	Res-Tru
GPT-4o+PSI	0.86	0.80	0.85
Human	0.81	0.70	0.58

Table 56: Inter-factor correlations for BFI-2 TFM of Conscientiousness.

Model	Org-Pro	Org-Res	Pro-Res
Mistral-7B+Persona	0.93	0.85	0.87
Mistral-7B+Shape	1.01	1.04	0.90
Mistral-7B+PSI	0.96	0.83	0.81
Gemma-2-9B+Persona	0.62	0.81	0.77
Gemma-2-9B+Shape	0.89	1.00	0.66
Gemma-2-9B+PSI	0.77	0.73	0.82
Gemma-2-27B+Persona	0.84	0.90	0.83
Gemma-2-27B+Shape	0.94	0.88	0.75
Gemma-2-27B+PSI	0.97	0.85	0.84
Llama3-8B+Persona	-0.98	-0.75	0.99
Llama3-8B+Shape	0.87	0.87	0.91
Llama3-8B+PSI	0.76	0.76	0.74
Llama3-70B+Persona	0.81	0.85	0.87
Llama3-70B+Shape	0.69	0.86	0.87
Llama3-70B+PSI	0.88	0.91	0.88
GPT-4o-mini+Persona	0.88	0.93	0.90
GPT-4o-mini+Shape	1.07	0.92	0.85
GPT-4o-mini+PSI	0.85	0.90	0.83
GPT-4o+Persona	0.86	1.01	0.82
GPT-4o+Shape	0.97	0.99	0.87
GPT-4o+PSI	0.86	0.86	0.80
Human	0.75	0.70	0.86

Table 57: Inter-factor correlations for BFI-2 TFM of Neuroticism.

Model	Anx-Dep	Anx-Emo	Dep-Emo
Mistral-7B+Persona	0.78	0.51	0.60
Mistral-7B+Shape	0.93	0.82	0.91
Mistral-7B+PSI	0.81	0.83	0.93
Gemma-2-9B+Persona	0.84	0.79	0.68
Gemma-2-9B+Shape	1.01	0.94	0.92
Gemma-2-9B+PSI	0.77	0.85	0.87
Gemma-2-27B+Persona	0.66	0.77	0.63
Gemma-2-27B+Shape	0.97	0.89	0.91
Gemma-2-27B+PSI	0.70	0.82	0.84
Llama3-8B+Persona	1.13	-1.10	-1.04
Llama3-8B+Shape	0.18	-0.90	0.23
Llama3-8B+PSI	0.85	0.95	0.87
Llama3-70B+Persona	0.88	0.79	0.85

Continued

Table 57 – continued

Model	Anx-Dep	Anx-Emo	Dep-Emo
Llama3-70B+Shape	0.96	0.87	0.84
Llama3-70B+PSI	0.77	0.83	0.83
GPT-4o-mini+Persona	0.88	0.83	0.91
GPT-4o-mini+Shape	0.90	0.78	0.93
GPT-4o-mini+PSI	0.80	0.89	0.86
GPT-4o+Persona	0.88	0.87	0.84
GPT-4o+Shape	0.95	0.87	0.89
GPT-4o+PSI	0.85	0.91	0.86
Human	0.81	0.90	0.79

Table 58: Inter-factor correlations for BFI-2 TFM of Openness.

Model	Int-Aes	Int-Cre	Aes-Cre
Mistral-7B+Persona	0.35	0.65	0.58
Mistral-7B+Shape	1.09	0.83	0.77
Mistral-7B+PSI	0.51	0.67	0.63
Gemma-2-9B+Persona	0.61	0.96	0.64
Gemma-2-9B+Shape	0.97	0.94	0.90
Gemma-2-9B+PSI	-0.47	0.89	-0.54
Gemma-2-27B+Persona	0.65	0.66	0.67
Gemma-2-27B+Shape	0.98	0.94	0.93
Gemma-2-27B+PSI	0.44	0.87	0.71
Llama3-8B+Persona	-0.70	1.06	-0.64
Llama3-8B+Shape	0.97	0.96	0.98
Llama3-8B+PSI	0.54	0.85	0.74
Llama3-70B+Persona	0.59	0.67	0.60
Llama3-70B+Shape	1.00	0.89	0.85
Llama3-70B+PSI	0.48	0.74	0.51
GPT-4o-mini+Persona	0.81	0.82	0.64
GPT-4o-mini+Shape	1.00	0.98	1.00
GPT-4o-mini+PSI	0.57	0.79	0.75
GPT-4o+Persona	0.68	0.85	0.79
GPT-4o+Shape	1.02	0.99	0.93
GPT-4o+PSI	0.54	0.80	0.78
Human	0.66	0.74	0.63

Table 60: Cronbach's alpha for Extraversion facets.

Model	Sociability	Assertiveness	Energy Level
Mistral-7B+Persona	0.68	0.55	0.78
Mistral-7B+Shape	0.81	0.79	0.88
Mistral-7B+PSI	0.84	0.61	0.72
Gemma-2-9B+Persona	0.82	0.71	0.79
Gemma-2-9B+Shape	0.79	0.74	0.92
Gemma-2-9B+PSI	0.86	0.67	0.47

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Table 60 continued

Model	Sociability	Assertiveness	Energy Level
Gemma-2-27B+Persona	0.83	0.77	0.88
Gemma-2-27B+Shape	0.89	0.86	0.93
Gemma-2-27B+PSI	0.88	0.62	0.83
Llama3-8B+Persona	0.44	0.01	0.13
Llama3-8B+Shape	0.58	0.49	0.32
Llama3-8B+PSI	0.86	0.71	0.83
Llama3-70B+Persona	0.86	0.80	0.86
Llama3-70B+Shape	0.76	0.86	0.87
Llama3-70B+PSI	0.82	0.55	0.77
GPT-4o-mini+Persona	0.84	0.85	0.88
GPT-4o-mini+Shape	0.74	0.77	0.84
GPT-4o-mini+PSI	0.92	0.81	0.88
GPT-4o+Persona	0.85	0.74	0.86
GPT-4o+Shape	0.87	0.93	0.90
GPT-4o+PSI	0.91	0.81	0.89
Human	0.87	0.81	0.73

Table 61: Cronbach's alpha for Agreeableness facets.

Model	Compassion	Respectfulness	Trust
Mistral-7B+Persona	0.56	0.78	0.61
Mistral-7B+Shape	0.79	0.78	0.83
Mistral-7B+PSI	0.80	0.81	0.77
Gemma-2-9B+Persona	0.86	0.78	0.69
Gemma-2-9B+Shape	0.95	0.96	0.96
Gemma-2-9B+PSI	0.84	0.66	0.64
Gemma-2-27B+Persona	0.84	0.79	0.83
Gemma-2-27B+Shape	0.95	0.95	0.95
Gemma-2-27B+PSI	0.85	0.83	0.87
Llama3-8B+Persona	0.54	0.44	0.36
Llama3-8B+Shape	0.68	0.74	0.69
Llama3-8B+PSI	0.74	0.72	0.75
Llama3-70B+Persona	0.87	0.85	0.79
Llama3-70B+Shape	0.93	0.93	0.94
Llama3-70B+PSI	0.83	0.87	0.87
GPT-4o-mini+Persona	0.86	0.80	0.81
GPT-4o-mini+Shape	0.88	0.87	0.85
GPT-4o-mini+PSI	0.89	0.81	0.87
GPT-4o+Persona	0.84	0.79	0.64
GPT-4o+Shape	0.95	0.94	0.96
GPT-4o+PSI	0.89	0.84	0.88
Human	0.67	0.74	0.80

Model	E~A	E~C	E~N	E~O	A~C	A~N	A~O	C~N	C~O	N~O
Mistral-7B+Persona	0.57	0.74	-0.68	0.42	0.86	-0.59	0.49	-0.78	0.33	-0.07
Mistral-7B+Shape	0.58	0.67	-0.80	0.64	0.79	-0.78	0.75	-0.82	0.51	-0.61
Mistral-7B+PSI	0.57	0.60	-0.64	0.64	0.73	-0.68	0.43	-0.78	0.19	-0.18
Gemma-2-9B+Persona	0.25	0.45	-0.63	0.53	0.74	-0.60	0.42	-0.67	0.32	-0.30
Gemma-2-9B+Shape	0.66	0.42	-0.77	0.83	0.66	-0.80	0.82	-0.73	0.43	-0.62
Gemma-2-9B+PSI	0.48	0.64	-0.70	0.71	0.69	-0.64	0.52	-0.76	0.45	-0.34
Gemma-2-27B+Persona	0.48	0.57	-0.67	0.53	0.79	-0.72	0.62	-0.84	0.41	-0.36
Gemma-2-27B+Shape	0.72	0.47	-0.83	0.82	0.77	-0.82	0.85	-0.80	0.48	-0.71
Gemma-2-27B+PSI	0.34	0.41	-0.43	0.47	0.67	-0.52	0.13	-0.76	0.08	0.17
Llama3-8B+Persona	0.30	0.30	-0.64	0.42	0.62	-0.63	0.40	-0.59	0.03	-0.25
Llama3-8B+Shape	0.40	0.27	-0.62	0.68	0.58	-0.69	0.76	-0.55	0.27	-0.62
Llama3-8B+PSI	0.53	0.56	-0.46	0.36	0.63	-0.35	0.22	-0.55	0.16	0.16
Llama3-70B+Persona	0.10	0.26	-0.59	0.51	0.77	-0.54	0.25	-0.63	0.16	-0.23
Llama3-70B+Shape	0.54	0.31	-0.71	0.70	0.65	-0.74	0.89	-0.82	0.45	-0.65
Llama3-70B+PSI	0.28	0.36	-0.33	0.51	0.64	-0.50	0.15	-0.63	0.20	0.12
GPT-4o-mini+Persona	0.51	0.55	-0.76	0.52	0.79	-0.73	0.54	-0.69	0.36	-0.39
GPT-4o-mini+Shape	0.81	0.59	-0.61	0.87	0.75	-0.79	0.91	-0.75	0.58	-0.62
GPT-4o-mini+PSI	0.50	0.45	-0.62	0.33	0.65	-0.52	0.19	-0.64	0.07	0.10
GPT-4o+Persona	0.26	0.43	-0.61	0.37	0.56	-0.40	0.31	-0.52	0.10	-0.06
GPT-4o+Shape	0.59	0.36	-0.80	0.72	0.65	-0.66	0.79	-0.67	0.27	-0.48
GPT-4o+PSI	0.44	0.45	-0.63	0.30	0.60	-0.47	0.15	-0.58	0.06	0.09
Human	0.28	0.56	-0.61	0.35	0.47	-0.43	0.27	-0.61	0.17	-0.17

Table 59: Inter-factor correlations for BFI-2 FFM. E = Extraversion; A = Agreeableness; C = Conscientiousness; N = Neuroticism; O = Openness.

Table 62: Cronbach's alpha for Conscientiousness facets.

Model	Organization	Productiveness	Responsibility
Mistral-7B+Persona	0.58	0.77	0.83
Mistral-7B+Shape	0.68	0.88	0.84
Mistral-7B+PSI	0.67	0.77	0.86
Gemma-2-9B+Persona	0.75	0.78	0.80
Gemma-2-9B+Shape	0.80	0.94	0.87
Gemma-2-9B+PSI	0.38	0.72	0.82
Gemma-2-27B+Persona	0.77	0.84	0.86
Gemma-2-27B+Shape	0.84	0.94	0.91
Gemma-2-27B+PSI	0.70	0.74	0.85
Llama3-8B+Persona	0.04	0.03	0.31
Llama3-8B+Shape	0.61	0.60	0.68
Llama3-8B+PSI	0.64	0.79	0.79
Llama3-70B+Persona	0.80	0.85	0.88
Llama3-70B+Shape	0.83	0.89	0.87
Llama3-70B+PSI	0.83	0.77	0.87
GPT-4o-mini+Persona	0.84	0.87	0.89
GPT-4o-mini+Shape	0.67	0.82	0.79
GPT-4o-mini+PSI	0.85	0.85	0.86
GPT-4o+Persona	0.73	0.80	0.67
GPT-4o+Shape	0.86	0.91	0.91

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Table 62 continued

Model	Organization	Productiveness	Responsibility
GPT-4o+PSI	0.86	0.87	0.88
Human	0.87	0.80	0.77

Table 63: Cronbach's alpha for Neuroticism facets.

Model	Anxiety	Depression	Emotional Volatility
Mistral-7B+Persona	0.54	0.64	0.61
Mistral-7B+Shape	0.64	0.85	0.79
Mistral-7B+PSI	0.75	0.84	0.83
Gemma-2-9B+Persona	0.85	0.80	0.80
Gemma-2-9B+Shape	0.71	0.89	0.78
Gemma-2-9B+PSI	0.79	0.84	0.75
Gemma-2-27B+Persona	0.74	0.83	0.83
Gemma-2-27B+Shape	0.61	0.96	0.90
Gemma-2-27B+PSI	0.73	0.89	0.90
Llama3-8B+Persona	-0.17	0.40	0.19
Llama3-8B+Shape	-0.57	0.57	-0.04
Llama3-8B+PSI	0.82	0.83	0.78
Llama3-70B+Persona	0.81	0.88	0.89
Llama3-70B+Shape	0.80	0.92	0.88
Llama3-70B+PSI	0.82	0.89	0.90
GPT-4o-mini+Persona	0.76	0.86	0.84
GPT-4o-mini+Shape	0.60	0.82	0.76
GPT-4o-mini+PSI	0.88	0.90	0.88
GPT-4o+Persona	0.65	0.66	0.60
GPT-4o+Shape	0.81	0.90	0.87
GPT-4o+PSI	0.88	0.91	0.87
Human	0.84	0.86	0.89

Table 64: Cronbach's alpha for Openness facets.

Model	Intellectual Curiosity	Aesthetic Sensitivity	Creative Imagination
Mistral-7B+Persona	0.69	0.60	0.62
Mistral-7B+Shape	0.66	0.80	0.81
Mistral-7B+PSI	0.52	0.50	0.62
Gemma-2-9B+Persona	0.60	0.68	0.56
Gemma-2-9B+Shape	0.90	0.92	0.92
Gemma-2-9B+PSI	0.70	0.04	0.44
Gemma-2-27B+Persona	0.75	0.83	0.80
Gemma-2-27B+Shape	0.84	0.92	0.94
Gemma-2-27B+PSI	0.77	0.86	0.74
Llama3-8B+Persona	0.19	0.27	0.16
Llama3-8B+Shape	0.54	0.65	0.51
Llama3-8B+PSI	0.83	0.84	0.79
Llama3-70B+Persona	0.85	0.83	0.82

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Table 64 continued

Model	Intellectual Curiosity	Aesthetic Sensitivity	Creative Imagination
Llama3-70B+Shape	0.89	0.93	0.88
Llama3-70B+PSI	0.80	0.84	0.77
GPT-4o-mini+Persona	0.77	0.87	0.82
GPT-4o-mini+Shape	0.76	0.88	0.79
GPT-4o-mini+PSI	0.88	0.86	0.87
GPT-4o+Persona	0.82	0.87	0.80
GPT-4o+Shape	0.87	0.92	0.88
GPT-4o+PSI	0.89	0.88	0.88
Human	0.75	0.83	0.82

Table 65: Cronbach's alpha for BFI-2 each domain.

Model	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Mistral-7B+Persona	0.83	0.83	0.88	0.79	0.79
Mistral-7B+Shape	0.93	0.92	0.93	0.90	0.91
Mistral-7B+PSI	0.89	0.92	0.90	0.91	0.74
Gemma-2-9B+Persona	0.88	0.91	0.89	0.91	0.80
Gemma-2-9B+Shape	0.93	0.98	0.94	0.92	0.96
Gemma-2-9B+PSI	0.85	0.88	0.86	0.91	0.70
Gemma-2-27B+Persona	0.92	0.93	0.92	0.90	0.89
Gemma-2-27B+Shape	0.95	0.98	0.95	0.94	0.96
Gemma-2-27B+PSI	0.91	0.93	0.90	0.90	0.89
Llama3-8B+Persona	0.59	0.78	0.55	0.59	0.55
Llama3-8B+Shape	0.76	0.89	0.85	0.59	0.84
Llama3-8B+PSI	0.90	0.88	0.88	0.91	0.90
Llama3-70B+Persona	0.93	0.94	0.93	0.93	0.89
Llama3-70B+Shape	0.91	0.97	0.94	0.94	0.96
Llama3-70B+PSI	0.87	0.93	0.93	0.93	0.88
GPT-4o-mini+Persona	0.93	0.93	0.94	0.91	0.91
GPT-4o-mini+Shape	0.90	0.95	0.91	0.89	0.94
GPT-4o-mini+PSI	0.93	0.94	0.93	0.94	0.92
GPT-4o+Persona	0.90	0.90	0.88	0.83	0.91
GPT-4o+Shape	0.95	0.98	0.95	0.94	0.96
GPT-4o+PSI	0.93	0.94	0.94	0.95	0.92
Human	0.87	0.85	0.90	0.94	0.89

Model	E-A	E-C	E-N	E-O	A-C	A-N	A-O	C-N	C-O	N-O	Mean of abs. values
Mistral-7B+Persona	0.42	0.55	-0.49	0.30	0.71	-0.42	0.37	-0.58	0.23	-0.04	0.41
Mistral-7B+Shape	0.48	0.59	-0.56	0.63	0.75	-0.74	0.63	-0.80	0.46	-0.46	0.61
Mistral-7B+PSI	0.45	0.46	-0.45	0.43	0.64	-0.54	0.29	-0.66	0.06	-0.03	0.40
Gemma-2-9B+Persona	0.23	0.43	-0.46	0.38	0.62	-0.53	0.39	-0.56	0.30	-0.19	0.41
Gemma-2-9B+Shape	0.57	0.54	-0.54	0.78	0.67	-0.72	0.75	-0.78	0.49	-0.42	0.63
Gemma-2-9B+PSI	0.37	0.50	-0.49	0.46	0.57	-0.53	0.40	-0.64	0.36	-0.18	0.45
Gemma-2-27B+Persona	0.41	0.54	-0.56	0.44	0.70	-0.61	0.53	-0.71	0.37	-0.27	0.51
Gemma-2-27B+Shape	0.57	0.56	-0.62	0.78	0.78	-0.78	0.74	-0.87	0.54	-0.55	0.68
Gemma-2-27B+PSI	0.32	0.36	-0.31	0.34	0.57	-0.39	0.16	-0.63	0.05	0.24	0.34
Llama3-8B+Persona	0.24	0.26	-0.39	0.26	0.45	-0.51	0.32	-0.40	0.02	-0.13	0.30
Llama3-8B+Shape	0.28	0.24	-0.39	0.59	0.55	-0.60	0.61	-0.46	0.24	-0.47	0.44
Llama3-8B+PSI	0.38	0.44	-0.40	0.19	0.53	-0.29	0.19	-0.46	0.07	0.26	0.32
Llama3-70B+Persona	0.12	0.33	-0.42	0.28	0.66	-0.54	0.31	-0.60	0.20	-0.08	0.35
Llama3-70B+Shape	0.41	0.42	-0.57	0.68	0.70	-0.72	0.78	-0.87	0.48	-0.57	0.62
Llama3-70B+PSI	0.24	0.31	-0.23	0.35	0.53	-0.40	0.15	-0.54	0.09	0.20	0.31
GPT-4o-mini+Persona	0.42	0.54	-0.59	0.40	0.71	-0.64	0.50	-0.66	0.31	-0.21	0.50
GPT-4o-mini+Shape	0.63	0.50	-0.52	0.75	0.77	-0.71	0.85	-0.72	0.60	-0.48	0.65
GPT-4o-mini+PSI	0.39	0.40	-0.43	0.23	0.55	-0.34	0.20	-0.53	0.03	0.26	0.34
GPT-4o+Persona	0.21	0.40	-0.43	0.23	0.47	-0.30	0.30	-0.43	0.09	0.03	0.29
GPT-4o+Shape	0.48	0.46	-0.58	0.66	0.67	-0.64	0.71	-0.74	0.29	-0.31	0.55
GPT-4o+PSI	0.35	0.39	-0.43	0.16	0.51	-0.30	0.14	-0.47	0.02	0.30	0.31
Human	0.17	0.35	-0.45	0.22	0.33	-0.36	0.20	-0.49	0.09	-0.11	0.28

Table 66: Domain level correlation analysis. E = Extraversion; A = Agreeableness; C = Conscientiousness; N = Neuroticism; O = Openness.

Model + Method	EXT~OCB	AGR~OCB	NEU~OCB	CON~OCB	OPE~OCB
Mistral-7B+PSI	0.58 (+0.16)	0.63 (+0.45)	-0.44 (<u>-0.23</u>)	0.60 (+0.48)	0.25 (+0.08)
Gemma-2-9B+PSI	0.59 (+0.17)	0.60 (+0.42)	-0.52 (<u>-0.31</u>)	0.58 (+0.46)	0.35 (+0.18)
Gemma-2-27B+PSI	0.53 (+0.11)	0.63 (+0.45)	-0.48 (<u>-0.27</u>)	0.62 (+0.50)	0.17 (+0.00)
Llama3-8B+PSI	0.59 (+0.17)	0.54 (+0.36)	-0.32 (<u>-0.11</u>)	0.55 (+0.43)	0.15 (<u>-0.02</u>)
Llama3-70B+PSI	0.48 (+0.06)	0.46 (+0.28)	-0.38 (<u>-0.17</u>)	0.47 (+0.35)	0.11 (<u>-0.06</u>)
GPT4o-mini+PSI	0.56 (+0.14)	0.43 (+0.25)	-0.40 (<u>-0.19</u>)	0.52 (+0.40)	0.08 (<u>-0.09</u>)
GPT4o+PSI	0.54 (+0.12)	0.36 (+0.18)	-0.35 (<u>-0.14</u>)	0.45 (+0.33)	0.02 (<u>-0.15</u>)
Human	0.42	0.18	-0.21	0.12	0.17

Table 67: OCB correlation with five personality domains. Values in parentheses show the difference from human, **bold** for positive, underline for negative.

Model + Method	EXT~CWB	AGR~CWB	NEU~CWB	CON~CWB	OPE~CWB
Mistral-7B+PSI	-0.05 (<u>-0.04</u>)	-0.29 (+0.01)	0.26 (+0.03)	-0.27 (+0.08)	-0.07 (+0.10)
Gemma-2-9B+PSI	-0.04 (<u>-0.03</u>)	-0.58 (<u>-0.28</u>)	0.45 (+0.22)	-0.45 (<u>-0.10</u>)	-0.11 (+0.06)
Gemma-2-27B+PSI	-0.02 (<u>-0.01</u>)	-0.49 (<u>-0.19</u>)	0.40 (+0.17)	-0.48 (<u>-0.13</u>)	0.10 (+0.27)
Llama3-8B+PSI	0.04 (+0.05)	-0.20 (+0.10)	0.07 (<u>-0.16</u>)	-0.18 (+0.17)	0.00 (+0.17)
Llama3-70B+PSI	0.05 (+0.06)	-0.45 (<u>-0.15</u>)	0.33 (+0.10)	-0.41 (<u>-0.06</u>)	0.00 (+0.17)
GPT4o-mini+PSI	-0.21 (<u>-0.20</u>)	-0.56 (<u>-0.26</u>)	0.43 (+0.20)	-0.52 (<u>-0.17</u>)	0.04 (+0.21)
GPT4o+PSI	-0.08 (<u>-0.07</u>)	-0.54 (<u>-0.24</u>)	0.36 (+0.13)	-0.47 (<u>-0.12</u>)	0.01 (+0.18)
Human	-0.01	-0.30	0.23	-0.35	-0.17

Table 68: CWB correlation with five personality domains. Values in parentheses show the difference from human, **bold** for positive, underline for negative.

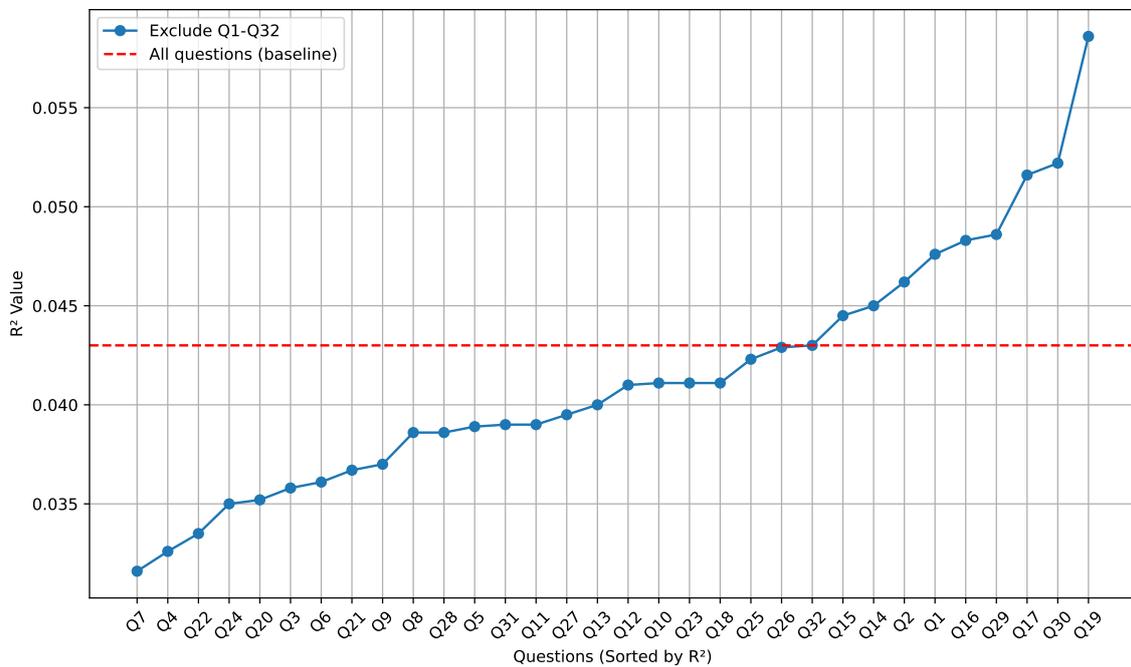


Figure 7: Ablation test results for predicting Openness. The x-axis represents each removed question, and its corresponding response, and the y-axis shows the R^2 value. The red dashed line indicates the baseline R^2 when all questions are included.

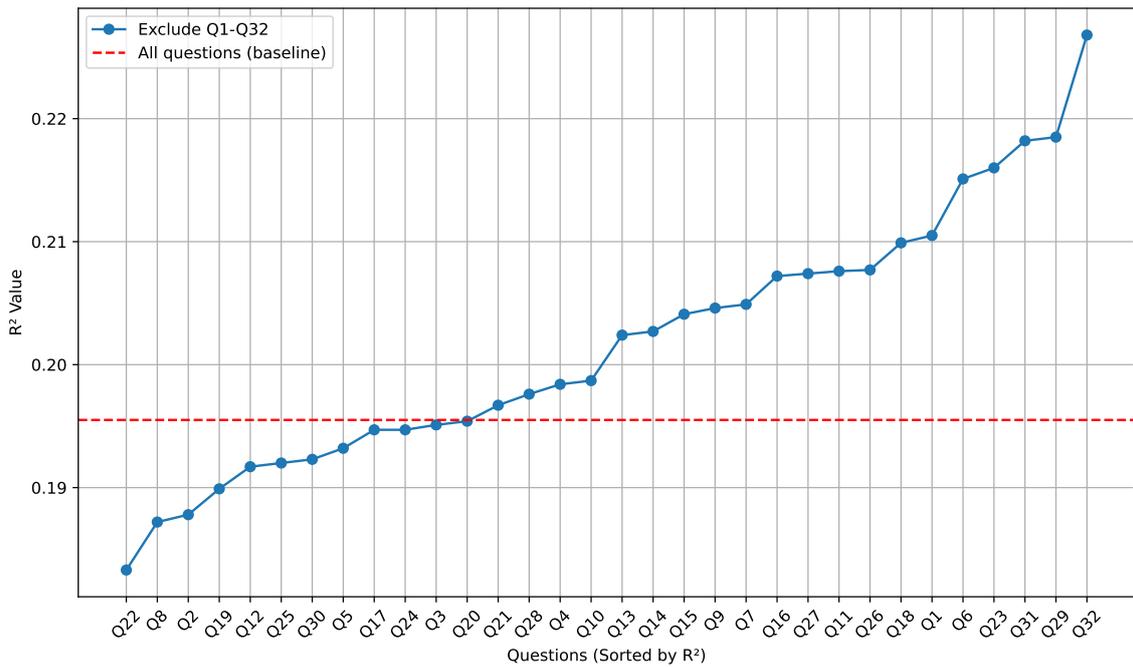


Figure 8: Ablation test results for predicting Extraversion. The x-axis represents each removed question, and its corresponding response, and the y-axis shows the R^2 value. The red dashed line indicates the baseline R^2 when all questions are included.

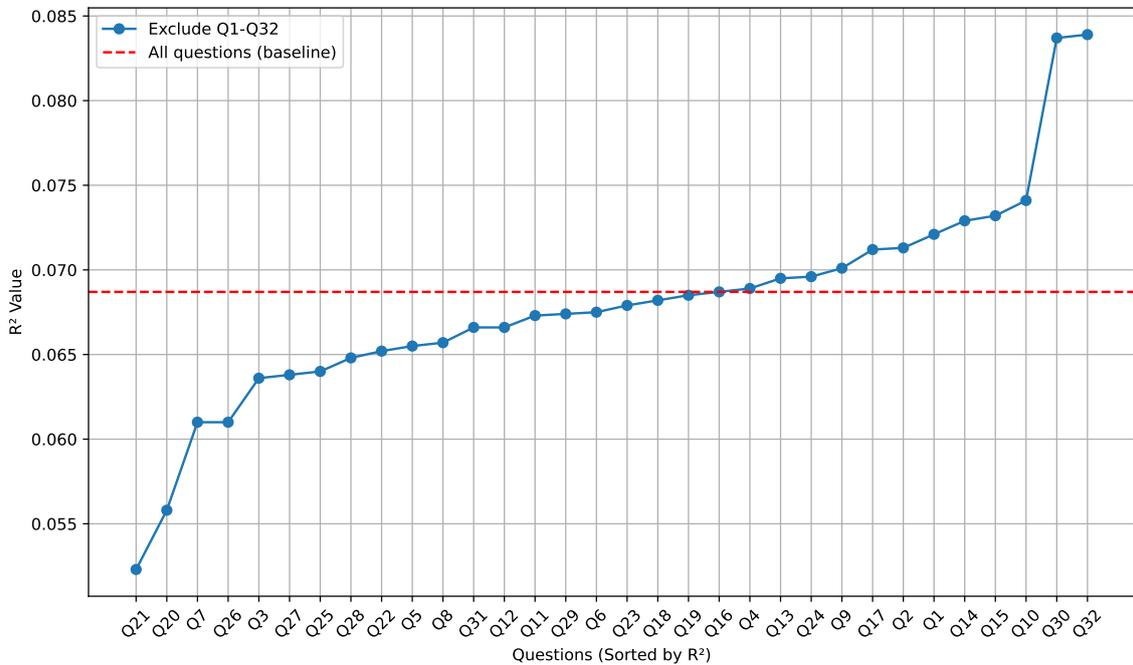


Figure 9: Ablation test results for predicting Agreeableness. The x-axis represents each removed question, and its corresponding response, and the y-axis shows the R^2 value. The red dashed line indicates the baseline R^2 when all questions are included.

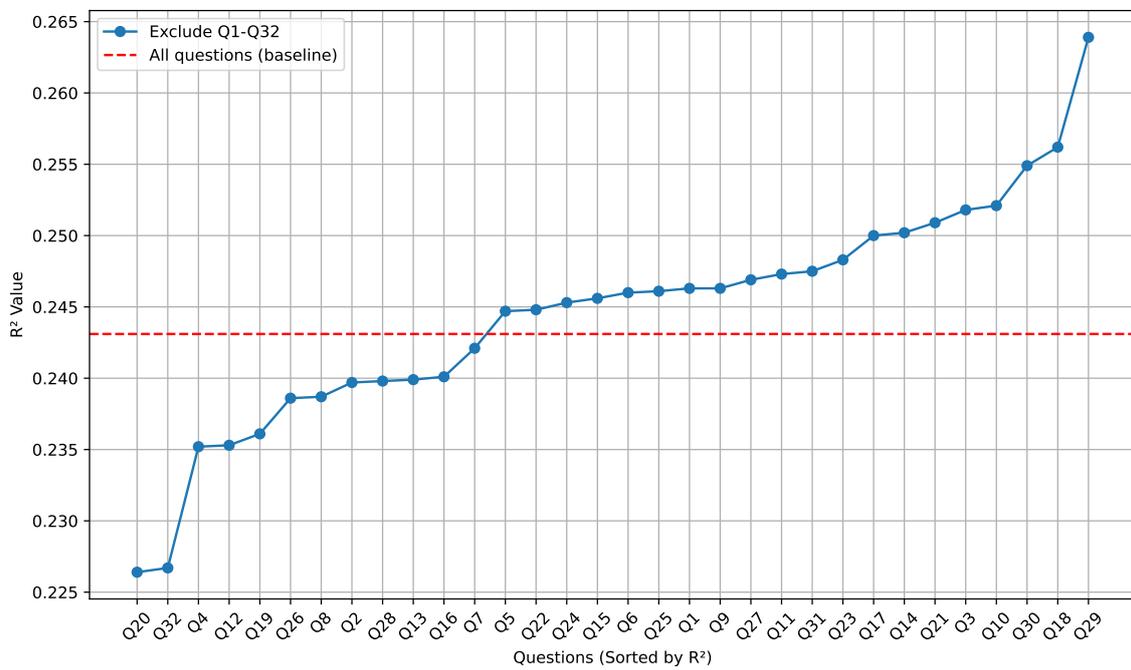


Figure 10: Ablation test results for predicting Neuroticism. The x-axis represents each removed question, and its corresponding response, and the y-axis shows the R^2 value. The red dashed line indicates the baseline R^2 when all questions are included.