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МІЖНАРОДНІ ОСОБЛИВОСТІ СПІЛКУВАННЯ МОЛОДІ ЗІ ШТУЧНИМ ІНТЕЛЕКТОМ

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INTERCULTURAL DIFFERENCES IN YOUTH COMMUNICATION WITH AI

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Анотація. *Штучний інтелект (ШІ) став невід'ємною складовою повсякдення: молодь дедалі частіше залучає інструменти ШІ до навчання, роботи та вирішення побутових завдань. Водночас результати досліджень вказують на ризики формування деструктивної або надмірної референтності до ШІ, що загрожує зниженням рівня критичного мислення та появою адиктивних поведінкових патернів. У цьому контексті вивчення того, як молодь концептуально позиціонує ШІ щодо реальних соціальних партнерів, є критично важливим для калібрування довіри та прогнозування трансформацій у міжособистісній взаємодії під впливом відносин «людина – ШІ».*

Мета. Метою дослідження було визначити місце ШІ у семантичному просторі сприйняття молоді у двох культурних контекстах (Україна та Італія), а також зіставити позиціонування ШІ з двома соціально значущими об'єктами – «другом» та «ворогом».

Методологія. Дві групи респондентів (Україна: n = 63; Італія: n = 63; вік 18-30 років, M = 22) взяли участь в онлайн-оцінюванні ШІ, «друга» та «ворога» за методикою семантичного диференціала (24 біполярні пари прикметників; шкала від 1 до 7). Для кожного об'єкта в обох культурних групах окремо проведено аналіз головних компонент (PCA) із застосуванням варимакс-ротації (загалом шість рішень). Компоненти відбиралися за критерієм Кайзера ($\lambda > 1$), а значущими вважалися факторні навантаження $|f| \geq 0{,}40$.

Ключові результати. В обох культурах оцінка ШІ структурувалася за окремими соціально-моральними та інструментальними вимірами, проте домінантні смислові осі виявилися відмінними. В українській вибірці провідний компонент сприйняття ШІ акцентував на аспектах довіри та безпеки, тоді як в італійській – домінувала репрезентація ШІ як більш спокійного та керованого інструмента. В обох групах ШІ чітко диференціювався від людських постатей через параметри штучності та зниженої емоційності. Структури образів «друга» та «ворога» продемонстрували когерентний контраст між підтримкою/ресурсністю та моральною загрозою, при цьому в репрезентації «ворога» спостерігалася культурно специфічна інтеграція девальвації його компетентності.

Перспективи подальших досліджень. Обмеженнями роботи є помірний обсяг вибірки та поперечний зріз дослідження (cross-sectional design). Майбутні розвідки мають бути спрямовані на перевірку стабільності цих семантичних структур на більших і різноманітніших вибірках із врахуванням контекстуальних чинників (якість офлайн-соціалізації, соціальний статус, міцність мереж дружніх зв'язків). Також доцільно дослідити, чи виступають індивідуальні особливості (зокрема емоційний інтелект) буфером проти ризиків, пов'язаних з інтенсивним використанням ШІ.

Ключові слова: *штучний інтелект, міжкультурна комунікація, семантичний диференціал, факторний аналіз, молодь.*

Формули: 3; рис.: 0; табл.: 1; бібл.: 10

Abstract. *Artificial intelligence (AI) has become part of everyday life, and young people increasingly use AI tools for study, work, and daily problem solving. At the same time, research highlights the risk of harmful or excessive reliance, including potential reductions in critical thinking and the emergence of dependency-like patterns. Understanding how youth conceptually position AI in relation to human social partners is therefore important for trust calibration and for anticipating how the human–AI relationship may reshape social interaction.*

Aim. The aim of this study was to map how youth in two cultural contexts (Ukraine and Italy) perceive AI within a semantic space and to compare AI positioning with two socially salient human targets (a friend and an enemy).

Methodology. Two groups of participants (Ukraine: n = 63; Italy: n = 63; ages 18–30, M = 22) completed online ratings of AI, a friend, and an enemy on a semantic differential with 24 bipolar adjective pairs (1 = left pole; 7 = right pole). Principal component analysis (PCA) with varimax rotation was performed separately for each target in each cultural group (six solutions). Components were retained using Kaiser's criterion (λ >1), and salient loadings were defined as | f | ≥ 0,40.

Key results. Across cultures, AI evaluations were organized by separable socio-moral and instrumental dimensions, but the dominant meaning of axes differed. In the Ukrainian sample, the leading AI component emphasized trust and safety, whereas in the Italian sample the dominant structure reflected a calmer and more manageable representation. In both groups, AI remained distinct from human targets due to dimensions capturing artificiality and reduced emotionality. Friend and enemy structures showed coherent contrasts between support/resourcefulness and moral threat, with culture-specific integration of competence-related devaluation in the enemy's representation.

Future research. The study is limited by modest sample sizes and its cross-sectional design future work should test the stability of these semantic structures in larger and more diverse samples, incorporate contextual factors (e.g., quality of offline social life, social status, strength of friendship networks), and examine whether individual differences (e.g., emotional intelligence and the strength of social ties) buffer risks associated with intensive AI use.

Keywords: *artificial intelligence, intercultural communication, semantic differential, factor analysis, youth.*

Formulas: 3; fig.: 0; tab.: 1; bibl.: 10

Intercultural communication increasingly involves interactions with artificial intelligence (AI) systems. Yet, the social meaning of AI may differ across cultural contexts, particularly among young people who frequently use AI-enabled technologies. The present study examines how youth from two cultural groups (Ukraine and Italy) perceive AI relative to two socially salient human targets (a friend and an enemy). We use a semantic differential approach to map these targets within a latent semantic space and compare the resulting structures across cultures.

Analysis of recent research and publications. Prior research suggests that people can form attachment-like relationships with artificial agents and digital humans, particularly in contexts of social connection and support (Krämer et al., 2011; Sullivan et al., 2023; Zhang et al., 2023). Recent work has also raised concerns about over-reliance on AI systems and the potential psychological risks that can arise in sustained human–AI relationships (Kim & Lee, 2024; Yatani et al., 2024). Related literature further discusses risks of AI-based digital companionship for youth (Bhat et al., 2025), practical challenges of integrating AI into youth mental health care (Marshall et al., 2025), and early work on AI-assisted online social therapy in youth mental health contexts (D'Alfonso et al., n.d.).

Related work in the Ukrainian context has begun to address psychological aspects of youth communication with AI (Dyshkant & Vasylchenko, 2025). In adjacent research on interpersonal dynamics, emotional intelligence has been linked to conflict-related tendencies, which may inform how young people frame "friend" and "enemy" targets in evaluative judgments (Muzyka & Nykonenko, 2025).

Task statement (aim and methods). The aim of the study is to identify and compare latent semantic dimensions used by Ukrainian and Italian youth to evaluate AI, a friend, and an enemy. Methodologically, we apply principal component analysis (PCA) with varimax rotation to semantic differential ratings collected via an online questionnaire.

The subject of research is youth social relationships with artificial intelligence. The subject of research comprises the

psychological and sociological characteristics of how young people evaluate AI and position it relative to socially salient human targets (a friend and an enemy) within a latent semantic space.

The practical significance of the study lies in the potential application of its results across several domains. First, the findings can inform the development of more ethical, safe, and human-centered AI systems that better reflect users' psychological needs and help minimize risks of dependency and social isolation. Second, the results may be used by psychologists and social educators to design recommendations for healthier youth interaction with AI in online environments, including guidance for overcoming communication barriers and for forming realistic expectations about digital relationships. Third, educational institutions may apply the findings when designing digital literacy programs that incorporate psychological and sociological aspects of human–AI communication, support the development of healthy digital habits, and counteract potentially negative stereotypes about AI use.

Study focus. This study examines how youth in two cultural groups (Ukraine and Italy) evaluate AI relative to two socially salient human targets (a friend and an enemy) using a semantic differential approach.

Sample. Two groups participated: Ukrainian youth (n = 63) and Italian youth (n = 63). Participants were 18–30 years old (M = 22). Gender was recorded via a self-report item in the questionnaire. The Italian sample included 33 men, 29 women, and 1 nonbinary participant; the Ukrainian sample included 18 men and 45 women.

Ethics. Participants took part voluntarily via an online questionnaire. The study collected anonymous responses and included an informed-consent statement at the beginning of the survey. No personally identified information was collected.

Materials and Measures. Participants evaluated three targets: AI, a friend, and an enemy. Evaluations used a semantic differential consisting of 24 bipolar adjective pairs (e.g., good–bad). The adjective pairs were: stupid–smart; fast–slow; useful–harmful; inflexible–adaptive; understandable–complex; template-like–creative; interesting–boring; innovative–outdated; false–accurate; safe–dangerous; doubtful–reliable; honest–deceitful; emotional–unfeeling; multifunctional–limited; entertaining–educational; structured–chaotic; real–artificial; bad–good; free–dependent; frightening–calming; overrated–underrated; friendly–hostile; unpredictable–stable; arrogant–submissive. Participants responded on a 7-point likert scale (1 = left pole; 7 = right pole). The instrument was administered in Ukrainian for the Ukrainian group and in Italian for the Italian group.

Translation. The semantic-differential adjective pairs were administered in Ukrainian and Italian. Items were translated to preserve the intended evaluative meaning of each bipolar pair. To minimize semantic drift across languages, wording was reviewed by bilingual speakers familiar with both cultural contexts.

Procedures. Data collection proceeded in two stages using online Google Forms. In Stage 1, participants provided adjectives associated with AI. Based on respondents' inputs, we constructed a semantic-differential scale with bipolar adjective pairs. In Stage 2, a second Google Form asked participants to evaluate three objects (AI, friend, enemy) on the resulting semantic differential. The order of objects and adjective pairs was fixed and identical for all participants in both cultural groups. The survey link was distributed via messaging applications (e.g., WhatsApp, Telegram) and through personal requests to complete the questionnaire.

Data Analysis. For each cultural group, we conducted separate exploratory analyses for each target (AI, friend, enemy), yielding six analyses in total. Specifically, we used principal component analysis (PCA) with varimax rotation. For the AI target, four components were retained in each cultural group. For the friend and enemy targets, three components were retained in each cultural group. Factor loadings with an absolute value of .40 or higher were treated as salient for

interpretation. The component structures were interpreted and compared to examine how each group positions AI relative to friend and enemy within a semantic space. Analyses were conducted in SPSS and JASP. Because all questionnaire items were required in Google Forms, there were no missing responses.

Components were retained using the eigenvalues-greater-than-one rule (Kaiser's criterion). Analyses were conducted separately by cultural groups and objects to obtain target-specific semantic structures.

The number of retained components was determined using Kaiser's criterion:

$$\lambda_k > 1, \quad (1)$$

To report the relative contribution of each retained component, we used the

percentage of variance explained:

$$Var_k(\%) = 100 \times \frac{\lambda_k}{\sum_j^p \lambda_j}, \quad (2)$$

where λ_k is the eigenvalue for component k and p = 24 is the number of adjective pairs.

Because PCA can be conducted on standardized variables, the z-score transformation (used when standardization is applied) is:

$$z_{ij} = \frac{x_{ij} - \bar{x}_j}{s_j}, \quad (3)$$

where x_{ij} is participant i's rating on adjective pair j, x_j is the sample mean, and s_j is the sample standard deviation.

Results of the study. To keep the main text concise, we report summary information for each PCA solution (component labels, variance explained, and representative high-loading adjective pairs). Full loading matrices are available from the authors upon request.

Results and Interpretation. In each cultural group, the PCA solutions yielded interpretable latent dimensions for AI, friend, and enemy. In what follows, we summarize the retained components for each target, report their variance explained, and interpret each component based on adjective pairs with salient loadings ($|f| \geq .40$). We then compare how AI is positioned relative to friend and enemy across the Ukrainian and Italian samples, highlighting convergent and divergent dimensions that may reflect intercultural differences in social meaning-making around AI.

Summary of PCA solutions. All six PCA summaries (two cultures × three objects) are presented together in Table 1.

Table 1

Summary of PCA solutions by target and cultural group

Group & target	Component label	Var. (%)	Representative high-loading adjective pairs ($\|f\| \geq .40$)
Ukraine: AI	Reliable (trustworthy)	16	Safe–dangerous (.73); Friendly–hostile (.71); Bad–good (−.69)
	Expert / competence	15	Innovative–outdated (.77); Multifunctional–limited (.61); Interesting–boring (.61)
	"Impostor" (smartness/accuracy)	13	False–accurate (.73); Overrated–underrated (.67); Stupid–smart (.65)
	Technological / artificiality	8	Real–artificial (.76); Entertaining–educational (.72); Emotional–unfeeling (.48)

Continuation of Table 1

Group & target	Component label	Var. (%)	Representative high-loading adjective pairs (| *f* | ≥ .40)
Ukraine: Friend	Capable / effective	19	False–accurate (−.67); Fast–slow (.66); Useful–harmful (.65)
	Virtuous / authentic	16	Friendly–hostile (.74); Real–artificial (.70); Bad–good (−.63)
	Reliable (stability/structure)	7	Unpredictable–stable (.59); Overrated–underrated (−.55); Structured–chaotic (−.44)
Ukraine: Enemy	Effective (low perceived effectiveness)	17	Template-like–creative (−.85); Inflexible–adaptive (−.69); Interesting–boring (.68)
	Humane / virtuous (low)	16	Bad–good (−.81); Friendly–hostile (.70); Safe–dangerous (.68)
	Doubtful / treacherous	10	Structured–chaotic(.80); False–accurate (−.55); Real–artificial (.51)
Italy: AI	Good / “boring” (valence/calmness)	16	Arrogant–submissive (.77); Frightening–calming (.76); Entertaining–educational(.67); Friendly–hostile (−.65)
	Effective (engagtement/modernity)	15	Interesting–boring (.77); Innovative–outdated (.68); Overrated–underrated (−.66)
	Authentic / “emotional” (human-likeness)	13	Emotional–unfeeling (.77); Multifunctional–limited (.69); Real–artificial (.62)
	Trustworthy / didactic	8	Honest–deceitful (.53); Entertaining–educational (.48)
Italy: Friend	Supportive / resourceful	27	Friendly–hostile (.86); Frightening–calming (−.79); Educated–uneducated (−.77); Bad–good (−.75)
	Effective (structured/clear)	15	Structured–chaotic (−.65); Understandable–complex (−.62); False–accurate (.59)
	Expressive (creativity/safety)	12	Template-like–creative (−.69); Safe–dangerous (.63); Emotional–unfeeling (.60)
Italy: Enemy	Supportive / resourceful (low)	17	Arrogant–submissive (−.75); Bad–good (−.73); Honest–deceitful (−.73)
	Effective / competent (low)	13	Free–dependent (−.63); Friendly–hostile (−.60); Complex–understandable (−.53)
	Doubtful / treacherous	10	Structured–chaotic(−.72); Innovative–outdated (−.56); Doubtful–reliable (−.49)

Note. PCA with varimax rotation. Salient loadings were defined as | *f* | ≥ 0.40. Negative loadings on positive poles indicate low perceived endorsement of that pole for the target.

Source: authors' calculations based on the survey data.

Discussion. This section provides a concise interpretation of the extracted components and highlights the most salient cross-cultural differences in how AI is positioned relative to a friend and an enemy.

Key patterns for AI. Across both samples, AI evaluation separated (a) socio-moral appraisal (e.g., friendliness, goodness, safety) from (b) instrumental appraisal (e.g., interest, innovation, multifunctionality), but the prominence and structure of these dimensions differed by culture. In the Ukrainian sample, the leading dimension was trust/safety (AI as a potentially partner-like agent that must be evaluated for reliability), whereas in the Italian sample the leading dimension reflected a more good-natured/calm and manageable image (AI as non-threatening and controllable). Both groups also showed a dimension capturing effectiveness/modernity, although the Italian "effectiveness" factor included an explicit qualification (overrated), consistent with mild skepticism toward AI-related social hype.

Two additional dimensions help explain why AI does not fully overlap with human targets. First, the Ukrainian impostor/authenticity dimension indicates ambivalence about whether AI represents genuine intelligence or an algorithmic simulation. Second, the technological/artificiality dimension (present in both groups) marks a boundary between AI and human social partners by emphasizing non-human, unemotional, and artificial properties.

Friend and enemy. For "friend," Ukrainian participants emphasized capability/effectiveness as the primary axis, with moral qualities and stability forming additional, separable dimensions. In contrast, Italian participants' leading factor was more integrative (supportive/resourceful), suggesting a holistic representation in which friendliness and positive moral appraisal cohere strongly. For "enemy," Ukrainian participants' structure foregrounded devaluation of competence alongside moral threat, whereas the Italian structure emphasized moral threat more centrally, with competence-related devaluation appearing as a secondary dimension.

Positioning AI between a friend and an enemy. Functionally, AI aligns most strongly with the capability/effectiveness dimension that is central to the friend representation (especially in the Ukrainian sample), supporting the view of AI as a pragmatic resource. In practical terms, this pattern suggests that youth tend to approach AI primarily as a tool that can help them solve problems efficiently (e.g., generating ideas, finding information, assisting with studies or work), rather than as a social partner in the full interpersonal sense.

At the same time, the present semantic structures indicate that AI occupies an intermediate social position: it can be evaluated with some of the same criteria used for humans (e.g., helpfulness, stability, honesty), yet it is not granted the same moral and relational status as a friend. Two mechanisms appear to sustain this boundary. First, the authenticity/autonomy ("impostor") theme in the Ukrainian sample suggests uncertainty about whether AI's "smartness" reflects genuine understanding or only a convincing simulation. This ambiguity may limit emotional closeness and keep AI in a "conditionally trusted" category: it can be useful, but its outputs still require verification. Second, the technological/artificiality dimension emphasizes non-human qualities (artificial, unemotional), which reduces the likelihood that AI will be interpreted as capable of loyalty, empathy, or responsibility–attributes that are central in the friend representation.

The comparison with the enemy target further clarifies AI's positioning. AI does not map strongly onto the enemy's moral-threat profile (hostility, danger, deceit), but some adjective pairs that load on trust and safety can make AI potentially enemy-adjacent under certain framings (e.g., if it is seen as unsafe, unreliable, or manipulative). This highlights a key asymmetry: moving from "tool" to "threat" may require fewer semantic shifts than moving from "tool" to "friend," because threat

perceptions can be triggered by uncertainty and lack of control.

Overall, the Ukrainian semantic space appears more differentiated and security-salient (trust as a primary axis), consistent with a stronger need to evaluate AI in terms of risk and reliability. In contrast, the Italian space is comparatively smoother and more pragmatic, with trust embedded in a broader positive appraisal (calm/manageable AI), which may reflect a more routine, low-threat integration of AI into everyday tasks. Taken together, these findings suggest that cross-cultural differences in youth communication with AI may be driven less by whether AI is seen as "good" or "bad" and more by how cultures organize the transition from instrumental usefulness to social acceptance and moral accountability.

Limitations. Several limitations should be considered when interpreting the findings. First, each PCA was conducted on a modest sample size (n = 63 per cultural group), which may affect the stability of component solutions, especially with 24 adjective pairs. Second, the semantic differential was administered in two languages; despite careful translation, subtle differences in connotation may influence cross-cultural comparability of specific adjective pairs. Third, target and item order were fixed for all participants, which may introduce order or fatigue effects. Finally, the convenience sampling strategy and online recruitment limit generalizability beyond the sampled populations.

Future directions. Future research should extend the present cross-sectional findings with longitudinal and mixed methods designs to capture how youth representations of AI evolve over time and with continued exposure. In addition, future studies should employ richer participant profiling, including temperament- and character-related measures, to examine how stable individual differences are associated with AI evaluations and communication patterns. Finally, it would be valuable to model contextual and social-environmental moderators (e.g., the number and perceived quality of close friendships, broader social integration, and other external conditions) to clarify how offline social connectedness relates to AI positioning in semantic space and to trajectories of AI use.

Conclusions. This study provides a structured comparison of how young people from two cultural contexts position AI relative to prototypical social targets (friend, enemy) in a semantic space. The results suggest both shared dimensions (e.g., capability/effectiveness and socio-moral appraisal) and culture-specific emphases (e.g., trust/safety in the Ukrainian sample versus calm/manageability in the Italian sample).

Scientific novelty, theoretical, and practical value. The scientific novelty of the study lies in mapping AI, friend, and enemy within comparable latent semantic spaces across two cultural contexts using a unified semantic differential instrument. Theoretically, the findings contribute to intercultural perspectives on human–AI communication by showing how trust, competence, and human-likeness are organized differently across cultures. Practically, the extracted dimensions can inform the design of AI systems and communication strategies that are sensitive to culturally specific expectations about reliability, controllability, and social alignment.

Socio-economic effect and prospects for further research. From a socio-economic perspective, culturally attuned AI communication may reduce misunderstandings and increase appropriate trust calibration, which can support more effective use of AI tools in education, work, and everyday problem solving. Future research should test the stability and generalizability of the extracted structures in larger samples and examine whether specific framings of AI roles (assistant vs. autonomous agent) shift AI's positioning toward friend-like or enemy-like representations.

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