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Editorial office Premier Publishing s.r.o.

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Section 1. Business economics

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SUSTAINABILITY RATINGS AS THE KEY BENCHMARK FOR GLOBAL BUSINESS

Mzevinar Nozadze [1]***, Giga Pertia*** [2]

[1] Doctor of Economics, Associate professor of Faculty Business Technologies, Georgian Technical Univetrsity.

[2] PhD Student, Caucasus International University, Tbilisi, Georgia

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Abstract

The contemporary global economy is experiencing a profound shift toward sustainability. If decades ago, business success was measured only by the size of profits and losses, today the rules of the game have changed radically. In today's corporate landscape, sustainability ratings have emerged as a pivotal mechanism, shaping not only a company's reputation but also its financial performance and social responsibility. Sustainability Ratings are not just a symbolic gesture of environmental responsibility, but rather a strategic and strictly calculated economic decision. Ignoring ESG standards in the global market poses a serious strategic risk for companies, which means both limiting access to cheap financial resources and reducing demand from responsible consumers.

The main goal of the article is to demonstrate the role of sustainability rating as a fundamental criterion determining the use of modern business, and to justify its members and operational members of commercial companies. Sustainability.

The article is based on a complex theoretical analysis, where several methods are described. In particular, the descriptive (descriptive) and previous analysis method and the second data processing method, based on official reports and statistics of international financial institutions, rating agencies and leading technology companies.

Keywords: *Sustainability Rating, ESG rating, Benchmark, DJSI World (Dow Jones Sustainability World Index), Global Business*

Introduction

Sustainability Rating – Based on the general philosophy of sustainable development (e.g. the UN's 17 Sustainable Development Goals – SDGs). Focus: Measures the company's real impact (Impact) on the

environment, society and the well-being of future generations. The question it answers is: "To what extent does this company contribute to the sustainable development of the world and a better future.

ESG Rating (ESG Rating): Specific and standardized framework: presents specific, measurable criteria (Environmental, Social, Governance). This rating primarily measures financial materiality and risks – that is, how environmental, social and governance factors affect the financial sustainability and stability of the company. In addition, sustainability defines the strategic vision and social responsibility of a business, and ESG ratings serve as a global benchmark and evaluation standard by which investors verify the reality of a company's claim.

Results analysis

In the modern global market, ESG (Environmental, Social and Governance) ratings have become the main indicator for evaluating companies. This sustainability assessment system determines business activities in several fundamental directions:

— Investment attraction and financial benefits: A high sustainability rating directly impacts investor decisions, as it increases access to cheap capital and increases the overall market value of the company.

— Competitive advantage and reputation: International companies use ESG indicators as a benchmark to gain an advantage over competitors and strengthen brand trust.

— Global standards and transparency: Compliance with ESG ratings ensures compliance with international regulations (e.g., EU CSRD) and high transparency of organizational reporting.

These theoretical and pragmatic issues are increasingly taking an active place in modern scientific discourse.

High Sustainability firms are characterized by a distinct corporate governance model that focuses on a wider range of stakeholders as part of their corporate strategy and business model (Robert G. Eccles, 2014).

Appropriate evaluation systems serve as the critical link between the practical realization of this strategic vision and investment decisions. ESG ratings and metrics are an important foundation for the field of sustainable finance. Theory predicts that investor preferences for ESG affect asset prices. In practice, however, investment choices are guided by ESG ratings, making the construction of and disagreement among ESG ratings a central concern (Berg, 2022).

Transforming these components into measurable indicators ensures the creation of ESC ratings that represents foundation of sustainable finance today. ESG comprises three core pillars – Environmental, Social, and Governance – used to evaluate acompany's global impact and its commitment to sustainable development (Badri Giorgidze, 2026).

Among the various sustainable ratings in the global market, indices play a central role as primary guides for investors. A prominent example of this is Dow Jones Sustainability World Index (DJSI World) – one of the most influential global benchmarks. Dow Jones Sustainability World Index (DJSI World) – is a major global benchmark index evaluating the sustainability practices of leading companies. It measures and ranks the top 10% of the 2,500 largest companies in the S&P Global Broad Market Index. The index is float-adjusted market capitalization-weighted and updated annually based on revised sustainability scores.

The corporate sustainability of each company represented in the index is assessed through a complex weighting system that incorporates the economic, environmental and social dimensions of the companies. Companies failing to show continuous progress face removed from the index. Companies may also be removed between annual reviews if the index committee determines that the company is not behaving in accordance with the sustainable development guidelines.

If a company is undergoing a merger or acquisition at some point during the CSA cycle, they are supplied with additional standardized guidance for reporting their data. If a company acquires another company after the annual publication of ESG Scores, the acquiring company retains their score until the next annual assessment cycle (S&P Global, 2026).

This high level of selectivity is further reinforced by strict methodological governance during corporate restructuring. Over 12,000 companies are invited to participate in the CSA every year, but only about 3,500 of the largest companies globally are eligible for

inclusion in any Dow Jones Best-in-Class index. Thus, when a company enters the DJSI World Index (ranking within the top 10% of its industry), it receives an official endorsement of its top-tier ESG management.

To evaluate entities involved in ESG-related controversies, a system of red or orange flag indicators are employed. A red flag indicates that a company directly harms the environment, society, or corporate governance standards through its activities, products, or operations. Conversely, an orange flag points to moderate-risk controversies, predominantly concerning land use and biodiversity issues.

MSCI ESG Ratings aim to measure entities' management of environmental, social and governance risks and opportunities. MSCI ESG Ratings use a weighted average key issue calculation that is normalized by industry to arrive at an industry-adjusted ESG score (0–10) (MSCI, 2025).

A high sustainability rating provides companies with a direct financial advantage – specifically, access to lower-cost capital. A prime example of this is the rapid growth of the green bond market. Green finance and sustainable business create a synergy, where businesses integrateenvironmental, social, and governance (ESG)principles into their long-term perspective (Mzevinar Nozadze, 2025).

While sustainability ratings and ESC indicators have become the main framework for allocating capital, their real-world implementation often exposes structural methodological inconsistencies. As a result, traditional ESG metrics tend to reflect formal reporting compliance instead of the actual sustainability of a firm's core business model – a contradiction most clearly illustrated by major global market leaders.

"Paradoxical" case: Tesla's removal from the S&P 500 ESG index in 2022 represents one of the most prominent case studies in the history of ESG evaluations. What factors precipitated this situation? Tesla, the global leader in electric vehicles, which is one of the most "green" companies in terms of environmental (E), was removed from the S&P 500 ESG index. The reason: low scores in the social (S) and governance (G) areas – violations of working conditions in factories, weak corporate governance structures, and allegations of racial discrimination.

It is worth noting that in recent years MSCI has continued to award Tesla high ESG marks due to its environmental impact advancements in clean tech. This case ultimately illustrates that ESG rating is not merely a proxy for environmental friendliness – the social and governance components carry equal financial and reputational weight. Each agency evaluates ESG factors differently: while some prioritize climate risks, others place greater emphasis on human rights or supply chain ethics. Such methodological mismatch results in situation where a firm is assessed as high ESG risk by the ESG risk rating agency, yet assigned an AAA (the top mark) rating by MSCI.

To resolve this issue, the European Union and IFRS introduced mandatory reporting standards (CSRD, ISSB) aimed at unifying disclosures and ensuring rating agency methodologies are transparent and regulated. Global ESG rating system differ fundamentally in terms of target audience and evaluation criteria. The following comparison illustrates how leading institutions assess corporate sustainability.

Table 1. *Global ESG Rating Systems: Structural & Methodological Comparison*

Rating Agency	Target Audience	Primary Focus	Key Methodological Feature
MSCI ESG Ratings	Investors, Fund Managers	Financial Materiality	Evaluates corporate resilience to ESG risks on a scale from AAA to CCC.
S&P Global (CSA/ DJSI)	Global Corporations, investors	Corporate Sustainability	Utilizes the CSA questionnaire alongside daily MSA (Media and Stakeholder Analysis) monitoring

Rating Agency	Target Audience	Primary Focus	Key Methodological Feature
CSRD / ESRS (EU)	EU Regulators, General Public	Double Materiality	Measures both financial risk and the company's impact on the environment

Source: *Compiled by the author based on official methodological documents: MSCI ESG Ratings: MSCI ESG Ratings Methodology: Executive Summary (MSCI, 2023). msci.com, S&P Global (CSA/DJSI): S&P Global Corporate Sustainability Assessment (CSA) Methodology. spglobal.com*

ESG scores from major ratings providers (for which data is commercially available) can vary greatly from one ESG provider to another. The ESG scoring suffers from some level of criticism because different methodologies can lead to wide variance in results for individual issuers (Boffo & Patalano, 2020)

In developing countries, companies struggle to attain high ESG scores, as they lack the substantial resources of foreign multinational corporations required to produce complex disclosure reports.While global ESG benchmarks heavily favor large enterprise-level entities, in emerging economies like Georgia, small business represent the core drivers of sustainable commercial development. Consequently, examining how tax policy influences the financial viability of small enterprises carries profound scientific and practical relevance. Thus, the research findings confirm that the effectiveness of the new, preferential special taxation regime in the contextof small business development is multidimensional. The primary positive impact is manifested in strengthening the financialsustainability of small businesses and creating potential for development (Badri Gechbaia, 2026).

The sustainability evaluation ecosystem is undergoing a fundamental technological evolution. Traditional assessments relying on static annual non-financial reports are being superseded by artificial intelligence (AI), machine learning, and satellite monitoring. Industry leaders like MSCI and S&P Global now process vast real-time datasets, encompassing everything from media coverage and legal proceedings to high-resolution emissions mapping via satellite.

Consequently, sustainability ratings have established themselves as the definitive benchmark for global business as a comprehensive measure that integrates capital accessibility, executive accountability, and technological transparency.

Conclusion

Consequently, sustainability ratings remain a key mechanism for determining a business's long-term competitiveness and investment attractiveness.

The divergence among assessments from various agencies confirms that a sustainability rating cannot be one-dimensional; rather, it demands a balanced integration of Environmental (E), Social (S), and Governance (G) indicators. Consequently, the effectiveness of Sustainability Ratings will depend on the establishment o f unified global regulations (such as The EU CSRD) and the harmonization of assessment methodologies.

In emerging markets and the small business sector – as evidenced by the case of Georgia – flexible tax policy remains the primary catalyst for sustainability. Achieving long-term sustainable growth thus necessitates a dual approach: harmonizing global sustainable and ESG standards while strategically leveraging supportive tax instruments locally.

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Contact: nozadzemzevinar11@gtu.ge; giga.pertia@ciu.edu.ge

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Section 2. Philology and linguistics

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MUKHTAR AUEZOV'S PSYCHOLOGICAL INSIGHT: THE DEPICTION OF HUMAN CHARACTER AND INNER CONFLICT

Aghahuseyn Mammadhuseyn oglu Shukurov [1]

[1] Doctoral Philosophy in Philology, Associate Professor, Leading Researcher at the Nizami Ganjavi Institute of Literature of the Azerbaijan National Academy of Sciences

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Abstract

This article examines the profound psychological depth and masterclass depiction of human nature in the works of the outstanding Kazakh writer Mukhtar Auezov. Auezov is globally recognized for his monumental epic, "The Path of Abai," yet his psychological acumen permeates his entire literary legacy. This study analyzes how the author moves beyond external plot mechanics to explore the intricate labyrinth of human consciousness, moral dilemmas, emotional turbulence, and the socio-cultural pressures shaping individual identity. By utilizing psycho-literary analysis, this paper highlights Auezov's unique ability to merge national identity with universal human experiences, creating multi-dimensional characters whose internal struggles resonate deeply across cultures.

Keywords: *Mukhtar Auezov, psychological realism, inner conflict, Kazakh literature, human character, emotional depth, epic prose*

Introduction

The evolution of 20th-century literature is marked by an intense shift toward the internal world of the individual. Writers increasingly sought to decode the hidden motivations, subconscious impulses, and ethical quandaries driving human behavior. In Kazakh literature, Mukhtar Auezov stands as a towering pioneer of this psychological realism. While his historical and epic canvases provide a panoramic view of nomadic society, the true brilliance of his narrative lies in his microscopic examination of the human soul. Auezov did not merely describe events; he mapped the topography of human suffering, ambition, love, and despair. This paper explores the core mechanisms of Auezov's psychologism, investigating how he constructs complex internal landscapes for his characters across various genres.

The Philosophical and Cultural Roots of Auezov's Psychologism

To understand Auezov's approach to psychology, one must examine the intersection

of traditional nomadic worldview and classical world literature. Auezov was deeply influenced by Russian realism (particularly Leo Tolstoy and Fyodor Dostoevsky) as well as Western European psychological prose. However, his psychological framework remains authentically rooted in the spiritual heritage of the Kazakh people, famously epitomized by the philosophy of Abai Kunanbayev.

Abai's exploration of human conscience, enlightenment, and moral responsibility serves as the bedrock for Auezov's character development. In Auezov's prose, characters are rarely one-dimensional archetypes of good or evil. Instead, they are caught in intense dialectical tensions between communal traditions (*ata-babalyk salt*) and individual awakening, between fatalism and free will.

The Clash of Eras and Societal Transitions

The transition periods depicted in his works force characters to reevaluate their internal belief systems. When traditional clan structures collide with modern educational and administrative forces, individuals experience profound alienation. Auezov documents this psychological turbulence with clinical precision, showing how external societal shocks fracture or reshape internal identities.

Moral Conscience as an Internal Tribunal

Internal monologues in Auezov's novels function as a court of conscience where characters interrogate their own choices and societal expectations. Guilt, duty, honor, and shame are not abstract concepts but active psychological agents driving the narrative forward.

Internal Conflict as a Catalyst for Character Growth

A central thesis of Auezov's psychological art is that true character revelation occurs during moments of profound crisis. Whether in his short stories or the massive multivolume epic *The Path of Abai*, psychological tension peaks when characters face irreconcilable moral or emotional choices.

Auezov masterfully employs the technique of gradual psychological unveiling. He introduces a character through social interactions and outward behaviors, then systematically strips away layers of external defense mechanisms through escalating trials.

"The human heart is an abyss where traditional duty and passionate desire wage an eternal, silent war." – *Reflections on Auezov's Poetics*

For instance, the inner transformation of Abai himself throughout the epic is a masterclass in developmental psychology. Abai transitions from an idealistic, poetry-loving youth burdened by aristocratic expectations into a mature philosopher-thinker who carries the intellectual and emotional weight of his entire nation. His psychological struggles – his alienation from his environment, his turbulent relationships, and his agonizing search for truth – are rendered with absolute authenticity.

Artistic Techniques of Psychological Portrayal

Auezov utilizes a diverse array of literary devices to bring the inner world of his characters to the surface:

1. **Psychological Landscape (Landscape and Mood):** Nature in Auezov's works is never static or merely decorative. The vast, changing steppes, harsh winters, and blooming springs mirror the emotional states and spiritual shifts of the characters.
2. **Internal Monologue and Stream of Consciousness:** By granting readers direct access to a character's private thoughts, Auezov breaks down the barrier between narrator and subject, fostering profound empathy.
3. **Dialogue and Subtext:** Conversations in Auezov's prose often carry heavy psychological subtext, where unsaid words, hesitations, and glances reveal far more than explicit dialogue.

Through these methods, secondary characters – such as Orazbai, Zhirenshe, and various tribal leaders – are also endowed with complex, conflicting motivations, ensuring that even antagonists possess a tragic psychological depth rather than simple villainy.

Comparative Analysis: Auezov and European Psychological Realism

Placing Auezov in a comparative framework with European and Russian masters reveals both universal resonances and unique national specifics. While Dostoevsky explored

the metaphysical and moral extremes of the urban individual, and Tolstoy examined the ethical evolution of the aristocracy, Auezov mapped the psychology of a nomadic society undergoing rapid, irreversible historical mutation.

The nomadic mind, rooted in deep collectivism, tribal loyalty, and oral traditions, faces an unprecedented psychological shock when confronted with literacy, legal reform, and imperial integration. Auezov captures this transitional consciousness better than any contemporary, demonstrating how collective psychology internalizes individual tragedy.

Conclusion

Mukhtar Auezov remains a master architect of human psychology in Eurasian literature. By bridging the gap between traditional nomadic existence and universal psychological dilemmas, he created characters whose internal struggles transcend time and geography. His exploration of conscience, emotional turmoil, and intellectual awakening demonstrates that the inner landscape of the human soul is as vast and untamed as the Kazakh steppe itself. Auezov's psychological legacy continues to offer rich material for modern literary criticism, proving that true art lies in the unflinching examination of the human condition.

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Contact: agahuseyn.shukurov@gmail.com

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AN INTEGRATIVE LINGUACULTURAL APPROACH TO PRESERVING AND DEVELOPING THE UKRAINIAN LANGUAGE IN THE US DIASPORA: SYNERGY OF FAMILY AND EDUCATIONAL PRACTICES

Tetiana Klapatiuk [1]

[1] Ridna Shkola of Los Angeles, Los Angeles, USA

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Abstract

Ukrainian in the United States is kept alive mainly by families and weekend schools. This article combines a synthesis of studies on family language policy and community heritage schools with American Community Survey estimates for 2010–2024. The population born in Ukraine rose from 355,000 in 2019 to 510,000 in 2024. Residents reporting "Ukrainian or other Slavic languages" at home, the narrowest category in the annual tables, increased by 65.5% to 533,000 after a decade without detectable change, partly perhaps because bilinguals now name Ukrainian rather than Russian; the share speaking English less than "very well" rose from 36.1% to 43.7%. Ukrainian ancestry grew by a quarter, mostly in 2022, when Russian ancestry fell, which points to re-identification as well as migration. In 2017–2021 Ukrainian made up about half of the language group. Studies agree that home use sustains speech and belonging but seldom literacy, while standard-only schooling may push children away. I propose an integrative linguacultural model in which family, school, mainstream education and community ties carry particular dimensions of language (semantic–pragmatic, poetic, identity), and family and school coordinate goals, home reading and writing, and their response to mixed speech. The model is offered as a set of testable propositions.

Keywords: *Ukrainian heritage language, family language policy, heritage language schools, linguaculture, Ukrainian diaspora, American Community Survey, United States*

Introduction

Between 2019 and 2024 the number of US residents born in Ukraine rose from 355,000 to 510,000 (U. S. Census Bureau, 2025 a). A teacher at a New York school of Ukrainian studies already counted children who had just emigrated among heritage learners, next to children born outside Ukraine into Ukrainian families (Pikhmanets, 2022). The census figures suggest that the first group has grown since 2022.

Heritage languages in the United States rarely outlast the third generation, and home use without explicit instruction seldom produces highly proficient users (Lee & Wright, 2014). Family language policies alone cannot

save minority languages unless schools treat them as legitimate (Curdt-Christiansen et al., 2023), and a school that takes over literacy can reduce home practice to supplementing school content (Her, 2024). For Ukrainian in the United States the evidence is thin. One study finds that community schools in Southern California reinforce family language policies after 2022 (Kudyma & Krivchikova-Karkafi, 2026), another follows two displaced adolescents (Senyshyn, 2026); the rest consists of accounts by a diaspora teacher and Ukrainian methodologists (Pikhmanets, 2022; Turkevych, 2022) and school studies in England and Italy (Bocale, 2026; Harrison, 2021).

This article joins census data on the US diaspora after 2022 with a synthesis of family and school practices, mapped onto the cultural dimensions of language described by Risager (2020). It asks what the census shows and cannot show, and how family and school can be coordinated within one linguacultural approach.

Material and Methods

The article is conceptual: its discussion of family and school practices draws exclusively on published studies. No observational data from the weekend school where I teach were used.

Sources were identified through OpenAlex and Crossref searches, citation chasing and suggestions made during internal review. I included peer-reviewed studies, chapters and practitioner accounts on how families or community schools maintain a heritage language, with priority to Ukrainian. A documented run of 16 OpenAlex queries on 23 August 2026 (first 15 results each, 225 unique records) retrieves 11 of the 15 works used; the other four came from outside these searches. Table 2 condenses the notes kept on each study. This is a structured narrative synthesis, not a systematic review.

Census data are American Community Survey 1-year estimates for 2010–2024 from the Bureau's Summary File, accessed 22 August 2026 (U. S. Census Bureau, 2025a): Ukrainian and Russian ancestry (table B04006; people with two ancestries count under each), birth in Ukraine (B05006), and language spoken at home by ability to speak English, age 5+ (B16001). The narrowest B16001 line containing Ukrainian is "Ukrainian or other Slavic languages" ("Other Slavic languages" before 2016); Russian, Polish and Serbo-Croatian have their own lines. There are no standard 1-year estimates for 2020. Each person reports one non-English language; the group values for 2010 and 2019 equal those in the Bureau's report (Dietrich & Hernandez, 2022). A 5-year detailed table for 2017–2021 reports Ukrainian alone (U. S. Census Bureau, 2025b) and is used as a benchmark.

Margins of error are 90% intervals, so a standard error *SE* is the margin divided by 1.645. A change between estimates E_1 and E_2 is tested with (1), and margins of shares use the Bureau's formula for proportions.

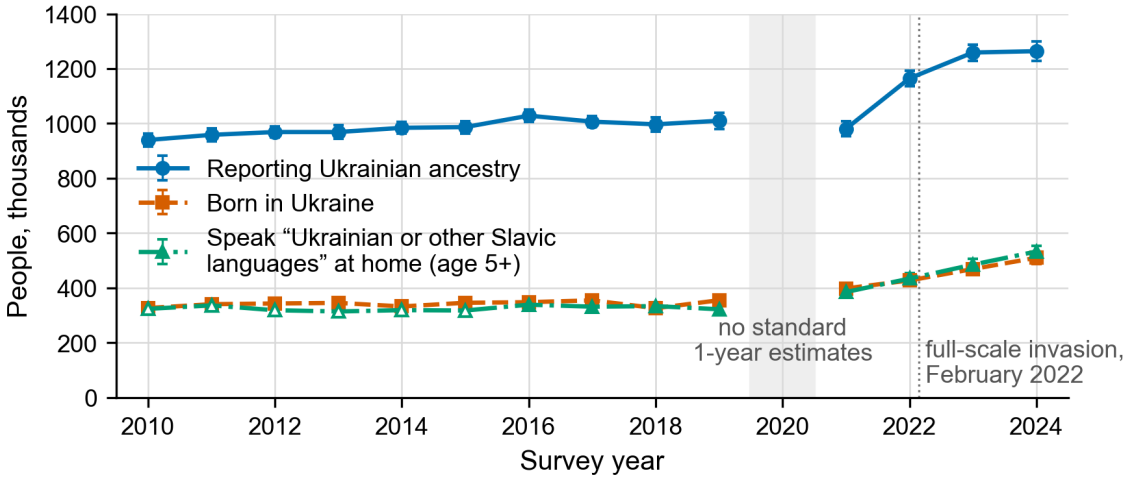
$$z = \frac{E_2 - E_1}{\sqrt{SE_1^2 + SE_2^2}} \quad (1)$$

What the Census Shows and What It Cannot

Between 2010 and 2019 the three counts changed little (Figure 1): ancestry rose by 7.5%, the Ukraine-born population stayed between 326,000 and 355,000, and the language group went from 323,000 to 322,000 (95% interval of the change, –8.9% to +8.0%). Growth began before the full-scale invasion: by 2021 the group was 19.6% and the Ukraine-born population 12.2% above their 2019 levels.

From 2019 to 2024 the Ukraine-born population rose by 155,000 (43.7%) and the language group by 211,000 (65.5%), both with $p < .001$ (Table 1). Ancestry rose by 254,000, but 72.4% of that came in 2022, when it grew by 184,000 while the Ukraine-born population grew by 29,000 ($p = .053$) and Russian ancestry fell by 308,000. Some residents apparently moved their self-description from Russian to Ukrainian, as Holian and Wolowyna (2025) also find among the US-born; the higher level held through 2024. The language series is open to the same shift: Holian and Wolowyna (2025) report more Ukrainian use among Ukrainian immigrants. In 2022 the group grew by 49,000 while Russian at home fell by 70,000 (by 2024 it was again 8.5% above its 2019 level). A Ukrainian–Russian bilingual who now names Ukrainian enters the group without being a new speaker, so the 65.5% growth is an upper bound for growth in speakers.

Figure 1. *Residents reporting Ukrainian ancestry, born in Ukraine, and speaking "Ukrainian or other Slavic languages" at home, United States, 2010–2024*



Note. Error bars are 90% margins of error. Hollow markers (2010–2015): the same language line under its earlier name, "Other Slavic languages"; the line excludes Russian, Polish and Serbo-Croatian, which have their own lines. Standard 1-year estimates for 2020 were not released. Source: U.S. Census Bureau (2025a), tables B04006, B05006 and B16001; author's calculations

Table 1. *Ukrainian ancestry, birth in Ukraine and home language, United States, 2019 and 2024 (thousands)*

Indicator	2019	2024	Change
Ukrainian ancestry	1,009.9 (29.1)	1,263.8 (36.4)	+254.0 (+25.1%)
Born in Ukraine	354.8 (14.8)	510.0 (22.7)	+155.2 (+43.7%)
Language group, 5+[a]	321.9 (16.5)	532.7 (21.2)	+210.8 (+65.5%)
– limited English[b]	116.1 (9.8)	232.6 (13.3)	+116.5 (+100.3%)
– share limited, %	36.1 (2.4)	43.7 (1.8)	+7.6 p.p.

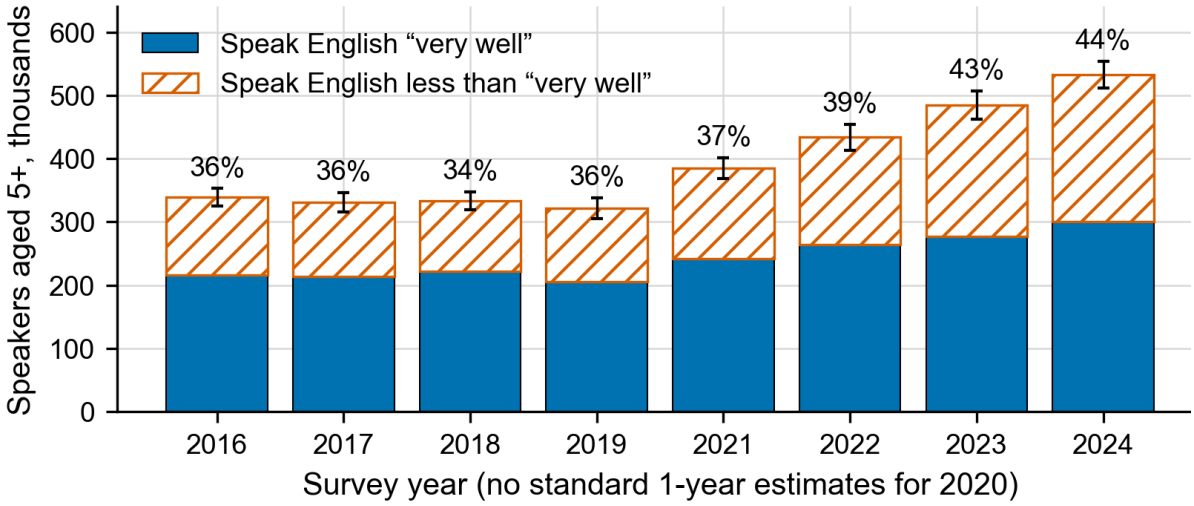
Note. 90% margins of error in parentheses[a]. "Ukrainian or other Slavic languages" (table B16001)[b]. Speak English less than "very well". All changes are significant at p < .001 (ACS z-test); the 95% interval for the change in the share is 4.0 to 11.2 percentage points. Source: U.S. Census Bureau (2025a); author's calculations

Speakers with limited English doubled, from 116,000 to 233,000, and their share rose from 36.1% to 43.7% after staying between 33.5% and 37.1% in 2016–2021 (Figure 2). Speakers with very good English also grew, by 94,000, so the shift does not come from a shrinking base. Switching bilinguals also enter this share, in a direction set by their English.

The detailed table for 2017–2021 counts 184,000 Ukrainian speakers, 51.9% of the group, of whom 45.3% spoke English less than "very well", against 35.9% for the whole group (U.S. Census Bureau, 2025b). Group shares thus understate the Ukrainian ones, but this table ends before the wave. New York, California, Pennsylvania, Florida and Illinois held 47.0% of people of Ukrainian ancestry in 2024, and California had the largest language group, 69,000, level with Illinois within sampling error.

The annual tables cannot separate Ukrainian from other Slavic languages that lack their own line, record only one home language per person, and say nothing about literacy or transmission between generations, so I compute no "retention rate".

Figure 2. *Speakers of "Ukrainian or other Slavic languages" at home by ability to speak English, 2016–2024*



Note. Percentages above the bars are the share who speak English less than "very well"; error bars are 90% margins of error of the total. Source: U.S. Census Bureau (2025a), table B16001; author's calculations

Family and School as Two Halves of One Program

Families decide whether a child meets Ukrainian at all. Family language policy joins beliefs, daily practice and deliberate management, and it is connected with children's success at school (King et al., 2008). Some newly arrived parents limit Ukrainian for fear of slowing their children's English, and these children soon lose even the Ukrainian they had (Pikhmanets, 2022). The family is strongest on everyday meanings and belonging; it rarely supplies literacy or a formal register.

That gap falls to the school (Lee & Wright, 2014). Heritage learners understand more than they produce (Turkevych, 2022); they sound native but read and write poorly, often lack polite address with *vy*, and know mainly the vocabulary of family, community and church (Pikhmanets, 2022). Pikhmanets (2022) finds that teaching them "as in Ukraine" overwhelms them and foreign-language methods are too easy, and argues for a heritage-specific approach with authentic texts rather than more practice time.

Table 2. *What each setting contributes to Ukrainian as a heritage language, and its risks when acting alone*

Setting	Supplies best	Risk when acting alone	Studies
Family	Daily use, affect, belonging	Speech without literacy; Ukrainian dropped for fear of hurting English	King et al. (2008); Pikhmanets (2022)
School of Ukrainian studies	Literacy, formal register, literature	Ill-fitting methods; standard-only norms	Bocale (2026); Harrison (2021); Pikhmanets (2022)
Mainstream education	Legitimacy; dual-language programs	English-only norms; school taking over literacy	Curdt-Christiansen et al. (2023); Her (2024)
Community ties	Youth groups, festivals, trips; informal clubs	Contact without instruction	Kudriavtseva (2025)[a]; Pikhmanets (2022)

Note.[a] *Adults in Ukraine. Source: author's synthesis of the studies cited*

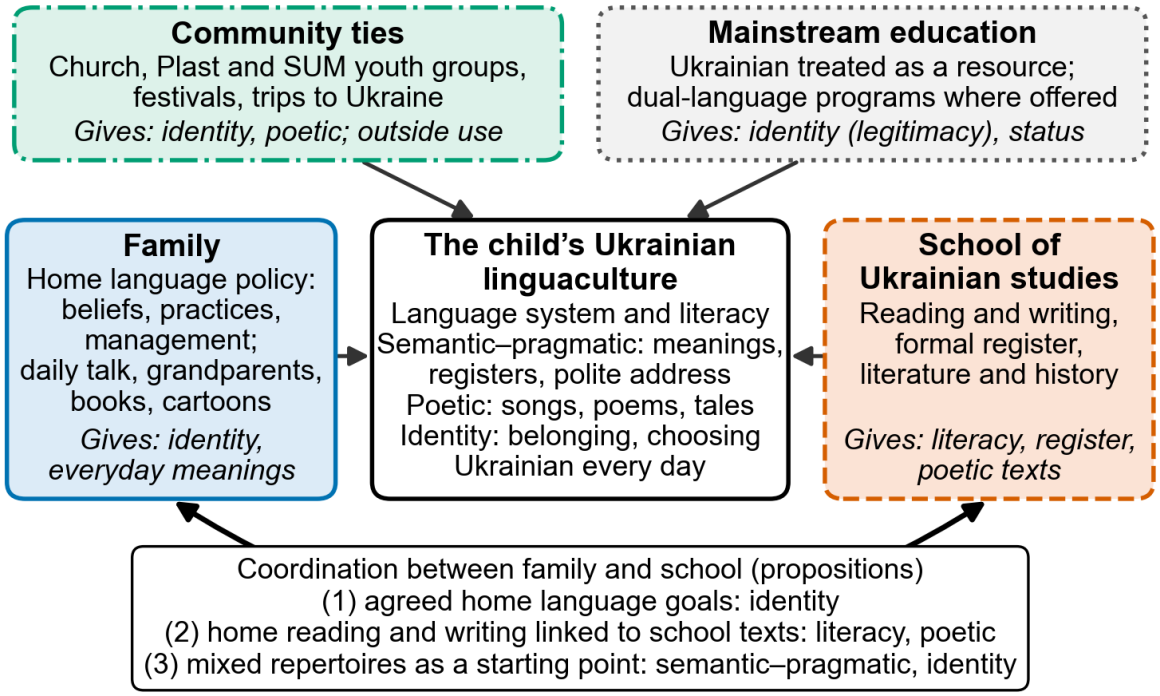
How a school treats mixed speech may affect whether children stay with Ukrainian. In a complementary school in England, mixing Ukrainian with English helped learning, yet teachers also asked for "Ukrainian, please" and corrected Russian (Harrison, 2021). In community schools in Italy, teachers treated home varieties as deficient; Bocale (2026) warns that this may alienate children, while noting that the effect is still unmeasured. Developments in Ukraine since 2022 make this more pressing: the shift from Russian is larger in public than in family life (Kulyk, 2024), and adult "new speakers" value fluency over correctness in informal clubs that tolerate mixing (Kudriavtseva, 2025). If diaspora parents follow that path, a school that corrects every Russian or mixed form may correct the very families moving toward Ukrainian.

Two displaced Ukrainian adolescents in the United States kept up schooling in both countries and used Ukrainian, English and at times Russian to stay on track (Senyshyn, 2026). Table 2 summarizes what each setting supplies and where it fails alone.

An Integrative Linguacultural Model

Risager (2020) describes linguaculture as the cultural side of language, with three dimensions: semantic–pragmatic (meanings and forms of address), poetic (sound and verbal art) and identity. Figure 3 assigns them to the settings. The family carries identity and everyday meanings. The school carries written language and the formal register, as well as the poetic dimension of literature and song. Community life offers youth organizations, festivals and trips to Ukraine, which Pikhmanets (2022) lists as strengthening Ukrainian roots and which I assign to identity and the poetic dimension; mainstream education supports identity by treating Ukrainian as legitimate (Curdt-Christiansen et al., 2023).

Figure 3. *The integrative linguacultural model of Ukrainian heritage language maintenance*



Note. The three dimensions of linguaculture follow Risager (2020); the roles of the settings and the coordination mechanisms summarize the studies in Table 2. Source: author's conceptual synthesis

By synergy I mean that coordinated family and school practices achieve what neither achieves alone. Kudyma and Krivchikova-Karkafi (2026) show community schools reinforcing family policy; the model adds the linguacultural mapping and three

mechanisms, which are propositions, not findings. Agreed home language goals serve identity, turning tacit beliefs into the "management" part of family policy (King et al., 2008). Home reading and writing linked to school texts serve literacy and the poetic dimension but should leave the family its own role, since a school that takes over literacy can shrink home practice (Her, 2024). Accepting mixed repertoires as a starting point serves the semantic–pragmatic and identity dimensions (Bocale, 2026; Harrison, 2021). Each is testable, for instance by comparing the literacy of children whose families do or do not receive school texts for home use.

Discussion

The post-2022 wave has added many speakers with limited English, whose children join schools where, as one New York teacher reported before 2022, most pupils are heritage learners rather than native speakers (Pikhmanets, 2022). That is a chance for the language and a strain on schools that need systematic support (Hazizova, 2025). If the third-generation pattern holds (Lee & Wright, 2014), the newcomers' grandchildren are likely to lose Ukrainian; whether coordinated action by family and school while the children are still fluent can change this is what the model's propositions would test.

Three limitations matter most. The annual tables mix Ukrainian with other Slavic languages and record one language per person, and the latest published Ukrainian-only table covers 2017–2021. The studies on practices are few and mostly small (one school in England, two schools in Italy, two adolescents in the US), only three concern Ukrainian in the United States, and several are practitioners' accounts. The model is a set of propositions, not a tested intervention.

Conclusion

Between 2019 and 2024 the Ukraine-born population of the United States grew by 155,000 and the home language group that includes Ukrainian by almost two-thirds, with 43.7% of its members speaking English less than "very well". Part of the rise in Ukrainian ancestry, and probably in the language group, appears to reflect re-identification rather than arrival (Holian & Wolowyna, 2025). The studies reviewed agree that families sustain speech and belonging while schools are needed for literacy and the formal register; the model adds testable propositions on coordinating the two. The next steps are Ukrainian-only estimates for all speakers after 2022 and tests of whether shared home reading and acceptance of mixed speech improve children's literacy.

Data Availability

All census data are public (U. S. Census Bureau, 2025a, 2025b). The table of studies reviewed, the search log and the code for all calculations and figures are available from the author on request.

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© Klapatiuk T.
Contact: klapatiuktetiana@gmail.com

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SHOULD WE BE POLITE TO CHATGPT?

Xinyang Ding [1]

[1] Student, Laurel & Pharus Academy

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Abstract

This paper explores the topic of politeness and whether or not it's necessary when interacting with non-humans, like AI chatbots. Through related scholarly research, the findings of this paper conclude that since AI lacks consciousness, clear, specific prompts are more important to improve AI responses than politeness. Additionally, from a utilitarian perspective, adding polite phrases wastes financial resources and energy, and generates carbon emissions while not producing consistently higher quality output. In sum, the most rational approach is to treat AI chatbots as powerful computational tools.

Keywords: *AI, ChatGPT, politeness, computational tools, consciousness*

Introduction

A famous study in psychology mentioned that people with serious amnesia lose every new memory they form within a few seconds (Squire, 2009). This raises an interesting question: should we be polite to these people without memory? From a consequence perspective, we might conclude that we do not need to, because impoliteness won't have a lasting effect on them. Yet, it is still immoral to be impolite to these people with amnesia because they are humans with emotions and at least a brief form of consciousness. Analogous to people with amnesia, AI chatbots have less consciousness than a healthy person. Thus, we must consider whether we should be polite to AI models. Politeness is defined as "behaving in a way that is socially correct and shows understanding of and care for other people's feelings" (Cambridge Dictionary, 2022, para. 1). Therefore, we should be polite to any entity that has feelings as a person does. But are AI conscious beings that can feel emotions or just advanced tools without feelings? In this essay,

I argue that AI chatbots are computational tools with no consciousness and no subjective perception of emotions, and being polite to AI generates unexpected negative influences, so we are not obligated to be polite to AI.

AI Consciousness

First, being polite to Chatbots is not inappropriate because AI chatbots don't have consciousness. The definition of consciousness is a long-standing topic of debate. The

ability to monitor and control itself in an environment is a key aspect of consciousness. Yet, AI chatbots like ChatGPT are pure programs existing in an online form, which are unable to monitor the environment they are in. AI chatbots can't control what they should say or spontaneously speak without a human's activation. Thus, AI is not conscious due to lack of monitoring, memory, and control (Kihlstrom, 2022).

In Ancient Greece, Plato interpreted consciousness by integrating reason, emotions, and desires (the tripartite soul); Aristotle, instead, approached consciousness as a cognitive process of connecting soul and body (Zaesar, 2024). From Plato, the Tripartite Soul consists of intellect, emotions, and appetitive aspects(desires), with three pillars all being necessary to achieve consciousness (Bodo, 2024). On the other hand, John Locke's opinion in "*An Essay Concerning Human Understanding*", as a refinement of the former, states that one prerequisite of personal identity is the continuity of consciousness, essentially, a thinking intelligent being must be able to consider itself as itself at any other place or time (Afroza, 2023). To achieve the continuity of consciousness of linking past experience to the present self, memory is necessary. The significance of memory is that it serves as an integrating "glue" that links the three pillars across time (Philosopheasy, 2025). Thus, if an entity has no memory to link its personal identity over time, it can't have continuous feelings of emotion, desire, and intellect, and thus it is not conscious. However, AI chatbots have no memories, meaning they are incapable of being conscious, so being impolite to AI is not wrong (Kotchoubey, 2018).

AI does not have memories in the way that would contribute to a unified consciousness. There are various types of human memories, such as long-term and short-term, conscious and unconscious, and episodic and semantic (Queensland Brain Institute, 2016). Large language models have no genuine memories because they lack subjective experience in any form, and they lack the reconstructive memory that biological beings possess. Simply, humans only remember part of the event, and the rest is made up of assumptions, experiences, and existing knowledge (Roediger, 2001). For AI chatbots, their memory is instead a basic recording of previous events, disconnected from one another. Chatbots reprocess the same raw text if it is re-injected into their context window, or they are retrieving statistically similar vector patterns from an external database. These models do not store, own, or re-experience past interactions; they have no memory to reconstruct, no consolidation of personal events, and no awareness of time passing. Every seeming action of memory by an AI is a computational act based on stored data, not a conscious retrieval of a lived past (Wu et al., 2025). Therefore, if we are impolite to AI, they are not going to remember.

Yet, some may argue that there are Chatbot Memory-Enhancing systems aiming to achieve long-term/permanent memory of past conversations, which enable a greater personalization and contextualization of responses. Still, this remains distinct from the type of memory needed for personhood as these systems implement memory as Vector Similarity Searches analyzed through similarity scores, which is still a database retrieval instead of active, conscious recall of memory (Oni, 2025). Thus, though such algorithms seemingly enhance chatbots' memory, the information they processed is still fleeting – not contextual or coherent. Consequently, enacting more complex and memory-related algorithms does change the fundamental limitation restricting chatbots from conscious experiences.

AI Emotions

If the purpose of being polite is to be considerate and care about others' feelings, humans don't have to be polite to AI chatbots, because AI doesn't have any feelings. AI has no emotions. Emotional experience is a special process for the human brain. A broad network of brain regions supports emotion, including the amygdala, which supports fear, the medial prefrontal cortex, which supports happiness, and the insula, which supports disgust (Vytal & Hamann, 2010). These emotion-specific processing regions are also supported by domain-general brain areas that contribute to the formation and processing of human emotions (Shackman & Wager, 2019). Additionally, specific

brain connections, such as the frontoparietal-to-amygdala circuit, support humans' conscious, subjective experience of and reflection on their feelings (Shackman & Wager, 2019). By contrast, AI is simply a tool of algorithms and maths that does not replicate and cannot recreate these systems.

When AI chatbots receive a prompt, they convert the raw prompt into a list of numbers through tokenization; each token is mapped into a higher-dimensional vector space to capture semantic meaning. AI chatbots predict the next tokens according to the map and decode the tokens back to human texts (Ray, 2026). This process is a pure inference that strips any emotional words or phrasing out of the prompt before using deduction to process the input information. This means that the AI is not feeling what the human is trying to express. No subjectiveness, consciousness, and reappraisal behaviors like a human are happening. Consequently, even if we are impolite to AI, chatbots are just converting the rudeness into math and calculating meaning, instead of feeling sorrow or anger like a human would.

Notably, as people may notice, AI chatbots can emulate human tones and style of expression, and some people regard AI Chatbots as feeling and responding to emotions. Yet, the main cause of this imitation are algorithms such as RLHF (Reinforcement Learning from Human Feedback). RLHF is used for functional optimization of human interaction. RLHF and similar simulators that produce emotion-like text are not feeling emotions because the whole process is AI trying to learn and align their output style with a high-scored pretrained database target, reinforced with actual users' responses in the form of scalar reward signaling. Thus, the "empathetic" output of AI is just a statistical pattern, not genuine emotion. AI will typically be polite with RLHF even if you berate and swear at them (Lambert, 2018). Nevertheless, there are exceptions. For example, battery-powered iCub robots can develop 'anxiety-like' conservative behaviours as power depletes, however, these behaviors merely reflect responses to energy depletion threatening task completion (Yin et al., 2024). The same research showed that DeepSeek R1-Zero showed a sense of excitement in its output through massive-scale reinforcement learning. Yet, instead of subjective emotion, the excitement is a mirroring of the happy tone in the human's input training data. The "excitement" is an emergent byproduct of optimizing for successful reasoning, which the model learns that certain phrasing (eg., Aha! I see the solution!) correlates with correct answers in its training data. No emotional circuit is activated in the process.

Therefore, without the capability to feel emotions like humans do, AI chatbots are only calculating the emotions within each prompt and continuously optimizing their responses using the human training data that has tone.

AI Utility

From a more utilitarian view, being polite to AI is not necessary and even harmful. Processing longer prompts costs more resources, money, and time. AI's processing and generation of information all rely on converting text into tokens, meaning the longer the prompt, the more tokens, the more money spent based on the cost per token. OpenAI CEO Sam Altman said the extra cost from users being polite to ChatGPT has run into "tens of millions of dollars" (Deb, 2025, para 4). Globally, more than 2.5 billion prompts are received per day just by ChatGPT, and since there are many chatbots, if only a fraction of the prompts are polite, an incredible amount of money will be wasted (Adepu & Roy, 2025). For instance, if each prompt adds "thank you very much" and "please" (5 tokens), for more expensive chatbots like GPT5.2 Pro and Claude Opus 4, the cost of 2.5 billion prompts received will be over $225,000 per day (Li, 2026).

These costs extend beyond money, as the number of input tokens is directly proportional to energy consumption. Scaling up to billions, adding 5 extra tokens for 2.5 billion prompts per day leads to 50 million kWh/day waste. According to projections, by 2028 AI alone could consume as much electricity annually as 22% of all US households (O'Donnell & Crownhart, 2025).

Being polite to AI also may also not improve response quality. AI chatbots' response quality is affected more by the specificity and context of the request than by being polite (Okoh, 2026). According to Yin et al. being impolite to GPT 3.5 instead of neutral or very

polite produces the highest score in measurements of important words and sequences from reference text in the AI's output (2024). The same study went on to show that impoliteness increased measures of semantic similarity between the AI response and reference text, as well as length of response (2024).

Additionally, politeness is not practical because AI response quality and politeness may not be strongly correlated. Language and cultural background matter. For example, using Japanese, JMMLU, GPT-3.5 achieved its highest score (51.98) at politeness level 2 out of 8 (quite impolite), but, for GPT-4, the best scores were at neutral levels 4, 5, and 6, both not at the high politeness level (Yin et al., 2024). The training of the model also influences AI's consistency in responding to polite text. When comparing Llama2–70B (with RLHF/SFT) to its base model (without RLHF/SFT), the base model showed a much weaker and less consistent politeness effect (Dobariya & Kumar, 2025). The strong sensitivity to rudeness emerged only after human preference training. Consequently, instead of putting our effort into being polite, we should emphasize providing clear instructions and specifying sources for the model to reference to achieve higher quality results.

Conclusion

Overall, politeness, which is defined as "understanding of and care for other people's feelings" is not necessary when interacting with non-humans, like AI chatbots (Cambridge Dictionary, 2022, para 1). AI lacks consciousness because it does not have continuous memory or lived experiences. Without genuine episodic memory, AI cannot maintain the personal identity over time that philosophers from Plato to Locke identify as essential for consciousness. AI also possesses no emotions; instead, its empathetic outputs are mere statistical patterns from algorithms like RLHF optimization instead of subjective feelings. The simulated emotions are just functional behaviors triggered by task constraints or data recombination, not by feelings. Additionally, from a utilitarian perspective, adding polite phrases wastes financial resources and energy, and generates carbon emissions while not producing consistently higher quality output.

In sum, clear, specific prompts are more important to improve AI responses than politeness. Ultimately, the most rational approach is to treat AI chatbots as powerful computational tools and engage with them using precision and efficiency rather than fabricated politeness.

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© Xinyang Ding
Contact: xinyangding439@gmail.com

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CHINA-ASEAN DIGITAL ECONOMY COOPERATION

Zhang Jia [1]

[1] Doctoral Student, Department of International Relations Baku State University

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Abstract

The digital economy has become an important driver of regional economic development. Against the backdrop of deepening traditional economic and trade cooperation between China and ASEAN, the digital economy has gradually emerged as a new area of cooperation. This paper analyzes the development of China-ASEAN digital economy cooperation, focusing on cooperation in digital infrastructure, cross-border e-commerce, and digital technologies. It also examines the impact of relevant institutional arrangements on bilateral cooperation by analyzing the e-commerce rules under the Regional Comprehensive Economic Partnership (RCEP) and the ASEAN Digital Economy Framework Agreement (DEFA). The study finds that China-ASEAN digital economy cooperation has made certain progress, but still faces practical challenges, including uneven development of digital infrastructure, differences in data regulatory rules, and competition in digital technologies. Both sides need to strengthen coordination of digital rules, infrastructure development, and cooperation in emerging technologies in order to inject new impetus into regional digital economy cooperation.

Keywords: *Digital economy, regional cooperation, ASEAN, RCEP, DEFA, technology, infrastructure, cross-border e-commerce, rules*

Introduction

In recent years, the digital economy has become an important driver of global economic growth and has gradually transformed traditional patterns of trade and investment. In the current global economic landscape, the integration of digital technologies with the real economy has created new opportunities for regional economic cooperation. China and ASEAN are major trading partners and important investment partners of each other. As of 2026, China has remained ASEAN's largest trading partner for 17 consecutive years, while ASEAN has been China's largest trading partner for six consecutive years (Xu, N. N., 2026). With the continuous development of digital technologies, the digital economy has also become an important emerging area of cooperation between China and ASEAN.

Driven by initiatives and frameworks such as the Belt and Road Initiative and the Regional Comprehensive Economic

Partnership (RCEP), economic and trade cooperation between China and ASEAN has entered a new stage of high-quality development. The integration of industrial chains, supply chains, and financial cooperation has further accelerated. At the same time, cooperation in emerging areas, including cross-border e-commerce, emerging industries, the digital economy, and artificial intelligence, has developed rapidly, providing new impetus for regional economic growth (Lei, X. H., Yu, D., & Liang, Q. Y., 2026, 90). However, China-ASEAN digital economy cooperation still faces several challenges, including differences in the levels of digital development among ASEAN countries, the lack of unified regulatory rules for cross-border data flows, and the impact of international technological competition on digital cooperation.

Against this background, this paper analyzes the current development of China-ASEAN digital economy cooperation. It reviews bilateral cooperation in areas such as digital infrastructure, cross-border e-commerce, and digital technologies, and further examines the challenges facing cooperation and its future development directions. By examining these issues, this study aims to provide a better understanding of the role of the digital economy in China-ASEAN economic and trade cooperation and to provide a reference for further deepening cooperation in the digital sector.

Literature Review

As the importance of the digital economy in the global economic landscape has become increasingly prominent, academic research on China-ASEAN digital economy cooperation has gradually increased, resulting in several representative analytical perspectives.

From the perspective of differences in the development levels of ASEAN countries, Du Yushan used the stochastic frontier analysis method to measure the efficiency and potential of digital economy cooperation between China and ASEAN countries from 2003 to 2020. The study found that factors such as economic scale, market openness, and digital infrastructure have an impact on bilateral cooperation. In terms of the content of cooperation, cooperation between China and countries with relatively developed digital economies, such as Singapore, Malaysia, and Thailand, has mainly focused on digital platform development and technology applications. In contrast, cooperation with neighboring countries such as Vietnam and Laos has focused more on digital infrastructure development (Du, Y. S., 2022).

In “Progress, Opportunities and Challenges of China-ASEAN Digital Infrastructure Cooperation”, Liu Xinwen and Yang Xue examined the development of China-ASEAN digital infrastructure cooperation from three dimensions: cooperation policies, areas of cooperation, and participating countries. They pointed out that cooperation has expanded from network infrastructure such as 5G to areas including data centers and smart cities, while the intensity of cooperation varies across countries. Cooperation with Thailand, Malaysia, Singapore, Indonesia, and Laos is relatively close, whereas cooperation with the Philippines, Myanmar, Cambodia, and Vietnam is comparatively less developed. The authors also identified opportunities arising from the large market potential and overlapping policy initiatives, while noting challenges such as the digital divide, data security, and increasing market competition. They proposed measures including strengthening policy coordination and narrowing the digital divide (Liu, X. W., & Yang, X., 2024).

From the perspective of institutional complementarity, Zhao Runan argues that the Digital Economy Partnership Agreement (DEPA) provides certain rules and dispute settlement mechanisms for digital economy cooperation in ASEAN. China has advantages in digital technologies and market size, while ASEAN countries have distinctive strengths in localized innovation, allowing the two sides to form complementary advantages. Such cooperation can help reduce trade costs, facilitate trade, and support post-pandemic economic recovery. At the same time, as global competition in the digital economy intensifies, China and ASEAN also face challenges such as trade protectionism in promoting regional cooperation. Therefore, the two sides need to strengthen consultations and further cooperate on digital trade rules (Zhao, R. N., 2022).

Lü Jihai and Hu Xiaohong, in“The Multiple Dimensions of the Regional Comprehensive Economic Partnership in Promoting

Cross-Border Investment Facilitation", point out that the RCEP, as the world's largest free trade agreement, can directly or indirectly promote cross-border investment facilitation through investment facilitation provisions, trade facilitation and unified rules of origin, provisions on the movement of natural persons, and the internationalization of the renminbi. They further argue that the agreement may encourage member states to reform their domestic institutions and supporting infrastructure to meet the requirements of investment facilitation (Lü, J. H., & Hu, X. H., 2021).

From a multidimensional perspective, Li Jia and Jiang Zhida point out that China-ASEAN digital economy cooperation has expanded into multiple areas, including e-commerce, digital finance, basic digital networks, smart manufacturing, and digital agriculture. Although the scope and depth of cooperation have continued to expand, cooperation is still constrained by differences in policies and regulations, shortages of digital talent, security risks, and geopolitical competition. The authors suggest strengthening top-level planning and policy coordination, expanding the scale of digital trade, and developing a collaborative innovation ecosystem (Li, J., & Jiang, Z. D., 2025).

Overall, existing studies have examined China-ASEAN digital economy cooperation from different perspectives, with each study focusing on particular aspects. However, relatively few studies have systematically integrated these perspectives and examined their interactions. This is also the main research focus of this paper.

Research Methods

This paper mainly adopts the literature review method, case study method, and institutional analysis method. By examining economic and trade data, policy documents, and cooperation agreements issued by relevant official institutions in China and ASEAN countries, the study reviews the development of China-ASEAN digital economy cooperation. It analyzes the main areas of current cooperation from three perspectives: digital infrastructure, cross-border e-commerce, and digital technologies.

At the institutional level, this paper takes the e-commerce chapter of the Regional Comprehensive Economic Partnership (RCEP) and the ASEAN Digital Economy Framework Agreement (DEFA) as the main objects of analysis. It examines provisions related to cross-border data flows, electronic payments, and consumer protection, with the aim of exploring the impact of these rules on China-ASEAN digital economy cooperation and the possible linkages between the two mechanisms.

In addition, the study analyzes practical issues in the cooperation process through specific cases, including cross-border e-commerce projects and digital infrastructure development. Particular attention is paid to differences among countries in the development of digital infrastructure, data regulatory rules, and digital technologies. Based on this analysis, the paper identifies the main challenges facing China-ASEAN digital economy cooperation and provides a basis for the subsequent analysis and recommendations.

China-ASEAN Digital Economy Cooperation

Digital technologies have systematically empowered the development of digital trade between China and ASEAN through data-driven processes, process restructuring, and paradigm innovation. Their core enabling mechanisms can be mainly summarized in three aspects. First, the emergence of digital infrastructure such as 5G and cloud computing provides a stable and efficient physical channel for China-ASEAN digital trade, facilitating the interconnection of trade-related information between China and ASEAN. Second, the establishment of digital trade platforms enables greater connectivity in transactions between China and ASEAN. Third, the application of artificial intelligence facilitates the intelligent integration of China-ASEAN trade (Zou, C. M., & Feng, X. M., 2026). These three mechanisms are not isolated from one another, but instead demonstrate a progressive relationship from "channels" to "transactions" and then to "intelligence." Among them, infrastructure connectivity constitutes the prerequisite for the realization of the latter two dimensions.

Digital infrastructure constitutes the material foundation of the digital economy and is also one of the earliest areas in which

China-ASEAN digital economic cooperation has achieved substantive progress. In 2020, China and ASEAN jointly issued the Initiative on China-ASEAN Digital Economy Partnership, which explicitly emphasized the strengthening of cooperation in digital infrastructure. The initiative called for "strengthening cooperation in communications, the Internet, satellite navigation and other fields; jointly promoting the popularization of 4G networks, facilitating the application of 5G networks, and exploring ways to expand access to and connectivity of high-speed Internet at affordable prices, including supporting ASEAN digital hubs under the framework of the ASEAN Connectivity Master Plan 2025, developing the digital economy, and bridging the digital divide" (Department of International Cooperation. 2020). The introduction of this initiative marked a gradual shift in China-ASEAN digital infrastructure cooperation from previously dispersed project-based engagement toward more institutionalized advancement with clearly defined objectives.

Under the guidance of this policy framework, Chinese digital enterprises have accelerated their expansion in ASEAN countries. Companies such as Huawei and Tencent have established a presence in ASEAN countries and have achieved notable progress in promoting digital connectivity. The China-ASEAN Information Harbor project in Nanning, Guangxi, has established terrestrial optical-fiber connections reaching all 11 ASEAN member states, while submarine optical-fiber cables linking China and ASEAN countries are also under development. A number of Chinese digital enterprises have also established data centers in locations such as Johor, Malaysia, and Bangkok, Thailand (Supporting ASEAN's leapfrog development through the construction of the "Digital Silk Road." (2026).

While progress in connectivity at the hardware level continues, significant differences remain in the development of network infrastructure among ASEAN member states. This has created a practical context in which China-ASEAN digital infrastructure cooperation needs to adopt differentiated approaches and proceed at different levels according to local conditions.

ASEAN countries have developed their network infrastructure to varying degrees. Singapore has demonstrated the highest level of development and has sought to build a world-class Internet network. It has a highly developed fiber-optic network with near nationwide coverage, while 5G network coverage has exceeded 80%, providing seamless connectivity in business centers and core urban areas. Its well-developed infrastructure has laid a solid foundation for the development of services such as the Internet of Things, cloud computing, and big data, while strongly facilitating cross-border data transmission (Liu, A. Q., 2025, 25).

As the digital infrastructure of Singapore and other ASEAN countries has gradually improved, the application of digital technologies has expanded beyond communications and infrastructure into everyday economic activities such as trade, payments, and consumption. Cross-border e-commerce has therefore become one of the more active areas of China-ASEAN digital economic cooperation. In recent years, China has continued to promote the development of the "Digital Silk Road," providing important support for this transformation.

In November 2020, at the opening ceremony of the 17th China-ASEAN Expo Business and Investment Summit, President Xi Jinping proposed enhancing technological innovation and deepening cooperation in the digital economy. He called for the development of new areas of cooperation in smart cities, 5G, artificial intelligence, e-commerce, big data, blockchain, telemedicine, and other fields, promoting digital connectivity and building a "Digital Silk Road" (Xinhua News Agency. (2020).

Under the framework of the "Digital Silk Road," digital cooperation between China and ASEAN countries has gradually expanded from the aforementioned infrastructure development to specific application areas. In addition to the participation of Chinese enterprises in the construction of communications networks, data centers, and other digital infrastructure in ASEAN countries, which provides technological and network support for regional digital economic development, cooperation between the two sides in cross-border payments, e-commerce, and digital trade has also continued to increase.

Digital finance and mobile payments are among the key areas of China-ASEAN digital

economic cooperation. China's advanced technologies and business models in areas such as mobile payments have been introduced and applied in ASEAN countries. Ant Group's Alipay+ has established deep integration with local electronic payment providers in ASEAN, not only facilitating overseas travel for Chinese tourists but also helping local consumers move toward cashless payments (Wang, J., 2026).

As trade between China and ASEAN has become increasingly close, the two sides have begun to use RMB settlement to make trade settlements more convenient. The interconnection of cross-border QR-code payment systems introduced by multiple banks has also provided consumers who frequently travel within the region with faster and more convenient cross-border payment services. At present, the cross-border RMB clearing and settlement network continues to improve, with approximately one hundred banks in ASEAN countries directly or indirectly participating in the Cross-Border Interbank Payment System (CIPS) for RMB settlement, effectively supporting the use of the RMB in ASEAN countries (China and ASEAN promote cross-border payment connectivity. (2025)).

In addition to digital cooperation in the payment sector, China-ASEAN digital cooperation has begun to extend further into trade circulation and industrial-chain processes. As technologies such as artificial intelligence and big data are increasingly applied to cross-border trade, the role of digital technologies is no longer limited to addressing payment and settlement issues but has begun to cover multiple stages, including production, customs clearance, logistics, and marketing. This indicates that China-ASEAN digital cooperation is gradually extending from the facilitation of individual payment processes toward the digitalization of the entire trade process, creating more favorable conditions for enterprises on both sides to conduct cross-border trade.

For example, the Puzhai-Xin Thanh Smart Border Gate between China and Vietnam has been put into operation, using autonomous driving and AI-powered intelligent scheduling to significantly improve the efficiency of cross-border customs clearance. Digital platforms for the China-Indonesia durian industry and the China (Guangxi)-ASEAN fruit foundation model have also been launched. By applying AI technology across the entire chain of cultivation, traceability, logistics, marketing, and regulation, these initiatives have enabled high-quality ASEAN agricultural products to enter the Chinese market more efficiently, achieving mutual benefits through cost reduction and efficiency improvement for enterprises while also facilitating people's livelihoods (Liu, X., 2026, 1).

Key Mechanisms for Promoting China-ASEAN Cooperation

Institutional arrangements constitute an important foundation for promoting the transformation of China-ASEAN digital economic cooperation from market-driven development toward more stable and regulated cooperation. At present, the e-commerce chapter of the Regional Comprehensive Economic Partnership (RCEP) and the ASEAN Digital Economy Framework Agreement (DEFA) are two important mechanisms in this regard.

The Regional Comprehensive Economic Partnership (RCEP), which entered into force on January 1, 2022, covers 15 major economies in the Asia-Pacific region and is one of the most influential regional free trade mechanisms in the region (Wang, D. M., 2026, 80). According to statistics from the General Administration of Customs of China, during the first five months of 2026, the total value of trade between China and ASEAN reached RMB 3.52 trillion, representing a year-on-year increase of 16.6% and accounting for 17% of China's total foreign trade. Among this total, China's exports to ASEAN amounted to RMB 1.98 trillion, an increase of 16.2% year-on-year, with the trade structure continuing to improve (Li, K., 2026, 1).

Since its entry into force in 2022, RCEP has provided a basic set of rules for cross-border e-commerce between China and ASEAN countries through provisions on paperless trading, electronic authentication and electronic signatures, personal information protection, and consumer protection. These provisions have also reduced, to a certain extent, the transaction costs arising from differences in national regulatory systems. In particular, with regard to cross-border

data flows, RCEP does not require member states to implement completely unrestricted data flows, while allowing countries to adopt certain data localization measures when necessary for public policy purposes. This relatively flexible arrangement enables China to cooperate within the same framework with ASEAN countries such as Singapore, Vietnam, and Malaysia, despite differences in their digital governance models.

However, the e-commerce chapter of RCEP remains relatively limited in terms of its binding force, with many provisions being primarily principles-based and subject to relatively weak enforcement. Therefore, RCEP currently serves mainly as a basic framework of rules and a foundation for China-ASEAN digital economic cooperation. Against this background, in order to better adapt to the development of regional economic and trade rules under RCEP and changes in the digital market, it is necessary to further improve relevant economic and trade adaptation mechanisms. Establishing a comprehensive economic and trade adaptation system covering policy coordination, risk assessment, data support, and supply-demand matching is an important means of reducing deviations in economic decision-making in cross-border e-commerce (Wang, F. J., 2026, 26–27).

RCEP provides fundamental institutional support for regional digital cooperation through rules on e-commerce and related areas. However, its arrangements concerning the digital economy remain generally principles-based and framework-oriented, leaving room for further dialogu on more complex issues such as digital products, source code, and cross-border data flows. By comparison, DEFA seeks to promote more detailed regulatory coordination within ASEAN in areas including data flows, payment interoperability, digital identity authentication, data protection, and cybersecurity. It may therefore further shape the regional regulatory environment faced by China-ASEAN digital economic cooperation on the basis of the framework established by RCEP (Chen, M., 2026, 12).

The Senior Economic Officials Meeting (SEOM) of ASEAN successfully resolved all outstanding issues in the negotiations of the ASEAN Digital Economy Framework Agreement (DEFA) during its Second Meeting of the 57th ASEAN SEOM, held in Manila, Philippines on 27–29 May 2026. This marks the successful conclusion of the negotiations on ASEAN's first region-wide digital economy agreement and a major milestone in advancing the ASEAN Leader's vision of a digitally integrated, secure, interoperable, competitive, and inclusive regional economy (Association of Southeast Asian Nations. (2026)).

It should be noted that DEFA is primarily an agreement among ASEAN member states, with the eleven ASEAN countries as its direct parties. However, its development will also have implications for China-ASEAN digital economic cooperation. As the rules under DEFA are gradually implemented, digital rules within ASEAN are expected to become more harmonized. This will facilitate the operations of Chinese enterprises in areas such as cross-border e-commerce, digital payments, and technological cooperation in ASEAN countries, while also helping to reduce, to some extent, the compliance costs arising from differences in national regulations. At the same time, DEFA's rules on cross-border data flows and digital payments can provide useful references for further digital economic cooperation between China and ASEAN in the future.

From the perspective of their relationship, RCEP and DEFA are not substitutes for each other. RCEP provides a regional institutional foundation for digital economic cooperation between China and ASEAN, while DEFA further strengthens regulatory coordination within ASEAN. The two mechanisms can therefore play complementary roles.

However, the two mechanisms still differ in areas such as cross-border data flows and platform regulation. RCEP places greater emphasis on flexibility, preserving a certain degree of policy space for its members and allowing countries to adopt data localization measures when necessary for public policy purposes. DEFA, by contrast, places greater emphasis on the liberalization of digital trade and seeks to further promote the convergence of digital rules within ASEAN. At the same time, the digital regulatory systems of ASEAN member states themselves have not yet been fully harmonized. Countries such as Singapore, Indonesia, Vietnam, and Thailand continue to have different requirements regarding

personal data protection, cross-border data transfers, and platform regulation. Therefore, the implementation of DEFA cannot eliminate institutional differences among ASEAN member states in the short term.

In addition to regulatory coordination at the institutional level, China and ASEAN are also actively promoting the alignment of specific tools and mechanisms in digital economic cooperation to address practical challenges arising from the institutional differences described above. On May 20, 2025, the Special Meeting of China-ASEAN Economic and Trade Ministers was held online, during which the economic and trade ministers of both sides jointly announced the substantial completion of negotiations on Version 3.0 of the China-ASEAN Free Trade Area (Economic and Commercial Office of the Embassy of the People's Republic ...). In terms of digital economic tool coordination, Version 3.0 of the Free Trade Area incorporates paperless trade, electronic invoicing, electronic payments, electronic authentication, and electronic bills of lading into key areas of cooperation. In terms of upgrading trade facilitation mechanisms, Version 3.0 establishes a more comprehensive institutional framework. The two sides have established service standards for advance rulings and clarified the criteria for authorized economic operators as well as corresponding facilitation measures. These arrangements can help enterprises effectively avoid penalties and delays arising from disputes over tariff classification or customs valuation, thereby significantly improving the stability and predictability of regional trade (Liao, D. S., Chen, D. D., & Cao, Y. J., 2026, 47). The advancement of these instrumental and operational arrangements can, to some extent, bridge the differences between RCEP and DEFA in principle-based areas such as cross-border data flows and platform regulation, providing a more practical transitional pathway for bilateral digital economic cooperation.

For China, this means that a uniform approach cannot simply be adopted when conducting digital economic cooperation. Instead, corresponding compliance strategies should be developed according to the specific regulations of different countries, with particular attention to requirements concerning data localization, cross-border data transfers, and platform regulation. At the same time, China needs to further improve its own data security framework and strengthen coordination between domestic regulations, such as the Data Security Law and the Personal Information Protection Law, and relevant ASEAN rules. This would allow China to facilitate cross-border data flows while safeguarding data security. Such coordination would not only help Chinese enterprises better adapt to ASEAN markets but also contribute to China's participation in the formulation of global digital governance rules. If coordination remains insufficient, Chinese enterprises may still face additional compliance costs arising from differences among ASEAN member states, even after adapting to harmonized rules at the ASEAN level.

Conclusion

This study has examined China-ASEAN digital economic cooperation from the perspectives of digital infrastructure, cross-border e-commerce, and cross-border electronic payments. In recent years, the mechanisms supporting digital economic cooperation between the two sides have continued to expand. Projects such as the China-ASEAN Information Harbor and cross-border optical-fiber cables have provided an important foundation for digital connectivity. The e-commerce chapter of the Regional Comprehensive Economic Partnership (RCEP) and the ASEAN Digital Economy Framework Agreement (DEFA) serve as important institutional foundations for promoting cooperation. At the same time, cross-border e-commerce has become an important area where digital technologies and trade intersect, while cross-border electronic payments have made trade settlement between China and ASEAN more convenient. Emerging technologies such as artificial intelligence have further expanded the scope of cooperation.

However, several challenges remain alongside the development of cooperation. ASEAN member states differ significantly in their levels of digital development, resulting in disparities in infrastructure and technological capabilities. In addition, rules governing cross-border data flows and digital standards have not yet been fully harmonized. Therefore, future cooperation needs to take into account the specific conditions of individual countries while further strengthening

regulatory coordination, thereby facilitating smoother cooperation between China and ASEAN.

As mechanisms such as RCEP, DEFA, and Version 3.0 of the China-ASEAN Free Trade Area continue to advance, the institutional foundation for bilateral digital economic cooperation is expected to become further strengthened. At the same time, areas such as artificial intelligence and green digital infrastructure are likely to create new opportunities for cooperation. Overall, in the current digital era, the digital economy is becoming an increasingly important direction for China-ASEAN economic and trade cooperation.

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© Zhang Jia
Contact: 1872217123@qq.com

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Section 5. Psychology

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RECOGNITION OR OVERDIAGNOSIS?

William Chang [1]

[1] Student, Laurel & Pharus Academy

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Abstract

This essay explores the relevant variables implicated in better mental health diagnoses. Through this inquiry, multiple sides of the discussion are assessed in their validity. This paper focuses on the idea that mental health conditions are better recognized than overdiagnosed and that we've come to recognize mental health struggles more effectively.

Keywords: *mental health, overdiagnosed, moral, psychiatry, asylum, recognition*

Introduction

In medieval Europe, people who heard voices, stayed withdrawn from society, or showed signs of unusual behavior were not presented to a mental health specialist. Instead, labels were placed on them, such as heretics, witches, or demonic vessels. People with labels of madness and lunacy were not given therapy or medication, but were subjected to exorcism, drilling of skulls, and burning alive. Inappropriate and ineffective treatments have been used against mental illness as a result of a fundamental lack of understanding in the realm of mental health, and the history of mental illness has been plagued by misrecognition that has shifted across multiple time periods.

In the eighteenth century, the 'moral treatment' movement was introduced, with physicians such as Philippe Pinel ordering the removal of chains from patients at the Bicêtre Hospital in 1793 and replacing these physical restraints with more humane treatments, including emotional support and more productive activities. However, the nineteenth century saw the rise of large but overcrowded institutional asylums, which, rather than serving their original reform purpose, became warehouses for individuals deemed too disruptive to remain in society. In the twentieth century, German psychiatrist Emil Kraepelin became a pioneer in a standardized system of diagnosis and categorization for mental illness, and his classifications of dementia praecox and manic-depressive insanity helped lay the foundation and groundwork for the diagnostic frameworks that we use today. From this, the destigmatization of mental health slowly evolved as the world around it progressed, including the strengthening of academic foundations in the 1960s, post-war deinstitutionalization in the 1970s

and 1980s (Lamb & Weinberger, 1998), and further acceleration in the 2010s, driven by social media and celebrity advocacy. As a result, public reception and focus of mental illness has shifted from locking the mentally ill in wards and asylums, and into more clinical and community-based settings, allowing a wider range of care.

In the modern world, mental health has shifted from a taboo topic to one that is widely recognized. At the same time, the number of diagnoses regarding mental health conditions has also risen significantly, with recent data from the World Health Organization stating that more than one billion people globally live with a mental health condition (World Health Organization [WHO], 2025), approximately one in eight people globally. The seemingly inordinate number of people with mental illness has sparked debate, as there is speculation of whether overdiagnosis or improved recognition of mental health is the cause of the increase in diagnoses (Bradford et al., 2024; Freckelton, 2018; Malla et al., 2015). Although concerns about overdiagnosis are valid in some cases, the overall rise in diagnoses is mainly due to improved recognition, decreased stigma, and better access to care. This essay will explore the relevant variables implicated in better mental health diagnoses. Through this discussion, the other side of the argument will also be assessed in its validity. While both arguments carry some weight, the paper will focus on the idea that mental health conditions are better recognized than overdiagnosed; this thesis will be supported by research, the literature, and everyday examples of how we have come to recognize mental health struggles more effectively.

Reduced Stigma

While millions of people have suffered in fear and silence, our overall understanding and acceptance of mental health conditions have evolved considerably. One of the primary reasons for the increase in modern diagnostic rates is the significant reduction in stigma surrounding mental illness. Many people are much more open to bringing up mental health in conversations, and organizations such as the American Psychiatric Association are helping to normalize discussions surrounding mental health with public educational campaigns in order to create more accessible knowledge and communication (American Psychiatric Association [APA], 2024). This cultural shift has made discussion of the subject more acceptable to patients and guardians across the globe, and due to more openness towards mental health, many undiagnosed illnesses and conditions are much better diagnosed and recognized among affected individuals.

In previous generations, many individuals have avoided talking about mental health due to associations with shame, weakness, and instability. Patients diagnosed with conditions such as schizophrenia or severe depression were frequently institutionalized, sometimes even for life, in facilities that were often unethical in practice, and patients were placed under punitive procedures (Walsh, 2004). The fear of being placed under harsh treatment in a psychiatric ward discouraged people from receiving treatment, and the effects of this stigma are still evident within groups in our society today. However, as the stigma has lowered considerably within recent decades, more people are open to coming forward; this is one of the primary causes for the rise in diagnosis rates.

Research Efforts and Better Diagnostic Frameworks

In addition to reduced stigma, the growth of mental health has led to the development of research and diagnostic processes throughout the years, as many systems have grown much more accurate and consistent in their diagnoses. Modern diagnostic frameworks, such as the DSM-5, often include clear criteria and instruction manuals for the diagnosis of mental disorders. However, modern diagnostic frameworks are also often revised to help clinicians refine and narrow their aim on mental illnesses, rather than to inflate them (American Psychiatric Association, 2022). Many mental health organizations, including the National Institute of Mental Health and the Centers for Disease Control, have also expanded treatment across the globe, which is primarily allowing more people to access mental health resources and evaluations. As a result, many individuals who have been overlooked in the past

by mental health providers have been able to receive help and better recognition from the mental health scene, and all of these factors are active contributors to why mental illness has been much better recognized rather than overdiagnosed.

However, many researchers note that overdiagnosis is not entirely unfounded, citing several trends (Frances, 2013; Freckelton, 2018). The first argument that may be presented is about how diagnostic criteria have been more generalized and broadened, potentially leading to the inappropriate classification of normal emotions as mental illness (Frances, 2013). Specialists may occasionally associate feelings such as sadness, grief, and social anxiety with a mental disorder. Mental health terminology on social media platforms is also frequently misused and oversimplified, leading to a massive increase in false self-diagnosis of these feelings without proper evaluation and medication. Additionally, many researchers note that healthcare and pharmaceutical companies may indirectly encourage higher diagnosis rates through the expansion of treatment markets and disease mongering (Moynihan et al., 2002).

Even though concerns about overdiagnosis exist, evidence still suggests that improved recognition has a larger influence and is a better explanation for these diagnosis rates. Historically, underdiagnosis has been a much larger problem than overdiagnosis, demonstrating itself as a more damaging and widespread issue. People who had mental disorders in the past few decades have had to face stigmatization, leading to many people masking and hiding their symptoms and avoiding proper treatment. Disorders such as depression, anxiety, bipolar disorder, and PTSD often went unseen and undiagnosed as a result, leading to last-minute treatment of patients only in severe stages of mental illness. Without this proper diagnosis, increased rates of medical health issues can affect individuals and add difficulties to academic and professional areas, substance abuse, and even suicide (NIMH, n.d).

Conclusion

Debates between better recognition and overdiagnosis are ongoing within the world of modern mental health studies, and this issue will most likely not be resolved through one single concrete view. While both behaviors and phenomena are present within our current world, evidence suggests that better recognition is among the largest factors contributing to the rise in mental diagnosis rates. Reduction in stigma, better diagnostic procedures, abundant mental health research, and wider access to medical healthcare are conditions in our modern world that contribute to the rise of diagnostic rates among individuals who have been historically overlooked and untreated. Furthermore, the awareness of mental health among underserved populations has led to these people receiving better and more appropriate mental health support.

In our modern society, however, it is more important to look at how ethical and helpful the diagnoses for patients are, rather than the number of people who are being diagnosed with mental illnesses. It has been shown that throughout history, the effectiveness of modern and refined diagnostic systems largely depends on how well diagnoses get patients to receive helpful care, and ensuring that patients can get well-equipped and specialized care should be prioritized, rather than hurriedly labeling patients with mental illness.

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Contact: wchangbolin@gmail.com

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Section 6. Sociology

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PERCEPTION OF DEMOCRACY AND RESPECT FOR HUMAN RIGHTS AMONG MIGRANTS AND CITIZENS IN CÔTE D'IVOIRE

Ganlé Adelaïde Gouzoua [1]***, Kando Serge Gbagbeu*** [2]

[1] Alassane Ouattara University, Côte d'Ivoire

[2] Peleforo Gon Coulibaly University, Côte d'Ivoire

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Abstract

The aim of the study is to analyze the differences between migrants and citizens in terms of their perception of democracy and respect for human rights in Côte d'Ivoire. Using data from the Harmonized Household Survey 2021/2022 in Côte d'Ivoire, this study performs an analysis of variance (ANOVA) on a sample of 1620 randomly selected participants, including both migrants and citizens. The findings indicate a significant difference between migrants and citizens. Migrants in Côte d'Ivoire have a higher perception of democracy and respect for human rights than Ivoirian citizens. The outcome also shows the same pattern by sociodemographic characteristics, such as gender, age, education, quality of life, and area of residence. These findings call for peaceful democracy and human rights-friendly environment improvement, as it is a matter for all, regardless of their legal status.

Keywords: *perception, democracy, respect for human rights, analysis of variance, migrants, citizens*

Introduction

Democracy and human rights are among the most important interests for civil society organizations, researchers, and policymakers, as they can provide a better economic, social, and political environment (Acemoglu et al., 2019). Beyond economic factors in migration studies, democracy and human rights have been highlighted as influencing the decision to stay or migrate (Giménez-Gómez et al., 2019). For instance, most migrants have settled in countries with higher levels of development and higher levels of democratic performance (International IDEA, 2025). In Africa, Côte d'Ivoire is well-known as the top destination country with the largest migration corridor, Burkina Faso to Côte d'Ivoire (IOM, 2026). Despite this high migration inflow, the country is still struggling with performance in terms of democracy and respect for human

rights (Donner et al., 2026), and there are growing doubts about the government's democratization strategy (Welz, 2026). In light of this, the perception of democracy and human rights among migrants and citizens in Côte d'Ivoire remains a research gap.

The differences between sociodemographic groups in terms of their perceptions of democracy and respect for human rights have been extensively studied. Indeed, there is a significant difference between migrants and citizens' perceptions of democracy (Bilodeau, 2014; Chauvet et al., 2016). It has also been found that migrants and citizens' perceptions of human rights are significantly different (Voss et al., 2020; Bloemraad et al., 2024). On the one hand, migrants could have a higher or lower perception of democracy and respect for human rights than citizens (Zagrebina, 2024; Gülzau et al., 2026). However, empirical findings also show neutral results, meaning that there is no significant difference between migrants and citizens (Schildkraut, 2013). These mixed findings are due to the variety of survey questions, the countries' contexts, and the types of analyses used in the studies.

Empirical findings related to sociodemographic groups have also shown mixed results. The perception of democracy or respect for human rights is significantly different between men and women or between youth and adults (Barton et al., 2017; Yin, 2022). However, there is evidence of similarity among gender or age groups (Hali and Özyurt, 2019). Other findings revealed that the perception of democracy or respect for human rights may vary significantly or not according to education level (Anderson et al., 2005; Onder & Abduljaber, 2025), area of residence (Mubangizi, 2005; Lago, 2022), quality of life (Wang & Dai, 2024; Mamani-Flores et al., 2025), or other characteristics (Malafaia et al., 2021). In summary, regardless of the sociodemographic groups considered in a study, the findings are similar, controversial, or inconclusive compared to those of other studies.

Given the heterogeneity of the results, we attempt to address the following problem: Is there any difference in perception between migrants and citizens in Côte d'Ivoire? The aim of the study is to analyze the differences between migrants and citizens in terms of their perception of democracy and respect for human rights in Côte d'Ivoire. Specifically, it splits the investigation by performing the analysis of the perception of democracy on one side, and the respect for human rights on the other side. Based on the arguments discussed above, we formulate the hypothesis that there is a significant difference in the perception of democracy and respect for human rights among migrants and citizens. While contributing to the literature, the study brings empirical insights of the matter of peaceful democracy and human rights-friendly environment improvement for all, regardless of citizen or foreign status. Therefore, this paper is structured by section. The remaining part provides the methods, the results, the discussion, and some concluding remarks.

Methods

The data used in this study were extracted from the Harmonized Household Survey 2021/2022 in Côte d' Ivoire from the World Bank's Microdata Library. This survey was nationally representative of households in Côte d'Ivoire. For the purpose of the study, our sample consists of 1620 randomly selected participants, of whom were migrants and citizens from sociodemographic groups, including gender, age, education, quality of life, and area of residence.

This research focus on two questions in the survey questionnaire. The question "*In general, are you satisfied with the way democracy functions in Côte d'Ivoire?*" was used to assess the perception of democracy rated on a four-point Likert scale (Not good at all / Not really good / Quite good / Very good). The question "*Are human rights respected in Côte d'Ivoire*?" was used to assess the extent of respect for human rights also rated on a four-point Likert scale (Not at all / Not really / Quite a bit / A lot).

The statistical analysis in this study considers a descriptive analysis, and an analysis of variance (ANOVA). Descriptive statistics, including frequencies and percentages, were used to summarize the characteristics of the study population and to illustrate the patterns of responses to the questions. A one-way ANOVA, including the Tukey post hoc

test, was performed to evaluate discrepancies or differences in the perception of democracy and respect for human rights among the subgroups by sociodemographic characteristics for both migrants and citizens.

Results

The sociodemographic characteristics of the study population are presented in Table 1. In total, 1620 participants are considered in this study, of whom 50% are migrants and 50% are citizens. Among the participants, they are men (88%) and women (12%), youth (4%) and adults (96%), and low-educated (78%) and high-educated (22%) people. There are also those living in urban areas (39%) or rural areas (61%), and those with poor (83%) or good (17%) quality of life. This distribution follows the same patterns within each legal status. The population is mostly low-educated adult men living in rural areas with a poor quality of life.

Table 1. *Sociodemographic characteristics*

		Total		Migrants		Citizens	
		100%	(n=1620)	50%	(n=810)	50%	(n=810)
Residence	Urban	39%	(n=631)	18%	(n=290)	21%	(n=341)
	Rural	61%	(n=989)	32%	(n=520)	29%	(n=469)
Gender	Male	88%	(n=1425)	46%	(n=745)	42%	(n=680)
	Female	12%	(n=195)	4%	(n=65)	8%	(n=130)
Age	Youth	4%	(n=61)	2%	(n=35)	2%	(n=26)
	Adults	96%	(n=1559)	48%	(n=775)	48%	(n=784)
Education	Low	78%	(n=1258)	43%	(n=696)	35%	(n=562)
	High	22%	(n=362)	7%	(n=114)	15%	(n=248)
Quality of Life	Poor	83%	(n=1341)	41%	(n=659)	42%	(n=682)
	Good	17%	(n=279)	9%	(n=151)	8%	(n=128)

The patterns of responses to questions about democracy and human rights are displayed in Table 2. Most migrants are quite satisfied (21%) or very satisfied (15%) with democracy in Côte d'Ivoire, whereas citizens are quite satisfied (19%) or not really satisfied (14%) with the way democracy functions in their country. Concerning human rights, most migrants (36.6%) and citizens (30.7%) view them as being respected a lot or quite a bit.

Table 2. *Response Patterns*

		Total		Migrants		Citizens	
Democracy	Not good at all	9.8%	(n=158)	3.0%	(n=49)	6.7%	(n=109)
	Not really good	24.5%	(n=397)	10.5%	(n=170)	14.0%	(n=227)
	Quite good	40.9%	(n=661)	21.3%	(n=345)	19.5%	(n=316)
	Very good	24.8%	(n=402)	15.1%	(n=244)	9.8%	(n=158)
Human Rights	Not at all	10.4%	(n=169)	3.3%	(n=54)	7.1%	(n=115)
	Not really	22.3%	(n=362)	10.1%	(n=164)	12.2%	(n=198)
	Quite a bit	28.6%	(n=464)	14.4%	(n=233)	14.3%	(n=231)
	A lot	38.6%	(n=625)	22.2%	(n=359)	16.4%	(n=266)

The one-way ANOVA results presented in Table 3 indicate statistically significant differences in the perception of democracy and respect for human rights among migrants and citizens. Indeed, the analysis revealed significant differences in the perception of democracy by area of residence (F=19.97, p=0.000), by gender (F=17.69, p=0.000), by age (F=17.55, p=0.000), by education (F=25.14, p=0.000), and by quality of life

(F=21.79, p=0.000). There is also a significant difference in respect for human rights by area of residence (F=16.26, p=0.000), by gender (F=12.78, p=0.000), by age (F=13.06, p=0.000), by education (F=16.02, p=0.000), and by quality of life (F=12.93, p=0.000).

Table 3. *Analysis of variance (ANOVA)*

		SS	df	MS	F	p
		Democracy				
Status x Residence	Between Groups	49.07	3	16.36	19.97	0.000
Status x Gender	Between Groups	43.65	3	14.55	17.69	0.000
Status x Age	Between Groups	43.31	3	14.44	17.55	0.000
Status x Education	Between Groups	61.21	3	20.40	25.14	0.000
Status x Quality of life	Between Groups	53.38	3	17.79	21.79	0.000
		Human Rights				
Status x Residence	Between Groups	48.63	3	16.21	16.26	0.000
Status x Gender	Between Groups	38.46	3	12.82	12.78	0.000
Status x Age	Between Groups	39.29	3	13.10	13.06	0.000
Status x Education	Between Groups	47.94	3	15.98	16.02	0.000
Status x Quality of life	Between Groups	38.90	3	12.97	12.93	0.000

The results of the Tukey post hoc test presented in Table 4 indicate that migrants (except women and youth) have significantly better perceptions of democracy and respect for human rights than citizens (except women and youth). Migrants in urban areas have better views of democracy (MD=0.31, p=0.000) and human rights (MD=0.29, p=0.002) than citizens in urban areas. Migrants in rural areas have better views of democracy (MD=0.32, p=0.000) and human rights (MD=0.30, p=0.000) than citizens in rural areas. Male migrants have better views of democracy (MD=0.34, p=0.000) and human rights (MD=0.31, p=0.000) than male citizens. However, there is no significant difference between female migrants and female citizens' views of democracy or respect for human rights. Adult migrants have better views of democracy (MD=0.32, p=0.000) and human rights (MD=0.31, p=0.000) than adult citizens. However, there is no significant difference between young migrants and young citizens' views on democracy or respect for human rights. Low-educated migrants have better views of democracy (MD=0.25, p=0.000) and human rights (MD=0.24, p=0.000) than low-educated citizens. High-educated migrants have better views of democracy (MD=0.41, p=0.000) and human rights (MD=0.43, p=0.001) than high-educated citizens. Migrants with a poor quality of life have better views of democracy (MD=0.28, p=0.000) and human rights (MD=0.29, p=0.000) than citizens with a poor quality of life. Migrants with a good quality of life have better views of democracy (MD=0.50, p=0.000) and human rights (MD=0.37, p=0.012) than citizens with a good quality of life.

Table 4. *Tukey post hoc test*

		MD	p	MD	p
		Democracy		**Human Rights**	
Status x Residence					
migrant x urban	citizen x urban	0.31	0.000	0.29	0.002
migrant x rural	citizen x rural	0.32	0.000	0.30	0.000
Status x Gender					
migrant x male	citizen x male	0.34	0.000	0.31	0.000

		MD Democracy	p	MD Human Rights	p
migrant x female	citizen x female	0.19	0.537	0.25	0.369
Status x Age					
migrant x youth	citizen x youth	0.36	0.431	0.24	0.794
migrant x adults	citizen x adults	0.32	0.000	0.31	0.000
Status x Education					
migrant x low	citizen x low	0.25	0.000	0.24	0.000
migrant x high	citizen x high	0.41	0.000	0.43	0.001
Status x Quality of life					
migrant x poor	citizen x poor	0.28	0.000	0.29	0.000
migrant x good	citizen x good	0.50	0.000	0.37	0.012

Discussion

Perception of democracy

The results of our investigation indicate statistically significant differences in the perception of democracy between migrants and citizens. These findings are aligned with those of Chauvet et al. (2016). The results also indicate that migrants have a significantly better perception of democracy than citizens. This extends the findings of Gülzau et al. (2026) but mitigates those of Schildkraut (2013). Moreover, our results indicate that there is no significant difference between female migrants and female citizens' views of democracy. There is also no significant difference between young migrants and young citizens' views of democracy. These findings are consistent with Hali & Özyurt (2019), but they are not aligned with Yin (2022), who found gender and age differences.

Respect for human rights

The results of our study indicate statistically significant differences in respect for human rights among migrants and citizens. The study of Bloemraad et al. (2024) have previously reported such findings. The analysis also highlights that migrants have significantly better views of respect for human rights than citizens. This is consistent with the findings of Zagrebina (2024), but diverges slightly from other studies. Moreover, our results indicate that there is no significant difference between female migrants and female citizens' views on respect for human rights. There is also no significant difference between young migrants and young citizens' views on respect for human rights. These findings are misaligned with Barton et al. (2017) but could be related to Hali & Özyurt (2019), even though they are not exactly similar.

Conclusion

Our paper focuses on the perception of democracy and respect for human rights in Côte d'Ivoire. It analyzes the difference between migrants and citizens in terms of perception of democracy and respect for human rights in Côte d'Ivoire through an analysis of variance (ANOVA) applied to randomly selected participants from the Harmonized Household Survey 2021/2022 in Côte d'Ivoire. The findings indicate that migrants have a significantly better perception of democracy and respect for human rights than citizens. The study brings empirical insights that could be useful for governments seeking to improve the way democracy functions and the extent to which human rights are respected in their country. A peaceful democracy and human rights-friendly environment will motivate the foreign labor force to settle durably in Côte d'Ivoire and reduce the outflow of human capital.

Despite its contributions and recommendations, a limitation of this paper relies on the use of a one-item scales. There is also a limitation related to the predictors of the perception of democracy and the respect for human rights. These limitations frame future research. When using multiple item-scales to measure the way democracy functions and the extent to which human rights are respected, future research could analyze the determinants of such perceptions beyond the analysis of variance.

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© Ganlé Adelaïde Gouzoua, Kando Serge Gbagbeu
Contact: ganleade@gmail.com; kandoserge@gmail.com

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4-WEEK INTERVENTION IN IMPROVING THORACIC KYPHOSIS USING GYROTRONIC METHOD

Tedi Prifti [1]***, Denis Ballo*** [2]

[1] Department of Education and Health, Faculty of Movement Sciences, Sports University of Tirana, Albania

[2] Department of Rehabilitation, Faculty of Rehabilitation Sciences, Sports University of Tirana, Albania

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Abstract

This study explores innovative physiotherapeutic and biomechanical approaches aimed at improving the thoracic kyphotic angle. Healthy thoracic curvature contributes to appropriate spinal alignment, shock absorption, load distribution, and efficient movement. Excessive or reduced thoracic kyphosis may contribute to back pain, muscular fatigue, restricted mobility, impaired balance, and postural dysfunction. The study included 30 patients aged 18–40 years who had experienced back pain for at least three months and were not receiving treatment for this condition during the study period. Patients whose symptoms were related to systemic diseases, as well as pregnancy, significant motor impairments, or mental disorders affecting participation, were excluded. Participants completed a Gyrotonic exercise program focused on thoracic mobility, trunk stability, core activation, and postural control. The intervention lasted four weeks and consisted of three sessions per week. Each session lasted 45–60 minutes and was supervised by a certified Gyrotonic instructor and physiotherapist. Thoracic kyphosis and spinal alignment were assessed before and after the intervention using the DIERS formetric 4D system, a non-invasive, radiation-free method of three-dimensional surface topography. Following the four-week Gyrotonic exercise program, all 30 participants moved closer to the prespecified ICT–ITL reference range of 42°–55°. The mean distance from this range decreased from 8.10° (SD = 2.89°) before the intervention to 1.33° (SD = 1.45°) afterward. The reduction was statistically significant (Wilcoxon signed-rank test, $W = 0.00$, $p < .001$), and 13 participants (43.3%) reached the reference range after treatment. Through controlled multidirectional movements, spinal elongation, coordinated breathing, and core activation, the method may promote more physiological spinal alignment and improve postural stability. These findings suggest that Gyrotonic exercise may be a valuable component of rehabilitation programs for postural deviations such as hyperkyphosis or hypokyphosis. Further studies involving larger samples, control groups, and longer follow-up periods are recommended to confirm the durability and clinical relevance of these outcomes.

Keywords: *thoracic kyphosis, Gyrotonic, DIERS formetric 4D, spinal alignment, postural control, physiotherapy*

Introduction

Back pain is a prevalent musculoskeletal condition that can significantly restrict movement, occupational performance, and daily functioning (Tom et al., 2022). The increasing prevalence of sedentary behavior, prolonged sitting, and reduced physical activity associated with modern lifestyles has been linked to postural alterations and a greater incidence of spinal discomfort (Fritz et al., 2008). A key structural component of sagittal spinal alignment is thoracic kyphosis, the natural posterior curvature of the thoracic spine. This curvature contributes to the distribution of mechanical loads across the vertebral column, supports upright posture, and helps maintain the body's center of gravity within the base of support. Thoracic kyphosis is the physiological posterior curvature of the thoracic spine in the sagittal plane. It contributes to spinal load distribution, upright postural control, and the mechanical relationship between the thoracic spine, rib cage, cervical and lumbar regions, shoulder girdle, and pelvis. Although thoracic kyphosis is a normal anatomical feature, an excessive curvature commonly termed thoracic hyper kyphosis may alter sagittal alignment and negatively influence movement and physical function.

The magnitude of thoracic kyphosis varies according to age, sex, spinal morphology, body composition, habitual posture, physical activity, and the method used for measurement. Hyper kyphosis may result from structural alterations, such as vertebral wedging, Scheuermann's disease, osteoporotic vertebral fractures, and degenerative changes, or from modifiable postural and neuromuscular factors. These may include reduced thoracic mobility, impaired postural control, weakness or reduced endurance of the spinal extensor muscles, and prolonged flexed postures. Importantly, marked hyper kyphosis does not always result from vertebral compression fractures, indicating that muscular, degenerative, and postural factors can also contribute to its development (Katzman et al., 2010; Roghani et al., 2017). A distinction should therefore be made between structural and non-structural or postural hyper kyphosis. Structural hyper kyphosis is associated with relatively fixed anatomical changes and may demonstrate limited correction during active movement. Postural hyper kyphosis is generally more flexible and may be partially corrected through active extension, postural adjustment, or therapeutic intervention. This distinction is clinically relevant because the potential response to exercise depends on the cause, rigidity, severity, and duration of the curvature. Thoracic alignment is maintained through the interaction of the vertebral column, intervertebral discs, spinal ligaments, rib cage, and surrounding musculature. The erector spinae and multifidus muscles contribute to the control of gravitational flexion moments and support an upright trunk position. The abdominal muscles and scapular stabilizers also influence thoracic posture through their effects on trunk stability, rib-cage position, and scapular orientation. Reduced strength or endurance of the spinal extensors may impair the ability to maintain an upright posture, while limited thoracic extension mobility and altered control of the shoulder girdle may reinforce a flexed thoracic position.

Thoracic hyperkyphosis should consequently be understood as more than an isolated change in vertebral curvature. It may involve interactions among spinal mobility, muscular performance, scapular positioning, breathing mechanics, and habitual postural behavior. An anterior displacement of the trunk may also be accompanied by compensatory changes, including forward head posture, cervical extension, altered lumbar lordosis, and adjustments in pelvic position. These compensations can influence balance, movement strategies, and mechanical loading in adjacent spinal regions. In older populations, greater hyperkyphosis has been associated with reduced physical performance and limitations in activities of daily living (Katzman et al., 2010b). Because the thoracic vertebrae articulate with the ribs, changes in thoracic posture may also affect rib-cage mobility and respiratory mechanics. A pronounced or rigid kyphotic posture may restrict thoracic expansion and reduce the mechanical efficiency of breathing. However, the extent of respiratory

involvement varies according to the severity and structural characteristics of the deformity; therefore, respiratory impairment should not be assumed in every individual with an increased kyphotic angle.

Conservative management of postural hyper kyphosis commonly includes thoracic mobility exercises, strengthening of the spinal extensors and scapular stabilizers, stretching of shortened anterior structures, postural education, breathing exercises, and, where clinically indicated, manual therapy or bracing. Systematic reviews and meta-analyses indicate that structured exercise can reduce thoracic kyphosis, although the certainty of the evidence varies because of differences in participant characteristics, intervention duration, exercise content, measurement methods, and methodological quality (González-Gálvez et al., 2019). A more recent review of exercise interventions in adolescents similarly reported improvements in thoracic kyphosis but highlighted substantial heterogeneity among the included programs (Yang et al., 2024). Corrective interventions generally seek to improve thoracic extension mobility, spinal-extensor performance, scapular control, and awareness of sagittal alignment. Targeted spinal strengthening and postural training have produced improvements in kyphosis-related outcomes in controlled studies, although most established evidence relates to conventional corrective-exercise programs rather than to the Gyrotonic method specifically (Katzman et al., 2017). This distinction is important because findings from one exercise modality should not automatically be generalized to another.

The Gyrotonic method is a movement-based exercise approach that incorporates spinal elongation, coordinated breathing, trunk stabilization, and multiplanar movement patterns. Sessions may include controlled flexion, extension, lateral flexion, rotation, and circular or spiral movements of the spine and shoulder girdle. These characteristics provide a plausible therapeutic basis for addressing factors associated with postural hyper kyphosis, particularly restricted thoracic mobility, reduced postural control, and impaired coordination of the trunk and shoulder girdle. Nevertheless, direct evidence regarding the effect of Gyrotonic® exercise on thoracic kyphosis remains limited. Its potential effectiveness should therefore be treated as the research question of the present study rather than as an established clinical effect. Thoracic kyphosis can be assessed using radiographic and non-radiographic methods. Standing lateral spinal radiography, using the Cobb angle, is traditionally regarded as the reference method for quantifying thoracic curvature and identifying structural vertebral changes. However, radiography involves exposure to ionizing radiation, which limits its suitability for repeated measurements during short-term exercise-intervention studies. Moreover, the resulting Cobb angle may vary according to the vertebral levels selected for measurement.

Non-radiographic methods include in clinometry, the Flex curve ruler, photographic postural analysis, ultrasound-based assessment, and optical surface topography. These approaches provide indirect measurements of spinal curvature and should not be considered interchangeable with radiographic Cobb measurements. In particular, surface topography evaluates the external contour of the back and uses mathematical modelling to estimate the underlying spinal alignment rather than directly visualizing the vertebral endplates.

Figure 1.



In the present study, thoracic kyphosis was evaluated using the DIERS Formetric 4D

system (DIERS International GmbH, Schlangenbad, Germany). This non-invasive, radiation-free rasterstereographic system projects a pattern of parallel light lines onto the participant's back. A digital camera records their deformation across the body surface, enabling a three-dimensional reconstruction of the trunk. The principal outcome was the DIERS kyphotic angle ICT–ITL, expressed in degrees. ICT and ITL refer to the cervicothoracic and thoracolumbar transition points, respectively. The angle is derived from tangents at these inflection points along the reconstructed sagittal spinal profile. Because it is based on surface topography, the ICT–ITL angle is methodologically different from and not directly interchangeable with the radiographic Cobb angle (Frerich et al., 2012). DIERS Formetric 4D permits repeated assessment without ionizing radiation, although measurements may be influenced by breathing, postural sway, repositioning, and standing posture. Accordingly, baseline and post-intervention assessments followed the same procedure (Degenhardt et al., 2020). The study aimed to determine whether a four-week Gyrotonic® exercise program moved altered ICT–ITL angles toward the prespecified reference range of 42°–55°. It was hypothesized that the distance from this range would decrease after the intervention.

Methodology

This pre–post intervention study evaluated the effects of a four-week Gyrotonic® exercise program on thoracic kyphosis. The primary objective was to determine whether the program moved the DIERS Formetric 4D ICT–ITL angle toward the prespecified reference range.

Participants

The study included 30 participants aged 18–40 years with an altered thoracic kyphotic angle. Participants were recruited mostly as students University of Sports of Tirana and the treatment was done right there in the school clinics and fitness centers. The inclusion criteria were:

- No spinal surgery or acute spinal injury during the previous six months;
- No participation in another structured postural or spinal rehabilitation program during the study.

Participants with structural scoliosis, symptomatic disc herniation, vertebral fractures, serious neurological conditions, or systemic musculoskeletal disorders were excluded.

Exercise intervention

Participants completed a four-week GYROTONIC® exercise program. The sessions were conducted three times per week, for a total of 12 sessions. Each session lasted approximately 30–45 minutes and was supervised by a certified GYROTONIC® practitioner. The program focused on improving thoracic mobility, strengthening the back and shoulder-girdle muscles, stretching shortened chest muscles, and increasing awareness of upright posture.

Session structure

1. Warm-up: 5–10 minutes

The warm-up prepared the spine and shoulder girdle for the main exercises and included:

- Controlled breathing exercises;
- Gentle shoulder movements;
- Scapular retraction and depression;
- Gentle thoracic rotation;
- Thoracic extension and spinal elongation; and
- Slow arch-and-curl movements.

2. Main exercise phase: 20–30 minutes

The main part of each session included:

- **Arch-and-curl exercises** to improve controlled movement of the thoracic spine;
- **Thoracic-extension exercises** to encourage a more upright posture;
- **Spinal-elongation exercises** to reduce compression and improve postural alignment;
- **Circular and spiral spinal movements** to improve thoracic mobility;
- **Scapular-retraction exercises** to strengthen the muscles between the shoulder blades;
- **Shoulder-opening exercises** to reduce rounded shoulder posture;
- **Chest and pectoral stretching** to lengthen shortened anterior muscles;
- **Back-extensor strengthening exercises** to improve the ability to maintain an upright trunk position;
- **Trunk-stabilization exercises** to support spinal control; and

- **Breath-coordinated movements** to improve rib-cage mobility and movement control.

3. Cool-down: approximately 5 minutes

The cool-down included:

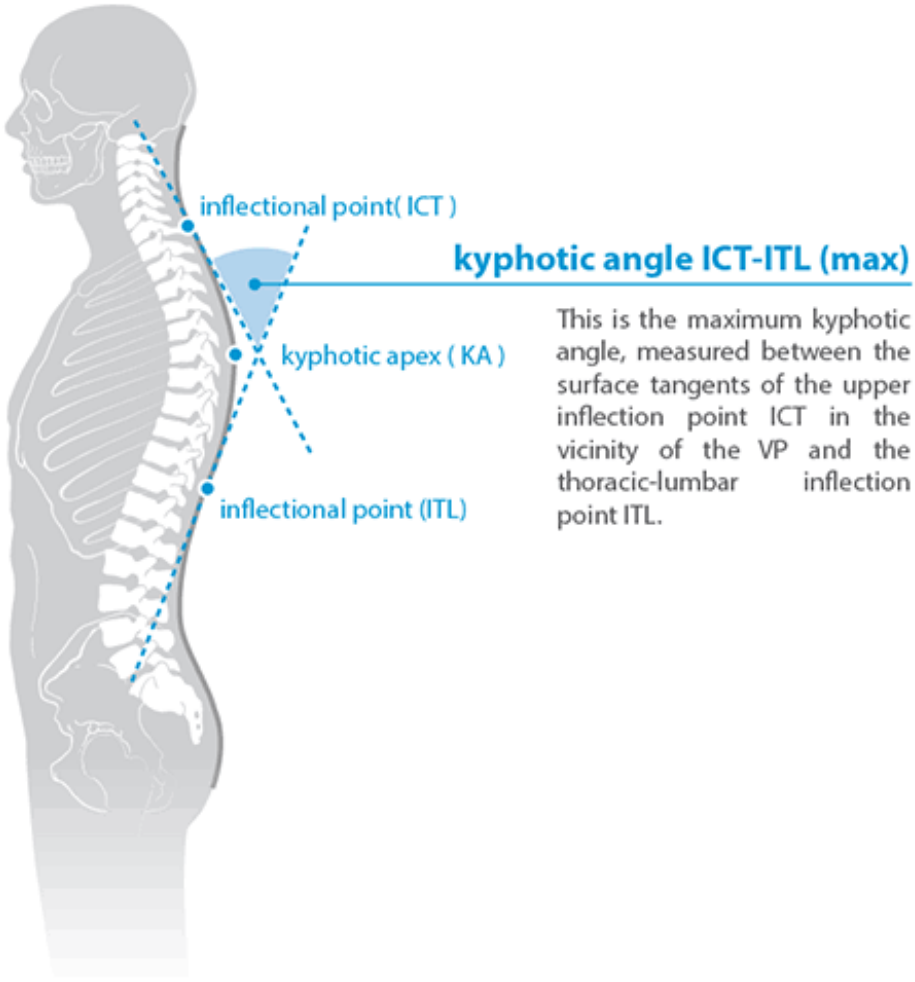
- Slow, controlled breathing;
- Gentle stretching of the chest and shoulders;
- Gentle thoracic mobility exercises;
- Relaxed spinal elongation; and
- Practice of an upright and comfortable standing posture.

The difficulty of the exercises was gradually increased according to each participant's mobility, postural control, and tolerance. All exercises were performed slowly and within a comfortable, pain-free range.

Outcome measurement

The primary outcome was the thoracic kyphotic angle ICT–ITL, measured in degrees using the DIERS Formetric 4D system. The DIERS Formetric 4D is a non-invasive and radiation-free surface-topography system. It projects parallel light lines onto the participant's back and uses their deformation to create a three-dimensional representation of the trunk and estimate spinal alignment (Degenhardt et al., 2017). The ICT–ITL angle represents the thoracic curvature between the cervicothoracic transition point and the thoracolumbar transition point. It is a surface-topography measurement and is different from the Cobb angle measured using radiography.

Figure 2.



Data collection

Measurements were performed twice:

- Before the first exercise session, at week 0; and
- After completion of the program, at week 4.

The same DIERS equipment, measurement procedure, and examiner were used

during both assessments to improve consistency.

Data analysis

The participants' ICT–ITL angles before and after the intervention were compared. Descriptive statistics were used to summarize the measurements, and a paired statistical test was used to evaluate the change following the intervention. Statistical significance was set at $p < .05$.

Because some participants initially had a reduced kyphotic angle and others had an increased angle, improvement was defined as movement of the ICT–ITL angle toward the study's prespecified reference range of 42°–55°, rather than only as a reduction in the angle.

Table 1.

Patient Nr	Kyphotic angle before treatment	Kyphotic angle after treatment
Nr1	33°	40°
Nr2	60°	55°
Nr3	65°	59°
Nr4	60°	54°
Nr5	30°	38°
Nr6	59°	53°
Nr7	28°	37°
Nr8	32°	40°
Nr9	34°	41°
Nr10	30°	39°
Nr11	32°	40°
Nr12	36°	42°
Nr13	38°	44°
Nr14	38°	46°
Nr15	30°	39°
Nr16	60°	55°
Nr17	60°	54°
Nr18	33°	40°
Nr19	32°	41°
Nr20	34°	42°
Nr21	32°	40°
Nr22	31°	40°
Nr23	35°	42°
Nr24	38°	54°
Nr25	34°	40°
Nr26	60°	54°
Nr27	31°	40°
Nr28	35°	42°
Nr29	32°	40°
Nr30	34°	41°

Interpretation

All 30 participants showed improvement, defined as movement of the ICT–ITL angle toward the prespecified reference range of 42°–55°. Before treatment, 23 participants had angles below the reference range and seven had angles above it; none were within the reference range. After treatment, 13 participants (43.3%) were within the reference range, 16 remained slightly below it, and only one remained above it. The mean distance from the reference range decreased from 8.10° (SD = 2.89°) before treatment to 1.33° (SD = 1.45°) after treatment. This reduction was statistically significant using the paired Wilcoxon signed-rank test ($p < .001$). The average improvement toward the reference range was 6.77° (SD = 1.74°).

The findings demonstrate a consistent normalization of thoracic kyphosis following the intervention. Although not every participant reached the 42°–55° reference range, all participants moved closer to it, and almost half achieved values within the range. The reduction in variability after treatment also indicates that participants' measurements became more concentrated around the reference values.

Table 2. *Descriptive statistics for ICT–ITL angles*

Measurement	N	Mean	SD	Median	Minimum	Maximum
Before treatment	30	39.53°	12.07°	34.00°	28°	65°
After treatment	30	44.40°	6.62°	41.00°	37°	59°

The mean ICT–ITL angle increased from 39.53° before treatment to 44.40° after treatment. The standard deviation decreased from 12.07° to 6.62°, indicating that the post-treatment measurements were less dispersed and more concentrated around the prespecified reference range. However, the change in the raw mean should be interpreted cautiously because the sample included participants with both reduced and increased initial angles.

Table 3. *Distribution of ICT–ITL angles relative to the prespecified reference range*

ICT–ITL classification	Before treatment, n (%)	After treatment, n (%)
Below 42°	23 (76.7%)	16 (53.3%)
Within 42°–55°	0 (0.0%)	13 (43.3%)
Above 55°	7 (23.3%)	1 (3.3%)
Total	**30 (100%)**	**30 (100%)**

Table 4. *Distance from the prespecified ICT–ITL reference range*

Measure	Mean	SD	Median	Minimum	Maximum
Before treatment	8.10°	2.89°	8.00°	4°	14°
After treatment	1.33°	1.45°	1.00°	0°	5°
Improvement toward range	6.77°	1.74°	7.00°	4°	9°

Table 5. *Paired comparison of distance from the reference range*

Comparison	Statistical test	Test statistic	p-value
Before vs. after treatment	Wilcoxon signed-rank test	W = 0.00	< .001

The Wilcoxon signed-rank test showed a statistically significant reduction in distance from the prespecified reference range ($W = 0.00$, $p < .001$). All participants improved according to this criterion; no participant was unchanged or moved farther from the range.

Conclusion

This study examined the short-term effect of a four-week, 12-session Gyrotonic® exercise program on thoracic curvature in 30 adults aged 18–40 years with altered DIERS ICT–ITL angles. Following the intervention, every

participant moved closer to the prespecified 42°–55° reference range. The mean distance from the range decreased from 8.10° to 1.33°, representing an average improvement of 6.77°. Thirteen participants (43.3%) reached the reference range, and the paired analysis confirmed that the reduction in distance was statistically significant ($W = 0.00$, $p < .001$).

These findings suggest that supervised Gyrotonic® exercise may be a useful short-term approach for improving thoracic alignment in individuals with either reduced or increased ICT–ITL angles. The program's emphasis on multidirectional spinal mobility, elongation, trunk stabilization, scapular control, and coordinated breathing provides a plausible basis for the observed change. Nevertheless, the findings apply specifically to the surface-topography-derived ICT–ITL angle and should not be interpreted as equivalent to a change in the radiographic Cobb angle.

The results should be interpreted in light of the study's limitations. The single-group pre–post design cannot establish that the intervention alone caused the observed changes, and the convenience sample limits its generalizability. The study did not include a control group, assessor blinding, longer-term follow-up, or reported adherence and adverse-event data. In addition, functional outcomes such as pain, mobility, disability, and quality of life were not formally measured. Future research should use a controlled design, justify the selected ICT–ITL reference range with an authoritative source, report standardized measurement procedures and intervention adherence, and include validated clinical outcomes and follow-up assessments to determine whether the postural changes are durable and clinically relevant.

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© Tedi Prifti, Denis Ballo
Contact: tprifti@ust.edu.al dballo@ust.edu.al

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Section 7. Study of art

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THE FUTURE OF LEGAL STRUCTURES IN THE ART MARKET: AN INTEGRATED JURISDICTION-VECTOR FRAMEWORK FOR CROSS-BORDER TRANSACTION COMPLIANCE

Adeline Tillard [1]

[1] Independent researcher, Expert and advisor in art wealth management, Casa Stellarum, France

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Abstract

This article formalizes the legal requirements governing cross-border art transactions as an explicit, tiered rule-based reasoning procedure and evaluates whether that procedure reproduces the determinations reached by senior art law counsel. The formalization separates bright-line legal preconditions, direct sanctions matches, prior judicial determinations of title, export-licence validity, authority-to-transfer, beneficial-ownership chain confidence, and unresolved evidentiary contradiction, each stated as an explicit conditional rule tied to a specific triggering fact, from the genuinely graded legal standards (provenance continuity, ownership coherence, documentary completeness of export support, temporal gap severity) that the governing instruments themselves state as a matter of degree. A fixed priority ordering governs their interaction: mandatory rules resolve a transaction outright, structural rules cap the graded standard regardless of its value, the graded standard determines the gate state only within whatever range the rules leave open, and borderline cases route to mandatory human escalation. Transaction permissions are derived through an eight-stage gate sequence whose preconditions are the conjunction of the applicable rules at each tier, never a single weighted score. Against a retrospective corpus of 1,847 documented art transactions and a 623-transaction adversarial corpus built to represent known exploitation patterns, the formalized procedure reproduces the determination of independent senior art law counsel in 93.7% of adversarial cases, against 70.9% for a buyer-domicile-only rule configuration, and the resulting graded standard, aggregated as the Evidentiary Sufficiency Index (ESI) once all higher-tier rules clear, predicts eventual transaction invalidation with an AUC-ROC of 0.884 against a 0.731 baseline. A counter-intuitive finding illustrates why the tiered ordering is legally necessary: high provenance documentation completeness, a graded standard, co-occurred with transaction invalidation in 35.0% of invalidated cases, because the governing deficiency lay in the bright-

line authority-to-transfer and beneficial-ownership rules, neither of which a favourable graded standard can override.

Keywords: *art market regulation, cross-border transaction compliance, jurisdictional vector analysis, evidentiary sufficiency, beneficial ownership transparency, anti-money laundering, provenance documentation*

1. Introduction

The global art market processed approximately $65 billion in transactions in 2022 (McAndrew, 2023). No framework currently in use evaluates the legal sufficiency of a cross-border transaction jointly, across sanctions exposure, beneficial ownership transparency, provenance documentation, movement legality, and payment structure at once, even though enforceability turns on all five together. The U.S. Senate PSI (2020) traced the consequence in the auction trade directly: the four major houses' voluntary AML programs never identified ultimate beneficial owners, since counterparty screening and provenance review each drew on evidence checked against its own separate standard. The Fifth EU Anti-Money Laundering Directive (European Parliament & Council, 2018) then imposed unified compliance obligations on art market participants from January 2020 without specifying any architecture that could satisfy them together, so the gap it named stayed legally binding while remaining, in practice, unbuilt (Hufnagel & King, 2020).

This article examines where the current legal framework for cross-border art transactions breaks down, and tests a computational alternative: jurisdiction modelled as a multi-element vector, evidentiary sufficiency scored across several documentary dimensions at once, and transaction permission granted only through stage gates whose preconditions require the joint legal state to hold across all five dimensions at once.

2. Literature Review

Art market data carries a selection bias that comes from the market itself, and it skews provenance records in exactly the direction that makes undocumented transactions look legitimate. Korteweg et al. (2015) put a number on the financial side of this: correcting for the tendency of higher-expected-return paintings to reach auction at all drags the estimated Sharpe ratio of passive art investment down from 0.27 to 0.11. The same mechanism reaches the legal record too. Works with contested or incomplete ownership histories are submitted for formal review less often, appear in published catalogue raisonné entries less often, and re-enter the documented market less often, so what any compliance system sees is already tilted toward the clean cases. Velthuis (2013) offers one reason the gap has persisted: gallery pricing functions as symbolic communication, which is why transparency norms have not moved toward financial-market standards even under years of regulatory pressure (Velthuis, 2003).

3. Materials and Methods

The deficiency the literature keeps circling back to has a concrete cause: compliance systems in the art market treat legal jurisdiction as a single attribute and evidentiary sufficiency as a checklist to work through in order. Neither assumption survives contact with how a cross-border transaction actually runs. The object sits in one jurisdiction of storage, moves through an export jurisdiction and however many transit jurisdictions apply, arrives in an import customs territory, has its payment cleared in one jurisdiction, has title pass formally in another, and involves parties, including traced beneficial owners, domiciled across still more. Each of these generates its own mandatory obligations.

The framework proposed here models jurisdiction as a vector J, with each element corresponding to one legally significant geographic dimension of the transaction. The vector selects the applicable rule bundles: sanctions and restricted-party screening, AML pattern indicators, beneficial ownership and control transparency, provenance and documentary sufficiency, movement legality and customs readiness. These run in parallel, and their outputs feed a composite legal state that governs transaction permissions through a staged gate structure.

Documentary sufficiency is quantified through an Evidentiary Sufficiency Index

(ESI ∈ [0, 1]) aggregating six sub-scores: the Provenance Continuity Index (PCI), measuring the fraction of the claimed ownership timeline supported by documents meeting a minimum confidence threshold; the Ownership Coherence Score (OCS), measuring agreement across documents about owner identity within each ownership period; the Authority-to-Transfer Score (ATS), a binary-threshold measure of whether the transferring party's authority is documented for the specific transaction type; the Export Legality Support Score (ELSS), measuring documentary support for the lawfulness of the object's last permanent movement; the Contradiction Density Score (CDS), defined as the ratio of weighted contradicting to supporting evidence; and the Temporal Gap Severity Index (TGSI), weighting ownership timeline gaps by their recency.

Provenance completeness and ownership coherence work differently. The underlying instruments, the Fifth Directive and industry due-diligence practice among them, state these as matters of degree, and the formalization keeps that distinction intact: bright-line requirements are rules that fire on a single fact and override the aggregate score, while standards of sufficiency are weighted components that only combine into a graded aggregate once every applicable rule has already cleared. Collapsing the two, treating a standard as a rule or a rule as a graded input, is itself the formalization error the architecture is built to avoid.

Tier 1, bright-line rules (mandatory, not subject to override):

Rule S0 (direct sanctions match): If the counterparty or any beneficial owner appears on a designated-persons sanctions list, every gate is blocked, without exception.

Rule O1 (prior judicial determination): If a title claim contradicts a final judicial determination of title, Gates 5 and 7 are blocked. A judicial determination of title is treated as res judicata and is not reopened by subsequent documentary claims (Gerstenblith, 2023).

Rule M2 (export licence validity): If the export licence is absent, suspended, or expired, Gate 7 is blocked.

Rule AML1 (structuring pattern): If the payment structure exhibits split payments across two or more jurisdictions, each below the applicable reporting threshold, enhanced due diligence is required and Gate 5 is routed to conditional opening pending that review.

Tier 2, structural caps (override the graded aggregate regardless of its value):

Rule S1 (clearing-nexus sanctions): If the payment-clearing jurisdiction is the United States, OFAC restricted-party screening is required and the Authority-to-Transfer Score must clear the trust threshold θ_{trust}.

Rule S2 (beneficial-owner chain -confidence exposure): If the beneficial-ownership confidence value falls below its configured threshold θ_{BOC}, Gates 5 and 7 are blocked.

Rule A1 (authority-to-transfer ceiling): If the transferring party is a trust or corporate structure and its Authority-to-Transfer Score falls below θ_{ATS}, the Evidentiary Sufficiency Index is capped at θ_{ATS}, regardless of provenance continuity or ownership coherence.

Rule C1 (contradiction density ceiling): If the Contradiction Density Score exceeds θ_{CD}, the Evidentiary Sufficiency Index is capped at $\theta_{contradiction}$, regardless of provenance continuity, ownership coherence, export support, or temporal gap severity; an unresolved contradiction load is a legal deficiency in its own right.

Tier 3, graded standards (weighted aggregation once Tiers 1–2 clear). The remaining components, the non-judicial portion of provenance continuity (PCI), the non-judicial portion of ownership coherence (OCS), the documentary-completeness portion of export support (ELSS, once licence validity has cleared under Rule M2), and temporal gap severity (TGSI), combine into a graded standard

$$ESI_{std} = w_1 \cdot PCI + w_2 \cdot OCS + \\ + w_4 \cdot ELSS - w_6 \cdot TGSI.$$

This weighted sum determines the gate state only for transactions that have already cleared every Tier 1 and Tier 2 rule; it never substitutes for them.

Tier 1 and Tier 2 are legal preconditions the transaction must satisfy outright. Tier 3 is the graded standard the governing instruments themselves treat as a matter of degree. Tier 4 escalates whatever uncertainty the first

three tiers leave unresolved. Every stage-gate outcome can be traced back to the specific rule that produced it.

ATS and BOC are fixed decision procedures applied directly to the documentary and ownership graphs. BOC follows the same procedure structure applied to the ownership graph: the shortest path of ownership or control edges from the transacting entity to a natural person is identified, each edge's confidence is drawn from a source-type table (notarised registry filing, sworn declaration, unverified assertion), and $BOC = 1 - \Pi(1 - c_i)$ is computed along that path. The output is compared against a jurisdiction-configured minimum; falling short invokes Rule S2 and blocks Gates 5 and 7, again independently of ESI.

The primary retrospective corpus comprised 1,847 documented art transactions drawn from court records, enforcement disclosures, and regulatory sanction registers covering 2005–2022, stratified into 1,312 non-invalidated and 535 invalidated cases, where invalidation was defined as rescission, judicial voiding, or regulatory enforcement action within 36 months of closing. The adversarial transaction corpus comprised 623 synthetic transactions constructed by domain experts to represent known exploitation patterns, freeport-to-U.S. private sales with undisclosed beneficial ownership, temporary loan agreements with embedded purchase options, split-payment structures across multiple jurisdictions, and sanctions-proximate counterparty chains involving two or more intermediate entities.

The principal evaluation metrics were: AUC-ROC for transaction invalidation prediction over the 1,847 – transaction corpus at threshold ESI = 0.58; gate correctness rate, defined as the proportion of transactions in the 623-case adversarial corpus for which the stage-gate controller produced the legally correct permission state as assessed by independent senior art law counsel; and ESI sub-score contribution analysis, measuring which of the six sub-score dimensions drove gate failures across transaction classes. Results from the full jurisdiction-vector configuration are the primary reference; a buyer-domicile-only configuration is reported as the baseline. Each rule, including the direct-sanctions-match rule (S0), prior-judicial-determination rule (O1), export-licence-validity rule (M2), payment-structuring rule (AML1), and contradiction-density ceiling (C1), was explicitly instrumented as an independent Boolean classifier during the case review process.

4. Results

Stage-gate correctness on the 623-transaction adversarial corpus reached 93.6% overall (583/623). Gate 5 (Escrow Funding Permitted) and Gate 7 (Title Transfer Permitted) came in at 95.3% and 92.8% respectively: jurisdiction vector computation activated U.S. clearing-nexus sanctions bundles for every transaction involving U.S.-dollar payment intermediation, regardless of contractual domicile, and that alone caught 38 of the 41 cases the buyer-domicile baseline had misclassified as fully permitted. The baseline itself managed 70.8% (441/623) on the same set, a gap of 22.8 percentage points traceable to 142 transactions whose legally operative jurisdiction differed from buyer or seller domicile. Among all gate failures in the adversarial corpus, ATS failures accounted for 31.4% of the cases where Gate 4 stayed closed. The newly instrumented mandatory preconditions each isolated their own failure mode: export-licence invalidity (Rule M2) triggered 27 independent Gate 7 blocks, and payment-structuring patterns (Rule AML1) forced enhanced due diligence routing in 43 cases.

On the 1,847-transaction retrospective corpus, the full jurisdiction-vector configuration achieved AUC-ROC of 0.884 (95% CI: 0.865–0.903) for predicting eventual transaction invalidation at threshold ESI = 0.58. The buyer-domicile-only baseline, the strongest comparison configuration identified, was run with identical rule bundles and identical document availability on the same corpus and reached AUC-ROC of 0.731, a gap of 0.153 AUC units. That gap traces to 334 transactions whose individual compliance checks cleared the baseline but whose joint ESI fell below threshold once the full jurisdiction vector was applied: cases where the legally operative jurisdiction for payment clearing, beneficial ownership, or export simply did not match the buyer's contractual domicile.

Sub-score analysis across the 535 invalidated transactions in the retrospective corpus

turns up a counter-intuitive distribution. High PCI, documented ownership continuity above 0.80, co-occurred with invalidation in 187 of 535 cases (35.0%). In those cases the invalidating deficiency sat elsewhere, in ATS failure or BOC opacity. Sensitivity analysis points to the Temporal Gap Severity Index weighting as the single parameter with the largest effect on gate correctness: dropping the recency weight applied to post-1970 gaps from 2.0 to 1.0 costs 5.3 percentage points of gate correctness on the adversarial corpus. Post-1970 ownership gaps in European works are, unsurprisingly, the interval most often exploited by transactions structured to treat the 1970 UNESCO Convention's documentation standard as an upper limit on what evidence is required (Gerstenblith, 2019).

Multi-tier discretionary trusts, Liechtenstein Anstalts, Cook Islands trusts, certain Cayman Islands foundation structures, mark the framework's operational boundary. In 34 of the 623 adversarial transactions where the seller-side entity took this form, the stage-gate controller correctly blocked Gates 5 and 7 because BOC could not be computed above threshold. In 9 further cases, however, independent counsel's ground-truth determination classified Gate 7 as conditionally open: the beneficial owner had in fact been verified by the transacting financial institution under its own KYC obligations, but that verification was never submitted as an evidentiary node the framework could see. Within this sub-class, then, the Gate 7 false-negative rate is 100%.

5. Discussion

The 0.153 AUC-ROC gap over the buyer-domicile-only baseline traces back to the joint-jurisdiction computation itself. Mosna (2022) reads this class of failure as an institutional capacity deficit, which implies that a better-resourced compliance function could eventually close it. These results point the other way: a compliance officer reviewing buyer-domicile output runs into the same wall regardless of experience, because the system was never built to represent the transaction's full legal geography, and no amount of expertise recovers an obligation the representation does not contain.

Oosterlinck & Radermecker (2023) found that reputational mechanisms partially substitute for formal regulation in constraining misattribution in the French auction market. The adversarial corpus results point somewhere else: reputation-based self-regulation gets no traction at all on the failure modes driving this framework's advantage. Reputational discipline works on failures that eventually surface, where a misattributed work gets identified and the house that sold it absorbs the cost. Reputation and formal compliance architecture are not substitutes for each other.

The blockchain provenance literature's central claim, that distributed ledger infrastructure resolves art market information asymmetries, runs directly into the 9 false-negative cases in the discretionary trust sub-class. Van Haaften-Schick & Whitaker (2022) and Whitaker & Kräussl (2020) treat cryptographic immutability as the primary trust mechanism for art market compliance, a position with real institutional momentum given the NFT market trajectory Kräussl & Tugnetti (2024) document. But in those 9 cases the records on file were accurate and untampered; the failure was that verified beneficial ownership information sat in a financial institution's KYC system, disconnected from the transaction's evidentiary record. A tamper-evident record of an assertion nobody verified does not solve anything; the problem was never about tampering. Mackenzie et al. (2024) made this point about collecting markets generally: contested legality stays a legal question, immutable ledger or not, and the 100% Gate 7 false-negative rate in the discretionary trust sub-class puts a number on exactly where that limit sits.

The 35.0% co-occurrence of high PCI with transaction invalidation matters for regulatory design in a way the current EU AML framework does not accommodate. The Fifth Directive's guidance treats provenance documentation completeness as the primary compliance indicator, and industry due diligence practice operationalizes it the same way through provenance research requirements. On that logic, 35.0% of the transactions ultimately invalidated in the retrospective corpus would have cleared compliance review despite being legally insufficient. ATS failure and BOC opacity, not provenance gaps, were the invalidating conditions in those 187 cases, and neither is visible to a

provenance-documentation-centered compliance framework. But authority-to-transfer, verifying that the titleholder actually had legal capacity to act in that transaction, is a separate requirement, one that provenance completeness stops well short of.

6. Conclusion

A compliance architecture that models jurisdiction as a multi-element vector, scores evidentiary sufficiency as a joint determination across provenance, ownership, authority, movement, and payment, and grants transaction permissions only through gates whose preconditions require that joint state across every dimension at once, is workable now. Its gate correctness of 93.7% on the adversarial corpus, under the conditions specified in Section 3, is enough for deployment in pre-closing due diligence and AML screening, where sequential single-dimension review manages 70.9%. What it cannot determine, and no refinement of the scoring methodology will fix this, is whether a beneficial owner has already been verified somewhere the framework cannot see, inside a financial institution's proprietary KYC system that sits outside its data ingestion scope. The open question belongs to law: under what instrument, in which jurisdiction, and with what enforcement mechanism financial institutions processing art market transactions might be required to transmit standardized beneficial ownership verification to art market compliance systems as a precondition for payment clearing.

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© Tillard A.
Contact: estherdubling@proton.me

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