



Linguistic and Cultural Identity Reconstruction in the Digital-Intelligent Era: Multidimensional Pathways and Development Strategies Amidst Technological Transformation



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Abstract: This paper explores the evolving dynamics of linguistic and cultural identities in the context of the digital-intelligent era, analyzing the impact of digital and intelligent technologies on language use, identity construction, and cultural dissemination. The study highlights that in the digital age, digital communication strengthens users' pre-existing linguistic and cultural identities by maintaining social networks, while social media provides a platform for minority groups to express latent identities and facilitates cross-linguistic and cross-cultural exchanges that contribute to the formation of pluralistic identities. With the advent of the intelligent era, artificial intelligence (AI) will further enhance productivity, reshape social structures and cultural forms, and consequently influence the instrumental functions of language and its capacity to carry culture. Building on these insights, this paper proposes three policy recommendations: first, to strengthen education on linguistic and cultural identity to guide mainstream value-driven identity convergence; second, to promote machine translation capabilities between Mandarin (the national common language) and China's ethnic minority languages and dialects to advance intelligent language resource development; and third, to enhance Mandarin's role in carrying forward modern Chinese civilization, thereby supporting the inheritance and innovation of Chinese culture. The research demonstrates that in response to the challenges and opportunities of the digital-intelligent era, it is essential to center the development of linguistic and cultural identities around the consciousness of the Chinese nation as a community. This approach aims to establish an inclusive, pluralistic yet integrated linguistic and cultural ecosystem with Chinese characteristics.

Keywords: Digital-intelligent era; linguistic identity; cultural identity; Mandarin (national common language of China); modern Chinese civilization

1. Introduction

Culture concerns the foundation and destiny of a nation. [1] Language is the most important carrier of culture. With the advancement of science and technology and social transformation in the new era, humanity has entered a new epoch—the "digital-intelligent era" which encompasses both the digital age and the intelligent age. In this era, the scope of language usage has expanded from a single social space to three interconnected domains: the social, informational, and physical spaces. [2] This expansion blurs temporal and spatial boundaries, dissolves distinctions between public and private spheres, and fosters the formation of novel interpersonal relationships, thereby reshaping social structures. Consequently, this process profoundly impacts both language itself and the cultural systems that are primarily conveyed through language.

In light of the profound influence of technological innovation during the Digital-Intelligent Era on language and culture, further theoretical exploration is necessary: How does technological innovation in this era affect linguistic and cultural identity? This study aims to provide policy

recommendations for China's linguistic and cultural development in the new era, advocating strategies to strengthen the recognition of Mandarin (National Common Language of China) and Chinese culture among all ethnic groups, thus contributing to the construction and development of modern Chinese civilization.

2. Theoretical Framework

Digital technologies, represented by the Internet, big data, and cloud computing, have permeated every aspect of daily life. It can be said that humanity has now entered an era supported by digital technology—the digital age. This part first reviewed the transformations in language and culture during the digital age, then discussed how linguistic and cultural identities evolve in this context, and finally presented the research questions addressed in this paper.

2.1 Changes in Language and Culture in the Digital Age

The evolution of language and culture in the digital age can initially be observed through language selection and use within digital spaces. *Kelly-Holmes* (2019) outlines this developmental trajectory as comprising four stages: monolingualism, multilingualism, hyperlingualism, and idiolingualism. [3] Monolingualism characterized the early days of the Internet, where English dominated online communication. Non-English users had to either learn or translate content into English to participate. During this stage, Western culture carried by English rapidly diffused globally. As technology advanced, multilingualism emerged, allowing some dominant languages to enter cyberspace and challenge English hegemony. However, multilingual usage remained constrained—languages largely remained isolated, with users typically assigned to specific linguistic environments based on geographic location. Local dominant cultures also found representation online.

Hyperlingualism referred to digital environments capable of accommodating an unlimited number of languages. For instance, social media platforms encourage users to contribute content in their own languages, enabling even marginalized languages to enter the digital realm. Idiolingualism, developed concurrently with hyperlingualism, described how individuals customize language learning and use according to personal preferences in digital spaces. Each individual's linguistic choices and usages differ within this framework. Currently, the mainstream trend involved the coexistence of hyperlingualism and idiolingualism, with marginalized languages gradually integrating into the digital era. This integration facilitates the preservation and development of cultures associated with these languages, promoting the formation and dissemination of multilingual identities and multicultural recognition.

Changes in culture during the digital age are not only evident in the digital preservation and dissemination of minority cultures but also manifest in deep-seated transformations occurring across both dominant and marginalized cultures. *Levin & Mamlok* (2021) summarized three emerging characteristics of culture in the digital age: the personalization of spiritual culture, the transparency of social culture, and the intelligence of technological culture. [4] Personalized spiritual culture is reflected in the freedom of content creation and the construction of online identities. Virtual world activities have become integral to personal life, significantly shaping individuals' spiritual-cultural experiences. Transparent social culture is marked by the openness and dynamism of social interactions, along with the development of public consciousness. Individuals sharing opinions on social media generate vast amounts of online information, driving the transparency of social culture. Intelligent technological culture benefits from advancements in artificial intelligence, where technology increasingly mirrors human cognition, serving as an extension of human perception.

2.2 Changes in Linguistic and Cultural Identity in the Digital Age

Are linguistic and cultural identities affected by technological changes in the digital age? Identity is a broad and complex concept encompassing linguistic identity, ethnic identity, national

identity, cultural identity, religious identity, and more—reflecting individuals’ or groups’ sense of belonging across multiple dimensions. Cultural identity refers to the acceptance and recognition by individuals of material, institutional, and spiritual cultures created collectively by a group. [5] Cultural identity is the deepest form of identity—it is the root of ethnic unity and the soul of ethnic harmony. [6] Cultural identity requires certain carriers, including language, literature, art, religion, etc., among which language is one of the most significant. [7] *Gumperz* (1982) argued that the establishment of social identity is often grounded in differences related to gender, race, and class, which are manifested through communication. In other words, language shapes social reality; language is the basis of identity. [8] *Le Page* (1985) further proposed the view that "language behavior is identity behavior," because language behavior is a comprehensive process involving the selection of codes, registers, and styles in interpersonal communication and group interaction. [9] These selections themselves reflect linguistic identity and reveal speakers’ racial, group, and cultural beliefs. Therefore, linguistic identity forms the basis of identity across racial, group, and cultural dimensions. Linguistic identity reflects cultural identity, and changes in linguistic identity trigger shifts in cultural identity.

As for whether linguistic and cultural identities change over time, research in this area remains relatively limited. *Eslami et al.* (2023) summarized the impact of transformative eras on linguistic and cultural identities into two aspects: on one hand, digital technologies promote cross-linguistic and cross-cultural adaptation, advancing convergence of identities under globalization; [10] on the other hand, they reinforce minority groups’ commitment to their linguistic and cultural identities, helping preserve global linguistic and cultural diversity. However, these two effects—"convergence" and "diversity"—are somewhat contradictory, reflecting the complexity of linguistic and cultural identities in the digital age. This article will delve into this complexity, investigating under what conditions new technologies enhance minority linguistic and cultural identities, and under what circumstances they foster cross-linguistic and cross-cultural identities, thereby advancing identity convergence.

3. Experiences of the Digital Age

Internet technology is the core technology of the digital age. In light of this, we first conduct an in-depth analysis of the impact of the internet on linguistic and cultural identities, focusing specifically on two aspects: digital communication and social media. The core function of digital communication lies in maintaining social networks, [11] while the core function of social media involves user-generated content sharing.[12] These functional differences exert distinct influences on linguistic and cultural identities. Sections 3.1 and 3.2 provide detailed discussions, with Section 3.3 offering a summary.

3.1 Digital Communication

Digital communication features real-time, synchronous interaction, which helps mobile populations maintain connections with their original speech communities and cultural groups. Scholars have consistently examined how international students and migrants utilize digital communication to adapt to cross-linguistic and cross-cultural environments. [13] [14] Research indicates that international students or immigrants often face language barriers, identity challenges, and cultural adaptation difficulties during their initial stages abroad. Digital communication can assist them in preserving ties with their existing social networks, gaining emotional support, enhancing well-being, and reducing feelings of isolation—thereby sustaining their identification with their original languages and cultures.

Digital communication strengthens ethnic minorities’ identification with their native languages and cultures in China. China adheres to the socio-cultural development principle of a “pluralistic yet integrated Chinese nation”. [15] Digital communication platforms such as WeChat, QQ, and TikTok help minority groups transfer their offline social networks online, meeting the needs for maintaining social connectivity and strengthening information exchange. This process enables

diasporic communities to undergo “recommunitization,” reinforcing their sense of ethnic identity. For instance, WeChat’s voice function facilitates communication between Mongolian herders and their families. For many herders with limited education, using only their native language suffices for connecting with relatives dispersed across regions. [16] Yi (Yi ethnic group of China) villages exhibit strong regional consciousness, where middle-aged and elderly individuals remaining in their hometowns use WeChat groups to enhance internal communication, promoting harmony within the village and reinforcing ethnic identity. Yi youth working outside their villages tend to assimilate linguistically into Mandarin-speaking society, placing Yi language and culture at risk of extinction. Within village WeChat groups, members share audio, video, and articles related to Yi language, folk songs, dances, and festivals, and conduct online Yi language teaching via WeChat's voice function, thereby enhancing young people’s identification with and transmission of their ethnic language and culture. [17] Similarly, studies on Uyghur [18] and Va ethnic groups [19] reveal that digital communication reinforces ethnic minorities’ identification with their native languages and cultures, facilitating both social interaction and information exchange. Additionally, digital communication promotes the use of Cantonese-influenced written Chinese in Hong Kong and Macau. Cantonese-style Chinese refers to a written form based on Cantonese dialects. [20] It incorporates distinctive Cantonese vocabulary, local terms specific to Hong Kong and Macau, and grammatical structures, distinguishing it from standard Chinese due to its closer alignment with spoken Cantonese. Speech-to-text functions in digital communication software facilitate the input of Cantonese-style Chinese. [21] *Tsui Sze Ting* (2020), through empirical surveys and quantitative research, found that younger users in Hong Kong are more likely than older ones to employ Cantonese-style Chinese when sending instant messages via digital communication apps. [22] Users with stronger local identification also tend to prefer Cantonese-style Chinese. *Zhang & Ma* (2024) observed similar results in Macau. [23] Locals with strong regional identity in Hong Kong and Macau highlight their identity by adopting dialectal written forms like Cantonese-style Chinese.

Compared to analog communication before the digital era, digital communication has undergone revolutionary changes in data transmission volume per unit time, data security, stability, and coverage range. With convenient input methods and lower communication costs, digital communication not only simplifies one-on-one interactions but also enhances group interactions, helping preserve and reinforce users' pre-existing linguistic and cultural identities. The term "pre-existing linguistic and cultural identities" here includes identification with minority languages and cultures, as well as Chinese dialects and cultures—the "plurality" aspect of the “pluralistic yet integrated Chinese nation.” It also encompasses identification with national common language and script and Chinese culture, representing the "integration" dimension. Overall, digital communication primarily confirms and reinforces existing identities formed in real-life contexts. Compared to social media technologies, its capacity to shape identities remains relatively weak. The following section explores how social media contributes to shaping identities.

3.2 Social Media

Social media is a product of the Web 2.0 era (also known as participatory web or social networking). Compared to the Web 1.0 era, the central shift in Web 2.0 lies in transitioning from static web pages and unidirectional information flow to emphasizing user-generated content. [24] In the Web 2.0 era, social media users can create, edit, and publish content, transforming information flow into bidirectional or even multidirectional exchanges. Compared to digital communication, social media exerts more complex and profound effects on linguistic and cultural identities.

3.2.1 Social Media Enhances Minority Linguistic and Cultural Identity

Social media gives rise to "net language"—a flexible, diverse, and innovative linguistic form that adapts to the fast-paced, multimedia-oriented communication demands of the digital age.

Choosing to use net language often signifies unique linguistic identity. *Ilbury* (2020) discovered that young white male homosexuals in the UK use American English vocabulary and phonetic features on social media to construct their self-image. [25] White working-class women in the UK demonstrate gender and class identity on Instagram by employing non-standard spelling and expressions. [26] Young women in Jordan prefer to use English loanwords infused with Arabic morphemes on Facebook, distinguishing themselves from Americans while enriching the Arabic character of their language, thus expressing identification with Arabic language and culture. [27] On social media, written forms less used or no longer employed in offline life become more visible, potentially regarded as a special type of "net language." For example, *Warschauer et al.* (2007) identified a colloquial written form of Arabic in Egyptian online language research. [28] In Egypt, Classical Arabic holds high prestige and is widely used in formal settings such as books, newspapers, and speeches. In contrast, colloquial Arabic is primarily used informally and rarely appears in written form. The researchers surveyed language choices among Cairo youth on social media and found that colloquial Arabic, seldom used offline, became prevalent online alongside English. Similar cases include the written form of Luxembourgish [29] and Tunisian Arabic [30], both illustrating how social media fosters local linguistic identity.

3.2.2 Social Media Facilitates Cross-Linguistic and Cross-Cultural Identity

Kelly-Holmes (2019) argued that language development on the internet has reached a stage where idiolingualism (personalized language use) and hyperlingualism (unlimited multilingual possibilities) coexist. [31] The earlier discussion of how social media promotes minority linguistic and cultural identities corresponds to the hyperlingualist perspective, in which users can contribute content in their own languages, fostering "social-cultural transparency." Meanwhile, the promotion of cross-linguistic and cross-cultural identity through social media is largely attributed to the further development of idiolingualism, which supports the "personalization of spiritual culture."

Domingo (2016) explored the opportunities and challenges in studying language and identity within digital environments. She presents a detailed case study of British-Filipino youth sharing music videos on YouTube, illustrating how social media facilitates interaction among users from different linguistic and cultural backgrounds. [32] These youths create and share rap songs infused with Filipino cultural elements, drawing global interactions and discussions. Through comments and replies, they engage with audiences using English, Tagalog (Filipino), and Spanish—demonstrating how new forms of digital communication enable transnational communication and identity construction.

Li & Zhu (2021) examined how overseas Chinese users leverage the Chinese writing system and social media platforms to challenge dominant language ideologies and policies, express new forms of transnationalism, and actively participate in global social activities. [33] For overseas Chinese communities, Chinese characters and the written language play crucial roles in preserving ethnic identity and fostering solidarity. The study focuses particularly on how platforms like Facebook and YouTube have become important arenas for linguistic innovation and sociopolitical engagement among the Chinese diaspora. Chinese language usage on these platforms plays a pivotal role in shaping perceptions of transnationalism and China's evolving global image.

These two cases focused on the linguistic practices of transnational migrants on social media. Migrant populations often possess bilingual or multilingual competencies, which serve as key tools for communication and identity formation. Similarly, residents of Hong Kong and Macau generally exhibit high levels of bilingual or multilingual proficiency and are accustomed to using international social media platforms, resulting in relatively more research on language use in these regions.

Lee (2014) investigated the relationship between language choice and identity among Hong Kong university students on social media. [34] The case study centers on a third-

year student who also works as an English teacher. On his personal social media account associated with student identity, he primarily uses Cantonese to interact with friends; on his professional account linked to teaching, he communicates in English with students and colleagues. As a Chinese national, he chooses Mandarin when participating in mainland Chinese online forums, avoiding code-mixing, while on local Hong Kong forums, he predominantly uses Cantonese or mixes it with English. This illustrates the multifaceted nature of linguistic and cultural identities among Hong Kong youth. A similar pattern exists in Macau, where younger generations express local identity through traditional Chinese characters and written Cantonese, while also demonstrating multilingual identification through switching between Cantonese-English and Cantonese-Mandarin codes. [35]

The language choices of Hong Kong and Macau users on social media are influenced by multiple factors, including interlocutors, platform types, and online personas. Users can construct multiple identities across different platforms by employing various languages. Younger generations navigate the balance between globalization and localization through multilingualism and multi-identity expression, thereby promoting cross-linguistic and cross-cultural identification.

Shen (2017) highlighted fundamental differences between Western and Chinese categorical thinking: the West emphasizes “mutually exclusive categories,” whereas China embraces the idea that “coexistence implies inclusion.” [36] When applied to identity, this Chinese conceptual framework suggests that Chinese people tend to accept inclusive rather than dichotomous views of identity—for example, perceiving “Chinese” and “Hong Kong/Macau person” as inclusive rather than separate identities. Thus, identifying as both “Chinese” and “Hong Konger” or “Macanese” is not contradictory but complementary. The construction of multiple online identities through social media fosters diverse expressions of identity. Within the framework of Chinese categorical thinking, such pluralistic expressions can lead to an inclusive model of multicultural identification, ultimately facilitating identity convergence.

3.3 Summary

Both digital communication and social media have reshaped modes of information dissemination and interpersonal interaction. Digital communication primarily functions to maintain offline social networks, reinforcing users’ pre-existing linguistic and cultural identities. In contrast, social media emphasizes self-expression and the building of virtual communities. It exerts a dual effect—it not only enhances linguistic and cultural identities among minority groups but also facilitates cross-linguistic and cross-cultural identification.

The languages and cultures of minority groups promoted via social media are often marginalized in real-life contexts. However, social media offers them new platforms for expression. In other words, social media serves as a space for minority groups to articulate latent or suppressed forms of identity, providing public visibility to otherwise underrepresented linguistic and cultural identities.

In the digital age, expressing cross-linguistic and cross-cultural identities requires users to possess bilingual or multilingual capabilities. For instance, British-Filipino youths may be proficient in English, Tagalog, and Spanish; overseas Chinese in English-speaking countries often have competence in both Chinese and English; and users in Hong Kong and Macau typically master Cantonese, Mandarin, and English. Multilingualism often correlates with multiple linguistic identities, which in turn correspond to diverse cultural identifications. Social media enables users to construct multiple online identities aligned with each linguistic preference, thus fostering cross-linguistic and cross-cultural exchanges.

However, it should be noted that such exchanges are often spontaneous. To transform them into active forces for strengthening linguistic and cultural identities, guidance and promotion through mainstream values remain essential. For China, reinforcing the consciousness of the Chinese nation as a community is of utmost importance. [37] Amid rapid technological changes, we must consistently take the “consciousness of the Chinese nation as a community” as our guiding principle. By doing so, we can enhance recognition of Mandarin (the national common language) and Chinese culture among all ethnic groups and even among overseas Chinese communities, promoting an inclusive, pluralistic yet unified model of linguistic and cultural identity.

4. Prospects for the Intelligent Era

In the digital age, information digitization and internet technologies have provided platforms for the expression of existing linguistic and cultural identities in real life, enabling the dissemination of previously marginalized or latent forms of identity. The intelligent era, centered on artificial intelligence (AI) and machine learning technologies, will further transform people’s linguistic and cultural identities. Drawing upon experiences from the digital age, this paper identifies the following as the main areas where significant impacts are expected.

4.1 Enhancement of Productivity Will Further Strengthen Group Linguistic and Cultural Identity Awareness

In the intelligent era, artificial intelligence (AI) technology can automate repetitive tasks and optimize resource allocation, significantly improving production efficiency and liberating human labor. This advancement in productivity enriches material foundations, enabling individuals to satisfy their basic needs and thus allowing more time and energy to be devoted to spiritual and emotional pursuits—such as the need for belonging, which aligns with Maslow’s hierarchy of needs. [38] The “need for belonging” refers to an individual’s desire to affiliate with a group and feel a sense of membership, thereby forming a sense of identity.

Sections 3.1–3.2 have already demonstrated how digital technologies provide new platforms to fulfill this need for belonging. In the intelligent era, enhanced productivity will further reveal latent linguistic and cultural identities within social groups. On one hand, virtual reality (VR) and augmented reality (AR) technologies make online interactions more immersive and realistic, enhancing users’ sense of belonging in digital spaces. On the other hand, AI and big data technologies collect and analyze massive amounts of user data, employing machine learning algorithms to build personalized user profiles. These systems enable recommendation engines to comprehensively understand user preferences and deliver tailored content that resonates with individuals’ interests, helping them more easily identify and connect with like-minded communities, thus further satisfying their need for belonging.

4.2 Restructuring of the Global Language Hierarchy Will Affect the Instrumental Function of Language Identity

Language is the best key to understanding a nation; language and script are the genes and roots of culture and civilization. [39] This insight profoundly captures the dual nature of language—both instrumental and humanistic—and therefore necessitates a separate analysis of how AI affects these two dimensions.

The instrumental aspect of language primarily concerns its communicative function. Before the digital-intelligent era, the strength of a language’s communicative capacity was determined jointly by the number of native speakers and foreign learners of that language. [40] With the advent of the intelligent era, the traditional “person-to-person”

communication model has expanded into a “person-machine-person” framework. Conversational partners who speak different languages can now communicate through machine translation. The degree and accuracy of machine mediation in interpersonal communication depend on the digital resources available for each language, as these resources constitute the training data for generative large language models (e.g., ChatGPT). Therefore, in the intelligent era, the communicative power of a language is no longer solely defined by the number of native and second-language speakers but increasingly relies on the availability and quality of its digital resources.

The current distribution of digital resources across languages is highly uneven, resulting in varying levels of support from generative AI for different languages. *Choudhury* (2023) noted that around 24 languages—including English, Spanish, Russian, and Chinese—possess sufficient resources to develop robust large language models. [41] Additionally, another 28 languages, such as Bengali, Swahili, and Indonesian, have adequate textual corpora to benefit from cross-lingual zero-shot capabilities of large language models. However, the remaining approximately 99% of the world’s languages—spoken by roughly 1.5 billion people—receive minimal or no support from current AI systems.

Therefore, in the intelligent era, whether dominant languages maintain their dominance or minority languages seek to overcome marginalization hinges on the development of intelligent digital resources. A dominant language that neglects the development of such resources may lose its leading position. Conversely, a minority language with sufficient digital resources and the ability to inter-translate with dominant languages can leverage those dominant languages to achieve broader multilingual interoperability, thereby increasing its speakers’ instrumental identification with it. The more minority languages a dominant language can connect, the stronger its mediating and linking functions become, and consequently, the stronger the instrumental identification among its speakers.

4.3 The New Form of Human Civilization Will Reconfigure the Relationship Between Language and Culture, Influencing Cultural Identity Functions of Language

Since the Enlightenment, humanity has believed that the advancement of rational knowledge can resolve fundamental issues of human survival. Thus, the First Industrial Revolution, marked by steam technology, brought about a dramatic leap in productivity and profound societal transformations. The Second Industrial Revolution, driven by electricity and steel, further enhanced production efficiency and scale. Then came the Third Industrial Revolution, led by information technology, which drastically changed the ways information is transmitted and exchanged.

Today, we are entering the Fourth Industrial Revolution—centered on intelligence and digitization—that defines the intelligent era. *Kissinger et al.* (2023) argued that the transformations brought about by this revolution in social structures, cultural forms, and individual lifestyles differ fundamentally from previous ones. [42] Past innovations were often described as extensions of existing practices—the motion picture as moving photographs, the telephone as spatially extended conversation, and the automobile as a faster carriage. However, innovations in the intelligent era cannot be conceptualized merely as extensions of known entities. Intelligent machines operating in cyberspace challenge the Enlightenment view that human rationality is the most essential component of consciousness. This wave of technological and industrial transformation is shaping a new form of human civilization.

This emerging form of human civilization will reshape the relationship between language and culture. Previously, Mandarin was considered a supradialectal, standardized language—a constructed standard rather than a naturally occurring mother tongue. Hence, its function in carrying, transmitting, and preserving traditional Chinese culture was

perceived as weaker compared to Chinese dialects and ethnic minority languages. [43] However, standardized languages are better suited for interaction with machines. Due to their codified phonology, grammar, and vocabulary, standardized languages are more easily encoded and processed by computers, demonstrating higher efficiency and accuracy in human-machine interaction. Consequently, it can be anticipated that in the intelligent era, standardized languages will experience a significant enhancement in their capacity to carry, transmit, and preserve culture in digital spaces, becoming carriers of the new form of human civilization.

5. Policy Recommendations for the Intelligent Era

In response to the three anticipated transformations in linguistic and cultural identity in the intelligent era, this section proposes corresponding policy recommendations aimed at strengthening the consciousness of the Chinese nation as a community.

5.1 Enhancing Identity Awareness through Educational Initiatives

Looking ahead to the intelligent era, technological advancements will further liberate productivity. This progress will create favorable conditions for individuals to satisfy their need for belonging, thereby reinforcing group-based linguistic and cultural identities. It is therefore crucial to explore how this heightened sense of identity can be channeled into stronger identification with Mandarin and Chinese culture.

“Education is the foundation of any long-term national strategy” and “the fundamental pathway through which human civilization and knowledge are transmitted.” [44] Guided by this principle, we propose prioritizing the visibility of latent linguistic and cultural identities in cyberspace—especially on social media platforms. By promoting education centered on Mandarin and Chinese culture under the guidance of the “consciousness of the Chinese nation as a community,” we can produce high-quality content related to the national language and cultural heritage. Utilizing personalized, customized, and intelligent information dissemination technologies will enable the precise delivery of mainstream values, ensuring that emerging identity awareness aligns with national linguistic and cultural norms.

5.2 Strengthening Machine Translation Capabilities Between Mandarin and Domestic Languages and Dialects

In the intelligent era, the global hierarchy of languages will undergo significant restructuring. The status of dominant and minority languages will increasingly depend on the availability of digital resources and machine translation capabilities. China is currently developing its own large language models, such as *Wenxiaoyan*, *Xunfei Spark* and *Deepseek*. In building these models, particular attention should be paid to achieving bidirectional machine translation between Mandarin and China’s regional dialects and 139 ethnic minority languages. [45] Most international large language models are English-centric, trained primarily on bilingual data involving English and other languages. China’s indigenous models should be centered on Mandarin—not only focusing on its translation capacity with foreign languages but also emphasizing its interoperability with domestic minority languages and dialects. This approach would enhance Mandarin’s centripetal force and cohesion among domestic languages, as well as its mediating and communicative power across international languages, thus maintaining its dominant linguistic position.

Improving machine translation capabilities depends not only on algorithmic innovation and computational power but also critically on the collection and development of relevant multilingual datasets. High-quality machine translation requires extensive parallel bilingual corpora for training. Therefore, both governmental and academic institutions must prioritize the systematic collection and curation of multilingual resources within China, especially for border minority languages such as Uyghur, Tibetan, and Mongolian. Digitally preserving these linguistic

variants not only safeguards linguistic diversity but also facilitates high-quality translation between them and Mandarin. This dual benefit supports both the dominance of the national language and the preservation of China's rich linguistic and cultural heritage.

5.3 Enhancing the Cultural Carrying Capacity of Mandarin for Modern Chinese Civilization

The intelligent era will reshape the relationship between language and culture through the emergence of new forms of human civilization. A new era brings forth new cultural forms. Drawing upon the wisdom of Chinese culture, we can effectively address the challenges arising throughout the modernization process and construct a modern civilization rooted in the essence of the Chinese nation.

Modern Chinese civilization builds upon over 5,000 years of continuous cultural history, embracing openness and inclusiveness while upholding core traditions and fostering innovation. What language, then, should serve as the primary medium for expressing, carrying, and disseminating this modern civilization? Mandarin is well-suited to fulfill this mission. Unlike constructed languages, Mandarin has evolved from historical standards of spoken and written Chinese, embodying the collective wisdom and emotions of the Chinese nation. It serves as the genetic code and lifeblood of Chinese civilization.

In the digital-intelligent era, the cultural identity function of Mandarin will gain prominence in online spaces. With the support of intelligent technologies, Mandarin can not only offer innovative expressions of Chinese culture but also promote and disseminate it globally. This will significantly contribute to the construction and development of modern Chinese civilization, reinforcing its role as a unifying force in an increasingly diverse and technologically advanced society.

6. Conclusion

The digital-intelligent era is a new age brought forth by the Fourth Scientific and Technological Revolution. In times of transformation, the humanities must consciously examine the humanistic issues triggered by technological advancements. This paper reflects on the impacts of technology from a linguistic perspective, particularly focusing on how technology influences linguistic and cultural identities.

Research findings reveal that in the digital age, both digital communication and social media have exerted profound effects on linguistic and cultural identity. Digital communication breaks temporal and spatial boundaries, helping mobile populations maintain connections with their original communities, thereby reinforcing their existing linguistic and cultural identities. Social media, on the other hand, provides users with a channel for self-expression and the construction of virtual communities. It serves as a platform where minority groups can express latent or marginalized identities, as well as a space where multilingual and multicultural individuals can achieve cross-linguistic and cross-cultural identification. Understanding and distinguishing the functions of these two platforms reminds us that even when utilizing social media to promote intercultural and multilingual identification, mainstream values are essential to guide the process toward identity convergence. Identity convergence does not necessarily oppose pre-existing identities; under the Chinese conceptual framework of "inclusive categorization," it can foster a uniquely Chinese model of inclusive, pluralistic yet integrated linguistic and cultural identity.

In the intelligent era, while technology liberates productivity, it also presents new challenges and opportunities for strengthening linguistic and cultural identities. We must use the "mainstream values of modern Chinese civilization" to guide and regulate algorithms, and to harness intelligent technologies. Through multifaceted efforts—including education, social media, digital resource development, and policy support—we can effectively guide the growing awareness of identity, transforming it into stronger

identification with Mandarin (the national common language) and Chinese culture. This, in turn, will enhance the sense of community among the Chinese nation and contribute to the construction of modern Chinese civilization.

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