

Cultural and Cooperative Interaction Patterns Along the Belt and Road: A Psychological Analysis Based on Social Media Big Data

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Abstract

Clarifying the characteristics of public sentiment in countries and regions along the “Belt and Road” and identifying effective models for cooperation and exchange constitutes a major issue concerning the implementation of national strategy. However, due to vast territories, numerous ethnic groups, and exceptionally complex geopolitical, economic, and cultural factors (such as former Soviet influence, European and American colonialism, religious traditions, etc.), traditional analytical methods often prove ineffective. This study integrates cultural psychology and big data analysis techniques, utilizing social media Twitter data to analyze self-representation characteristics (independence or individualism) of countries and regions along the “Belt and Road,” and establishes predictive models of self-representation and social trust (generalized trust, particularized trust) to explore behavioral patterns of cooperation and exchange with these entities—specifically, whether self-representation is independent or interdependent, and whether interpersonal relationship preferences favor generalized trust among strangers or particularized trust among acquaintances. Results indicate that countries and regions along the “Belt and Road” exhibit substantial variation in the individualism cultural indicator of self-independence, which is primarily influenced by the colonial history of European and American countries and local religious traditions; furthermore, generalized trust toward strangers and foreigners and particularized trust toward family members and acquaintances can be predicted through individualism indicators. In summary, cultures along the “Belt and Road” are diverse, and their individualism indicators can be rapidly calculated from massive corpora generated through social media to establish predictive models of self-representation and social trust. This study provides a novel technical pathway for analyzing the characteristics of “public sentiment” in the strategic regions of the “Belt and Road” and exploring local behavioral patterns of cooperation and exchange.

Full Text**Technology Supports the Belt and Road Initiative: Cultural and Cooperative Interaction Patterns Along the Route—A Psychological Analysis Based on Big Data from Social Media****WU Michel Shengtao^{12†}, ZHOU Yang^{13†}, FU Xiaolan¹, LIU Xiaoqian¹, LIU Tinali⁴, ZHU Tingshao^{1*}**¹Institute of Psychology, Chinese Academy of Sciences, Beijing 100101, China²Institute of Communication, Chinese Academy of Sciences, Beijing 100101, China³Institute of Population Research, University of Chinese Academy of Sciences, Beijing 100049, China⁴Institute of Population Research, Peking University, Beijing 100871, China

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Understanding the “hearts and minds” of people in Belt and Road countries and identifying effective models for cooperation and interaction constitute a critical issue for national strategic implementation. However, traditional analytical methods often prove ineffective due to the vast territories, numerous ethnic groups, and exceptionally complex geopolitical, economic, and cultural factors (such as former Soviet influence, European and American colonialism, and religious traditions). This study integrates cultural psychology with big data analytics, utilizing Twitter data to analyze self-representation characteristics (independence or individualism) in Belt and Road countries and regions, and establishes a predictive model linking self-representation with social trust (generalized trust and particularized trust) to explore behavioral patterns for cooperation and interaction. Specifically, we examine whether self-representation is independent or interdependent, and whether interpersonal relationship preferences favor generalized trust among strangers or particularized trust among acquaintances.

Our results reveal substantial variation in the individualism indicator of self-independence across Belt and Road countries and regions, primarily influenced by European and American colonial histories and local religious traditions. Furthermore, generalized trust toward strangers and foreigners, as well as particularized trust toward family and acquaintances, can be predicted through individualism indicators. In conclusion, the cultures along the Belt and Road are diverse; their individualism indicators can be rapidly calculated through massive corpora generated from social media, enabling the construction of pre-

dictive models for self-representation and social trust. This research provides a new technological pathway for analyzing the “hearts and minds” characteristics and exploring local cooperative interaction patterns in Belt and Road strategic regions.

Keywords: Belt and Road, individualism, trust, social media

Regional Strategy and Geopolitical Challenges

As an emerging major power, China faces both unprecedented opportunities and complex challenges. On one hand, the Belt and Road Initiative’s implementation brings unprecedented development opportunities, contributing significantly to economic growth and even trade surpluses. On the other hand, China must inevitably engage closely with relatively unfamiliar Islamic civilizations while facing scrutiny or challenges from countries in the former Soviet region and traditional spheres of European and American influence in South Asia and the South China Sea. The Belt and Road region spans vast territories with numerous ethnic groups, and geopolitical, economic, and cultural factors (such as former Soviet influence, European and American colonialism, and Islamic traditions) are exceptionally complex. Specifically, among the 69 Belt and Road countries and regions included in this study (including Hong Kong and Taiwan, China; see Appendix Table 1), 33 were formerly colonized by European and American powers, and 31 were part of the Soviet bloc or sphere of influence—both groups having maintained strong historical traditions and their own “rules of the game.” Even among the 28 relatively independent Islamic-majority countries outside these two blocs, 17 were colonized by European and American powers and 5 fell within the Soviet sphere of influence.

In post-colonial countries or regions such as India and the Philippines, subtle ties with former metropolises persist to this day. Within China’s sovereign scope, Hong Kong and Taiwan have also experienced continuous complications due to British and American colonial “protection” or interference. It is evident that the Belt and Road does not represent a uniform, monolithic dialogue, nor a hierarchical relationship between a “Middle Kingdom” and surrounding smaller states, but rather a complex dance of diverse cultures in a complicated geopolitical landscape. Historically, despite major setbacks, the Soviet Union remains concerned about its traditional sphere of influence and maintains military and political influence. European and American powers, compelled by national independence movements and Western economic decline, have temporarily withdrawn—particularly as American conservatism rises and overseas energy dependence decreases, leading to a slow retreat from Asia. However, European and American influence on Asia has been profound, and major powers such as Japan and India are also seeking new development space. Beyond the Soviet Union and the West, the Islamic world is rising, and terrorism—born from its confrontation with the Soviet Union and the United States—is spreading, which will inevitably complicate

China's domestic and foreign affairs.

Against this backdrop, understanding the “hearts and minds” characteristics of Belt and Road regions and exploring local cooperative interaction patterns is extremely important. However, China remains relatively unfamiliar with the cultures of Belt and Road countries. Historically, China often maintained a “Middle Kingdom” mentality, showing little concern for neighboring countries. After the Opium Wars, China began to observe the world, but focused excessively on—and even became dependent on—European and American countries, neglecting and remaining ignorant about nations beyond the West. In real international relations, the lack of systematic cultural research on neighboring countries has caused continuous troubles in peripheral relations. Under the new Belt and Road Initiative, China is entering traditional spheres of Soviet and American influence without comprehensive knowledge of local cultures or adequate preparation for establishing effective cooperative relationships.

Regional Culture and Cooperative Interaction

Culture constitutes an important factor affecting regional cooperation and economic exchanges. For instance, individualists are more willing to establish economic and trade cooperative relationships, whereas collectivists show relatively lower willingness for economic cooperation and prefer familiar or in-group members when selecting trading partners. Therefore, analyzing the cultural characteristics of Belt and Road countries and regions provides an effective entry point for understanding local “hearts and minds” and exploring interaction patterns. Cultural psychology offers a conceptual framework for understanding national and regional cultural differences, with the most discussed concept being individualism/collectivism—the former emphasizing independence between self and others, the latter emphasizing interdependence and group belonging or conformity.

Economic production, political history, and religious beliefs all influence the formation of individualism/collectivism. Previous research on East-West cultural differences found that agricultural civilizations emphasizing secular ethics (such as China's Confucian ritual tradition) pursue relational harmony and tend to strengthen collectivism, whereas maritime civilizations emphasizing rational spirit (such as ancient Greek logical tradition) highlight analytical thinking and tend to strengthen individualism. In recent years, increasing research has discovered that even within the same culture (Western/Eastern), substantial cultural differences exist. For example, with urbanization and market economy development, a country's culture increasingly tilts toward individualism, as seen in both China and the United States. In the United States, states that joined the Union later demonstrate more independent pioneering spirit and higher individualism scores. Regarding religious beliefs, inherited religions (such as Judaism and Islam) emphasize family relationships and parish practices (such as children inheriting parental religious beliefs and temple worship), fostering higher collectivism among believers; conversion religions (such as Protestant Christianity)

emphasize personal faith and choice, which have no necessary relationship with family and parish practices, resulting in higher individualism among believers.

The Belt and Road region involves multiple cultural forms and varying levels of economic development—Eastern Europe and West Asia are relatively developed, while South and Central Asia lag behind. There are also differences in political history, such as former affiliation with Soviet or Western political blocs and varying durations of participation in international affairs as independent nations. Religious differences also exist, such as Christianity in Eastern Europe, Islam in West and Central Asia, Hinduism and Buddhism in South Asia, and Confucianism (or Confucian tradition) and Buddhism in East and Southeast Asia. Considering these numerous complex factors, Belt and Road countries and regions may exhibit significant cultural-psychological variation. Simultaneously, each country or region represents a complex combination of economic production, political history, and religious traditions, making simple horizontal comparisons between one or two regions using a single factor inappropriate. Therefore, this study conducts a multi-factor analysis of cultural variability across 69 Belt and Road countries and regions (including Hong Kong and Taiwan, China), rather than limiting itself to single-factor effects of economy, politics, or religion. In terms of cultural variables, this study focuses on the core element of individualism (self-independence); collectivism, which often refers to all cultures beyond individualism with ambiguous value goals that are difficult to measure accurately, is temporarily excluded from consideration.

Adopting a cultural perspective for psychological analysis of people in Belt and Road countries and regions helps us achieve relatively scientific understanding and judgment of local “hearts and minds” characteristics, thereby developing economic cooperation and political mutual trust through effective behavioral patterns. For example, cultures that more strongly favor individualism in self-representation also value self-expression or emancipative values more highly in cooperative interactions, placing greater emphasis on autonomy spirit and equal rights. At the interpersonal and intergroup level, social trust is closely related to culture and cooperative interaction—only with a tendency to trust the other party can there be willingness for economic cooperation, thereby reducing the cost of maintaining relationships. Extensive evidence indicates that collectivist societies emphasize nepotism, resulting in higher particularized trust within small circles of family and acquaintances; individualist societies have weaker nepotism and higher generalized trust relationships among strangers. The latter is more common in interactions between heterogeneous cultural groups across different countries, regions, and religions, and is particularly important for economic cooperation and political exchanges within modern society.

Analytical Approach and Big Data Advantages

Large-scale regional cultural analysis has traditionally relied on cross-cultural sampling surveys, such as the United Nations’ national statistical yearbooks or Gallup opinion polls. However, because these surveys involve numerous eco-

conomic, political, cultural, and health factors, their measurement of psychological variables—especially in specific domains—is relatively coarse, with few systematically validated measurement tools. Psychologists have also launched some global surveys, most notably Inglehart’s World Values Survey (WVS). However, as an independent, non-governmental, and non-commercial organization with limited resources, each wave can survey only about 60 countries with 1,000+ respondents per country, raising questions about sample size and representativeness. More importantly, many psychological variables are deeply embedded in cultural structures, influenced by social desirability or integrated into collective unconsciousness, making accurate subjective reporting through statistical surveys difficult.

With the development of information science and big data analytics, comprehensive sampling, rapid computation, and network analysis—previously impossible through traditional surveys—have become feasible. Big data can provide massive, timely datasets that are typically user-generated, representing precise records of user behavioral traces. Data results can also be visualized graphically, with data mining and modeling enabling predictive analysis of specific issues or domains. Additionally, big data collection and management can be automated through computers, saving substantial labor, time, and social survey costs.

In recent years, researchers have developed effective measurement and prediction systems for real-life cognition, emotion, and behavior in the internet age through concentrated mining of massive user data from prominent social media platforms like Twitter and Facebook. For example, studies using Twitter data to examine political intentions and psychological well-being demonstrate the feasibility of computing user psychological characteristics from online data. Researchers extracted a six-dimensional public emotion profile through semantic analysis of 9,664,952 Twitter posts. Comparing public emotion with major media events or popular cultural events—such as U.S. stock market fluctuations, international crude oil prices, U.S. presidential elections, and Thanksgiving—revealed that big data analytics systems for public mood on social media can also serve as effective prediction platforms for certain social and economic indicators.

Research Questions and Analytical Framework

As deep structures of human behavior, culture is deeply embedded in language habits and self-expression. Recent corpus analyses have found that if a society’s linguistic habits more frequently use first-person singular pronouns (such as “I”), this indicates higher levels of individualism or independent self in that culture.

This study analyzes psychological characteristics of Twitter content to calculate individualism indicators (self-independence) across 69 Belt and Road countries and regions, and extracts individualism scores from the WVS database for 28 Belt and Road countries and regions to compute their relationships with individual emancipation indices (autonomy, equality, choice, expression) and social

trust (generalized trust and particularized trust). We hypothesize significant within-region variation in individualism indicators across Belt and Road countries and regions, and that individualism significantly correlates with individual emancipation and social trust. Based on this correlation model, we predict social relationships or cooperative interaction patterns for all 69 Belt and Road countries and regions. The processing flow is shown in Figure 1

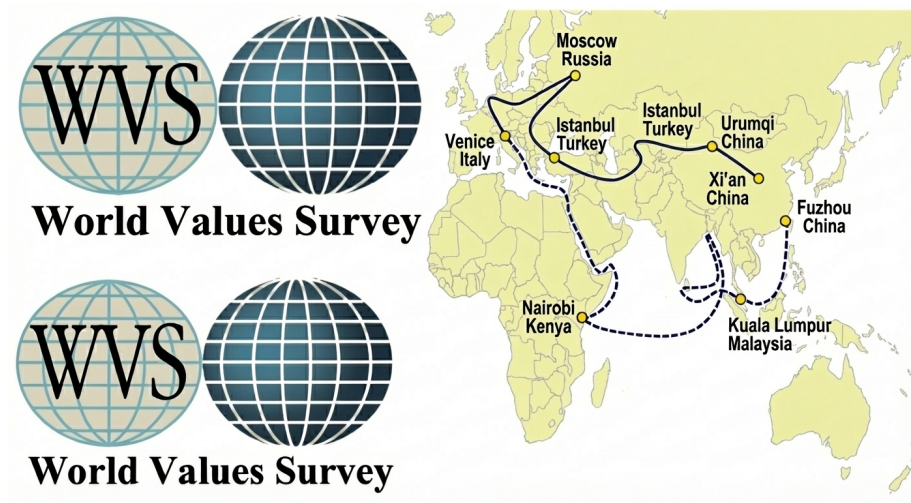


Figure 1: Figure 1

Individualism Index

The Twitter data used in this study were generated from August 2, 2013 to October 15, 2013. Based on nationality information in Twitter, we identified 2,137,002 users from 69 Belt and Road countries and regions, comprising 10,763,183 tweets. Among these, 32 countries or regions were included in the WVS database, and 28 had complete socio-economic information (such as per capita GDP, Gini coefficient, and urban population ratio).

We calculated the individualism indicator for each of the 69 countries and regions by computing the ratio of singular first-person pronoun frequency to total Twitter word count. Specifically, the higher the proportion of singular first-person pronouns (I, me, my, mine, myself) in a country or region's Twitter content, the higher its individualism (self-independence) is considered to be.

Individual Emancipation and Social Trust

The individual emancipation index comprises four variables: (1) **Autonomy**, including three items related to child-rearing goals ("independence," "imagina-

tion,” “disobedience”), with each selected item scoring 1 point and the total score being the weighted average of the three items; (2) **Equality**, including three items related to gender equality (“equal employment opportunities,” “equal income for men and women,” “women’ s economic independence”), scored 1-3 points (“agree” = 1, “disagree” = 3), with reverse scoring so that higher scores indicate stronger preference for equal rights; (3) **Freedom of Choice**, including three items related to acceptance of deviant behaviors (“homosexuality,” “abortion,” “divorce”), scored 1-10 points (“completely unacceptable” = 1, “completely acceptable” = 10), with higher scores indicating stronger preference for free choice; and (4) **Freedom of Expression**, including three items related to the importance of voice (“community voice,” “government decision-making voice,” “freedom of speech protection”), with each selected item scoring 1 point and the total score being the weighted average of the three items.

Social trust is divided into generalized trust and particularized trust, assessed through trust levels toward different interaction targets. Generalized trust targets include “people meeting for the first time,” “people with different religious beliefs,” and “people of other nationalities.” Particularized trust targets include “family,” “neighbors,” and “acquaintances.” The scale uses 1-4 point scoring (“trust very much” = 1, “do not trust at all” = 4), with reverse scoring so that higher scores indicate higher social trust.

First, we use the proportion of singular first-person pronouns (self-independence) as an indicator to calculate individualism scores for the 69 Belt and Road countries and regions, with normalization to obtain the distribution of individualism along the Belt and Road. Then, to obtain individual emancipation and social trust profiles for these countries and regions, we extract individualism scores (self-independence) for 28 Belt and Road countries and regions from the WVS database and compute their relationships with the individual emancipation index (autonomy, equality, choice, expression) and social trust levels (generalized trust, particularized trust).

The WVS is a global project investigating human values and beliefs, covering 60 countries and regions with data collected between 2010-2014 and a current sample size of 90,350. Among these, 34 are Belt and Road countries or regions, including 43,391 males (48.1%) and 46,868 females (51.9%), aged 16-99 years with a mean age of 42.05 ± 16.48 years.

Subsequently, using individualism as the independent variable and socioeconomic variables as control variables (such as per capita GDP, Gini coefficient, and urban population ratio), we create linear regression prediction models for individual emancipation and social trust indicators. Due to the small sample size ($n=28$), we employ leave-one-out cross-validation here. Assuming n samples, each sample serves as the test sample once while the remaining $n-1$ samples serve as training samples, cycling until every sample has been used once as validation data.

Results

Regional Differences in Individualism

As shown in Figure 2

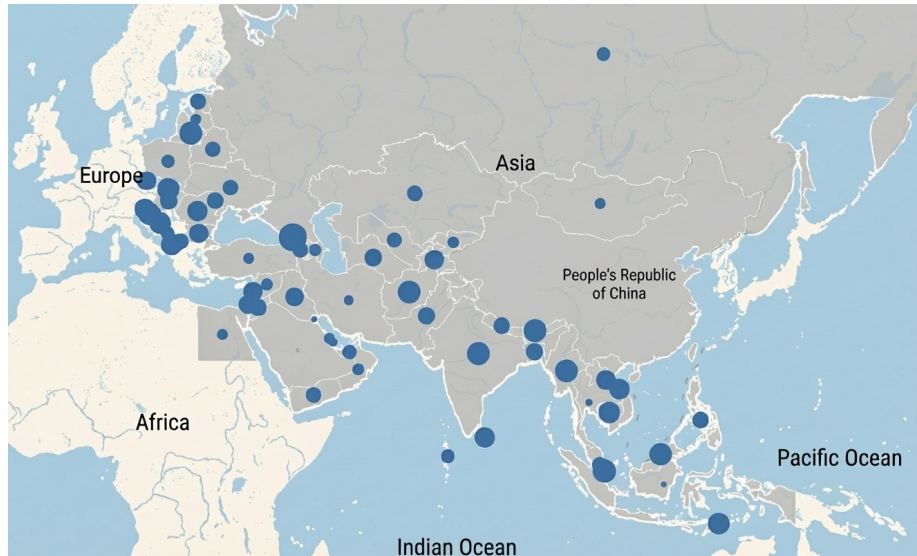


Figure 2: Figure 2

, significant regional variation exists in individualism across the 69 Belt and Road countries and regions. The three countries with the strongest self-independence are Georgia, New Zealand, and Vietnam; the three with the weakest self-independence are Indonesia, Kuwait, and Saudi Arabia. The score of the country or region with the highest self-independence (Georgia) is 16 times that of the lowest (Saudi Arabia). Detailed self-independence/individualism scores for all 69 countries and regions are provided in Appendix Table 1.

To further analyze how economic, political, and religious factors influence individualism, we conducted hierarchical regression modeling with individualism (self-independence) as the dependent variable, economic development levels (per capita GDP, Gini coefficient, urban population ratio) of Belt and Road countries and regions as control variables entered first, followed by political history (“year of UN admission,” “former Soviet bloc or sphere of influence,” “colonized by European and American powers”) and religious beliefs (“Islam as primary religion”) as independent variables, along with interaction terms.

As shown in Table 1 , none of the three economic factors significantly predicted individualism. Among political and religious factors, European colonial history and the interaction between European colonialism and Islamic faith significantly predicted individualism; the year of UN admission, former Soviet influence, main

effects of Islamic faith, and interaction effects between former Soviet influence and European colonialism or between former Soviet influence and Islam were not significant. Specifically, regions colonized by European and American powers showed higher individualism scores, while countries colonized by European and American powers that primarily practice Islam showed lower individualism scores.

Therefore, based on the influence scope of the three major political blocs, the Belt and Road region can be divided into three zones: (1) Post-colonial countries or regions, such as New Zealand and Singapore, whose cultures are primarily individualistic; (2) Islamic countries with colonial histories, such as Saudi Arabia and Indonesia, whose cultures are primarily collectivistic; and (3) Former Soviet countries and countries never colonized by European and American powers, such as Ukraine and Kazakhstan, whose cultures fall between individualism and collectivism.

Correlation Model Between Individualism and Individual Emancipation/Social Trust

Using the individualism indicator calculated from Twitter data as the independent variable and GDP, Gini coefficient, and urban population percentage as control variables, we created linear regression prediction models for six behavioral indicators from the WVS database for 28 Belt and Road countries and regions. Model results showed significant correlations between predicted and actual results for generalized trust and particularized trust, with correlation coefficients of 0.52 ($p=0.01$) and -0.51 ($p=0.01$), respectively. These results indicate that using individualism as an independent variable to predict generalized and particularized trust yields credible model performance.

We applied the prediction model to remaining Belt and Road countries and regions not included in the WVS database to predict their generalized and particularized trust scores. Integrating WVS data with predicted results yielded generalized and particularized trust scores for Belt and Road countries and regions, with distributions shown in Figures 3

and 4 [FIGURE:4]. Detailed scores are provided in Appendix Table 2.

Regression Models of Economic, Political, and Religious Factors on Individualism (Self-Independence)

Regression analysis with individualism (self-independence) as the dependent variable and individual emancipation (autonomy, equality, choice, expression) and social trust (generalized trust, particularized trust) scores as independent variables revealed that individualism was significantly positively associated with generalized trust, autonomy, and equality, but not significantly related to particularized trust, freedom of choice, or freedom of expression. In other words, countries or regions with stronger individualism exhibit stronger generalized trust and greater emphasis on autonomy and equality values.

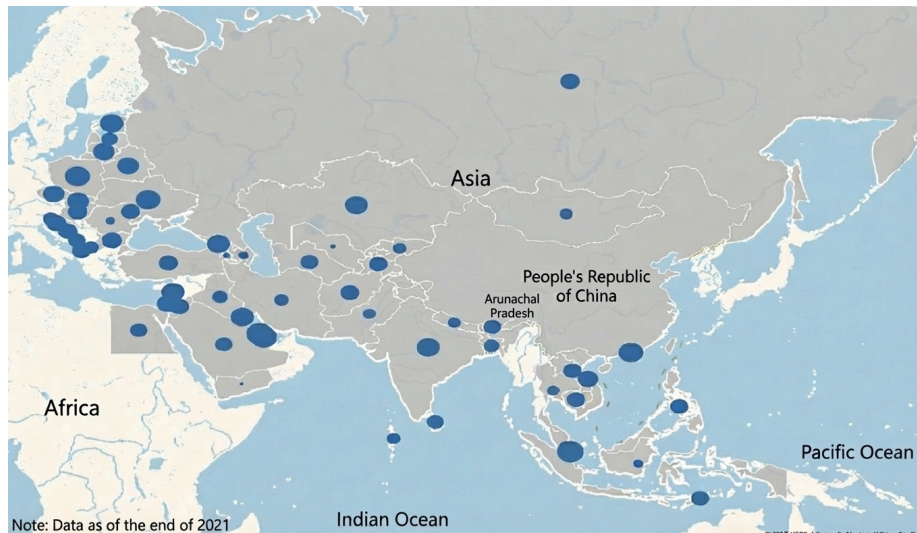


Figure 3: Figure 3

Discussion

Cultural Differences and “Hearts and Minds” Characteristics Along the Belt and Road

This study conducted large-sample analysis of Twitter data from 69 Belt and Road countries and regions, rapidly calculating local individualism indicators (self-independence) and establishing behavioral prediction models linking self-representation and social trust, demonstrating the feasibility of using social media big data to explore regional cultural characteristics and cooperative interaction patterns.

Specifically, through comprehensive examination of economic, political, and religious factors, we found that European and American colonial history represents the most significant influence on individualism. Through regression analysis with WVS behavioral indicators, we also discovered that countries or regions with higher individualism value autonomy and equality more highly, and show greater generalized trust toward strangers. The prediction model established through individualism indicators and WVS behavioral indicators for Belt and Road countries and regions can effectively predict generalized and particularized trust scores for other Belt and Road countries and regions—higher individualism correlates with greater reliance on generalized trust among strangers and less reliance on particularized trust among acquaintances.

Integrating cultural psychology with big data technology, this study relatively comprehensively clarifies the “hearts and minds” characteristics of Belt and Road countries and regions—something traditional social surveys cannot ac-

comply in the short term. Through multi-factor analysis, we identified European and American colonial influence as the most significant factor affecting individualistic self-representation among the complex economic, political, and religious factors along the Belt and Road—a factor overlooked in East-West comparative research and global studies dominated by Western scholars. Additionally, Islamic countries with European colonial histories show the lowest individualism. For example, among post-colonial countries or regions, Christian-majority New Zealand and Confucian cultural sphere Singapore score higher in self-independence, while Islamic Saudi Arabia and Kuwait score lower. This suggests we should attend to cultural specificity along the Belt and Road, particularly recognizing European and American colonialism (essentially Christian expansion) and Islamic faith as two important factors influencing cultural differences.

Cooperative Interaction Patterns Along the Belt and Road

Analyzing the cultural-psychological characteristics of Belt and Road countries and regions ultimately aims to explore effective cooperative interaction patterns. Based on our results, the 69 Belt and Road countries and regions can be divided into three categories: (1) **European-American Model**: Post-colonial countries or regions that are not Islamic, such as New Zealand and Singapore, whose behaviors exhibit more individualistic characteristics, requiring attention to their self-independence and stranger relationships; (2) **Islamic Model**: Post-colonial Islamic countries or regions, such as Saudi Arabia and Indonesia, whose behaviors exhibit more collectivistic characteristics, requiring attention to their self-interdependence and acquaintance relationships; and (3) **Soviet Model**: Former Soviet countries and countries never colonized by European and American powers, such as Ukraine and Kazakhstan, whose behavioral characteristics fall between individualism and collectivism, requiring case-by-case analysis.

Taking recent international economic and trade cooperation as an example, post-colonial countries or regions such as India, Singapore, and New Zealand were the earliest and most active supporters of the Asian Infrastructure Investment Bank (AIIB)—among the 38 Belt and Road countries (out of 57 total) that were AIIB founding members, post-colonial characteristics correlated with application timing at Spearman's $r = -0.41$ ($p < 0.01$), indicating that post-colonial countries applied to join the AIIB earlier.

The logical connection between cultural characteristics and cooperative behavior patterns exists because cooperative interaction behaviors are largely products of culturally imprinted self-representation and social relationships. Specifically, individualism positively correlates with autonomy, equality, and generalized trust because individualism emphasizes autonomous rights and non-dependence, requiring fair competition and opening-up.

Effectively promoting the Belt and Road Initiative urgently requires understanding the cultural and behavioral value characteristics of 沿线 countries and regions. This study provides psychological evidence for China to understand the person-

ality characteristics of different populations. For example, respecting the emphasis on autonomous rights and the pursuit of autonomy and equality rules in countries with higher self-independence. Meanwhile, the relationship between individualism and social trust provides references for how China can establish cooperative relationships with local people. For instance, when establishing cooperative relationships with countries showing higher individualism, China should emphasize generalized trust among strangers; conversely, when cooperating with countries showing lower individualism, China should emphasize particularized trust relationships among family and acquaintances.

The cultures of Belt and Road countries and regions are diverse. This study rapidly calculates individualism indicators through massive corpora generated from social media and establishes predictive models linking self-representation and social trust. The research effectively compensates for limitations of traditional social survey statistics, relatively comprehensively mapping the “hearts and minds” characteristics and cooperative interaction patterns of Belt and Road countries and regions. It also provides a new pathway for research on cultural psychology and international relations, and offers references for implementing the national Belt and Road Initiative—such as establishing interaction models suitable for local national conditions.

References

1. 宋周莺, 车姝韵, 张薇. 我国与“一带一路”沿线国家贸易特征研究. 中国科学院院刊, 2017, 32(4): 363-369.
2. Zheng Y, Zhang C. The Belt and Road Initiative and China's Grand Diplomacy. *China International Studies*, 2016, (1): 52-63.
3. 郑永年. 边疆、地缘政治和中国的国际关系研究. *外交评论*, 2011, 28(6): 12-29.
4. 郑永年. 中国的海洋地缘政治与陆地地缘政治. *外交评论*, 2014, (1): 1-11.
5. Hofstede G J, Jonker C M, Verwaart T. Individualism and Collectivism in Trade Agents. In: Nguyen N T, Borzemski L, Grzech A, et al (eds). *New Frontiers in Applied Artificial Intelligence*. IEA/AIE 2008. Lecture Notes in Computer Science, vol 5027. Berlin, Heidelberg: Springer, 2008.
6. Markus H R, Kitayama S. Culture and the self: Implications for cognition, emotion and motivation. *Psychological Review*, 1991, 98(2): 224-253.
7. Nisbett R E, Peng K, Choi I, et al. Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review*, 2001, 108(2): 291-310.
8. Zeng R, Greenfield P M. Cultural evolution over the last 40 years in China: Using the Google Ngram Viewer to study implications of social and political change for cultural values. *International Journal of Psychology*, 2015, 50(1): 47-55.
9. Greenfield P M. The changing psychology of culture from 1800 through 2000. *Psychological Science*, 2013, 24(9): 1722-1731.
10. Varnum E M W, Kitayama S. What's in a name? Popular names are less common on frontiers. *Psychological Science*, 2011, 22(2): 176-183.

11. Cohen A B, Singel J I, Rozin P. Faith versus practice: different bases for religiosity judgments by Jews and Protestants. *European Journal of Social Psychology*, 2012, 33(2): 287-295.
12. Cohen A B, Wu M S, Miller J. Religion and culture: Individualism and collectivism in the east and west. *Journal of Cross-Cultural Psychology*, 2016, 47(9): 1236-1249.
13. Oyserman D, Coon H M, Kimmelmeier M. Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, 2002, 128(1): 3-72.
14. Welzel C. *Freedom Rising: Human Empowerment and the Quest for Emancipation*. New York: Cambridge University Press, 2013.
15. Gheorghiu M A, Vignoles V L, Smith P B. Beyond the United States and Japan: Testing Yamagishi' s emancipation theory of trust across 31 nations. *Social Psychology Quarterly*, 2009, 72(4): 365-376.
16. Delhey J, Newton K, Welzel C. How general is trust in “most people” ? Solving the radius of trust problem. *American Sociological Review*, 2011, 76(5): 786-807.
17. Inglehart R. World Values Survey. <http://www.worldvaluessurvey.org/>
18. Greenwald A G, Banaji M R. Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review*, 1995, 102(1): 4-27.
19. 喻丰, 彭凯平, 郑先隽. 大数据背景下的心理学: 中国心理学的学科体系重构及特征. *科学通报*, 2015, 60(5): 520-533.
20. 薛婷, 陈浩, 赖凯声, 等. 心理信息学: 网络信息时代下的心理学新发展. *心理科学进展*, 2015, 23(2): 325-337.
21. Bollen J, Pepe A, Mao H. Modeling public mood and emotion: Twitter sentiment and socio-economic phenomena. *Computer Science*, 2009, 44(12): 2365-2370.
22. Kashima E S, Kashima Y. Culture and language: The case of cultural dimensions and personal pronoun use. *Journal of Cross-Cultural Psychology*, 1998, 29(3): 461-486.
23. Twenge J M, Campbell W K, Gentile B. Changes in pronoun use in American books and the rise of individualism, 1960-2008. *Journal of Cross-Cultural Psychology*, 2013, 44(3): 406-415.
24. Yamagishi T, Yamagishi M. Trust and commitment in the United States and Japan. *Motivation and Emotion*, 1994, 18(2): 129-166.
25. Cawley G C, Talbot N L C. On over-fitting in model selection and subsequent selection bias in performance evaluation. *Journal of Machine Learning Research*, 2010, 11: 2079-2107.

Appendix Table 1

Individualism Index (Self-Independence) and Socio-Economic Variables of Belt and Road Countries and Regions

[Country/Region data table with columns for: Country/Region, Per Capita GDP, Gini Coefficient, Urban Population Ratio, Year of UN Admission, European/American Colonial History, Former Soviet Bloc/Sphere, Primary Islamic Faith]

Note: Socio-economic variables listed refer to 2013 data published in the UN Human Development Report 2014, including per capita GDP, Gini coefficient, and urban population ratio. Missing Gini coefficient values were supplemented using CIA World Factbook data. Due to Hong Kong and Taiwan being part of China, their UN admission year is uniformly recorded as 1945. Except for Israel and former Soviet republics, nearly all other Belt and Road countries or regions experienced European/American aggression or colonization, but colonized countries/regions listed here refer only to those that completely lost sovereignty or signed “protectorate” agreements with metropolises.

Appendix Table 2

Generalized Trust and Particularized Trust of Belt and Road Countries and Regions

[Country/Region data table with columns for: Country/Region, Generalized Trust Score, Particularized Trust Score]

Note: This table includes only 59 Belt and Road countries and regions. Ten countries/regions with missing socio-economic variables (GDP, Gini coefficient, urban population) were excluded from the prediction model: Brunei, Myanmar, Kyrgyzstan, New Zealand, Oman, Serbia, South Korea, Syria, Taiwan (China), and UAE.

Source: ChinaXiv – Machine translation. Verify with original.