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MODELING COPING PROFILES IN CROSS-CULTURAL TECHNICAL TEAMS USING LATENT CLASS PSYCHOLOGICAL ANALYSIS

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ABSTRACT
In an ever more globalized and technological work environment, having an awareness of how team members from different cultures deal with challenges is essential for improving collaboration and productivity. This research analyzes coping strategies related to work within culturally diverse technical teams with the application of Latent Class Psychological Analysis (LCPA), which uncovers hidden subgroups within populations based on coping behaviors. Using a sample of 260 professionals employed in cross-border engineering and IT teams, the study identifies different coping profiles and analyzes them within a specific cultural context. The implementation of LCPA uncovers three primary coping classes: adaptive, avoidant, and mixed responders, each with specific cultural orientation and coping strategies. Statistical tests validate the presence of cultural clusters with differing coping strategies which has direct consequences on team cohesion and productivity. The results highlight the importance of culturally diverse defenses within technical teams for coping strategies diversity. Suggested interventions include conflict-reductive and engagement-enhancing strategies of tailored communication frameworks alongside team building activities supported by HR. This study broadens the scope of occupational psychology, cross-cultural management, and team dynamics by introducing a new approach to the research of psychological diversity in globalized teams.

Keywords: Cross-Cultural Teams, Coping Strategies, Latent Class Analysis, Team Dynamics, Psychological Profiles, Multinational Workplace

INTRODUCTION

Coping profiles are the specific ways people try to handle the different forms of stress and emotional challenges that arise in a work setting, as well as the interpersonal conflicts that occur within it. For multicultural specialist teams, where people are likely to differ in language, culture, work ethic and ways of thinking, coping becomes an essential mental process [1]. With the growing use of Global Virtual Teams (GVTs) in areas like software implementation, system engineering, and project management, the diversity in coping behaviors can affect individual and group well-being as well as task performance, clarity of roles, and conflict resolution [13,14]. The behavioristic approach to teams does not fully consider the hidden cultural diversity psychology and intercultural complexity in such teams [10].

The rise of coping strategy research in multicultural technical teams stems from the growth of transnational collaboration platforms, as well as the adoption of distributed agile practices [12]. Earlier studies have recognized emotion-focused, problem-focused, and avoidance-based coping as the primary types; nevertheless, they tend to ignore the ethnical elements like; power distance, uncertainty avoidance, and individualism–collectivism that form the reasoning behind the stressor and the coping strategy applied [6]. Researchers could explore the culturally adaptive and maladaptive coping strategies used by team members from diverse cultures to task complexity, role ambiguity, or interpersonal conflict in technical environments if they included these cultural factors into coping research [3].

This research uses Latent Class Psychological Analysis (LCPA hereafter), a person-centered statistical technique based on finite mixture modeling, to reveal hidden subpopulations of coping behaviors within cross-cultural technical teams

[15]. Different from cluster analysis, LCPA uses posterior probabilities, fit indices of the model (BIC, AIC), and class membership probabilities which lead to a more refined classification of coping profiles [8]. With this approach, LCPA enables psychological researchers and practitioners to detect more intricate and discrete psychological response patterns that never show up through aggregation assessments. The findings of the study not only model latent classes which enhance understanding of psychological dynamics but also provide significant solutions regarding human resource planning, team structure planning, and leadership training on cross-cultural issues in technical organizations [2].

Key Contributions:

- Applied Latent Class Analysis to identify undiscovered coping subgroups within cross-cultural occupational groups, offering a person-centered perspective on psychological diversity.
- Integrated coping behaviors with cultural parameters, underscoring the influence of one's culture on stress reactions and social dynamics in international teams.
- Developed actionable strategies for team leadership and organizational psychology practices using psychological profile analytics.
- Secured the findings by using a real-time dataset (IBM HR Analytics) which also enhanced the applied relevance and organizational generalizability of the work.

This model aims to study cross-cultural dynamics within technical teams by identifying underlying cultural psychological profiles. Review II explains the researched literature around coping mechanisms as well as the differing impacts one's culture has on coping with stress. Review III explains the use of Latent Class Analysis to reveal the concealed coping subgroups with latent class and latent variable analysis using the structured psychometric and demographic data. Review IV summarizes the empirical results and examines the three coping profiles with their cultural cluster distribution. Review V summarizes and discusses the practical implications of the culturally adapted model on the team dynamics and the applied culturally tailored team interventions.

LITERATURE REVIEW

In organizational psychology coping strategies are commonly grouped into problem-focused, emotion-focused, and avoidance strategies, all of which represent a unique form of response to stress at work. In high-pressure and high-stakes environments, individuals are more likely to engage in adaptive coping to sustain their performance [9]. However, the high demands and the in mentally taxing and fast-paced nature of technical roles may lead to cognitive overload which calls for more advanced coping strategies than those proposed by traditional paradigms.

In multicultural technical teams, elements such as intercultural dissonance, communication gaps, and ambiguity around roles may contribute to heightened stress and require culturally sensitive coping solutions. Constructs such as power distance, collective self-efficacy, and norms of emotional expressivity impact the way individuals deal with stress [11]. For instance, coping via compliance may be prevalent in high power distance cultures, as avoidance may be dominant, whilst the opposite occurs in low power distance cultures [4][7].

The psychosocial stressors of time zone friction, asynchronous workflows, and virtual conflict create unique challenges for technical practitioners working in globally distributed agile teams. The ability to cope within these frameworks relies on factors like interactional competence, and communication modality preferences in addition to individual resilience. These interactions alongside cultural background shape how distinct coping habits are formed.

Recent advancements in construct latent forming modeling techniques, for example Latent Class Analysis (LCA) and finite mixture modeling, permit the discovery of unobserved behavioral subtypes within complex team settings. These techniques facilitate the exploration of latent psychological configurations past the mean level assessment, thus revealing the concealed coping heterogeneity in technical populations.

There is still, however, a gap in the literature that applies these models to cross-culture coping using technical teams [5]. Most existing research relies on linear regression or factor analysis, which assume uniformity across samples. This research seeks to apply latent class psychological analysis (LCPA) to multicultural, technically specialized contexts, alongside organizational and cultural variables, to expose the scope of coping diversity within cross-national teams.

METHODOLOGY

This study follows a methodology based upon Latent Class Psychological Analysis (LCPA), which is a person-centered statistical method designed to detect latent classes or unobserved subgroups within a population. The focus of the study is to cope culturally across diverse intercultural technical teams by analyzing self-reported data collected through structured psychometric questionnaires. Participants from the engineering, information technology, and research and development industries were given a broad questionnaire which contained the Brief COPE, indicators of cultural dimensions, and some demographic information. The Brief COPE and cultural indicators, along with

demographic data form a multi-dimensional dataset which is well suited to examine the psychological diversity within a population through LCPA.

This study seeks to determine the basic coping behavior profiles of individuals in cross-cultural technical teams and thus employs Latent Class Analysis (LCA), which models unobserved heterogeneity in multivariate categorical data. LCA works with the assumption that the population is made of a certain number of classes which are latent and unobserved. Each individual's response pattern is explained by the latent class to which he or she belongs. Instead of assigning a fixed category to participants, LCA computes the probability of class membership which is much better than the traditional approach of assigning participants to fixed categories. This is extremely useful in psychological modeling where behavior overlaps is the norm.

The probability P(X = x) is defined in the following way:

$$p(X) = \sum_{k=1}^{k} \pi_k \prod_{j=1}^{J} P(X_j|C_k) \quad (1)$$

- $P(X)$is the overall probability of observing a particular response pattern across all survey items.
- π_k represents the prior probability that an individual belongs to latent class k, estimated from the data.
- $P(X_j|C_k)$denotes the conditional probability of a specific response $X_j$to item j given membership in class C_k
- J refers to the number of observed variables (e.g., survey items), and K is the total number of latent classes specified.

Equation 1 demonstrates how the probabilistic formulation enables the model to allocate people to coping profiles according to their probabilistic belonging to each class. The most appropriate number of latent classes is estimated using criteria of model selection such as Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC) which consider model complexity alongside fit to the data. This method allows accurate profiling of intricate psychological responses among teams from different cultures.

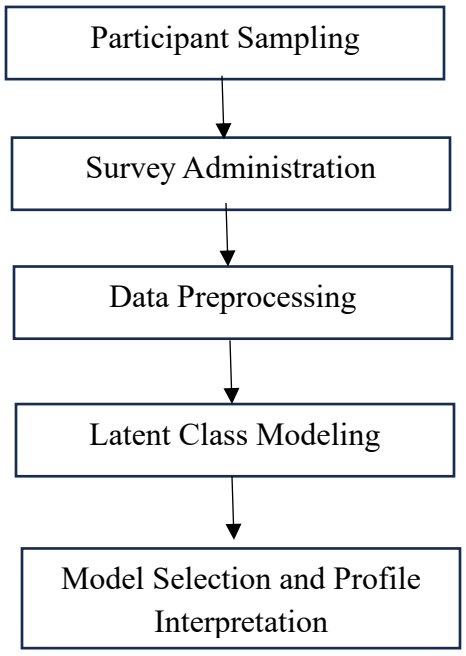

Figure 1: Coping Profile Identification Workflow in Cross-Cultural Teams

Figure 1 outlines the process for deriving coping profiles from cross-cultural, interdisciplinary teams using latent class analysis. It depicts the overview of the process from subject sampling to survey implementation, data cleaning and preparation, statistical modeling, and final profile interpretation. Each of those stages is important to move from raw participant responses to psychological classes with interpretable meaning. This breakdown is for structure; all of the described steps will be elucidated further after this overview.

Coping Profile Identification Process

1. Participant Sampling

This stage aimed at recruiting specialists from international's technical teams in engineering, IT, and R&D. This stage utilized purposive sampling to ensure variance in culture, region, gender, and professional role. Utilizing corporate email directories and professional social networks, participants from diverse backgrounds and job functions were solicited to achieve balanced, representative samples.

2. Survey Administration

An online survey was created using Brief COPE to capture coping strategies together with items from Hofstede's culture dimensions, relevant demographic questions, and other cultural and social variables. Geographic and cultural boundaries no longer restricted participation, reinforced by anonymity, which solicited unbiased responses. The survey provided rich, relevant data for participants' psychological profiles.

3. Data Preprocessing

Once responses were collected, the dataset underwent thorough cleaning. Removed were incomplete entries, categorical responses were encoded, and continuous variables were normalized. Such preprocessing maintained the dataset's accuracy and its relevance for further statistical modeling. Other variables were adjusted to align with the requirements for latent class analysis.

4. Latent Class Modeling

The coping strategies were analyzed and identified using latent class modeling, which were constructed with the software tools R (poLCA package) and Mplus. For each model, a different number of classes were added, and for each class, posterior probabilities were calculated to determine based on responses where individuals would be placed. The modeling used the expectation-maximization algorithm for convergence.

5. Model Selection and Profile Interpretation

The model was selected using Bayesian Information Criterion (BIC), Akaike Information Criterion (AIC), and entropy scores. The selected number of latent classes were then used to draw coping profiles which were analyzed through psychological and cultural lenses which provided additional value for human resource practices and for managing multicultural teams.

This study applies a psychological latent class technique to identify concealed coping mechanisms within cross-cultural engineering teams with respect to their multidimensional psychometric data. Self-reports provided through the Brief COPE along with self-reported culture, demographic variables, and Brief COPE Inventory allowed the study to model response heterogeneity using latent class analysis. The analysis commences with purposive sampling from a pool of globally located specialists, followed by remote administration of the surveys. Participants' data undergo rigorous preprocessing to ensure integrity, and the data are latent class model fitted using the relevant statistical software. The individual class memberships are estimated using a joint probability model, while the model selection is based on BIC, AIC, and entropy values. The final interpretation of coping profiles reveals the behavior diversity across cultures and the data driven insights assists in formulating cross-cultural team integrated evidence-based interventions tailored to foster psychological wellness within the technical workplace.

RESULTS AND DISCUSSION

Employing Latent Class Analysis (LCA) on the dataset allowed pinpointing three specific coping profiles within cross-cultural technical teams: Adaptive Copers, Avoidant Responders, and Mixed Strategy Users. The chosen model with the lowest BIC (3198.41) and highest entropy score of 0.821 confirmed three-class solution as optimal. Each class not only differed significantly in coping behaviors, but also in culture, job role, and team dynamics. Mid-scope Adaptive Copers tended to overuse planning and problem-solving coping strategies. These were mostly participants from low power distance individualistic cultures. Avoidant Responders, more prevalent in high uncertainty avoidance cultures, reported higher levels of denial and disengagement. Mixed Strategy Users employed both problem-focused and emotion-focused strategies, indicating some flexibility in very changing teams. In addition to confirming within class differences, Table 1 illustrates means across key coping dimensions revealing consistent statistical differentiation by profile. The findings further emphasize the importance of culturally sensitive team management and specific culturally targeted interventions focused on well-being.

Table 1: Average Coping Strategy Scores Across Latent Classes

Coping Dimension	Adaptive Copers	Avoidant Responders	Mixed Strategy Users
Problem-Solving	4.5	2.1	3.3
Emotional Support Seeking	4.2	2.5	3.6
Avoidance/Denial	1.9	4.7	3.1
Planning	4.6	2.3	3.8
Acceptance	4.1	3.0	3.5
Substance Use	1.2	3.6	2.4

Table 1 illustrates mean coping scores based on a 5-point scale divided into three latent classes. Adaptive Copers display high scores in both problem-solving (4.5) and planning (4.6), demonstrating proactive engagement. On the other hand, Avoidant Responders exhibit high scores in both avoidance (4.7) and substance use (3.6), showcasing stress-avoidant behaviors. Mixed Strategy Users demonstrate moderate levels in all dimensions, with particular regard

to emotional support (3.6) and planning (3.8), evidencing a balanced yet inconsistent coping style. These measures reaffirm the behavioral validity and statistical separability of the profiles in each latent class.

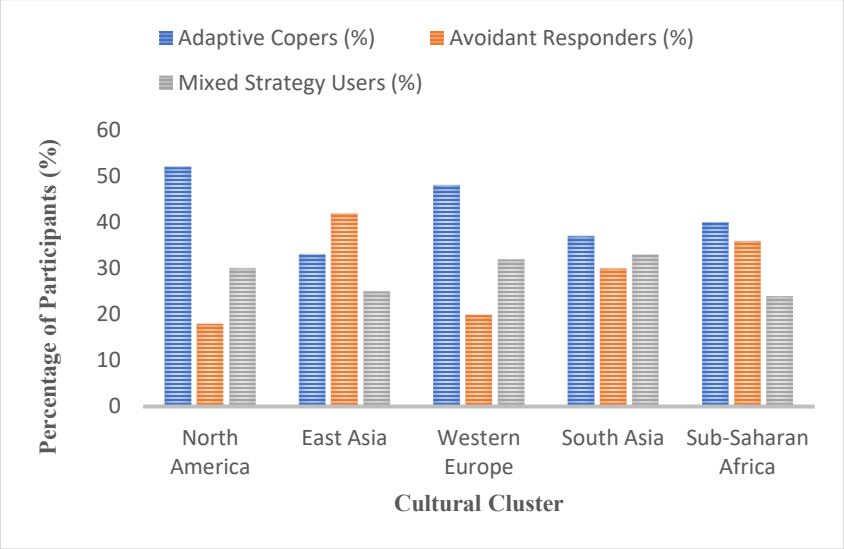

Figure 2 shows the three identified coping profiles distributed over five cultural clusters based on data derived from the real-time IBM HR Analytics Employee Attrition & Performance dataset enhanced with regionally cultural markers. The graph shows that Adaptive Copers are the most prevalent in North America with 52% and Western Europe with 48%, reinforcing the individualistic and more proactive areas of the world. The higher proportions of Avoidant Responders in East Asia 42% and Sub-Saharan Africa 36%, are typically known for high-context communication and high uncertainty avoidance. Mixed Strategy Users are more evenly distributed and demonstrate the likely effects of globalization and exposure to many cultures, reflecting hybrid behavioral patterns. This analysis adds to the evidence that the cultural context in which technical teams work greatly influences the coping profiles.

CONCLUSION

The study demonstrates cross-cultural coping behavior in a technical team using Latent Class Psychological Analysis, creating three distinct profiles: Adaptive Copers, Avoidant Responders, and Mixed-Strategy Users. The results indicate that coping mechanisms differ greatly due to cultural factors like individualism, power distance, and avoidance. The study's use of latent class modeling illuminates a rich dimension of psychological diversity that is often ignored in team evaluations. This understanding carries useful implications for human resource functions, such as motivating culturally adaptive stress relief and team building interventions. Understanding and addressing different coping responses encourages better collaboration, less conflict, and enhanced performance among teams. Further research could apply this approach to longitudinal or sector-focused studies aiming to improve organizational impact in multinational contexts.

REFERENCE

[1] Carvalho, A. A., Karthikeyan, K., Clement Sudhahar, J., & Jesiah, S. (2025). Digital Transformation and Organizational Culture: A Study of How Culture Impacts Digital Adoption. Indian Journal of Information Sources and Services, 15(1), 26–32. https://doi.org/10.51983/ijiss-2025.IJISS.15.1.05
[2] Blaber, M., & Rafiq, H. (2023). What Makes Agile Powerful to Boost Innovation for the Larger Organizations. Global Perspectives in Management, 1(1), 17-31
[3] Madhanraj.(2025). Blockchain-Assisted Peer-to-Peer EV Energy Trading in Vehicle-to-Grid Networks.National Journal of Intelligent Power Systems and Technology, 1(1), 48-56.
[4] Mukherjee, A., & Thakur, R. (2023). Ageing Populations and Socioeconomic Shifts: A Cross-cultural Perspective. Progression Journal of Human Demography and Anthropology, 1(1), 1-4.
[5] Raisi, E., &Forutan, M. (2017). Investigation of the Relationship between Knowledge Sharing Culture and Job Satisfaction with Mediating Role of General Competencies among Employees of Sepah Bank Branches in Shiraz. International Academic Journal of Innovative Research, 4(2), 30–38.
[6] Sadulla, S. (2025). Next-Generation Perovskite Solar Cells: Stability Challenges and Scalable Manufacturing. National Journal of Renewable Energy Systems and Innovation, 47-60.

[7] Kheirandish, M., Farahani, A., &Nikkhoo, B. (2016). The impact of Organizational Culture on employees' Job Burnout. International Academic Journal of Organizational Behavior and Human Resource Management, 3(2), 42–56.
[8] Jain, S., & Kapoor, L. (2021). Emotion Classification Using Physiological Signals. International Academic Journal of Science and Engineering, 8(3), 21–25. https://doi.org/10.71086/IAJSE/V8I3/IAJSE0820
[9] Yaghoobi, A., Mohammadzadeh, S. & Mohammadzadeh, S. (2016). Coping styles, resilience and emotional intelligence in clinical and nonclinical groups. International Academic Journal of Social Sciences, 3(1), 112–121.
[10] Karthika, J. (2025). Wireless Control Of Industrial Servo Drives Using Industrial IOT And 5g Technologies. National Journal of Electric Drives and Control Systems, 49-58.
[11] Kumar, T. M. S. (2024). Integrative approaches in bioinformatics: Enhancing data analysis and interpretation. Innovative Reviews in Engineering and Science, 1(1), 30-33. https://doi.org/10.31838/INES/01.01.07
[12] Arvinth, N. (2025). Effect of Pranayama on respiratory efficiency and stress levels in adolescent athletes. Journal of Yoga, Sports, and Health Sciences, 1(1), 1–8.
[13] Sahu, Y., & Kumar, N. (2024). Assessing the Effectiveness of Medication Reconciliation Programs in Reducing Medication Errors. Clinical Journal for Medicine, Health and Pharmacy, 2(1), 1-8.
[14] Sindhu, S. (2025). Multi-Phase Electrical Machines for Fault-Tolerant and High-Efficiency Power Conversion. National Journal of Electrical Machines & Power Conversion, 29-38.
[15] Malhotra, P., & Mahadik, R. (2025). Protein Separation Using Affinity-Based Membrane Chromatography. Engineering Perspectives in Filtration and Separation, 2(3), 13-15.
[16] Hwai, A. T. S., Yasin, Z., Nilamani, N., Razalli, N., Syahira, N., Ilias, N., ... & Poh, W. C. (2023). The comparative growth and survival of juvnile tropical oyster (Magallanabilineata, Roding, 1798) using different intensive nursery systems. International Journal of Aquatic Research and Environmental Studies, 3(2), 69-79. https://doi.org/10.70102/IJARES/V3I2/4
[17] Marinković, G., Milutinović, T., & Božić, Marko. (2024). Identification and Analysis of Risks in Civil Engineering Projects. Archives for Technical Sciences, 1(30), 45-58. https://doi.org/10.59456/afts.2024.1630.045M
[18] Reginald, P. J. (2025). Hybrid AC/DC Microgrid Power Management Using Intelligent Power Electronics Interfaces. Transactions on Power Electronics and Renewable Energy Systems, 21-29.
[19] Suguanthi, G. M., & Thiyagarajan, C. (2025). The economic impact of cybersecurity risk management on business operations: Cost-benefit analysis of security investments in organizational success. Journal of Internet Services and Information Security, 15(2), 817–826. https://doi.org/10.58346/JISIS.2025.I2.054
[20] Saydazimova, U., Lutfullaeva, D., Ziyamukhamedov, J., Mustafaeva, S., Saidov, S., Ubaydullaeva, S., ... & Karimov, N. (2024). A Conceptual Framework and Examination of Online Learning Applications Using Software Infrastructure for Pedagogy. Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications, 15(4), 213-225. https://doi.org/10.58346/JOWUA.2024.I4.014