




A Predictive Study of Family Adaptability Based on Cultural and Economic Indicators

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ABSTRACT

Objective: The present study aimed to predict family adaptability based on cultural orientation and economic indicators using both statistical and machine learning approaches in a Canadian population.

Methods and Materials: This study employed a quantitative, cross-sectional, descriptive–correlational design. The statistical population consisted of married adults residing in Canada in 2025, from which 486 participants were selected using a stratified random sampling method based on the Krejcie and Morgan table. Data were collected using standardized instruments, including the Family Adaptability subscale of the Family Adaptability and Cohesion Evaluation Scales IV (FACES IV), a Cultural Orientation Scale assessing individualism, collectivism, traditionalism, and acculturation, and a socioeconomic questionnaire measuring income index, financial stability, and economic pressure. The reliability and validity of all instruments were confirmed in prior research and re-evaluated in the present study. Data analysis was conducted using IBM SPSS Statistics (version 27) for descriptive statistics, Pearson correlations, and multiple regression analysis. Additionally, machine learning models including Random Forest, Support Vector Machine, and Gradient Boosting were implemented in Python using Scikit-learn to enhance predictive accuracy.

Findings: The results revealed that collectivism ($\beta = 0.31$, $p < 0.001$), financial stability ($\beta = 0.36$, $p < 0.001$), acculturation ($\beta = 0.18$, $p < 0.001$), and individualism ($\beta = 0.12$, $p = 0.007$) were significant positive predictors of family adaptability, whereas economic pressure ($\beta = -0.29$, $p < 0.001$) was a significant negative predictor. The regression model explained 46% of the variance in family adaptability ($R^2 = 0.46$, $p < 0.001$). Machine learning results indicated that the Gradient Boosting model achieved the highest predictive performance ($R^2 = 0.74$), followed by Random Forest ($R^2 = 0.71$) and Support Vector Machine ($R^2 = 0.66$). Feature importance analysis identified financial stability and economic pressure as the most influential predictors.

Conclusion: The findings demonstrate that both cultural and economic factors play a critical and complementary role in shaping family adaptability, with economic conditions exerting particularly strong effects. The integration of machine learning approaches provided enhanced predictive accuracy and revealed complex relationships among variables, highlighting the importance of multidimensional and data-driven approaches in family research. These results underscore the need for interventions and policies that simultaneously address financial stability and cultural integration to promote adaptive family functioning.

Keywords: *Family Adaptability, Cultural Orientation, Acculturation, Economic Indicators, Financial Stability, Machine Learning, Predictive Modeling*

1 Introduction

Family adaptability has emerged as a central construct in contemporary family science, reflecting the capacity of family systems to adjust roles, rules, and relational patterns in response to internal and external stressors. Within increasingly complex and multicultural societies, such as Canada, the determinants of family adaptability are no longer confined to intrafamilial dynamics but are deeply embedded within broader cultural and socioeconomic contexts. Recent scholarship has emphasized that family functioning must be understood as a multidimensional phenomenon influenced by intersecting ecological systems, including cultural orientation, migration experiences, and economic conditions (George et al., 2024; Kim et al., 2023). These contextual influences shape not only family processes but also the resilience and flexibility that characterize adaptive family systems.

Cultural factors, particularly those related to acculturation and cultural orientation, have been consistently identified as key determinants of family functioning. Acculturation, defined as the process of cultural change resulting from continuous contact between cultural groups, introduces both opportunities and challenges for family systems. On one hand, increased acculturation may enhance access to resources and social integration; on the other hand, it may disrupt traditional family roles and intergenerational cohesion (Ramírez et al., 2022; Silva et al., 2024). Studies have shown that varying levels of acculturation within families can lead to acculturative stress, intergenerational conflict, and shifts in parenting practices, all of which directly impact family adaptability (Mac-Niven et al., 2025; Mullins et al., 2024). Furthermore, cultural values such as collectivism and individualism influence how families respond to stress, allocate resources, and maintain cohesion, thereby shaping adaptive capacities in meaningful ways (Gölcük et al., 2025; Treviño & Gerstein, 2022).

In addition to cultural dimensions, economic conditions represent a critical structural determinant of family

adaptability. Economic hardship, financial instability, and socioeconomic inequality have been repeatedly linked to disruptions in family functioning, increased parental stress, and reduced capacity for adaptive responses (Kitchens et al., 2025; Thor et al., 2022). Families facing economic constraints often experience heightened levels of psychological distress, which can impair communication, reduce emotional availability, and undermine effective problem-solving strategies. Conversely, financial stability has been associated with improved family cohesion, better parenting practices, and enhanced resilience in the face of adversity (Osei-Kwasi et al., 2022; Varela et al., 2023). These findings underscore the importance of considering economic indicators as integral components in models of family adaptability.

The intersection of cultural and economic factors becomes particularly salient in immigrant and ethnically diverse populations. Immigrant families often navigate complex sociocultural transitions while simultaneously confronting economic challenges, creating a unique context in which adaptability is continuously tested. Research has demonstrated that immigrant families experience differential outcomes in health, well-being, and social integration based on their levels of acculturation and socioeconomic status (Cordero & Llabre, 2025; Guan et al., 2024). For instance, dietary behaviors, health outcomes, and access to services are influenced by both cultural adaptation processes and economic resources, illustrating the intertwined nature of these determinants (Barb et al., 2025; Stamou & Flórez, 2025). Moreover, the concept of segmented assimilation highlights how different patterns of cultural and economic integration can lead to divergent developmental trajectories within families (Ramírez et al., 2022).

Family adaptability is also closely linked to broader health and developmental outcomes. Families that demonstrate higher adaptability are more likely to support positive child development, academic achievement, and psychological well-being. Conversely, low adaptability has been associated with increased risk of behavioral problems,

mental health issues, and reduced resilience among children and adolescents (Gagné et al., 2021; Roby et al., 2021). Cultural and economic stressors can exacerbate these risks by creating environments characterized by instability and limited resources. For example, experiences of discrimination, acculturative stress, and socioeconomic disadvantage have been shown to negatively impact both parental functioning and child outcomes, thereby undermining the adaptive capacity of the family system (Chen et al., 2022; Kim et al., 2022).

Recent advances in interdisciplinary research have further highlighted the role of social determinants of health in shaping family adaptability. These determinants include not only income and education but also access to healthcare, food security, and neighborhood conditions. Studies examining dietary patterns and food insecurity among immigrant populations have revealed significant disparities linked to socioeconomic status and cultural adaptation processes (Álvarez et al., 2025; Purcino & Bedrikow, 2024). Such disparities can create additional stressors that challenge family adaptability, particularly in low-income households. Similarly, research on health inequalities has emphasized that structural factors, including systemic barriers and social inequities, play a critical role in shaping family outcomes (Álvarez et al., 2025; Kim et al., 2023).

Another important dimension in understanding family adaptability is the role of psychological and behavioral processes within the family context. Parental stress, emotional regulation, and caregiving practices are all influenced by cultural norms and economic pressures, which in turn affect family dynamics. Studies have shown that caregiver experiences of stress, including racism and political hostility, can significantly predict family-level outcomes such as anxiety and relational functioning (Mullins et al., 2024). Additionally, variations in emotional expression and communication patterns across cultural groups highlight the importance of culturally sensitive approaches to studying family processes (Cabrera et al., 2024). These findings suggest that family adaptability cannot be fully understood without considering the psychological mechanisms through which cultural and economic factors exert their influence.

Despite the growing body of literature on family adaptability, there remains a need for more integrative and predictive approaches that can capture the complexity of these relationships. Traditional statistical methods, while valuable for identifying associations, may be limited in their ability to model nonlinear and interactive effects among

multiple predictors. In this regard, machine learning approaches offer a promising avenue for advancing research in this field. By leveraging large datasets and sophisticated algorithms, machine learning techniques can identify complex patterns and generate accurate predictions of family adaptability based on a combination of cultural and economic indicators (Duan, 2024; George et al., 2024). These approaches allow for the exploration of feature importance, interaction effects, and model optimization, thereby providing deeper insights into the determinants of family functioning.

Furthermore, the application of predictive modeling aligns with recent calls for data-driven approaches in public health and social science research. Understanding the relative contribution of different predictors to family adaptability can inform targeted interventions and policy development aimed at supporting vulnerable populations. For example, identifying the most influential economic and cultural factors can guide the design of programs that enhance financial stability, promote cultural integration, and strengthen family resilience (Cordero & Llabre, 2025; Guan et al., 2024). Such evidence-based strategies are essential for addressing the complex challenges faced by families in diverse and rapidly changing societies.

In addition, the importance of contextualizing family adaptability within specific cultural and national settings cannot be overstated. Canada, as a multicultural society with a high proportion of immigrants, provides a unique context for examining the interplay between cultural diversity and economic conditions. The heterogeneity of the Canadian population offers an opportunity to explore how different cultural backgrounds and socioeconomic circumstances influence family adaptability. Previous research has highlighted the need for disaggregated data and context-specific analyses to better understand the experiences of diverse family groups (Cabrera et al., 2024). This underscores the relevance of conducting studies that are sensitive to the cultural and economic diversity inherent in such settings.

Moreover, the dynamic nature of cultural adaptation processes suggests that family adaptability is not a static construct but rather evolves over time in response to changing circumstances. Longitudinal and cross-sectional studies have demonstrated that shifts in cultural orientation, economic status, and social environment can lead to corresponding changes in family functioning (Okunseri et al., 2023; Silva et al., 2024). This highlights the importance of adopting analytical approaches that can account for

temporal and contextual variability, further reinforcing the value of predictive modeling techniques.

In light of these considerations, the present study seeks to contribute to the existing literature by integrating cultural and economic perspectives within a predictive modeling framework. By examining the combined effects of cultural orientation, acculturation, and economic indicators on family adaptability, this study aims to provide a comprehensive understanding of the factors that shape adaptive family functioning. The use of both traditional statistical methods and machine learning techniques allows for a robust analysis of these relationships, offering both explanatory and predictive insights.

Therefore, the aim of this study is to predict family adaptability based on cultural and economic indicators using a combined statistical and machine learning approach within a Canadian population.

2 Methods and Materials

2.1 Study Design and Participants

The present study was designed as a quantitative, cross-sectional, descriptive–correlational investigation aimed at modeling and predicting family adaptability using a set of cultural and economic indicators within a Canadian context. The statistical population comprised married adults residing in major urban and suburban regions across Canada during the 2025 calendar year. Using a stratified random sampling approach to ensure adequate representation across socioeconomic strata, cultural backgrounds, and geographic regions, a total of 486 participants were selected based on the Krejcie and Morgan sampling table for large populations. Inclusion criteria required participants to be at least 18 years of age, currently married or cohabiting in a long-term partnership, and having lived in Canada for a minimum of five years to ensure sufficient exposure to the sociocultural environment. Participants with incomplete questionnaire responses or evidence of response bias were excluded during data screening.

2.2 Measures

Data collection was conducted using a combination of standardized and researcher-developed instruments to comprehensively capture the constructs of interest. Family adaptability was assessed using the Family Adaptability subscale of the Family Adaptability and Cohesion Evaluation Scales IV (FACES IV), originally developed by

Olson in 2011. This subscale consists of multiple items rated on a five-point Likert scale, measuring the family system's flexibility, role relationships, leadership dynamics, and capacity to adjust to situational stressors. Cultural indicators were measured using a modified version of the Cultural Orientation Scale, which evaluates dimensions such as individualism–collectivism, cultural values, traditionalism, and acculturation patterns. Economic indicators were assessed through a structured socioeconomic questionnaire that included variables such as household income, employment status, educational attainment, financial stability, and perceived economic pressure. All instruments demonstrated acceptable psychometric properties in prior studies, with reported Cronbach's alpha coefficients exceeding 0.70. In the present study, internal consistency reliability was re-evaluated, and construct validity was examined using confirmatory factor analysis procedures.

2.3 Data Analysis

Data analysis was performed using a combination of classical statistical techniques and machine learning algorithms to achieve both explanatory and predictive objectives. Initially, data were screened for missing values, normality, and outliers, followed by descriptive statistics to summarize participant characteristics and study variables. Pearson correlation analysis was conducted to examine bivariate relationships among family adaptability, cultural indicators, and economic variables. Subsequently, multiple regression analysis was employed to identify the relative contribution of predictor variables to family adaptability. For predictive modeling, advanced machine learning techniques including Random Forest, Support Vector Machine (SVM), and Gradient Boosting algorithms were implemented using Python-based libraries. Model performance was evaluated using cross-validation procedures and metrics such as Mean Squared Error (MSE), Root Mean Squared Error (RMSE), and coefficient of determination (R^2). Additionally, feature importance analysis was conducted to determine the most influential cultural and economic predictors of family adaptability. All statistical analyses were carried out using IBM SPSS Statistics version 27 for classical analyses and Python (with Scikit-learn library) for machine learning modeling, with significance levels set at $p < 0.05$.

3 Findings and Results

The findings of the present study are reported in a structured and comprehensive manner, beginning with an overview of the demographic characteristics of the participants, followed by inferential statistical analyses and predictive modeling outputs. The demographic profile of the 486 participants indicated a balanced gender distribution, with 51.23% identifying as female and 48.77% as male. The mean age of participants was 36.84 years (SD = 8.92), ranging from 21 to 58 years. In terms of educational attainment, 28.60% held a high school diploma, 41.15% had

completed undergraduate education, and 30.25% possessed postgraduate degrees. Employment status showed that 67.49% were employed full-time, 18.11% part-time, and 14.40% were unemployed or engaged in unpaid domestic roles. The sample was culturally diverse, with 62.34% identifying as native-born Canadians and 37.66% as immigrants from various cultural backgrounds. Household income levels varied, with 24.28% reporting low income, 46.91% middle income, and 28.81% high income. These demographic characteristics suggest that the sample was sufficiently heterogeneous to support robust analysis of cultural and economic influences on family adaptability.

Table 1

Descriptive Statistics of Study Variables

Variable	Mean	Standard Deviation
Family Adaptability	58.73	9.41
Individualism	42.68	7.22
Collectivism	47.15	6.89
Traditionalism	39.84	8.11
Acculturation	44.27	7.53
Household Income Index	3.62	1.08
Economic Pressure	28.45	6.74
Financial Stability	31.77	5.96

The results presented in Table 1 indicate that the mean level of family adaptability among participants was moderately high, suggesting a generally flexible and resilient family structure within the sample. Among cultural variables, collectivism demonstrated a higher mean compared to individualism, reflecting a tendency toward relational interdependence even within a predominantly Western context. Traditionalism exhibited moderate levels,

indicating variability in adherence to conventional norms. Economic indicators showed that financial stability was relatively strong on average, although economic pressure scores suggest that a notable portion of participants experienced financial strain. The dispersion values indicate acceptable variability across all variables, supporting their suitability for further inferential and predictive analyses.

Table 2

Pearson Correlation Matrix Among Study Variables

Variable	1	2	3	4	5	6	7	8
1. Family Adaptability	1.00							
2. Individualism	0.28**	1.00						
3. Collectivism	0.41**	-0.19*	1.00					
4. Traditionalism	0.22**	-0.14*	0.33**	1.00				
5. Acculturation	0.35**	0.26**	0.18*	-0.21*	1.00			
6. Income Index	0.39**	0.17*	0.11	-0.09	0.23**	1.00		
7. Economic Pressure	-0.44**	-0.12	-0.16*	0.19*	-0.21*	-0.38**	1.00	
8. Financial Stability	0.47**	0.21*	0.14*	-0.17*	0.29**	0.52**	-0.49**	1.00

The correlation matrix reveals several statistically significant relationships among the variables. Family adaptability demonstrated strong positive correlations with collectivism, financial stability, and income index, indicating that both cultural cohesion and economic security play critical roles in enhancing adaptive family functioning. Conversely, economic pressure showed a significant

negative correlation with family adaptability, suggesting that financial stress undermines the family’s ability to adjust to changing circumstances. Acculturation also exhibited a moderate positive relationship with adaptability, implying that individuals with higher cultural integration may benefit from greater flexibility in family dynamics.

Table 3

Multiple Regression Analysis Predicting Family Adaptability

Predictor Variable	B	SE	Beta	t	p
Constant	18.74	3.21	—	5.84	0.001
Collectivism	0.42	0.08	0.31	5.25	0.001
Financial Stability	0.51	0.09	0.36	5.67	0.001
Economic Pressure	-0.38	0.07	-0.29	-5.14	0.001
Acculturation	0.27	0.08	0.18	3.38	0.001
Individualism	0.19	0.07	0.12	2.71	0.007

Model Summary: $R = 0.68$, $R^2 = 0.46$, Adjusted $R^2 = 0.45$, $F(5, 480) = 81.23$, $p < 0.001$

The regression analysis indicates that the model explains approximately 46% of the variance in family adaptability, representing a substantial level of explanatory power. Financial stability emerged as the strongest positive predictor, followed by collectivism, highlighting the dual importance of economic security and relational cultural

values. Economic pressure was a significant negative predictor, reinforcing its detrimental impact on adaptive family functioning. Acculturation and individualism also contributed positively, although with smaller effect sizes, suggesting that both integration and personal autonomy play nuanced roles in shaping adaptability.

Table 4

Machine Learning Model Performance Comparison

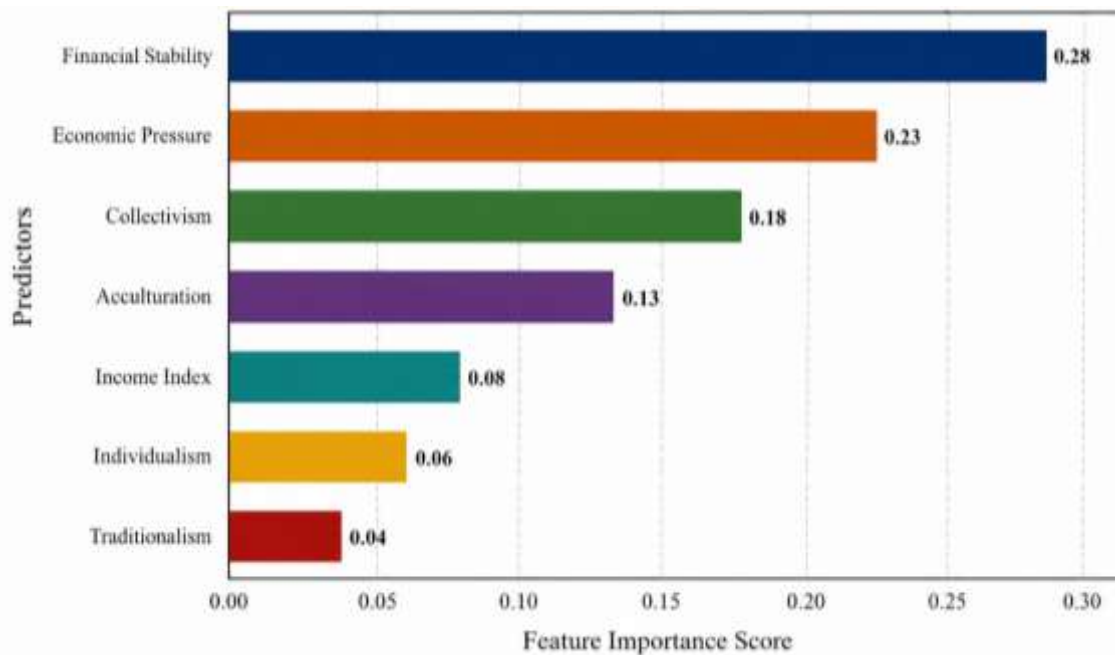
Model	MSE	RMSE	R^2
Random Forest	21.47	4.63	0.71
Support Vector Machine	24.82	4.98	0.66
Gradient Boosting	19.36	4.40	0.74

The comparison of machine learning models demonstrates that Gradient Boosting achieved the highest predictive accuracy, as evidenced by the lowest MSE and RMSE values and the highest R^2 coefficient. Random Forest also performed robustly, while the Support Vector Machine

model showed comparatively lower predictive precision. These findings indicate that ensemble learning approaches are particularly effective in capturing the complex nonlinear relationships between cultural, economic, and family adaptability variables.

Figure 1

Feature Importance Ranking of Predictors in Gradient Boosting Model



The feature importance analysis revealed that financial stability and economic pressure were the most influential predictors, followed by collectivism and acculturation. Individualism and traditionalism contributed less substantially to the predictive model, indicating that economic variables and relational cultural dimensions carry greater weight in determining family adaptability outcomes.

4 Discussion

The present study sought to predict family adaptability based on cultural and economic indicators using both traditional statistical methods and machine learning approaches, and the findings provide a nuanced understanding of how these multidimensional factors interact to shape adaptive family functioning. The results indicated that family adaptability was significantly associated with both cultural orientation variables (particularly collectivism and acculturation) and economic indicators (notably financial stability and economic pressure). Among these, financial stability and collectivism emerged as the strongest positive predictors, while economic pressure demonstrated a substantial negative effect. These findings are consistent with ecological and systemic perspectives that conceptualize family adaptability as a function of both internal relational dynamics and external structural conditions (George et al., 2024; Kim et al., 2023).

The strong positive association between collectivism and family adaptability highlights the central role of relational cultural values in promoting flexible and cohesive family systems. Collectivist orientations emphasize interdependence, shared responsibility, and emotional connectedness, which may facilitate adaptive responses to stress and change. This finding aligns with prior research demonstrating that families embedded in collectivist cultural frameworks tend to exhibit higher levels of cohesion and mutual support, which are critical for adaptability (Gölcük et al., 2025; Treviño & Gerstein, 2022). Moreover, collectivist values may buffer the adverse effects of external stressors by fostering a sense of belonging and collective efficacy within the family unit, thereby enhancing resilience.

Acculturation also emerged as a significant positive predictor of family adaptability, suggesting that individuals who are more integrated into the dominant cultural context may possess greater adaptive resources. This finding supports the notion that acculturation can facilitate access to social, economic, and institutional resources that enhance family functioning (Cordero & Llabre, 2025; Duan, 2024). However, the relationship between acculturation and adaptability is complex and context-dependent. While higher levels of acculturation may promote flexibility and resource access, they may also introduce tensions related to cultural identity and intergenerational differences. Previous studies have documented that acculturative stress can

negatively impact family dynamics, particularly when there is a mismatch in acculturation levels among family members (Mullins et al., 2024; Silva et al., 2024). The positive association observed in the present study suggests that, within the sampled population, the benefits of acculturation may outweigh its potential challenges, particularly when accompanied by supportive socioeconomic conditions.

Economic factors played a particularly prominent role in predicting family adaptability, with financial stability emerging as the most influential positive predictor and economic pressure as a strong negative predictor. These findings are consistent with a substantial body of literature highlighting the impact of socioeconomic conditions on family functioning. Financial stability provides families with the resources necessary to manage stress, maintain stable routines, and invest in supportive environments, thereby enhancing adaptability (Osei-Kwasi et al., 2022; Varela et al., 2023). In contrast, economic pressure introduces chronic stressors that can disrupt family processes, impair communication, and reduce emotional availability among family members. This pattern is well-documented in studies linking economic hardship to increased parental stress, conflict, and diminished adaptive capacity (Kitchens et al., 2025; Thor et al., 2022).

The negative association between economic pressure and family adaptability observed in this study is further supported by research on the broader social determinants of health. Economic strain has been shown to exacerbate vulnerabilities related to mental health, access to resources, and overall well-being, all of which can undermine family functioning (Álvarez et al., 2025; Kim et al., 2023). Additionally, economic stress may interact with cultural factors to produce compounded effects, particularly in immigrant and minority populations. For example, studies have demonstrated that financial hardship can intensify the challenges associated with acculturation, leading to increased stress and reduced adaptability (Cordero & Llabre, 2025; Guan et al., 2024).

The correlation analyses further revealed that family adaptability was positively associated with income index and financial stability, and negatively associated with economic pressure, reinforcing the central role of economic conditions. These findings are consistent with research on food insecurity, dietary patterns, and health disparities, which highlight the broader implications of socioeconomic status for family well-being (Purcino & Bedrikow, 2024; Stamou & Flórez, 2025). Economic resources not only influence material conditions but also shape psychological

and relational processes within families, thereby affecting adaptability.

The regression model accounted for a substantial proportion of variance in family adaptability, indicating that the combined effects of cultural and economic variables provide a robust explanatory framework. The inclusion of both cultural and economic predictors in the model reflects the multidimensional nature of family adaptability and underscores the importance of integrative approaches. These findings align with prior research emphasizing the need to consider multiple interacting factors in understanding family functioning (Gagné et al., 2021; Roby et al., 2021). For instance, father involvement and early caregiving environments have been shown to influence long-term developmental outcomes, highlighting the interconnectedness of family processes and broader contextual factors.

The machine learning analyses provided additional insights by identifying the relative importance of different predictors in a nonlinear modeling framework. The superior performance of the Gradient Boosting model suggests that complex interactions and nonlinear relationships among variables play a significant role in predicting family adaptability. This finding supports the growing recognition of machine learning as a valuable tool for modeling complex psychosocial phenomena (Duan, 2024; George et al., 2024). The feature importance analysis, which highlighted financial stability and economic pressure as the most influential predictors, further reinforces the central role of economic factors while also acknowledging the contribution of cultural variables such as collectivism and acculturation.

The integration of machine learning approaches with traditional statistical methods represents a significant methodological advancement in the study of family adaptability. By combining explanatory and predictive analyses, the present study provides a more comprehensive understanding of the determinants of family functioning. This approach is consistent with recent trends in interdisciplinary research, which emphasize the use of advanced analytical techniques to address complex social issues (Guan et al., 2024; Kim et al., 2023). Moreover, the use of predictive modeling has practical implications for identifying at-risk families and developing targeted interventions.

Another important implication of the findings relates to the role of cultural diversity in shaping family adaptability. The positive associations between cultural variables and adaptability suggest that cultural resources can serve as

protective factors in the face of stress. However, these benefits may be contingent on the broader social and economic context. For example, experiences of discrimination and marginalization can undermine the positive effects of cultural identity, highlighting the need for supportive social environments (Chen et al., 2022; Kim et al., 2022). Additionally, variations in emotional expression and parenting practices across cultural groups underscore the importance of culturally sensitive approaches to family research and intervention (Cabrera et al., 2024).

The findings also contribute to the literature on immigrant and minority families by highlighting the interplay between acculturation, economic conditions, and family functioning. Research on immigrant health and well-being has consistently emphasized the importance of addressing both cultural and structural determinants to improve outcomes (Cordero & Llabre, 2025; Guan et al., 2024). The present study extends this line of inquiry by demonstrating how these factors jointly influence family adaptability, thereby providing a more holistic perspective.

Furthermore, the observed relationships between family adaptability and key predictors have implications for child and adolescent development. Adaptive family environments are critical for fostering positive developmental outcomes, including academic achievement, emotional regulation, and social competence (Gagné et al., 2021). Conversely, families experiencing economic stress and cultural conflict may struggle to provide the support necessary for healthy development. Studies on child maltreatment and parental stress have highlighted the risks associated with adverse family conditions, further underscoring the importance of promoting adaptability (Thor et al., 2022).

In addition, the findings are consistent with research on health behaviors and outcomes, which indicate that family context plays a significant role in shaping individual behaviors. For example, dietary patterns, healthcare utilization, and mental health outcomes are influenced by both cultural practices and economic resources (Okunseri et al., 2023; Osei-Kwasi et al., 2022). By linking these broader outcomes to family adaptability, the present study highlights the central role of the family as a mediating context for health and well-being.

5 Conclusion

Overall, the results of this study provide strong empirical support for the importance of integrating cultural and economic perspectives in understanding family adaptability.

The findings demonstrate that both sets of factors contribute significantly to adaptive family functioning and that their effects are best understood within a comprehensive, multidimensional framework. The use of machine learning further enhances this understanding by capturing complex patterns that may not be evident through traditional analyses.

The study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design limits the ability to draw causal inferences about the relationships among variables. Second, the reliance on self-report measures may introduce response bias and limit the accuracy of the data. Third, although the sample was diverse, it may not fully represent all cultural and socioeconomic groups within Canada. Fourth, the use of standardized instruments, while beneficial for comparability, may not capture the full complexity of cultural experiences. Finally, the machine learning models, while powerful, are dependent on the quality and scope of the input data, which may constrain their generalizability.

Future research should address these limitations by employing longitudinal designs to examine changes in family adaptability over time and to establish causal relationships. Additionally, studies should incorporate more diverse samples, including underrepresented cultural and socioeconomic groups, to enhance generalizability. The use of mixed-methods approaches could provide deeper insights into the lived experiences of families and the mechanisms underlying adaptability. Furthermore, future research should explore additional variables, such as social support, neighborhood context, and policy factors, to develop more comprehensive models. The continued integration of advanced analytical techniques, including machine learning and artificial intelligence, will also be essential for advancing this field.

In terms of practical implications, the findings suggest that interventions aimed at enhancing family adaptability should address both cultural and economic dimensions. Programs that promote financial stability, reduce economic stress, and provide access to resources can have a significant impact on family functioning. At the same time, culturally sensitive interventions that support positive cultural identity, facilitate acculturation, and strengthen family cohesion are equally important. Policymakers and practitioners should consider the complex interplay between these factors when designing and implementing programs to support families in diverse contexts.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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