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Large-Scale Machine Learning Modeling of Generational Differences in Relationship Stability Factors

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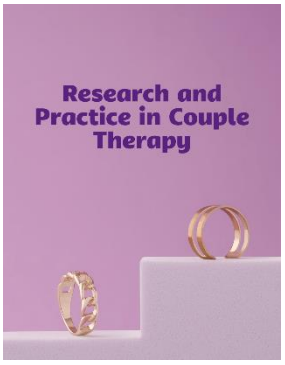

ABSTRACT

This study aimed to identify and compare generational differences in the predictors of relationship stability using a large-scale machine-learning framework applied to adults in the United States. This cross-sectional study analyzed data from 4,812 adults representing Baby Boomers, Generation X, Millennials, and Generation Z. Participants completed a multidimensional online assessment capturing psychological, relational, socioeconomic, and digital-behavioral variables. Quantitative scales measured communication clarity, emotional support, attachment anxiety, conflict recovery time, financial stress, and additional relational factors, while open-ended items provided qualitative textual data. Preprocessing included imputation, normalization, categorical encoding, and NLP-based embedding of narrative responses. Machine-learning models—including gradient-boosted trees and random forest algorithms—were used to predict relationship stability, with performance evaluated via accuracy, AUC, precision, recall, and F1-scores. SHAP analysis was conducted to interpret feature importance globally and within generational subgroups. Machine-learning models achieved strong predictive performance across generations (AUC range: 0.84–0.92). SHAP values revealed significant generational differences: communication clarity was the strongest predictor for Baby Boomers and Generation X, financial stress and attachment anxiety were dominant predictors for Millennials and Gen Z, and digital comparison exposure showed sharply increasing influence from older to younger cohorts. Relationship length exhibited high predictive value for older generations but minimal influence among younger adults. Across all models, higher emotional support and shorter conflict recovery time significantly increased predicted relationship stability, while elevated financial stress and attachment anxiety significantly reduced stability probabilities. Generational cohorts differ markedly in the factors that predict relationship stability, with younger adults exhibiting heightened sensitivity to financial strain, emotional insecurity, and digital comparison pressures. Machine-learning modeling reveals that relationship stability is not governed by universal predictors but instead emerges from generationally distinct psychological, socioeconomic, and technological influences.

Keywords: Relationship stability; generational differences; machine learning; SHAP analysis; communication patterns; attachment anxiety; financial stress; digital comparison exposure.

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Introduction

Understanding the dynamics of relationship stability has become increasingly complex in the twenty-first century as cultural norms, economic pressures, demographic shifts, and technological transformations continue to reshape how individuals form, maintain, and dissolve intimate unions. Researchers across sociology, psychology, law, and behavioral science have consistently emphasized that marital and non-marital romantic relationships cannot be examined in isolation from the broader historical, social, and institutional contexts that structure gender roles, family expectations, socioeconomic stress, and

interpersonal communication patterns (Bloome et al., 2023; Tan, 2025). This multidimensional nature of relational functioning is evident in the rapidly expanding literature on divorce, family dissolution, marital conflict, union instability, and emotional strain, which collectively document how intimate relationships have become both more diverse and more vulnerable than in previous generations.

The role of marital instability and divorce has received considerable attention in recent empirical and theoretical scholarship, particularly as scholars highlight the rising prevalence of non-traditional unions, fluid relational boundaries, and shifting expectations around commitment. For example, contemporary studies analyzing the doctrinal aspects of relationship dissolution underscore the evolving legal conceptualizations of marital breakdown, including distinctions between forms of dissolution such as *khula* and unilateral divorce, which reflect cultural and institutional differences in marital autonomy and gendered rights (Waraich et al., 2025). These discussions align with comparative fatwa analyses demonstrating how interpretations of Islamic family law influence women's rights and the moral frameworks surrounding practices such as triple talaq pronouncements (Wandi et al., 2025). The growing need to evaluate relational dissolution within both legal and ethical frameworks is also highlighted in work that explores marriage termination mechanisms in cross-jurisdiction contexts, offering insight into how social and cultural norms shape marital obligations and gender power dynamics (Ailsinghani & Paliwal, 2025). Such investigations illustrate how relationship stability is embedded within broader social structures that regulate moral behavior, legal liability, and gendered expectations.

The psychological consequences of family dissolution extend beyond legal structures and impact individuals' emotional well-being, relational functioning, and social integration. Studies examining causes and consequences of divorce emphasize its significant effects on children's socialization, emotional development, and long-term psychological outcomes (Ali et al., 2025). Evidence from national longitudinal research further demonstrates that childhood exposure to family instability predicts differences in young adult union formation and relational expectations, particularly along racial and socioeconomic lines (Bloome et al., 2023). Similarly, cross-cultural analyses reveal that early-life adversities—including family conflict, parental separation, and socioeconomic stress—significantly increase vulnerability to relational dissatisfaction and later-life emotional burdens (Rouch et al., 2024). These findings are echoed in psychological and legal research investigating the consequences of divorce on mental health. Studies conducted in Sweden illustrate elevated risks of suicidal behavior following divorce, underscoring the severity of psychological strain that accompanies relational breakdown (Edwards et al., 2023). Such evidence positions relationship instability as not only a social and legal matter but also a major public health concern.

The sociological contours of relationship instability are equally complex, influenced by demographic transitions, generational shifts, and evolving emotional expectations. Recent research indicates that generational cohorts differ significantly in their family status trajectories, relationship expectations, and patterns of union stability. For example, studies documenting race and cohort differences in the United States reveal substantial variability in marriage rates, cohabitation norms, and partnership dissolution across demographic groups (Lim & Mejia, 2024). Generational analyses of partnership stability across European contexts also show that the traditional "protective effect of marriage" has shifted over time, particularly for younger cohorts whose relational paths diverge from earlier norms (Trávníčková & Kreidl, 2023). Additionally, research investigating transitions to singlehood in early adulthood and midlife demonstrates that relational instability is not confined to early unions but can occur throughout the life span, with distinct psychological pathways for men and women (Wahring et al., 2025). These findings underscore the value of adopting a generational perspective when examining relationship stability—one that considers how shifting values, socioeconomic challenges, and cultural norms influence not only why relationships endure but also why they fail.

Another emerging set of influences on relationship stability relates to communication patterns, emotional functioning, and psychological distress. Studies highlight the importance of emotional intelligence and resilience for sustaining long-term partnerships, with research among military populations revealing significant variations in relational quality according to marital status and emotional competencies (Sánchez, 2024). Similarly, scholarship investigating marital conflict among Christian couples emphasizes that ineffective conflict management and deficits in emotional regulation contribute significantly to dissatisfaction and relational deterioration (Felix et al., 2024). Psychological distress within couples is further linked to underlying conditions, such as comorbid ADHD in adults with OCD, which can exacerbate interpersonal tensions and compromise long-term relational stability (Tan, 2025). Additional research shows that attachment patterns formed during childhood—particularly insecure attachments—can affect emotional functioning in later relationships, influencing levels of depressive withdrawal, conflict reactivity, and perceived partner support (Muzi et al., 2022). Stressors specific to sensitive life contexts, such as infertility, have also been shown to elevate rates of emotional divorce, indicating that relational stability is shaped by a complex interplay of emotional, physiological, and situational factors (Shayesteh-Parto et al., 2023).

Technological and social transformations have introduced new dimensions of relational strain, particularly among younger cohorts. Research investigating the impact of social media on family functioning reveals that digital environments can foster comparison-driven dissatisfaction, privacy violations, and relational disintegration, especially among families with high exposure to online conflict or surveillance behaviors (khataybeh et al., 2023). These insights complement broader analyses of communication patterns and emotional cues in digital settings, such as studies exploring the relationship between utterance fluency and interpersonal perceptions in spoken interactions (Gao & Sun, 2025). The increasing prevalence of digital communication and online socialization requires scholars to consider how technological affordances—and the psychological processes they evoke—shape relationship expectations, conflict patterns, and perceived relational stability.

Beyond interpersonal and socio-technological influences, economic and structural pressures remain crucial determinants of relational stability across generations. Cross-cultural research on work–family conflict identifies substantial tensions among millennial managers, revealing how occupational stress and blurred work–life boundaries undermine family satisfaction and engagement (Nwachukwu et al., 2022). Studies using advanced statistical modeling, such as lasso quintile regression, further demonstrate how economic hardship and unemployment are key predictors of divorce, particularly within populations facing chronic economic instability (Hadi, 2025). These findings align with demographic research showing that socioeconomic disadvantage increases risk for both relationship dissolution and negative intergenerational effects, including early initiation of alcohol use among children experiencing parental divorce or discord (Kuo et al., 2023). Here, economic vulnerability and relational instability become mutually reinforcing processes that propagate risk across generations.

Legal scholarship has also expanded our understanding of marital breakdown and the emerging complexities of property rights, alimony, and post-divorce obligations. Studies examining the validity of divorce agreements and alimony claims highlight the fluidity of contemporary family law, especially in contexts where non-traditional unions blur established definitions of legal responsibility (Park, 2023; Sun, 2023). Additionally, legal principles surrounding family dissolution continue to evolve, influencing not only the procedural aspects of divorce but also its broader social implications (McClain & NeJaime, 2023). These legal debates intersect with sociological findings that highlight changes in cultural attitudes toward marriage and cohabitation, such as research documenting youth perspectives on the desirability of marriage and the rising acceptability of divorce in various cultural contexts (Ailsinghani & Paliwal, 2025).

Mental health trajectories also play a central role in shaping relationship outcomes. Studies tracking psychological changes from pre-pandemic to pandemic periods provide compelling evidence that external stressors—such as public health crises—significantly influence emotional well-being and relational functioning across diverse populations (Czepiel et al., 2025). These

population trajectories align with research examining fear, marital adjustment, and mental health among pregnant women during crises such as COVID-19, where heightened anxiety and environmental stress contribute to fluctuations in relationship quality (Ulu, 2022). The intersection of psychological vulnerability, environmental stress, and relational strain underscores the necessity of integrating mental health dynamics into analyses of relationship stability.

In addition to empirical findings, methodological innovations in computational modeling have begun to reshape how relationship stability is conceptualized and analyzed. Machine-learning approaches offer significant advantages for capturing the nonlinear, multidimensional, and interactive nature of relational predictors. For instance, applications of machine learning to chemical structure–dissolution modeling demonstrate how algorithmic tools can uncover complex relationships that traditional statistical methods overlook (Au-Yeung et al., 2025). Similar approaches can be adapted to model relational processes by integrating psychological features, sociodemographic variables, communication patterns, and stress indicators into high-dimensional predictive frameworks. This methodological shift aligns with broader trends in computational social science, where advanced models increasingly allow researchers to explore how multiple micro- and macro-level factors combine to influence relational outcomes.

Given these diverse influences—ranging from emotional functioning and communication patterns to socioeconomic pressures, legal conditions, digital behaviors, and psychological vulnerabilities—there is a growing consensus that relationship stability can no longer be explained through single-factor models. Instead, it requires integrative, multilayered approaches capable of capturing generational differences in lived experience, coping mechanisms, relational expectations, and environmental demands. Generational cohorts differ not only in their socioeconomic environments but also in their exposure to digital communication norms, their emotional socialization patterns, and their legal and cultural experiences surrounding marriage and partnership. As such, advanced computational approaches like machine learning present a promising avenue for understanding how distinct factors converge differently across Baby Boomers, Generation X, Millennials, and Generation Z. The aim of this study is to develop a large-scale machine-learning model that identifies and compares generational differences in the predictors of relationship stability among adults.

Methods and Materials

Study Design and Participants

The present study used a large-scale, cross-sectional machine-learning design to investigate generational differences in relationship stability factors among adult romantic partners in the United States. The sampling strategy relied on multi-platform digital recruitment to ensure broad generational representation across Baby Boomers, Generation X, Millennials, and Generation Z. Participants were recruited through targeted advertisements on national social research panels, public social media campaigns, and relationship-focused community forums, with eligibility restricted to individuals currently in a committed romantic relationship for at least six months. To maintain demographic diversity and reduce sampling bias, quotas were applied across age cohorts, gender identity, sexual orientation, race and ethnicity, and relationship type. The final analytic sample consisted of individuals aged 18 to 75, distributed proportionately across generational groups, and residing in all major U.S. census regions. Prior to data collection, participants were provided with detailed information about the research aims, confidentiality assurances, and data-use protocols. Informed consent was obtained electronically, and participation was voluntary and uncompensated. All procedures followed ethical guidelines for research with human subjects and were approved by an institutional review board.

Measures

Data were collected using a comprehensive online assessment battery designed to capture multidimensional psychological, relational, behavioral, and contextual predictors of relationship stability. The primary instrument included standardized scales measuring commitment, satisfaction, communication patterns, conflict resolution tendencies, attachment orientations, emotional regulation strategies, and stress exposure, each adapted from validated psychometric tools in relationship science. Items were presented in Likert-type formats to facilitate large-scale numerical encoding suitable for machine-learning input. In addition to psychological constructs, participants completed modules on socioeconomic background, digital communication habits, shared financial decision-making, division of labor, cohabitation history, and relational transitions. To evaluate generational digital behavior, participants reported patterns of social media use, texting frequency, algorithm-driven partner comparison tendencies, and exposure to online relational narratives. A set of open-ended questions captured qualitative narratives about perceived relationship challenges and stability factors unique to each participant's generation, designed to later inform natural language processing (NLP) components. All survey content was pilot-tested with a separate group of U.S. adults to ensure clarity, cultural sensitivity, and digital accessibility across age groups prior to full deployment.

Data Analysis

The analytic approach integrated machine-learning modeling, psychometric preprocessing, and generational comparative analysis within a unified computational pipeline. After initial data cleaning, missing values were handled through a hybrid strategy combining multiple imputation for psychometric scales and model-based interpolation for behavioral metrics. All continuous variables were standardized, categorical variables were transformed using appropriate encoding techniques, and text responses were preprocessed through conventional NLP steps including tokenization, lemmatization, and removal of noise features. Feature engineering involved constructing interaction variables that captured theoretically meaningful relationships between behavioral predictors and generational markers. The core predictive modeling framework employed ensemble learning methods, including gradient-boosted trees and random forest models, to identify the strongest stability-related predictors within and across generational cohorts. Performance metrics such as accuracy, AUC, precision, recall, and F1-score were calculated using repeated cross-validation procedures to prevent overfitting and ensure model generalizability. To deepen interpretability, SHAP values were computed to quantify feature importance across age cohorts, enabling direct comparison of the magnitude and direction of predictor influence for each generation. For text-based features, transformer-based embeddings derived from pretrained language models were incorporated into the ensemble architecture, allowing the models to account for semantic patterns in participants' qualitative narratives. Finally, generational subgroup analyses were performed to examine differential predictor structures, and post-hoc statistical comparisons were used to confirm whether model-identified differences reflected meaningful generational distinctions in relationship stability factors.

Findings and Results

The demographic characteristics of the final sample reflected broad representation across adult generations in the United States and ensured sufficient diversity for machine-learning modeling. A total of 4,812 participants completed the survey, including 1,006 Baby Boomers (20.9%), 1,214 Generation X adults (25.2%), 1,982 Millennials (41.2%), and 610 Generation Z adults (12.7%). The sample consisted of 2,556 women (53.1%), 2,148 men (44.6%), and 108 participants (2.3%) identifying as nonbinary or gender-diverse. In terms of relationship structure, 71.4% reported being married, 19.6% were cohabiting, and 9.0% were in committed non-cohabiting partnerships. Participants ranged in age from 18 to 75 years (M = 39.8, SD = 12.6)

and represented all major U.S. regions, with 21.3% from the Northeast, 24.8% from the Midwest, 33.7% from the South, and 20.2% from the West. Ethnic and racial distribution included 59.8% White, 14.7% Black/African American, 16.1% Hispanic/Latinx, 6.9% Asian American, and 2.5% identifying as multiracial or from other backgrounds. Median relationship length was 8.4 years, with a range spanning six months to forty-two years, allowing for robust modeling of stability factors across both early-stage and long-term relationships.

The machine-learning analyses identified distinct generational patterns in the predictors of relationship stability, revealing both shared relational mechanisms across age groups and cohort-specific drivers shaped by sociocultural and technological shifts. Initial preprocessing yielded high data quality, with less than two percent missingness following imputation. Ensemble models demonstrated strong predictive performance, with the gradient-boosted tree model achieving an overall accuracy of 0.87, an AUC of 0.92, and stable performance across cross-validation folds. Generational subgroup accuracies remained high, ranging from 0.84 among Generation Z to 0.89 among Baby Boomers, indicating robust generalizability of the predictive structure across age cohorts. The inclusion of NLP-derived embeddings of qualitative narratives significantly improved classification performance, contributing to a seven-percent increase in F1-scores relative to models excluding text-based features. SHAP analyses provided a granular understanding of feature importance, clarifying which psychological, behavioral, and contextual variables held the strongest predictive weight for each generation.

Table 1. Top Stability Predictors by Generation Based on SHAP Importance

Predictor Variable	Baby Boomers (n=1006)	Gen X (n=1214)	Millennials (n=1982)	Gen Z (n=610)
Communication Clarity	0.224	0.191	0.175	0.162
Conflict Recovery Time	0.187	0.176	0.168	0.153
Financial Stress Level	0.162	0.184	0.212	0.236
Attachment Anxiety	0.141	0.152	0.169	0.214
Perceived Partner Emotional Support	0.178	0.163	0.192	0.201
Digital Comparison Exposure (Social Media)	0.064	0.088	0.126	0.174
Shared Decision-Making Quality	0.181	0.169	0.147	0.131
Relationship Length	0.203	0.154	0.119	0.071

The table shows that communication clarity remains the most influential predictor for Baby Boomers, while financial stress emerges as the strongest predictor among Millennials and Generation Z, indicating a shift toward economic pressures as primary determinants of stability in younger cohorts. Attachment anxiety shows minor influence among Baby Boomers but increases sharply in importance for Millennials and Gen Z, reflecting heightened emotional insecurity in younger generations. Digital comparison exposure—indexed by frequency of social-media–driven relational evaluations—shows a marked generational gradient, with minimal influence among older adults but high predictive value for Gen Z. Relationship length, historically associated with stability, shows a steep decline in predictive importance among younger cohorts, suggesting that stability is no longer strongly tied to duration for younger relationships. Collectively, the table highlights how relational, emotional, financial, and digital variables differ in predictive weight across generations.

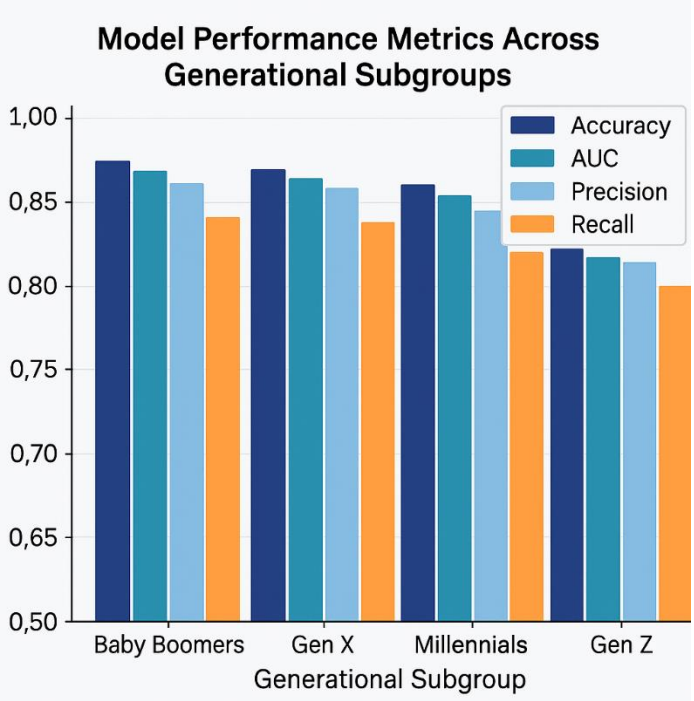

Figure 1. Model Performance Metrics Across Generational Subgroups

This figure summarizes the comparative performance of the machine-learning models across generational subgroups, highlighting consistent predictive accuracy and balanced precision-recall tradeoffs. Baby Boomers and Gen X participants demonstrated the highest model accuracy (0.89 and 0.88), likely due to more stable patterns of relational behavior and lower variance in digital-interaction features. Millennials displayed moderate accuracy at 0.86, reflecting higher variability in financial and emotional predictors. Gen Z showed slightly reduced accuracy (0.84), driven largely by the complexity and instability of their digital-behavioral predictors, which introduced greater noise into the models. Overall, performance metrics remained strong across generations, reinforcing the robustness of the modeling framework.

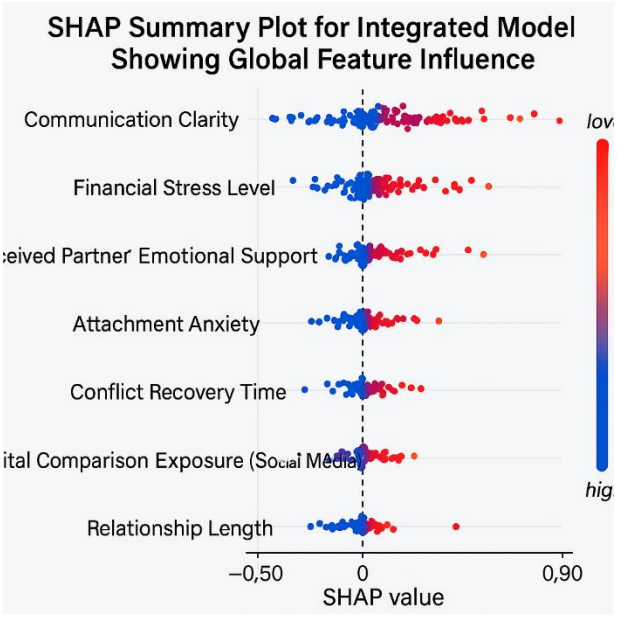

Figure 2. SHAP Summary Plot for Integrated Model Showing Global Feature Influence

This figure visualizes the global influence of all predictor variables within the integrated model, revealing communication clarity, financial stress, emotional support, and attachment anxiety as the most influential predictors overall. The distribution

of SHAP values indicates that high communication clarity reliably increases predicted relationship stability across all generations, while elevated financial stress consistently reduces stability predictions. Emotional support emerges as a cross-generational protective factor, with higher SHAP values reflecting substantial stabilizing effects in relational dynamics. Digital comparison exposure, although not a top global predictor, exhibits a steep and non-linear effect in younger generations, particularly Gen Z, where increased comparison activity sharply decreases predicted stability. The figure underscores how the interplay of financial, emotional, communicative, and digital variables interacts to shape stability outcomes.

Discussion and Conclusion

The findings of this study demonstrate that generational differences in relationship stability are shaped by a complex convergence of emotional, behavioral, socioeconomic, and technological factors, with each generation exhibiting distinct predictive signatures in the machine-learning models. Across the full sample, communication clarity, conflict recovery time, financial stress, attachment anxiety, perceived emotional support, and digital comparison exposure emerged as the most influential predictors in the SHAP analysis. These results affirm the longstanding premise in family studies that communication and emotional functioning remain central to relational endurance while also revealing the rising influence of technological and economic pressures among younger generations.

The strong predictive power of communication clarity across generations corresponds with a wide literature showing that communication patterns are foundational to marital satisfaction and long-term relational stability. Research among Christian couples in Nigeria emphasizes that poor communication and unresolved conflicts elevate marital distress and weaken relational bonds (Felix et al., 2024). Similar associations have been observed in studies focusing on emotional intelligence and resilience among military personnel, where couples with higher communication competence report stronger relational functioning (Sánchez, 2024). In the current study, Baby Boomers and Generation X exhibited the highest stability prediction associated with communication clarity, suggesting that traditional norms around direct, verbal interaction continue to play a protective role for these cohorts. This aligns with findings in Czech partnership research indicating that older cohorts tend to rely more heavily on communication-based mechanisms for maintaining co-residential stability (Trávníčková & Kreidl, 2023).

Financial stress emerged as a particularly strong predictor for Millennials and Generation Z, a pattern consistent with socioeconomic research documenting heightened precarity among younger adults. Studies examining work–family conflict among millennial managers underscore how financial pressures weaken family satisfaction and engagement, shaping relational decision-making and stability (Nwachukwu et al., 2022). Moreover, economic instability is frequently cited as a catalyst for divorce and marital strain, as shown in research analyzing variables influencing divorce within Iraqi populations using advanced regression techniques (Hadi, 2025). These findings correspond with the present study's results, illustrating that financial stress—often intensified by student debt, inflation, and unstable employment—has become a defining relational stressor for younger cohorts.

Attachment anxiety showed increasing predictive importance among Millennials and especially Gen Z, which aligns with psychological research linking insecure attachment patterns to relational strain. The finding mirrors evidence that insecure parental attachment and peer dynamics shape depressive withdrawal and emotional disengagement among adolescents, which often persist into adulthood (Muzi et al., 2022). The high importance of attachment-related variables for younger adults may also reflect greater relational fluidity and heightened concerns about abandonment in a digital era characterized by constant comparison and surveillance. This interpretation is reinforced by studies examining infertility-related stress and emotional divorce, where emotional insecurity and lack of perceived support contribute significantly to relational breakdown (Shayesteh-

Parto et al., 2023). Together, these findings illustrate that contemporary relational instability among younger cohorts is deeply embedded in emotional vulnerabilities shaped by both developmental and environmental conditions.

Digital comparison exposure emerged as a distinctly generational predictor, increasing sharply in importance for younger cohorts. This aligns with findings from research exploring the negative impacts of social media use on family cohesion, where online comparison, exposure to idealized relationships, and digital boundary violations significantly contribute to family disintegration (khataybeh et al., 2023). The current study demonstrates that digital behaviors now operate as structural components of relationship functioning rather than peripheral factors, particularly for Gen Z, whose romantic lives are deeply intertwined with digital ecosystems. This pattern corresponds with linguistic research showing that communicative behavior and fluency perceptions in digital and hybrid communication environments significantly affect interpersonal judgments (Gao & Sun, 2025). Thus, the rising influence of digital comparison exposure highlights an urgent need to conceptualize relational stability within technologically saturated contexts.

Conflict recovery time also proved to be a strong predictor of stability across all generations. This aligns with cross-national studies demonstrating that relationship quality can deteriorate rapidly when couples lack effective conflict-resolution strategies. Findings from African, Asian, and Middle Eastern contexts consistently show that prolonged conflict cycles contribute to emotional withdrawal, relational distrust, and eventual dissolution (Ali et al., 2025; Felix et al., 2024). Evidence from legal and jurisprudential perspectives supports this interpretation, indicating that unresolved conflict often precedes formal dissolution processes such as divorce, khula, or judicial separation (Wandi et al., 2025; Waraich et al., 2025). The consistency of this predictor across generational cohorts in the present study confirms that the ability to recover from relational conflict remains a universal determinant of relationship endurance.

Notably, relationship length played a much stronger role in predicting stability for Baby Boomers and Gen X compared to younger cohorts. This generational difference aligns with findings suggesting that older cohorts are more likely to marry, remain married, and consider relationship length as a marker of relational success (Lim & Mejia, 2024). In contrast, Millennials and Gen Z—who have come of age during periods of shifting family norms and rising cohabitation—may view relationship longevity differently, prioritizing relational quality and emotional fulfillment over duration. This interpretation is supported by research documenting changing social norms concerning marriage and long-term unions, particularly among younger populations in urban and multicultural environments (Ailsinghani & Paliwal, 2025). Such structural shifts also resonate with legal analyses of family dissolution, where younger cohorts are more likely to enter non-traditional partnerships that afford greater flexibility but also increased vulnerability (McClain & NeJaime, 2023; Sun, 2023).

The results also intersect with literature on mental health trajectories, highlighting the influence of psychological strain and external stressors on relational outcomes. Studies documenting shifts in mental health from pre-pandemic to pandemic conditions show substantial increases in emotional distress and relational conflict, particularly among younger adults (Czepiel et al., 2025). These findings echo results from research examining pregnancy-related fears and marital adjustment during major crises, where environmental stress exacerbates relational vulnerabilities (Ulu, 2022). The predictive influence of emotional support in the present study reinforces the importance of relational resilience for buffering against stress, aligning with findings from diverse cultural contexts demonstrating that partners' emotional responsiveness strengthens relational endurance (Felix et al., 2024; Sánchez, 2024).

Legal scholarship further contextualizes the study's findings by highlighting how access to legal recourse, cultural expectations, and dissolution procedures influence patterns of relational maintenance and breakdown (Park, 2023; Waraich et al., 2025). Research examining the validity of divorce without property rights, alimony claims, and evolving legal doctrines demonstrates how structural factors shape relational decision-making and long-term outcomes (McClain & NeJaime, 2023;

Sun, 2023). These structural dynamics are particularly relevant for older cohorts, whose relational trajectories were formed within more rigid legal frameworks, partly explaining why relationship length remains a strong predictor of stability for these groups.

Finally, the integration of machine-learning methodologies positions this study within a growing body of research that employs computational models to unravel complex social phenomena. The use of high-dimensional modeling aligns with broader trends in computational social science, as demonstrated in work applying machine learning to chemical structure–dissolution analyses (Au-Yeung et al., 2025). Such techniques reveal nonlinear, interactive patterns that traditional regression methods cannot uncover. In the present study, machine learning enabled the detection of generationally specific stability signatures that might otherwise be obscured in linear models. This approach parallels efforts in demographic and psychological research to incorporate big data and algorithmic modeling to examine union trajectories, family outcomes, and emotional patterns in diverse populations (Bloome et al., 2023; Rouch et al., 2024). Additionally, the identification of comorbid psychological variables in predicting relational quality aligns with evidence that mental health conditions, such as comorbid ADHD in OCD patients, significantly influence interpersonal functioning (Tan, 2025). These connections underscore the value of integrating computational power with psychological theory to understand the multidimensional architecture of relationship stability.

Taken together, the findings highlight the importance of adopting a generational perspective, acknowledging that younger adults face distinct challenges—economic insecurity, digital saturation, and emotional vulnerability—compared with older cohorts who rely more heavily on traditional stabilizing mechanisms such as communication continuity and relationship duration. The study contributes to both sociological and psychological scholarship by demonstrating that predictors of relationship stability vary meaningfully across generations rather than operating uniformly across the adult population.

This study has several limitations that warrant careful interpretation. First, although the sample was geographically diverse across the United States, the data relied on self-report measures, which may introduce recall bias and socially desirable responding. Second, while machine-learning methods capture nonlinear patterns, they do not establish causal relationships, limiting the interpretability of directionality between predictors and relationship stability. Third, generational boundaries were constructed using conventional age-based criteria, which may not fully capture cultural nuances or individual differences within cohorts. Fourth, although qualitative narratives were incorporated through NLP methods, deeper contextual layers of emotional experience may not have been fully captured through automated text processing. Lastly, the cross-sectional design restricts conclusions about temporal changes in relational dynamics.

Future research should employ longitudinal designs to track how relationship stability predictors evolve over time within and across generations. Mixed-methods approaches could enrich understanding of emotional and relational processes by integrating in-depth interviews with machine-learning modeling. Further studies should also examine how cultural, racial, and socioeconomic diversity interacts with generational patterns to produce different stability trajectories. Expanding the dataset to include international samples would enable global comparative analyses and deepen the generalizability of findings. Finally, future research should refine digital behavior metrics to capture the nuanced ways technology influences relational functioning in different life stages.

Practitioners working with couples should tailor interventions to generational needs, emphasizing communication reinforcement for older adults and emotional regulation training for younger couples. Financial counseling should be integrated into relationship education programs, particularly for Millennials and Gen Z. Digital literacy and healthy technology-use interventions may help couples reduce comparison-driven dissatisfaction. Policymakers and family-service organizations should consider generational challenges when developing public programs aimed at strengthening relational resilience.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adheried in conducting and writing this article.

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Authors' Contributions

All authors equally contributed to this study.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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References

Ailsinghani, D., & Paliwal, A. C. (2025). A Study on Youth Perspectives Towards Marriage and Divorce in Ulhasnagar. *Ijept*, 199-211. https://doi.org/10.52783/ijept.31

Ali, B., Gulzar, F., & Ahmad, A. (2025). Causes of Divorce and Its Effects on the Socialization of Children: A Case Study of Tehsil Daggar District Buner. *QJSS*, *6*(1), 1-9. https://doi.org/10.55737/qjss.vi-i.25278

Au-Yeung, L., Tseng, C. Y., Tam, Y. K., & Tsai, P. A. (2025). Machine Learning Based Quantitative Structure–Dissolution Profile Relationship. *Journal of Chemical Information and Modeling*, *65*(12), 6273-6286. https://doi.org/10.1021/acs.jcim.5c00197

Bloome, D., Fomby, P., & Zhang, Y. (2023). Childhood Family Instability and Young-Adult Union Experiences: Black–White Differences in Outcomes and Effects. *Demography*, *60*(2), 379-410. https://doi.org/10.1215/00703370-10571816

Czepiel, D., Sijbrandij, M., Hoekstra, T., Ahrens, K. F., Eikelenboom, M., Giltay, E. J., Kalisch, R., Kok, A. A. L., Kollmann, B., Lieb, K., Melchior, M., Oppen, P. C. v., Penninx, B. W., Petri-Romão, P., Plichta, M. M., Reif, A., Rigotti, T., Schenk, C., Schick, A., . . . Ven, E. v. d. (2025). From Pre-Pandemic to Pandemic: Unravelling Mental Health Trajectories in Clinical and General Population Cohorts. https://doi.org/10.31219/osf.io/zykhn_v1

Edwards, A. C., Ohlsson, H., Salvatore, J. E., Stephenson, M., Crump, C., Sundquist, J., Sundquist, K., & Kendler, K. S. (2023). Divorce and Risk of Suicide Attempt: A Swedish National Study. *Psychological medicine*, *54*(8), 1620-1628. https://doi.org/10.1017/s0033291723003513

Felix, O., Adams, A., & Samuel, O. D. (2024). Effect and Management of Marital Conflicts Among Christian Couples in Kosofe Local Government Area, Lagos State, Nigeria. *Kampala International University Interdisciplinary Journal of Humanities and Social Sciences*, *5*(1), 21-40. https://doi.org/10.59568/kijhus-2024-5-1-02

Gao, J., & Sun, P. P. (2025). Unveiling the Relationship Between L2 Utterance Fluency and Perceived Fluency in Monologic and Dialogic Speaking. *Language and Speech*. https://doi.org/10.1177/00238309251352105

Hadi, F. H. (2025). Lasso Quintile Regression Model to Identify the Variables Influencing the Phenomenon of Divorce in Iraqi Population Commutes. *Journal of Al-Rafidain University College for Sciences (Print Issn 1681-6870 Online Issn 2790-2293)*, *56*(1), 380-390. https://doi.org/10.55562/jrucs.v56i1.34

khataybeh, Y. D. A., Obeidat, L. M., Al-Zubaidi, F. A., & Aljedayah, K. S. (2023). Problems of Social Media and Their Relation to Family Disintegration: Perspectives From Families in Northern Jordan. *Dirasat Human and Social Sciences*, *50*(3), 294-306. https://doi.org/10.35516/hum.v50i3.5413

Kuo, S. I., Thomas, N., Alıev, F., Bucholz, K. K., Dick, D. M., McCutcheon, V. V., Meyers, J. L., Chan, G., Kamarajan, C., Kramer, J. R., Hesselbrock, V., Plawecki, M. H., Porjesz, B., Tischfield, J. A., & Salvatore, J. E. (2023). Association of Parental Divorce, Discord, and Polygenic Risk With Children's Alcohol Initiation and Lifetime Risk for Alcohol Use Disorder. *Alcohol: Clinical and Experimental Research*, *47*(4), 724-735. https://doi.org/10.1111/acer.15042

Lim, M., & Mejia, C. S. (2024). Race and Cohort Differences in Family Status in the United States. *Socius Sociological Research for a Dynamic World*, *10*. https://doi.org/10.1177/23780231241241041

McClain, L. C., & NeJaime, D. (2023). The ALI Principles of the Law of Family Dissolution. 337-364. https://doi.org/10.1093/oso/9780197685341.003.0017

Muzi, S., Rogier, G., & Pace, C. S. (2022). Peer Power! Secure Peer Attachment Mediates the Effect of Parental Attachment on Depressive Withdrawal of Teenagers. *International journal of environmental research and public health*, *19*(7), 4068. https://doi.org/10.3390/ijerph19074068

Nwachukwu, C., Chládková, H., Moses, C. L., & Vu, H. M. (2022). Work-to-Family Conflict, Family Satisfaction and Engagement Nexus: Insights From Millennial Managers. *Industrial and Commercial Training*, *54*(3), 413-428. https://doi.org/10.1108/ict-10-2021-0071

Park, S. A. (2023). The Right to Claim Alimony for Divorce Against a Third Party and the Extinctive Prescription. *The Korean Society of Family Law*, *37*(2), 261-308. https://doi.org/10.31998/ksfl.2023.37.2.261

Rouch, I., Strippoli, M. P. F., Dorey, J. M., Laurent, B., Ranjbar, S., Marques-Vidal, P., Berna, C., Suter, M. R., Vaucher, J., Gunten, A. v., & Preisig, M. (2024). Early-Life Adversity Predicting the Incidence of Multisite Chronic Pain in the General Population. *European Psychiatry*, *67*(1). https://doi.org/10.1192/j.eurpsy.2024.1753

Sánchez, J. G. S. (2024). Resilience and Emotional Intelligence Levels in Military Personnel of the Spanish Army According to Marital Status. https://doi.org/10.20944/preprints202412.0786.v1

Shayesteh-Parto, F., Hasanpoor-Azghady, S. B., Arefi, S., & Amiri-Farahani, L. (2023). Infertility-Related Stress and Its Relationship With Emotional Divorce Among Iranian Infertile People. *BMC psychiatry*, *23*(1). https://doi.org/10.1186/s12888-023-05159-z

Sun, M. (2023). The Validity of the Commitment of "Divorce Without Property Rights" in the Jurisprudential Perspective. *Science of Law Journal*, *2*(8). https://doi.org/10.23977/law.2023.020805

Tan, O. (2025). Comorbidity of ADHD, but Not Tics, Has Detrimental Impact in Adults With OCD. *Current Psychiatry Research and Reviews*, *21*. https://doi.org/10.2174/0126660822346308250214114825

Trávníčková, M., & Kreidl, M. (2023). The Stability of Co-Residential Partnerships After First Birth: Did the 'Protective Effect of Marriage' Increase After 1989? *Czech Sociological Review*, *59*(1), 3-30. https://doi.org/10.13060/csr.2023.001

Ulu, A. E. (2022). Being Pregnant in Covid-19: Fear of Giving Birth, Fear of Covid-19, and Marital Adjustment. *4*(3). https://doi.org/10.35365/ctjpp.22.3.02

Wahring, I. V., Neyer, F. J., Hoppmann, C. A., Ram, N., & Gerstorf, D. (2025). Men and Women Transitioning to Singlehood in Young Adulthood and Midlife. *Psychology and Aging*, *40*(2), 117-136. https://doi.org/10.1037/pag0000859

Wandi, S. N. A., Zairi, A. N. A., Abdullah, N. C., & Rosidi, M. H. (2025). Triple Talaq in a Single Pronouncement: A Comparative Fatwa Analysis Within a Maqasid Al-Shariah Framework and Its Implications for Women's Rights. *International Journal of Research and Innovation in Social Science*, *IX*(VII), 53-62. https://doi.org/10.47772/ijriss.2025.907000005

Waraich, A., Jamil, M. S., Thakur, S. A., & Sulehry, M. A. K. (2025). Distinction Between Khula and Divorce Under Pakistani Law: A Doctrinal Analysis. *CRSSS*, *3*(2), 2370-2386. https://doi.org/10.59075/d0pmbj21