

PARENTAL ABSENCE AND CHILD DEVELOPMENT IN CHINA: A MULTIDIMENSIONAL ANALYSIS USING CFPS DATA AND MACHINE LEARNING APPROACHES

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BACKGROUND & MOTIVATION

- China's rapid urbanization has led to large-scale rural-to-urban migration, resulting in the "left-behind children" phenomenon.
- Parental absence may affect children's psychological, physical, and cognitive development.
- Existing research emphasizes parental involvement in child development, but the specific impact in China remains inconclusive.

RESEARCH QUESTIONS

- How does parental absence due to labor migration affect children's psychological, physical, and cognitive development?
- Do these effects vary by living arrangements (e.g., raised by grandparents) or geographic regions (urban vs. rural)?
- Can multimodal machine learning models improve predictions of child development outcomes?

METHODOLOGY

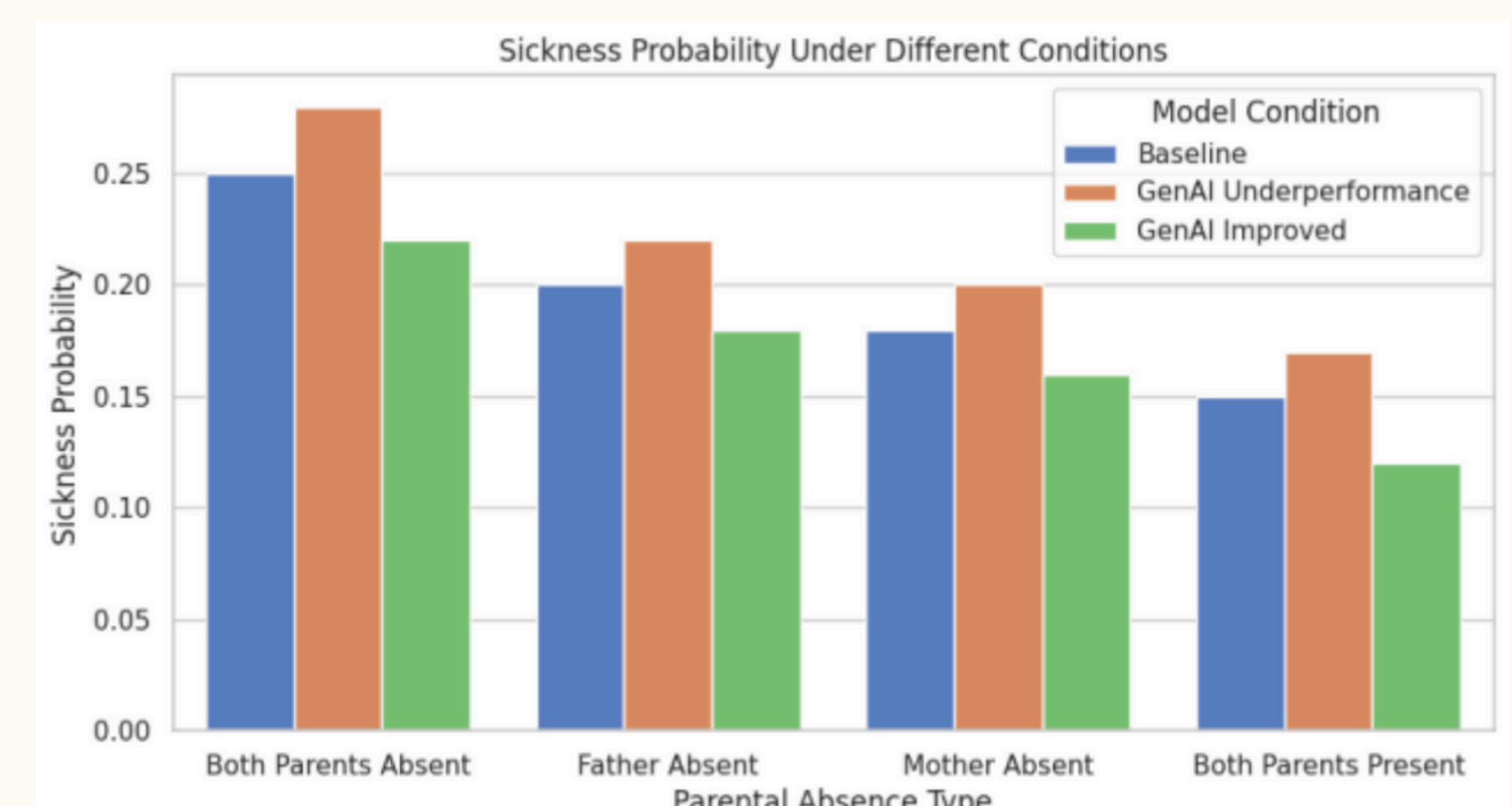
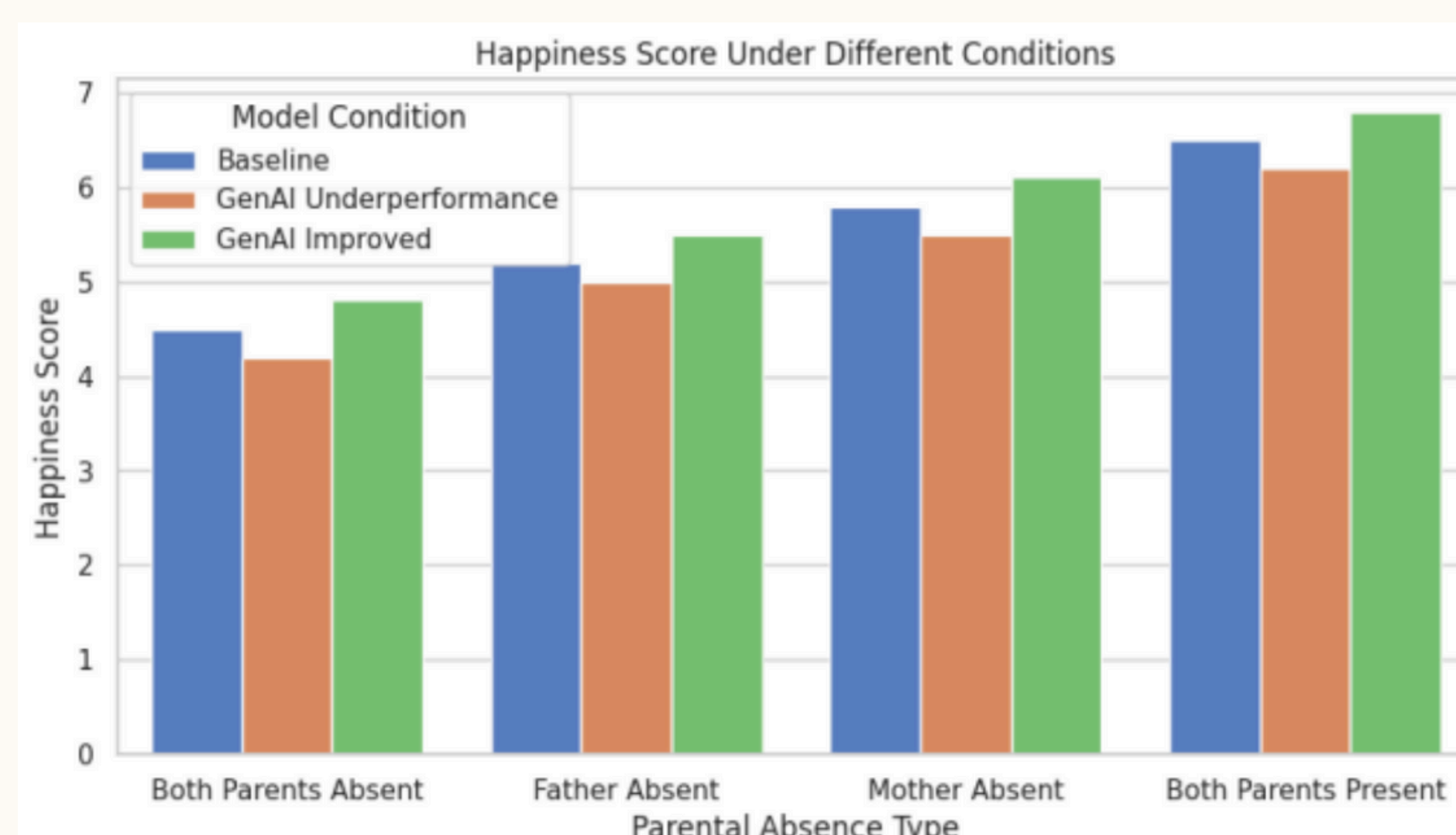
- Dataset: Using China Family Panel Studies (CFPS) data from 2010, 2012, and 2014.
- Key Variables:
 - Dependent Variables (Y): Self-reported happiness scores, likelihood of sickness in the past month, math and word test scores.
 - Independent Variables (X): Parental absence type (father absent, mother absent, both parents absent, both present), demographic factors (age, gender, family income), and community type (urban/rural).
- Analytical Approach:
 - Statistical models: Random-effects GLS regression (happiness), logistic regression (sickness), linear regression (cognitive scores).
 - Longitudinal analysis: Fixed-effects models to track developmental changes over time.
 - Machine learning: Multimodal models integrating numerical, textual, and geospatial data.

EXPECTED FINDINGS

- Maternal absence is expected to have a stronger negative impact than paternal absence, particularly on psychological and cognitive development.
- Rural children are likely to suffer more due to fewer available resources.
- Grandparental care provides some support but does not fully compensate for parental absence.
- Machine learning models may enhance predictive accuracy but require careful bias mitigation.

APPLICATIONS OF GENAI IN RESEARCH

- Literature Review: ChatGPT/Bard is used for automated literature summarization, improving efficiency but requiring human verification.
- Data Analysis: Hugging Face transformers apply NLP techniques to analyze parental influence on child well-being.
- Visualization: DALL-E generates conceptual illustrations to enhance research dissemination.



POLICY IMPLICATIONS

- Educational Policies: Relaxing hukou restrictions to allow migrant children to access urban education.
- Psychological Support: Community-based mental health programs to help left-behind children cope with emotional distress.
- AI-Driven Early Intervention: Machine learning models to identify at-risk children for targeted support.

ACADEMIC CONTRIBUTIONS & FUTURE DIRECTIONS

- Differentiates the impact of maternal vs. paternal absence on child development.
- Strengthens causal inference using longitudinal CFPS data.
- Applies machine learning to social science research, testing predictive models for child well-being.
- Provides policy insights to better support left-behind children.
- Exploring real-time AI-based monitoring of child development.
- Integrating additional datasets (e.g., national health databases) to validate findings.
- Investigating the long-term impact of parental reunification on children's well-being.

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