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Journal of Social Studies Education Research

Sosyal Bilgiler Eğitimi Araştırmaları Dergisi

2025:16 (3), 33-68

Enhancing Life Satisfaction Through Problem-Solving: The Mediating Impact of Financial Strain and Moderating Roles of Economic Hope and Education

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Abstract

This study examines the relationships among problem-solving (PS), perceived financial strain (PFS), economic hope (EH), education (ED), and life satisfaction (LS) across 32 countries with varying income levels, using data from 57,545 respondents. A moderated mediation model tests five hypotheses regarding their direct, mediating, and moderating effects. The findings show that problem-solving positively predicts life satisfaction (b = 0.371, p < .001), with financial strain serving as a mediator in this relationship, resulting in a significant indirect effect (b = -0.051, p < .001). Economic hope and education moderate these relationships, though their effects vary across high-income, upper-middle-income, and lower-middle-income countries. The study emphasizes the importance of problem-solving in improving life satisfaction, with economic hope and education as key buffers against financial strain. These results have important implications for policymakers, economic analysts, organizational leaders and managers, and educators. They advocate for solutions that enhance problem-solving skills, foster economic hope, and improve access to education to alleviate financial strain and promote global well-being.

Keywords: *Problem-solving, life satisfaction, perceived financial strain, economic hope, education.*

Introduction

Individuals today face increasing difficulty navigating the delicate balance between their personal strengths and the external threats posed by a rapidly changing world marked by economic instability and technological progress. Factors such as inflation, job loss, and rising income inequality have not only led to financial hardship but have, over time, contributed to the socioeconomic decline of entire nations, in some cases approaching conditions seen in developing countries. At the core of these dynamics are processes such as problem-solving, a significant life skill that plays a fundamental role in an individual's well-being and life satisfaction. Concurrently, perceived financial strain has emerged as a pivotal determinant of mental health and overall quality

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Received on 11.03.2025; Revised on 01.04.2025 and 07.07.2025; Accepted on 13.07.2025.

of life, underscoring the need for a deeper insight into its mediating role in the relationship between problem-solving and life satisfaction (Argabright et al., 2022; Ettman et al., 2023; Hertz-Palmor et al., 2021; Peltz et al., 2021; Rodrigues et al., 2023).

Existing research has consistently underscored the pivotal role of problem-solving in enhancing life satisfaction (Ayres & Malouff, 2007; McMillan & Morris, 2012). Research has linked effective problem-solving with positive outcomes, including improved mental health, strengthened interpersonal relationships, and increased life satisfaction (Çam et al., 2020; Wolfe & Patel, 2021; Xu et al., 2017). Although previous studies have consistently shown the beneficial influences of problem-solving capabilities on mental health and life satisfaction, little is known about the joint moderating roles of economic hope and education on these relationships, especially under various cultural and economic contexts. Nevertheless, in line with the conservation of resources theory (Hobfoll, 1989), individuals who have developed strong problem-solving skills are in a better position to protect their resources, and building up resources will make them less vulnerable to stress. Conversely, financial strain remains a profound stressor that negatively affects mental and psychological well-being (Hertz-Palmor et al., 2021; Peltz et al., 2021; Wolfe & Patel, 2021). Furthermore, financial pressures are particularly detrimental to vulnerable groups and are associated with increased stress, anxiety, and depressive symptoms, all directly related to lower life satisfaction (Argabright et al., 2022; Ettman et al., 2023; Rodrigues et al., 2023; Selenko & Batinic, 2011; Tarman & Eminanc, 2023).

Economic hope, or the positive expectation of one's future economic condition, has been found to buffer the negative consequences of stressful financial events (Hamarta, 2009; Snyder, 2002). According to Lybbert and Wydick (2018), hope creates resilience and adaptive decision-making, particularly in difficult financial situations. Education also works, as it provides individuals with the knowledge, skills, and tools they can leverage to overcome personal obstacles (Green, 2011). According to the human capital theory, proposed by Becker in 1964 and Schultz in 1961, investing in education can enhance economic productivity, emotional stability, and overall well-being. As Laureiro-Martinez et al. (2023) highlighted, attentional engagement is a crucial cognitive factor in enhancing the efficiency of problem-solving-type processes.

Unlike prior studies that primarily explore isolated relationships among these variables, this research uniquely integrates economic hope and education into a moderated mediation model.

Doing so extends the understanding of how these factors interact within a cross-cultural context encompassing 32 countries and diverse income levels. This research utilizes a moderated mediation model to address existing gaps by examining the relationships among problem-solving, perceived financial strain, economic hope, education, and life satisfaction. Specifically, this research employs Model 16 from Hayes (2022) to test five hypotheses that investigate direct, mediated, and moderated effects in these associations. MacKinnon et al. (2004) methodological insights also guide the statistical evaluation of these complex relationships.

This study seeks to address the following research questions: (1) What is the direct effect of problem-solving on life satisfaction? (2) Does perceived financial strain mediate the relationship between problem-solving and life satisfaction? (3) How does economic hope moderate the relationship between problem-solving and perceived financial strain? (4) How does education moderate the relationship between perceived financial strain and life satisfaction? (5) Do economic hope and education jointly moderate the indirect effect of problem-solving on life satisfaction through perceived financial strain?

This study aims to contribute to the body of knowledge by presenting a comprehensive model that integrates psychological and socio-economic factors influencing life satisfaction. Insights from existing literature offer valuable guidance for shaping policy recommendations and designing targeted interventions to enhance well-being and build resilience against financial stressors (Allas et al., 2020; Carr & Chung, 2014; Ettman et al., 2023; Rodrigues et al., 2023). Structured programs and policies that foster hope and resilience are crucial to mental health and overall life satisfaction (Özmen et al., 2021). Similarly, Seligman's (2004) findings highlight the importance of resilience and hope in fostering mental health and long-term well-being.

The following section presents a literature review relevant to the proposed model. It then presents the research method, data collection process, and in-depth analysis. The results and discussion sections follow.

Theoretical Background

Problem-solving is a cognitive process essential for identifying and resolving issues effectively. It significantly improves individual life satisfaction by overcoming challenges and achieving personal goals. As our next section will explore, problem-solving interacts with externally pressured stressors, such as financial strain. An early influential view of problem-solving was

pioneered by Newell and Simon (1972), who explored cognitive processes as part of human problem-solving and described how humans initiate and solve complex problems. This theory was expanded by D'Zurilla and Nezu (1990), who emphasized the role of effective problem-solving skills in mitigating stressors and improving mental health. Tallman et al. (1993) state that the social approach to problem-solving behavior centers on the idea that problems are best solved when a situation's cognitive and social aspects are mutually considered.

Research indicates that individuals who are strong problem-solvers tend to report better mental health, stronger social connections, and higher levels of life satisfaction (Ayres & Malouff, 2007; Xu et al., 2017). Structured problem-solving training and its impact on positive affect and job satisfaction have also been demonstrated to be meaningful (Ayres & Malouff, 2007), underscoring the importance of such training in fostering overall well-being in the workplace. Similarly, Xu et al. (2017) demonstrated that a specific adaptive coping style, specifically problem-solving, relates positively to well-being. The use of problem-solving strategies leads to higher life satisfaction, as it helps individuals deal with stress and adversity more effectively. Çam et al. (2020) found that self-efficacy mediates the relationship between problem-solving and hope, suggesting that individuals with effective problem-solving abilities have higher self-efficacy, which has a positive impact on their well-being and life satisfaction. Finally, research by Wolfe and Patel (2021) indicates that challenging financial circumstances are associated with psychological distress and negatively impact well-being.

Peltz et al. (2021) investigated the relationship between financial strain and work hours, sleep, and mental health among college students, highlighting the need for effective problem-solving of financial stressors to achieve better life satisfaction. In summary, problem-solving theory is centered on the idea that cognitive-behavioral processes are paramount in overcoming the stressors we encounter in daily life. Strong problem-solving skills will improve coping, stress management, and health and life satisfaction outcomes. Structured approaches, such as those proposed by Nezu (2004) and evident in the problem-solving strategies presented by D'Zurilla et al. (2004), highlight another potential area where targeted interventions could enhance these skills and their consequences.

Perceived financial strain refers to the subjective feelings of financial stress and insecurity, encompassing fears about the ability to fulfill financial obligations and overall economic well-

being. The financial strain theory highlights the indirect effects of economic stressors on mental and physical health, thereby underscoring the complexity of the relationship between financial burdens and overall well-being. Merton (1968) extended financial strain theory to explain how larger social structures contribute to financial strain and its direct link to well-being. Using a stress and coping model, Pearlin et al. (1981) provided the theoretical foundation for understanding financial strain as a risk factor for psychological distress, thereby establishing the association between economic hardship and poor mental health. The conservation of resources theory (Hobfoll, 1989) postulates that resource loss, including financial instability, is a core determinant of stress and diminished well-being.

Research underscores the detrimental effects of financial strain on mental health and life satisfaction. Wolfe and Patel (2021) state that individuals with strong problem-solving skills exhibit better financial stress management, which buffers against anxiety and improves overall well-being. Similarly, Peltz et al. (2021) investigated the impact of financial strain on college students, examining its effects on their sleep, working hours, and mental health. Ettman et al. (2023) demonstrated a significant association between financial strain and depression, highlighting the importance of financial adversity on mental health. This aligns with Selenko and Batinic (2011), who noted that financial strain moderates mental health outcomes.

The COVID-19 pandemic has intensified financial pressure, contributing to greater anxiety, depression, and lower life satisfaction. Job insecurity has also been linked to increased financial stress and poor mental health (Abbas et al., 2021). Sender et al. (2017) illustrated how job insecurity acts as a significant resource threat, amplifying psychological distress and financial strain. Rodrigues et al. (2023) concluded that economic instability during the pandemic significantly heightened psychological distress. Hertz-Palmor et al. (2021) examined income loss and depressive symptoms during this period, while Glenn et al. (2022) examined broader structural determinants, such as ideology and inequality, that influence financial strain. Alcover et al. (2022) emphasized the role of social support networks in mitigating the negative effects of financial strain. Hameed et al. (2024) stressed the importance of resilience and subjective well-being in the face of economic uncertainty.

These studies collectively highlight the importance of addressing financial stressors to enhance mental health and well-being. Developing good problem-solving skills and ensuring financial

security build resilience, helping manage stress and promote mental health. New technologies in education, reviewed by Lu and Xie (2024), show promise in fostering resilience and improving problem-solving skills. In conclusion, problem-solving and financial strain theories highlight the importance of cognitive-behavioral processes and economic stability in challenging situations. Together, they emphasize the role of developing problem-solving skills and financial security in building resilience and improving life satisfaction throughout the life course.

Economic hope is the optimistic belief about one's future economic prospects and the ability to achieve financial goals. Following human capital theory, economic hope validates individuals' decisions to invest more in education and skill development, enabling them to remain relevant in the face of automation and resulting in greater resilience and long-term life satisfaction. This psychological resource may serve as a buffer against the negative effects of financial stressors, thereby promoting resilience and enhancing mental health. Snyder's (2002) theoretical framework, known as the hope theory, posits that more hopeful individuals exhibit higher resilience and a greater ability to cope with stressors, thereby enhancing their well-being. Using this basis, Hamarta (2009) demonstrated that economic hope enhances individuals' coping skills in response to economic stressors. Those with high economic hope can resist uncertainty more strongly than others and will expect better times to come. Carr and Chung (2014) examined the moderating effect of labor market strategies on the relationship between employment insecurity and life satisfaction, indicating that the induction of labor market strategies that generate economic hope can enable individuals to maintain a positive perspective, regardless of financial stress. Lybbert and Wydick (2018) also examined the role of economic hope in poverty and aspirations, finding that higher levels of economic hope are associated with increased efforts to improve financial circumstances.

During the COVID-19 pandemic, economic hope was shown to play a critical role in enhancing mental health and resilience by mitigating the effects of financial strain (Hameed et al., 2024; Lemay Jr. et al., 2023). Pleeging and Burger (2020) further expanded on this perspective, highlighting the historical and multidisciplinary viewpoints of hope in economics and its importance in influencing economic behavior and decision-making. Similarly, Allas et al. (2020) analyzed the effects of the COVID-19 pandemic on life satisfaction in Europe by arguing that promoting economic hope can help lessen the detrimental impact of financial stressors.

Psychological resources, such as hope, play an important role in building resilience and well-being, bringing an important psychological angle to the conversation. Fostering economic hope in individuals is a way to manage stress better and think more positively.

Education has a significant impact on many life outcomes, including economic stability, job satisfaction, and overall well-being. Human capital theory posits that investing in education, training, and health effectively enhances productivity and economic performance, ultimately benefiting the well-being of both individuals and society. As such, education forms an integral part of human capital, as it enables individuals to harness their skills and knowledge optimally to tackle economic problems (Schultz, 1961). This theory was later extended by Becker (1964), who emphasized that educational investments enhance individuals' productivity and create economic stability. This theory states that one with higher levels of education will have better financial decision-making skills and will be more resilient to financial strain (Mincer, 1974). This finding was further supported by Green (2011), who found that higher educational achievement enables individuals to make informed decisions regarding financial matters, thereby reducing financial stress and increasing overall well-being. She et al. (2021) highlight that higher education provides people with the cognitive tools and skills, such as financial literacy and decision-making capabilities, necessary to educate themselves on complex financial issues, reduce financial strain, and enhance their well-being.

Carr and Chung (2014) examined the moderating role of labor market policies in the association between job insecurity and life satisfaction, suggesting that higher education levels buffer the negative impacts of job insecurity by equipping individuals with the skills and qualifications necessary to maintain stable employment in a competitive job market. Education's protective function is crucial for ensuring optimal well-being, particularly during economic crises. Hameed et al. (2024) emphasized the role of education in resilience during financial crises, acting as a buffer in economic uncertainty. McMillan and Morris (2012) illustrated how education provides an adaptive strategy for individuals to navigate stressors and improve life satisfaction. Education equips individuals with the skills and resources to overcome challenges, foster resilience, and improve overall well-being.

Life satisfaction is a cognitive assessment of an individual's overall quality of life, involving an evaluation of one's circumstances against personal standards and aspirations. As a key component

of subjective well-being, it encompasses both affective and cognitive dimensions (Diener, 1984; Kim-Prieto et al., 2005). High life satisfaction reflects a positive appraisal of one's life and is associated with numerous positive outcomes, including better mental health, stronger social relationships, and enhanced economic stability (Diener & Seligman, 2002; Easterlin, 2001). Easterlin (2001) found that increased income and economic security are positively correlated with higher life satisfaction, which in turn is related to better mental health and stronger social relationships. Roberts et al. (1983) were among the first to examine these connections, highlighting the relationship between service satisfaction, life satisfaction, and overall well-being. Building on this premise, Diener and Seligman (2002) investigated aspects of subjective well-being and identified life satisfaction as a crucial element in overall happiness and well-being. The research indicated that individuals with high life satisfaction tend to have better mental health and stronger relationships with others.

Green (2011) highlighted that higher educational attainment equips individuals with better coping strategies and resources to manage stress, fostering well-being and adaptability during economic crises. Additionally, McMillan and Morris (2012) demonstrated that effective problem-solving strategies mitigate the negative effects of work-life conflict, enhancing life satisfaction among executives. In addition, Oh and Yang (2022) examined the relationship between executive functions and life satisfaction in middle and later adulthood and found that coping strategies substantially increase life satisfaction. She et al. (2021) emphasized that higher education fosters life satisfaction by providing skills for financial stability, job fulfillment, and better problem-solving and coping mechanisms. Hameed et al. (2024) emphasize the importance of subjective well-being and resilience in navigating financial and social adversities, particularly during crises such as the COVID-19 pandemic. Life satisfaction is a multifaceted construct encompassing cognitive and emotional evaluations of one's overall quality of life. It is closely tied to personal attributes, such as education, problem-solving skills, and coping strategies, as well as external factors, including economic stability, social support, and resilience.

Research has applied problem-solving theory in various contexts, including mental health and coping strategies (Ayres & Malouff, 2007; Çam et al., 2020; D'Zurilla & Nezu, 1990; D'Zurilla et al., 2004; Heppner & Petersen, 1982; Nezu, 2004; Peltz et al., 2021; Wolfe & Patel, 2021; Xu et al., 2017). Indeed, problem-solving theory closely aligns with resilience and stress management

approaches by incorporating cognitive-behavioral techniques. Proper problem-solving enables individuals to manage stress and anxiety by developing adaptive coping mechanisms and making proactive choices, which are crucial during economic hardship. Specific problem-solving methods ease financial challenges by providing structured frameworks to tackle problems and decrease uncertainty. This study contributes to problem-solving theory by examining the relationship between problem-solving skills and life satisfaction. Cognitive-behavioral processes can buffer the negative effects of financial stress, promoting better well-being and life satisfaction. Within financial strain theory, problem-solving skills serve as critical psychological resources that mitigate the negative effects of financial strain.

This research also expands problem-solving theory by incorporating economic hope and education as essential resources in the problem-solving process. This nuanced understanding highlights the importance of cognitive-behavioral processes and resource interactions in mitigating financial strain. By focusing on protective factors that foster resilience and overall life satisfaction, this study explores the roles of economic hope and education in enhancing problem-solving skills. The integration of decision-making and problem-solving theories provides a comprehensive perspective on addressing wellness through the lens of financial and stress-related challenges. Together, these theoretical frameworks highlight the multidimensional nature of well-being, emphasizing the relationship of cognitive processes, psychological resources, and socio-economic conditions in fostering resilience and life satisfaction.

Data and Methodology

Participants and procedure: This study utilized cross-sectional data from online surveys conducted between March 2020 and July 2021. Recruitment was conducted across various avenues (e.g., social media, email invitations, online forums, and paid online panels) to ensure a diverse and representative sample. Recruitment employed a combination of convenience sampling, snowball sampling, and paid procedures to reach a wide array of participants. Additionally, paid online panels in key countries were utilized to achieve national representativeness and complement self-selected responses.

The study recruited 64,426 participants from 115 countries in 30 languages. After applying inclusion criteria (countries with ≥100 respondents) and using listwise deletion for missing data,

the final dataset consisted of 57,545 valid cases. Countries were clustered into high-income, upper-middle-income, and lower-middle-income levels based on World Bank classifications (2024) to ensure reliable estimates (Little & Rubin, 2019). Data for the current study were derived from the PsyCorona Study, a global psychological survey designed to understand at-risk behaviors and the psychological impact during a global pandemic. The data used in this research serves as a promising dataset to explore the relationships between life satisfaction, perceived financial strain, problem-solving capabilities, economic hope, and education. Hence, this large amount of data provides valuable insights into how these variables interact in the context of the global health crisis.

Ethical Considerations: The ethical survey committee authorized the PsyCorona survey for the University of Groningen and New York University Abu Dhabi. Before the survey, participants were asked to provide informed consent through an online form. This format provided detailed information about the study's objectives, methods, risks, and benefits. For participant confidentiality and privacy, participant data were anonymized prior to analysis, in accordance with the guidelines of the relevant ethics committee.

Sample Description: This study's sample included participants from 32 countries, categorized into three income-based clusters to ensure a diverse and representative demographic. The total sample size after listwise deletion was 57,545 participants, with 65.8% (37,848) from high-income countries (16 countries), 27.7% (15,955) from upper-middle-income countries (11 countries), and 6.5% (3,742) from lower-middle-income countries (5 countries), comprehensively representing different economic contexts in the study. To analyze the variables comprehensively, detailed demographic information, including age, gender, and education level, were collected.

Gender Distribution: The sample's gender distribution was as follows: 61.2% of participants identified as female, 38.3% identified as male, and 0.5% identified as other.

Age Distribution: Participants ranged from 18 to 85+ years. The age distribution of the sample was as follows: 23.3% of participants were aged 18-24, 23.9% were aged 25-34, 19.0% were aged 35-44, 14.5% were aged 45-54, 11.1% were aged 55-64, 7.1% were aged 65-75, 1.0% were aged 75-85, and 0.1% were aged 85+. A very small percentage (0.1%) did not report their age.

Education Levels: 1.5% of participants had primary education, 13.5% had general secondary education, 9.9% had vocational education, 23.3% had higher education, 31.0% held a bachelor's

degree, 15.9% held a master's degree, and 4.9% held a PhD degree.

Table 1

Selected Countries Based on Respondents (≥100) By Income Level

Income level	Country	Number of respondents	Percent (%)
High-income countries	Australia	1,216	2.1%
	Canada	1,533	2.7%
	France	1,792	3.1%
	Germany	1,695	2.9%
	Greece	2,910	5.1%
	Hungary	439	0.8%
	Italy	1,987	3.5%
	Japan	1,318	2.3%
	Netherlands	2,430	4.2%
	Poland	710	1.2%
	Romania	2,673	4.6%
	Saudi Arabia	1,437	2.5%
	South Korea	1,442	2.5%
	Spain	3,218	5.6%
	United Kingdom	1,933	3.4%
	United States	11,115	19.3%
Total		37,848	65.8%
Upper middle-income countries	Argentina	1,396	2.4%
	Brazil	1,387	2.4%
	China	1,554	2.7%
	Indonesia	2,379	4.1%
	Kazakhstan	806	1.4%
	Kosovo	786	1.4%
	Malaysia	888	1.5%
	Republic of Serbia	2,099	3.6%
	Russia	1,442	2.5%
	South Africa	1,418	2.5%
	Turkey	1,800	3.1%
Total		15,955	27.7%
Lower middle-income countries	Bangladesh	152	0.3%
	Egypt	1,106	1.9%
	Pakistan	720	1.3%
	Philippines	1,520	2.6%
	Vietnam	244	0.4%
Total		3,742	6.5%
The total included respondents		57,545	100.0%

Measurement Tools: The scales used in the survey were developed and validated by the PsyCorona team, a group of experienced scientists from various international institutions. This ensured the reliability and validity of their assessment of factors related to the COVID-19 pandemic (Agostini et al., 2022).

Perceived financial strain scale: This scale was developed by Elissa El Khawli, as referenced in Selenko and Batinic (2011), and was initially adopted from their study. Participants' perceived financial strain was assessed using three items to measure their financial stress. They were asked to rate their agreement with the following statements: "Agree or disagree: I am financially strained", "Agree or disagree: I often think about my current financial situation", and "Agree or disagree: Due to my financial situation, I have difficulties paying for my expenses". Each item was rated on a scale from -2 (*strongly disagree*) to 2 (*strongly agree*). The responses to these items were averaged to create an overall perceived financial strain score, with higher values indicating more significant financial strain.

Problem-solving scale: The problem-solving measure used in this study was developed by Elissa El Khawli, as referenced in Carver et al. (1989). The measure was initially adopted from their study on assessing coping strategies. Participants' problem-solving abilities were assessed using three items to measure their strategies for dealing with stressful situations. They were asked to rate their agreement with the following statements: "When dealing with stressful situations, what do you usually do? - I try to devise a strategy about what to do", "When dealing with stressful situations, what do you usually do? - I make a plan of action", and "When dealing with stressful situations, what do you usually do? - I think hard about what steps to take". Items were rated on a scale from 1 (*never*) to 5 (*very often*). The responses of these items were averaged to create an overall problem-solving score, with higher values indicating better problem-solving abilities.

Life satisfaction scale: Participants assessed their life satisfaction using three key items to measure happiness, life satisfaction, and a sense of purpose. They were asked to rate their agreement with the following statements: "In general, how happy would you say you are?" on a scale from 1 (*extremely unhappy*) to 10 (*extremely happy*); "In general, how satisfied are you with your life?" on a scale from 1 (*very dissatisfied*) to 6 (*very satisfied*); and "My life has a clear sense of purpose" on a scale from -3 (*strongly disagree*) to 3 (*strongly agree*). The responses of these items were averaged to produce an overall life satisfaction score, with higher scores indicating greater life

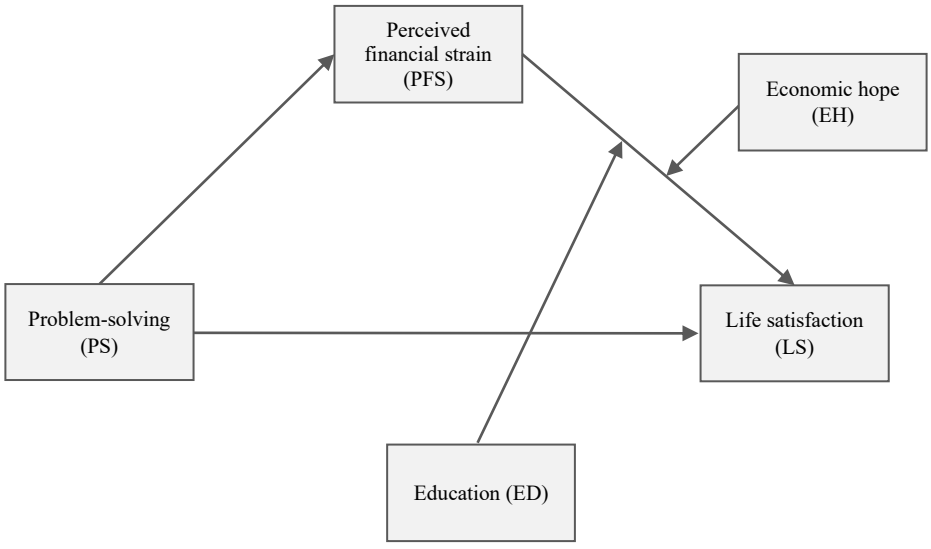
satisfaction.

Covariates: This analysis included education and economic hope as covariates, due to their potential confounding effects on the outcomes. Education was defined as the highest education level attained, grouped into primary education, general secondary education, vocational education, higher education, bachelor's education, master's education, and PhD education. Using these covariates could help us avoid confounding variables and provide a more accurate and comprehensive understanding of the relationships we studied. Participants rated their economic hope with the item: "Do you agree or disagree: I have high hopes that the situation regarding the economic and financial consequences of coronavirus will get better". The item was rated on a scale ranging from -3 to 3, where -3 represented "*strongly disagree*" and 3 represented "*strongly agree*". Ben Gützkow, Max Agostini, Elissa El Khawli, Jannis Kreienkamp, and Anne-Margit Reitsema contributed to this measure, which was included to capture participants' optimism about economic recovery.

Statistical analysis: The PROCESS macro (Hayes, 2022) was employed for mediation analysis, which integrates moderation and mediation into a conditional process model. Bootstrapping was employed to provide bias-corrected confidence intervals and enhance statistical power, ensuring the robustness of the results. Version 22 of SPSS software was employed for the data analysis.

Figure 1

Research model



To evaluate the proposed hypotheses, a moderated mediation model will be used to assess the relationships between problem-solving, perceived financial strain, economic hope, education, and life satisfaction. The analysis explores direct, mediated, and moderated pathways to understand how problem-solving affects life satisfaction.

Hypotheses:

H_1: *Problem-solving (PS) has a significant positive direct effect on life satisfaction (LS).*

H_2: *Perceived financial strain (PFS) mediates the relationship between problem-solving (PS) and life satisfaction (LS).*

H_3: *Economic hope (EH) moderates the relationship between problem-solving (PS) and perceived financial strain (PFS), and higher levels of economic hope strengthen the negative relationship between PS and PFS.*

H_4: *Education (ED) moderates the relationship between perceived financial strain (PFS) and life satisfaction (LS), with higher levels of education mitigating the negative effect of PFS on LS.*

H_5: *The indirect effect of problem-solving (PS) on life satisfaction (LS) through perceived financial strain (PFS) is moderated by both economic hope (EH) and education (ED), such that the indirect effect is greater for individuals with higher levels of EH and ED.*

These hypotheses explore the mediating role of perceived financial strain and the moderating effects of economic hope and education on the relationship between problem-solving and life satisfaction.

The following equations illustrate the tested relationships with specified direct, mediating, and moderating effects.

Model specification:

1. **The direct effect of problem-solving (PS) on life satisfaction (LS)** (H_1):

$$LS = b_1 \cdot PS + c \cdot \text{control variables} + \epsilon_1 \quad (1)$$

In this equation, PS has a direct effect on LS, where b_1 represents the coefficient for PS, c captures the effects of control variables (if included), and ϵ_1 denotes the error term.

2. **The mediating effect of perceived financial strain (PFS)** *(H_2)*:

   Path 1 (PS → PFS):

   $$PFS = a_1 \cdot PS + d_1 \cdot \text{control variables} + \epsilon_2 \quad (2)$$

   Path 2 (PFS → LS):

   $$LS = b_2 \cdot PFS + c' \cdot PS + e_1 \cdot \text{control variables} + \epsilon_3 \quad (3)$$

   Here, PFS is the mediator. a_1 represents the effect of PS on PFS, and b_2 represents the effect of PFS on LS. The term **c'** denotes the direct effect of PS on LS after accounting for the mediator. e_1 is the error term for the PFS equation, and e_3 is the error term for the LS equation.

3. **The moderating effect of economic hope (EH) on the PS → PFS path** *(H_3)*:

   $$PFS = a_2 \cdot PS + a_3 \cdot EH + a_4 \cdot (PS \cdot EH) + d_2 \cdot \text{control variables} + \epsilon_2 \quad (4)$$

   This equation tests whether EH moderates the relationship between PS and PFS. The term a_4 captures the interaction effect between PS and EH. a_2 represents the main effect of PS, while a_3 represents the main effect of EH.

4. **The moderating effect of education (ED) on the PFS → LS path** *(H_4)*:

   $$LS = b_3 \cdot PFS + b_4 \cdot ED + b_5 \cdot (PFS \cdot ED) + c' \cdot PS + e_2 \cdot \text{control variables} + \epsilon_3 \quad (5)$$

   This equation tests whether ED moderates the relationship between PFS and LS. The term b_5 captures the interaction effect between PFS and ED, while b_3 represents the main effect of PFS on LS, and b_4 represents the main effect of ED on LS.

5. **The moderated mediation effect** *(H_5)*:

   In this case, the indirect effect of PS on LS through PFS is moderated by both EH and ED. This requires combining the moderating effect of EH on the PS → PFS path and ED on the PFS → LS path. EH moderates the PS → PFS relationship, while ED moderates the PFS → LS relationship.

6. **The moderated mediation effect can thus be expressed as the product of the moderated paths:**

$$\text{Indirect effect of PS on LS through PFS} = (a_1 + a_4 \cdot EH) \cdot (b_2 + b_5 \cdot ED) \quad (6)$$

This represents the indirect effect of PS on LS through PFS, moderated by both EH and ED.

Results

Descriptive statistics: In the Table 2 are summarized the descriptive statistics associated with the primary measures of this study. This table provides an overview of the mean scores, standard deviations, and reliability coefficients (*Cronbach's alpha*) for problem-solving, life satisfaction, perceived financial strain, economic hope, and education. The resulting statistics provide valuable insights into the central tendencies and variability of the key variables, as well as the internal consistency of the scales used in the study.

Table 2

Descriptive Statistics for Key Measures

Measure	*M*, SD	Min, Max	Cronbach's alpha (α)
Problem-solving (PS)	3.34 (0.63)	1, 5	0.838
Life satisfaction (LS)	0.11 (1.04)	-2, 2	0.782
Perceived financial strain (PFS)	3.78 (1.37)	-0.33, 6.33	0.845
Economic hope (EH)	0.6 (1.74)	-3, 3	-
Education (ED)	4.36 (1.43)	1, 7	-

Note: Listwise deletion was employed to handle missing data, ensuring that only cases with complete information across all variables were included in the analysis. M = Mean, SD = Standard Deviation, Min = Minimum, Max = Maximum, Cronbach's alpha = Internal consistency reliability.

Notably, the problem-solving scale revealed a mean of 3.34 and a standard deviation of 0.63, suggesting that participants had moderate problem-solving skills. Life satisfaction has a mean of 0.11 (SD = 1.04), indicating variability in individuals' satisfaction with their lives. The perceived financial strain has a mean of 3.78, with a standard deviation of 1.37, indicating that many participants experience financial strain. Economic hope has a mean of 0.6 and a standard deviation of 1.74, indicating mixed sentiments regarding economic and financial optimism. The education levels have a mean of 4.36 with a standard deviation of 1.43, indicating a range of educational attainment among participants.

The values of Cronbach's alpha indicate the internal consistency of the scales, with PS at 0.838, LS at 0.782, and PFS at 0.845, all of which show good reliability. The Cronbach's alpha was not calculated for EH and ED, as they are single-item measures.

Correlation analysis: Next, we explore the relationships between these key measures through Pearson correlation analyses. Table 3 presents Pearson correlations among the key measures.

Table 3

Correlations Among Key Measures

Measure	1	2	3	4
1. Problem-solving (PS)	1.00	0.165**	0.079**	0.087**
2. Life satisfaction (LS)	0.165**	1.00	-0.298**	0.215**
3. Perceived financial strain (PFS)	0.079**	-0.298**	1.00	-0.050**
4. Economic hope (EH)	0.087**	0.215**	-0.050**	1.00
5. Education (ED)	0.053**	0.094**	-0.139**	-0.054**

Note: $p < 0.01$ (2-tailed).

Problem-solving is positively correlated with life satisfaction ($r = 0.165$, $p < .01$), indicating that individuals with greater problem-solving abilities tend to report higher life satisfaction. PS also shows a small positive correlation with economic hope ($r = 0.087$, $p < .01$), perceived financial strain ($r = 0.079$, $p < .01$), and education ($r = 0.053$, $p < .01$).

Life satisfaction is negatively correlated with perceived financial strain ($r = -0.298$, $p < .01$) but positively correlated with economic hope ($r = 0.215$, $p < .01$) and education ($r = 0.094$, $p < .01$). These findings suggest that higher life satisfaction is linked with lower perceived financial strain, higher economic hope, and higher education levels.

Whereas the perceived financial strain is negatively correlated with economic hope ($r = -0.050$, $p < .01$) and education ($r = -0.139$, $p < .01$), indicating that financial strain is linked with reduced economic hope and lower education levels. Economic hope, in turn, shows a small negative correlation with education ($r = -0.054$, $p < .01$). While these correlations are statistically significant, their small effect sizes suggest minimal practical relevance.

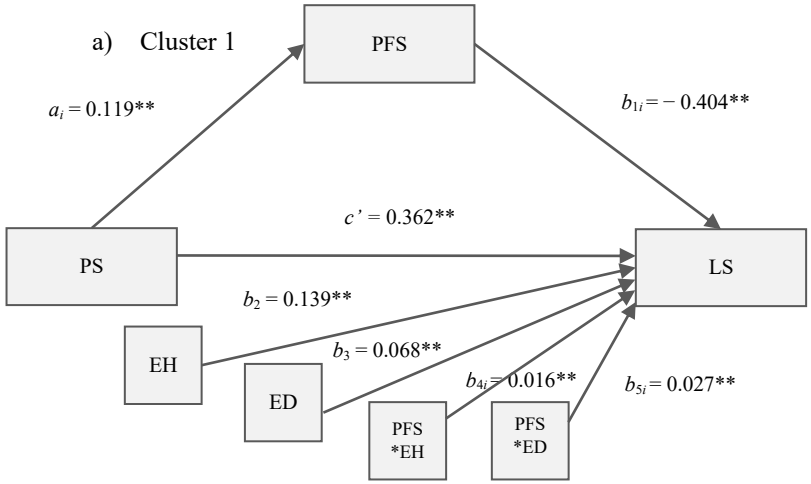
These correlations highlight the relationships among problem-solving, life satisfaction, perceived financial strain, economic hope, and education, providing insight into how these variables interact with one another. They provide preliminary support for the study's hypotheses, particularly the relationships tested in the proposed moderated mediation model.

Mediation Analysis: The mediation effects were examined using the PROCESS macro developed by Hayes (2022), specifically Model 16. A conditional indirect model was used to assess the mediating impact of perceived financial strain and the moderating effects of economic hope and education on both direct and indirect pathways. A bootstrapping method with 5,000 samples was used to estimate the indirect effects, along with 95% bias-corrected confidence intervals. This approach helps obtain accurate estimates and address non-normality in the sampling distribution. MacKinnon et al. (2004) state that bias-corrected bootstrapping provides the most valid confidence intervals and highest statistical power, particularly in complex mediation models.

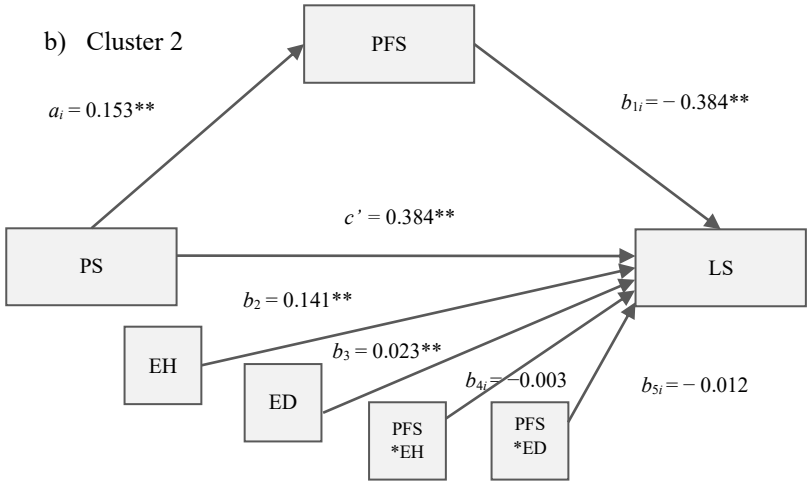
The mediation analysis provides critical insights into the mechanisms underlying the relationships between problem-solving, perceived financial strain, and life satisfaction, moderated by economic hope and education. The findings, including direct, indirect, and moderated effects, are presented in Figure 2, Table 4, and Table 5, providing a comprehensive overview of the mediation pathways and statistical results.

Figure 2

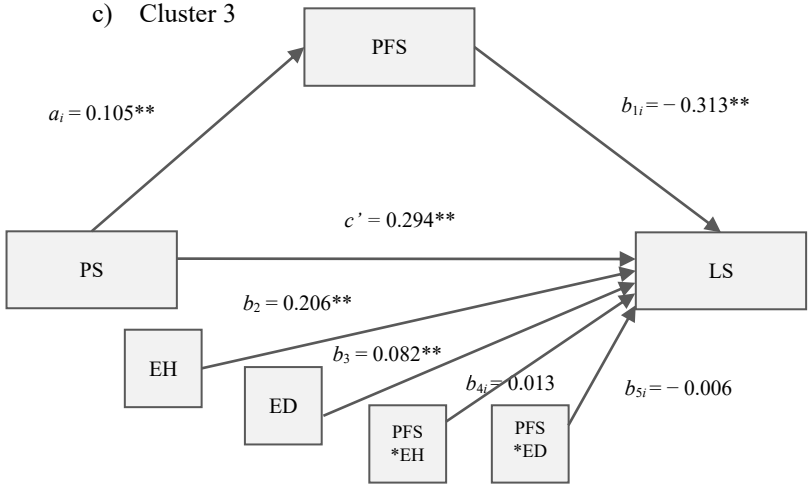
Serial Mediation Models



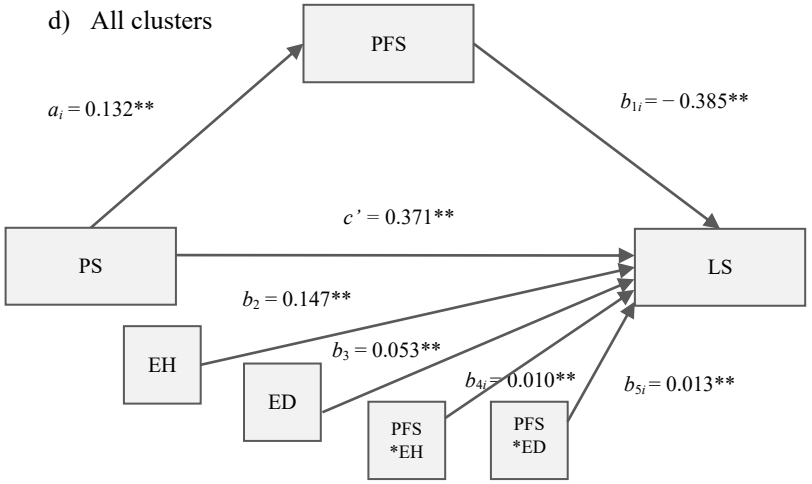
Note: *$p < 0.01$; **$p < 0.001$



Note: *$p < 0.01$; **$p < 0.001$



Note: *$p < 0.01$; **$p < 0.001$



Note: *$p < 0.01$; **$p < 0.001$

Cluster 1 model: PS had a significant positive effect on PFS (*path* a_1i: $b = 0.119$, $p < .001$), which in turn had a significant negative effect on LS (*path*b_1i: $b = -0.404$, $p < .001$). EH showed a significant positive effect on LS (*path*b_2: $b = 0.139$, $p < .001$) and positively moderated the effect of PFS on LS (*path*b_4i: $b = 0.016$, $p < .001$). ED also had a significant positive effect on LS (*path*b_3: $b = 0.068$, $p < .001$) and positively moderated the relationship between PFS and LS (*path*b_5i: $b = 0.027$, $p < .001$). The direct effect of PS on LS remained significant (*pathc'*: $b = 0.362$, $p < .001$).

Cluster 2 model: PS had a significant positive effect on PFS (*path* a_1i: $b = 0.153$, $p < .001$), which in turn had a significant negative effect on LS (*path*b_1i: $b = -0.384$, $p < .001$). EH showed a significant positive effect on LS (*path*b_2: $b = 0.141$, $p < .001$), and ED also significantly affected LS (*path*b_3: $b = 0.023$, $p = .002$). However, the interaction between PFS and EH (*path*b_4i: $b = -0.003$, $p = .538$) and between PFS and ED (*path*b_5i: $b = -0.012$, $p = .074$) were not statistically significant. The direct effect of PS on LS remained significant (*pathc'*: $b = 0.384$, $p < .001$).

Cluster 3 model: PS had a significant positive effect on PFS (*path* a_1i: $b = 0.105$, $p < .001$), which in turn had a significant negative effect on LS (*path*b_1i: $b = -0.313$, $p < .001$). EH showed a significant positive effect on LS (*path*b_2: $b = 0.206$, $p < .001$), and ED also had a significant positive effect on LS (*path*b_3: $b = 0.082$, $p < .001$). However, the relationship between PFS and EH (*path*b_4i: $b = -0.013$, $p = .306$) and between PFS and ED (*path*b_5i: $b = -0.006$, $p = .704$) were not statistically significant. The direct effect of PS on LS remained significant (*pathc'*: $b = 0.294$, $p < .001$).

All clusters model: PS significantly positively affected PFS (*path*a_i: $b = 0.132$, $p < .001$), which in turn had a significant negative effect on LS (*path*b_1: $b = -0.385$, $p < .001$). EH had a significant positive effect on LS (*path*b_2: $b = 0.147$, $p < .001$) and positively moderated the effect of PFS on LS (*path*b_4i: $b = 0.010$, $p < .001$). ED also had a significant positive effect on LS (*path*b_3: $b = 0.053$, $p < .001$) and positively moderated the effect of PFS on LS (*path*b_5i: $b = 0.013$, $p < .001$). The direct effect of PS on LS remained significant (*pathc'*: $b = 0.371$, $p < .001$).

Our moderated mediation analysis demonstrates that PS significantly impacts LS through both direct and indirect pathways. The total effect (*c*') of PS on LS was significant across all clusters, indicating the presence of complementary mediation, as defined by Zhao et al. (2010). The indirect effects through PFS ($a_1 \rightarrow b_1i$), and the positive effects of EH (b_2), and the combined indirect pathway involving both moderators, EH and ED ($a_1 \rightarrow b_4i \rightarrow b_5i$), all significantly contribute to

this relationship. This pattern suggests that while PS directly enhances LS, it also indirectly improves LS by reducing PFS, which subsequently boosts EH and ED. These improvements in psychological and educational resources further strengthen overall life satisfaction.

Table 4 presents the path coefficients from hierarchical regression analyses across all models, while Table 5 presents the direct and indirect effects from the moderated mediation analysis across all income clusters.

Table 4

Path Coefficients for Hierarchical Regressions Across All Models

Model	PS → PFS (path a_i)	PS → LS (path c')	PFS → LS (path b_1i)	EH → LS (path b_2)	PFS x EH → LS (path b_4i)	ED → LS (path b_3)	PFS x ED → LS (path b_5i)
Cluster 1[a]	*b* = 0.119 (0.001**)	*b* = 0.362 (0.001**)	*b* = - 0.404 (0.001**)	*b* = 0.139 (0.001**)	*b* = 0.016 (0.001**)	*b* = 0.068 (0.001**)	*b* = 0.027 (0.001**)
Cluster 2[b]	*b* = 0.153 (0.001**)	*b* = 0.384 (0.001**)	*b* = - 0.384 (0.001**)	*b* = 0.141 (0.001**)	*b* = - 0.003 (0.538)	*b* = 0.023 (0.002**)	*b* = - 0.012 (0.074)
Cluster 3[c]	*b* = 0.105 (0.001**)	*b* = 0.294 (0.001**)	*b* = - 0.313 (0.001**)	*b* = 0.206 (0.001**)	*b* = - 0.013 (0.306)	*b* = 0.082 (0.001**)	*b* = - 0.006 (0.704)
All clusters	*b* = 0.132 (0.001**)	*b* = 0.371 (0.001**)	*b* = - 0.385 (0.001**)	*b* = 0.147 (0.001**)	*b* = 0.010 (0.001**)	*b* = 0.053 (0.001**)	*b* = 0.013 (0.001**)

Note: In paths values are presented unstandardized coefficients B, whereas within the parentheses are the *p* values.
*$p < 0.01$; **$p < 0.001$

a High-income country
b Upper middle-income countries
c Lower middle-income countries

Table 5

Direct and Indirect Effects of Moderated Mediation Analysis Across All Clusters

Model	Direct Effect (c')	SE	95% CI	Indirect Effect (PFS) (aib_1i)	SE	95% CI	Indirect Effect (EH) (b_2)	SE	95% CI	Indirect Effect (PFS × EH) (aib_4ib_5i)	SE	95% CI	Total Effect (c' + indirect effects)	SE	95% CI
Cluster 1[a]	0.362	0.010	[0.342, 0.382]	-0.048	0.004	[-0.056, -0.040]	-0.056	0.005	[-0.065, -0.047]	-0.050	0.004	[-0.057, -0.041]	0.362	0.010	[0.342, 0.382]
Cluster 2[b]	0.384	0.016	[0.353, 0.416]	-0.059	0.006	[-0.070, -0.048]	-0.055	0.006	[-0.067, -0.044]	-0.062	0.006	[-0.075, -0.050]	0.384	0.016	[0.353, 0.416]
Cluster 3[c]	0.294	0.031	[0.233, 0.355]	-0.033	0.009	[-0.050, -0.017]	-0.030	0.009	[-0.049, -0.014]	-0.036	0.010	[-0.055, -0.018]	0.294	0.031	[0.233, 0.355]
All clusters	0.371	0.008	[0.354, 0.387]	-0.051	0.003	[-0.057, -0.045]	-0.056	0.003	[-0.062, -0.049]	-0.048	0.003	[-0.054, -0.043]	0.371	0.008	[0.354, 0.387]

Note: $p < 0.01$ (2-tailed).

b: Effect size
SE: Standard Error
CI: Confidence Interval

a High-income country
b Upper middle-income countries
c Lower middle-income countries

Hypotheses Testing

Hypothesis 1: Problem-solving (PS) has a significant and positive direct effect on life satisfaction (LS). The regression analyses confirmed that problem-solving is significantly and positively related to life satisfaction across all clusters. *Cluster 1*: A significant positive relationship was observed (b = 0.362, SE = 0.010, 95% CI [0.342, 0.382]), with the model explaining 17.0% of the variance in life satisfaction (R = 0.413, R^2 = 0.170, F(6, 37823) = 1293.866, p < .001). *Cluster 2*: Consistent with cluster 1, regression results showed a significant positive relationship (b = 0.384, SE = 0.016, 95% CI [0.353, 0.416]), explaining 15.5% of the variance in life satisfaction (R = 0.394, R^2 = 0.155, F(6, 15933) = 486.961, p < .001). *Cluster 3*: Problem-solving remained a significant predictor of higher life satisfaction (b = 0.294, SE = 0.031, 95% CI [0.233, 0.355]), accounting for 15.1% of the variance (R = 0.389, R^2 = 0.151, F(6, 3724) = 110.667, p < .001). *All clusters:* The relationship persisted, with problem-solving significantly predicting higher life satisfaction (b = 0.371, SE = 0.008, 95% CI [0.354, 0.387]), explaining 16.1% of the variance (R = 0.401, R^2 = 0.161, F(6, 57494) = 1840.465, p < .001).

These results robustly support H_1, demonstrating that problem-solving consistently predicts higher life satisfaction across all clusters, with explained variance ranging from 15.1% to 17.0%. This underscores the critical role of problem-solving abilities in promoting well-being and offers strong empirical support for the study's theoretical framework.

Hypothesis 2: Perceived financial strain (PFS) mediates the relationship between problem-solving (PS) and life satisfaction (LS). The regression analyses confirmed that perceived financial strain significantly mediates the relationship between problem-solving and life satisfaction across all clusters. *Cluster 1:* Mediation analysis indicated a significant indirect effect of problem-solving on life satisfaction through perceived financial strain (b = -0.048, SE = 0.004, 95% CI [-0.056, -0.040]), explaining 17.0% of the variance in life satisfaction (R = 0.413, R^2 = 0.170, F(6, 37823) = 1293.866, p < .001). *Cluster 2:* Consistent with cluster 1, mediation analysis showed a significant indirect effect (b = -0.059, SE = 0.006, 95% CI [-0.070, -0.048]), accounting for 15.5% of the variance in life satisfaction (R = 0.394, R^2 = 0.155, F(6, 15933) = 486.961, p < .001). *Cluster 3:* Perceived financial strain continued to significantly mediate the relationship between problem-solving and life satisfaction (b = -0.033, SE = 0.009, 95% CI [-0.050, -0.017]), with the model explaining 15.1% of the variance (R = 0.389, R^2 = 0.151, F(6, 3724) = 110.667, p < .001). *All*

clusters: The mediation effect held across all clusters, with perceived financial strain significantly mediating the relationship between problem-solving and life satisfaction (b = -0.051, SE = 0.003, 95% CI [-0.057, -0.045]), accounting for 16.1% of the variance (R = 0.401, R^2 = 0.161, $F(6, 57494)$ = 1840.465, $p < .001$).

These results strongly support H_2, highlighting the critical role of perceived financial strain as a mediator in the relationship between problem-solving and life satisfaction. The explained variance across clusters ranges from 15.1% to 17.0%, reinforcing the robustness of this mediating effect.

Hypothesis 3: Economic hope (EH) moderates the relationship between problem-solving (PS) and perceived financial strain (PFS), such that higher levels of economic hope strengthen the negative relationship between PS and PFS. The regression analyses tested whether economic hope moderates the relationship between problem-solving and perceived financial strain across all clusters. *Cluster 1:* Moderation analysis indicated that economic hope significantly moderates the relationship between problem-solving and perceived financial strain. The interaction term (PS × EH) was significant (b = 0.016, SE = 0.003, 95% CI [0.009, 0.022], $p < .001$), suggesting that higher levels of economic hope strengthen the negative relationship between problem-solving and perceived financial strain. The model explained 17.0% of the variance in perceived financial strain (R = 0.413, R^2 = 0.170, $F(6, 37823)$ = 1293.866, $p < .001$). *Cluster 2:* Moderation analysis showed that the interaction term (PS × EH) was not significant (b = -0.003, SE = 0.005, 95% CI [-0.013, 0.007], p = .538), indicating that economic hope does not significantly moderate the relationship between problem-solving and perceived financial strain in cluster 2. *Cluster 3:* Similarly, the interaction term (PS × EH) was not significant (b = -0.013, SE = 0.013, 95% CI [-0.038, 0.012], p = .306), suggesting no significant moderation effect in cluster 3. *All clusters:* Across all clusters, the interaction term (PS × EH) was significant (b = 0.010, SE = 0.003, 95% CI [0.005, 0.016], $p <$ .001), indicating that higher levels of economic hope strengthen the negative relationship between problem-solving and perceived financial strain. The model explained 16.1% of the variance in perceived financial strain (R = 0.401, R^2 = 0.161, $F(6, 57494)$ = 1840.465, $p < .001$).

These results partially support H_3, showing that economic hope significantly moderates the relationship between problem-solving and perceived financial strain in cluster 1 and across all clusters. However, the moderation effect was not significant in cluster 2 or cluster 3, indicating that the moderating role of economic hope varies across different clusters.

Hypothesis 4: Education (ED) moderates the relationship between perceived financial strain (PFS) and life satisfaction (LS), such that higher levels of education weaken the negative effect of PFS on LS. The regression analyses examined whether education moderates the relationship between perceived financial strain and life satisfaction across all clusters. *Cluster 1:* Moderation analysis revealed that education significantly moderates the relationship between perceived financial strain and life satisfaction. The interaction term (PFS × ED) was significant (b = 0.027, SE = 0.004, 95% CI [0.019, 0.035], $p < .001$), suggesting that higher education levels mitigate the negative impact of financial strain on life satisfaction. The model explained 17.0% of the variance in life satisfaction (R = 0.413, R^2 = 0.170, $F(6, 37823) = 1293.866$, $p < .001$). *Cluster 2:* The interaction term (PFS × ED) was not significant (b = -0.012, SE = 0.007, 95% CI [-0.026, 0.001], p = .074), indicating that education did not significantly moderate the relationship in this cluster. ***Cluster 3:*** Similarly, the interaction effect was not significant (b = -0.006, SE = 0.017, 95% CI [-0.039, 0.026], p = .704), suggesting no moderation effect in cluster 3. *All clusters:* When analyzing all clusters together, education significantly moderated the relationship between perceived financial strain and life satisfaction (b = 0.013, SE = 0.003, 95% CI [0.005, 0.019], $p < .001$). The model explained 16.1% of the variance in life satisfaction (R = 0.401, R^2 = 0.161, $F(6, 57494) = 1840.465$, $p < .001$).

These results partially support H_4, demonstrating that education significantly moderates the negative effect of financial strain on life satisfaction in cluster 1 and across all clusters combined. However, the moderation was not significant in clusters 2 and 3, indicating variability in education's moderating role across different economic contexts.

Hypothesis 5: The indirect effect of problem-solving (PS) on life satisfaction (LS) through perceived financial strain (PFS) is jointly moderated by economic hope (EH) and education (ED), with the effect being stronger among individuals with higher levels of EH and ED. Regression analyses examined whether the indirect effect of problem-solving on life satisfaction through perceived financial strain was moderated by both economic hope and education across all clusters. *Cluster 1:* The moderated mediation analysis revealed that both economic hope and education significantly moderated the indirect effect of problem-solving on life satisfaction through perceived financial strain. The interaction terms (PS × EH and PS × ED) were significant (EH: b = 0.016, SE = 0.003, 95% CI [0.009, 0.022], $p < .001$; ED: b = 0.027, SE = 0.004, 95% CI [0.019, 0.035], $p < .001$), indicating that the indirect effect was stronger among individuals with

higher levels of economic hope and education. The model accounted for 17.0% of the variance in life satisfaction ($R = 0.413$, $R^2 = 0.170$, $F(6, 37823) = 1293.866$, $p < .001$). *Cluster 2:* The analysis showed that neither economic hope nor education significantly moderated the indirect effect of problem-solving on life satisfaction through perceived financial strain. The interaction terms were not significant (EH: $b = -0.003$, $SE = 0.005$, 95% CI [-0.013, 0.007], $p = .538$; ED: $b = -0.012$, $SE = 0.007$, 95% CI [-0.026, 0.001], $p = .074$). The model explained 15.5% of the variance in life satisfaction ($R = 0.394$, $R^2 = 0.155$, $F(6, 15933) = 486.961$, $p < .001$). *Cluster 3:* Similarly, economic hope and education did not significantly moderate the indirect effect of problem-solving on life satisfaction through perceived financial strain. The interaction terms were not significant (EH: $b = -0.013$, $SE = 0.013$, 95% CI [-0.038, 0.012], $p = .306$; ED: $b = -0.006$, $SE = 0.017$, 95% CI [-0.039, 0.026], $p = .704$). The model explained 15.1% of the variance in life satisfaction ($R = 0.389$, $R^2 = 0.151$, $F(6, 3724) = 110.667$, $p < .001$). *All clusters:* Across all clusters, the moderated mediation analysis indicated that both economic hope and education significantly moderated the indirect effect of problem-solving on life satisfaction through perceived financial strain. The interaction terms (PS × EH and PS × ED) were significant (EH: $b = 0.010$, $SE = 0.003$, 95% CI [0.005, 0.016], $p < .001$; ED: $b = 0.013$, $SE = 0.003$, 95% CI [0.005, 0.019], $p < .001$), suggesting a stronger indirect effect for individuals with higher economic hope and education levels. The model explained 16.1% of the variance in life satisfaction ($R = 0.401$, $R^2 = 0.161$, $F(6, 57494) = 1840.465$, $p < .001$).

These findings partially support H_5, demonstrating that economic hope and education significantly moderate the indirect effect of problem-solving on life satisfaction through perceived financial strain in cluster 1 and across all clusters combined. However, the absence of significant effects in clusters 2 and 3 may reflect contextual or demographic variations in the moderating role of these variables.

The study findings from the moderated mediation analyses highlight the importance of problem-solving, perceived financial strain, economic hope, and education in predicting life satisfaction. Problem-solving showed a strong positive relationship with life satisfaction across all clusters (H_1), and perceived financial strain significantly mediated this relationship (H_2). Economic hope moderated the relationship in cluster 1 and in the combined sample, but not in clusters 2 and 3 (H_3). Similarly, education moderated the effect of financial strain on life satisfaction in cluster 1

and the combined clusters, but not in the other groups (H_4). Finally, the interaction of economic hope and education significantly moderated the indirect effect in cluster 1 and the overall sample, providing partial support for H_5. These results show the complex and context-dependent nature of the factors influencing life satisfaction.

Discussion

The present study provides significant insights into the relationships among problem-solving, perceived financial strain, economic hope, education, and life satisfaction across countries of varying income levels. These findings reveal the key direct, indirect, and moderated effects of these variables, highlighting universal trends while emphasizing contextual differences.

The direct effect of problem-solving on life satisfaction: H_1 was supported, showing a direct effect of problem-solving on life satisfaction across all clusters and a positive relationship between problem-solving and life satisfaction. These findings align with previous studies that suggest problem-solving can enhance psychological well-being and life satisfaction (Ayres & Malouff, 2007; Çam et al., 2020; Xu et al., 2017). Individuals with strong problem-solving abilities appear to be better equipped to tackle life's challenges, resulting in increased life satisfaction. This effect was also observed in high-, upper-middle-, and lower-middle-income countries, indicating the universal relevance of problem-solving as a key determinant of life satisfaction. This aligns with the problem-solving theory, which explains that effective problem-solving reduces stressors and increases life satisfaction (D'Zurilla & Nezu, 1990; Heppner & Petersen, 1982). The widespread nature of this potential effect makes sense, given that problem-solving plays a fundamental role in alleviating stress and building resilience, regardless of the economic context. By emphasizing its universal importance, this study supports the promotion of problem-solving skills across diverse global contexts, especially in initiatives aimed at alleviating life challenges and enhancing resilience.

The mediating role of perceived financial strain: In support of H_2, the mediation analysis reveals a significant mediation effect of perceived financial strain on the relationship between problem-solving and life satisfaction. Having strong problem-solving skills leads to lower financial strain and greater overall life satisfaction. This mediating effect remained significant across all clusters, highlighting financial well-being as a key pathway through which problem-solving positively

influences life satisfaction. These findings are consistent with previous research on the negative impacts of economic hardship on mental health and the buffering role of problem-solving (Ettman et al., 2023; Peltz et al., 2021; Rodrigues et al., 2023; Wolfe & Patel, 2021). Rogowska et al. (2021) found that pandemic-related stress negatively affected life satisfaction. On the other hand, their study highlights that adaptive coping mechanisms and lower material deprivation can serve as intermediaries in maintaining life satisfaction in stressful environments. This consistency aligns with Pearlin et al.'s (1981) theory of financial strain, which emphasizes the inverse relationship between financial strain and life satisfaction. Significantly, another dimension of economic hardship, namely financial depletion, may complement and arguably limit the effectiveness of communicating solutions and their capacity to improve life satisfaction in a greater sense. This consistency highlights the broader relevance of problem-solving as a tool for addressing financial strain, underscoring its importance in global efforts to enhance life satisfaction.

Moderation by economic hope: H_3 predicted that economic hope would moderate the association between problem-solving and perceived financial strain. Our results offer mixed support for this hypothesis. In high-income countries (*cluster 1*), economic hope was a significant moderator of this relationship, indicating that individuals who feel more economically hopeful are better able to cope with financial strain when they possess good problem-solving skills. This resonates with the principles of economic hope theory, which suggests that increased levels of economic hope enable individuals to adopt a more adaptive approach to coping with financial difficulties and develop resilience (Hamarta, 2009; Snyder, 2002). Economic hope emerges as a critical factor in shaping financial resilience, underscoring its potential for inclusion in policies aimed at addressing financial strain and promoting mental well-being. Research conducted during the COVID-19 pandemic highlighted the importance of economic hope in supporting mental health and resilience amid financial difficulties (Hameed et al., 2024). However, the moderation effect was insignificant for upper-middle-income countries (*cluster 2*) and lower-middle-income countries (*cluster 3*).

Moderation by education: H_4 suggested that education would moderate the relationship between perceived financial strain and life satisfaction. Our findings provide partial support for this hypothesis. In high-income countries (*cluster 1*), education significantly mitigated the negative impact of financial strain on life satisfaction. This aligns with earlier research that suggests the protective function of education in enhancing well-being (Green, 2011; She et al., 2021). This

perspective is supported by human capital theory, which argues that educational investments lead to better economic and well-being outcomes (Becker, 1993; Schultz, 1961). Conversely, the moderating effect was insignificant in upper-middle-income countries (*cluster 2*) and lower-middle-income countries (*cluster 3*). Differences in the quality and accessibility of education may explain this discrepancy and likely limit the protective potential of education in these contexts. These findings may be used to inform policies that improve the quality and accessibility of education, especially in middle-income countries, to better align the role of education in promoting resilience and well-being. These findings suggest that increasing educational quality and access may enhance its protective role, presenting an actionable target for policymakers to strengthen global life satisfaction.

Moderated mediation by economic hope and education: H_5 hypothesized that economic hope and education could mitigate the indirect impact of problem-solving on life satisfaction through perceived financial strain. To some extent, our findings support this hypothesis. In all clusters, but especially in the first (*high-income countries*), economic hope and education significantly reduced the indirect impacts. This implies that the indirect effect of problem-solving on life satisfaction increases with people's level of economic hope and education.

Economic hope significantly contributes to mental health and resilience during financial uncertainty, such as the COVID-19 pandemic (Hameed et al., 2024). The complex nature of economic hope, which shapes economic behavior and the decision-making of economic agents through historical and multidisciplinary lenses (Pleeging & Burger, 2020), highlights its significance even further. According to human capital theory, enhanced productivity and supportive economic outcomes become a function of education, with positive implications for overall well-being (Becker, 1993; Schultz, 1961). Education provides individuals with the necessary resources and resilience to cope with financial stress, as indicated by findings from Green (2011) and She et al. (2021).

Nonetheless, the moderation effects were insignificant in upper-middle-income countries (*cluster 2*) and lower-middle-income countries (*cluster 3*). This variability could be due to disparities in educational quality and access, which influence the effectiveness of education as a protective factor. Additionally, the varying levels of economic stability and access to financial resources in these clusters may play a more critical role in influencing financial strain (Rodrigues et al., 2023;

Ettman et al., 2023). These insights underscore the importance of integrating education and economic hope into strategies designed to enhance life satisfaction, highlighting their combined potential in promoting resilience and well-being.

Conclusion

This paper emphasizes the crucial role of problem-solving in achieving life satisfaction across various economic contexts, where perceived financial strain, economic hope, and education serve as mediators and moderators. In addition, the study contributes to the literature by bridging the gap between psychological and socio-economic perspectives, drawing upon problem-solving, financial strain, economic hope, and human capital theories. These findings highlight the pathways by which problem-solving reduces financial strain and enhances resilience, as well as the underlying determinants of well-being worldwide.

Implications for policy and practice: The results hold substantial implications for policymakers, economic analysts, organizational leaders and managers, and educators. The key to these solutions lies in developing problem-solving skills, alleviating financial stressors, fostering economic hope, and expanding access to quality education. To maximize effectiveness, interventions must be co-designed from cross-sectoral perspectives that consider systemic and population-specific barriers to equitable access and outcomes. Such initiatives need to be responsive to different economic and sociocultural contexts while promoting equity, inclusion, and sustainable improvements in quality of life.

Limitations and future research: This study has several limitations that should be addressed in future research. *Firstly*, the cross-sectional nature of the data prevents us from drawing causal conclusions regarding the relationships between the variables. Longitudinal designs are necessary to examine the ongoing relationships between problem-solving, perceived economic strain, economic hope, education, and future life satisfaction. *Secondly*, while the study included a diverse sample across different income-level countries, there may still be unaccounted-for cultural and contextual differences that influence the relationships among the variables. Cultural norms, social structures, and regional economic policies are likely to influence how problem-solving, financial hope, and education impact well-being. Cross-cultural comparisons will help illuminate these subtle relationships.

Future research should investigate the underlying mechanisms that underpin these relationships and examine contextual factors that may influence them across diverse economic contexts. For example, pulling apart how this dynamic may vary by gender, age, or regional differences could reveal added layers of complexity, perhaps exploring the potential of emerging technologies, such as AI-based learning tools, as not just a means to solve the problem but also as models of how to relieve the financial strain around the world. Additionally, future research could investigate possible mediators and moderators, such as social support, economic policies, and social capital, that could illuminate further strategies to promote life satisfaction. Such a strategy would facilitate the adaptation of overall interventions and the expansion of specific approaches to foster well-being in diverse economic contexts.

Acknowledgments: We would like to express our sincere gratitude to the Psycorona team for their invaluable contributions to this research. Their comprehensive data collection and management provided the foundation for our analysis.

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