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Associations between time perspective, subjective happiness, psychological well-being, and mental health: the moderating role of sociodemographic variables

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Abstract

The relationship between psychological well-being, mental health, and time perspective remains insufficiently understood. This study examines the associations among these variables and explores whether sociodemographic factors moderate these relationships. A cross-sectional sample of 428 Portuguese participants completed the Zimbardo Time Perspective Inventory, the Psychological Well-Being Scale, the Subjective Happiness Scale, and the Mental Health Inventory. Subjective happiness and mental health showed the strongest associations with time perspectives, whereas sociodemographic variables functioned as weak moderators. Specifically, regression analyses indicated that higher subjective happiness was associated with a more positive past perspective and a stronger future orientation, while better mental health was linked to a less negative past perspective and a less fatalistic present view. Although several sociodemographic variables (e.g., gender, education, age) demonstrated statistically significant moderating effects, their practical impact was minimal, with all interaction effect sizes being very small. These findings suggest that the associations between psychological well-being and time perspective are relatively consistent across demographic groups, with happiness and mental health showing the most robust links. While the cross-sectional design does not allow causal conclusions, the results highlight meaningful patterns of association and suggest that the strength of the associations between psychological resources and temporal orientations varied across life circumstances - for example, the association between mental health and future orientation was stronger among younger, unmarried individuals in this sample.

Keywords Mental health · Psychological well-being · Subjective happiness · Time perspective · Sociodemographics

Introduction

Time perspective - an individual's cognitive framework for understanding the passage of time (Zaleski, 1991) - is a powerful correlate of mental health. Extensive research has established that a balanced and positive time perspective, characterized by a positive view of the past and a purposeful future orientation, is strongly associated with higher subjective well-being and life satisfaction (Stolarski, 2016). Conversely, a dominant negative past or fatalistic present focus is linked to poorer psychological outcomes (Diaconu-Gherasim et al., 2023; Kuan & Zhang, 2022). While these associations are well documented, the direction of influence remains unclear. Much of the existing literature implicitly or explicitly frames time perspective as a precursor to well-being (e.g., Zimbardo & Boyd, 1999; Griffin & Wildbur, 2020). However, an alternative conceptual model

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suggests that internal psychological resources may also be closely connected to how individuals relate to time.

Elevated levels of psychological well-being, subjective happiness, and positive mental health may be associated with more adaptive time perspectives. This study explores whether these resources are linked to more positive interpretations of the past, more balanced engagement with the present, and a more purposeful orientation toward the future, as well as to lower levels of maladaptive perspectives such as a negative past or fatalistic present. This view is supported by research showing that psychological assets like self-compassion and meaning in life are key mechanisms through which time perspective relates to well-being (Pfund et al., 2022; Pyszkowska & Rönnlund, 2021), suggesting that psychological resources and temporal orientations may be interconnected. Furthermore, if well-being and time perspective are related, the benefits of a balanced time perspective (BTP) may, in part, reflect underlying psychological health (Diaconu-Gherasim & Mardari, 2022).

The primary aim of this study is therefore to examine this alternative conceptual direction by investigating whether psychological well-being and mental health show significant associations with specific time perspective profiles. Crucially, we explore how these associations may vary across individuals' life circumstances. Guided by Bronfenbrenner's (1979) ecological systems theory, we propose that the links between internal psychological resources and time perspective may differ depending on key sociodemographic factors (e.g., age, gender, education, marital status, professional status) that shape an individual's social context and opportunities (Andre et al., 2018). For instance, the association between mental health and future orientation may be stronger for younger adults, for whom the future holds more open possibilities (Mello et al., 2022), or for unmarried individuals, whose future plans may be more closely tied to their personal psychological state. Thus, our central research question is: To what extent do sociodemographic factors moderate the statistical associations between psychological resources (well-being and mental health) and time perspective? By examining for whom and under what conditions these associations are strongest, this research seeks to better understand the contextual factors linked to healthier time perspectives, with implications for targeted interventions.

Age plays a pivotal role in shaping which aspects of time perspective are most relevant and beneficial across different stages of life (Allemand et al., 2012; Wilton-Harding & Windsor, 2022). For younger individuals, such as adolescents and young adults, future orientation tends to show stronger positive associations with psychological well-being and mental health. Their developing identity and focus on life goals make a positive future outlook particularly relevant for motivation, hope, and life satisfaction (Kuan, 2023). Conversely, a negative past focus may be more destabilizing during these formative years (Kuan, 2023). In middle adulthood, balance becomes critical. Pressures from multiple roles in career and family may render excessive future focus—potentially linked to burnout—or excessive present hedonism—linked to neglect of responsibilities—more detrimental. A balanced time perspective that allows for both present enjoyment and future planning appears most adaptive during this stage (Pfund et al., 2022). For older adults, present focus gains prominence as a correlate of psychological well-being and mental health, particularly regarding emotionally meaningful experiences and relationships, consistent with Socioemotional Selectivity Theory (Carstensen et al., 1999). A positive past perspective through reminiscence or life review also becomes increasingly important for maintaining self-esteem and life satisfaction, while a fatalistic present or negative past orientation may be especially harmful in later life (Pfund et al., 2022).

Gender also appears to shape the pathways through which different time orientations relate to well-being, as societal roles and socialization experiences create nuanced and culturally dependent patterns (Blodgett et al., 2022; Bodecka et al., 2021). Women, often socialized toward relational focus, may show stronger associations between psychological well-being and positive past or present orientations centered on relationships (Fuentes et al., 2022). Men, frequently socialized toward agency and achievement, may show stronger associations between future orientation and psychological well-being or mental health (Fuentes et al., 2022). The impact of negative time perspectives, such as a past-negative orientation, on mental health symptoms like depression or anxiety may also differ due to gendered coping patterns or stigma, though these patterns are complex and culturally dependent (McKay & Cole, 2020).

Education functions as a significant resource multiplier, generally enhancing the positive associations of adaptive time perspectives while mitigating the detrimental associations of maladaptive ones, primarily by providing greater cognitive and socioeconomic resources (Burger & Strassmann Rocha, 2024). Higher education may strengthen the association between future orientation and psychological well-being or mental health by fostering long-term planning skills, goal-setting abilities, and access to opportunities where future focus is advantageous (Gao et al., 2025). Critical thinking skills developed through education may also help individuals reframe negative past experiences or challenge fatalistic present views, weakening the association between these maladaptive orientations and poorer mental health (Guthrie et al., 2009). Conversely, lower educational attainment may limit opportunities, potentially diminishing the benefits of a strong future orientation—or even making

it frustrating—thereby weakening its positive association with psychological well-being (Mezirow, 1997). It may also exacerbate the negative associations of fatalistic present or negative past perspectives due to fewer available buffers (Mezirow, 1997).

Marital status contributes another layer by establishing a relational context that may amplify the benefits of positive time perspectives or buffer the negative associations of maladaptive ones, although the quality of the relationship itself is critically important (Angelova & Trencheva, 2017; Nguyen et al., 2024). Being in a partnership may enhance the positive associations of present-hedonistic orientations focused on shared enjoyment or positive past orientations centered on relationship memories (Stolarski et al., 2014). Partnership may also buffer the negative associations of a past-negative orientation through supportive processing of past events (Johnson et al., 2021). However, marital distress or conflict may exacerbate the negative associations of maladaptive time perspectives, such as a fatalistic present view, and may weaken the benefits of a positive future orientation if shared goals are disrupted (Stolarski et al. 2016a). Single status may place greater emphasis on individual-focused time orientations, such as pursuing personal future goals or present self-focused enjoyment, for psychological well-being (Matud et al., 2014). Nevertheless, the moderating role of marital status is unlikely to be linear, as both partnership and singlehood carry potential benefits and challenges.

Professional status is another crucial structural factor, particularly influential during adulthood. Employment structures time, provides purpose, and shapes access to resources, which may influence how time perspectives relate to psychological well-being and mental health (Adams & Nettle, 2009). Meaningful employment may strengthen the positive associations between future orientation—related to career goals and financial planning—and psychological well-being or mental health (Stolarski et al. 2016a). It may also support positive present-focused orientations through engagement and mastery experiences. However, high-stress or insecure employment may weaken these associations or even link future orientation to anxiety (Paul et al., 2023). It may also reinforce a present-fatalistic view, such as feeling stuck in a dead-end job (Stolarski et al. 2016a). Unemployment may disrupt the typical benefits of future orientation, potentially weakening or reversing its positive associations with psychological well-being and mental health (Stolarski et al. 2016a). It may also amplify the negative associations of fatalistic present and negative past orientations due to the loss of structure and purpose (Paul et al., 2023). Retirement represents a major transition that alters the relevance of future work-related goals (Damman et al., 2013). Successfully navigating retirement may involve shifting toward time perspective patterns that are more beneficial for older adults—such as focusing on a meaningful present and positive past reminiscence—to support psychological well-being and mental health (Damman et al., 2013). However, the moderating role of occupational status is likely non-linear, as employment confers psychological benefits alongside potential stressors, while economic inactivity does not invariably predict poorer outcomes.

Thus, we hypothesize the following moderation patterns: Age will moderate the association between well-being and Future perspective, with stronger associations among younger adults; gender will moderate the associations between well-being and Past Negative and Present Fatalistic perspectives, with potentially higher emotional sensitivity among women (Bodecka et al., 2021); marital status may buffer or exacerbate the associations between Past Negative or Present Fatalistic orientations and psychological well-being, depending on relational support (Angelova & Trencheva, 2017); and higher education and professional status are expected to mitigate the negative associations of maladaptive time perspectives and strengthen the positive associations of Future orientation (Burger & Strassmann Rocha, 2024).

In sum, this study builds on previous literature by examining both the associations of happiness, well-being, and mental health with time perspectives and the moderating effects of key sociodemographic variables. While some moderation hypotheses are theory-driven, others are exploratory, given the limited empirical grounding. The findings aim to inform psychological theory and provide practical insights for developing interventions that support balanced and adaptive time perspectives across diverse demographic groups (Blodgett et al., 2022; Griffin & Wildbur, 2020; Lianov et al., 2020; Mello et al., 2022).

Methods

Procedures

Before initiating the research, ethical approval was secured from the Scientific Council of the Universidade Católica Portuguesa. Informed consent was obtained from all participants, facilitated through a consent form that outlined the study's purpose, the procedures involved, potential risks and benefits, confidentiality guarantees, and contact information for any inquiries. All collected data were stored securely and were accessible only to authorized personnel. To protect participants' identities, the data were anonymized in accordance with relevant data protection regulations.

This study employed a quantitative approach and included 428 participants who were recruited using a convenience

sampling method. To promote the study, a dedicated page was established on two social media platforms, along with a protocol that included a sociodemographic questionnaire and three psychological assessment instruments, which are detailed below. Data collection occurred from January to February 2024. Participants were excluded from the study if they were under 18 years of age, over 50 years of age, or if they were not Portuguese nationals. The study dataset contains no missing values. This is a result of the data collection methodology: the survey was administered online with compulsory response fields, meaning participants could not proceed to subsequent pages without providing answers to all questions. Additionally, age was found to be normally distributed: age (sk = 0.07; ku = -1.60); a series of Chi-Square goodness-of-fit tests showed that the distributions were not equal across categories. Gender was highly imbalanced, $\chi^2(1, N=428)=121.46$, $p < .001$, with more women than men. Marital status was also unequal, $\chi^2(1, N=428)=14.95$, $p < .001$, with more unmarried participants. Education level, $\chi^2(1, N=428)=4.94$, $p = .026$, and professional status, $\chi^2(1, N=428)=6.32$, $p = .012$, showed smaller but significant deviations from equal proportions.

Instruments

Sociodemographic questionnaire

Initially, participants were asked to complete a sociodemographic questionnaire to gather information for characterizing the sample. This questionnaire requested details such as age, gender (assigned at birth), marital status (married or in a common-law union or not), educational qualifications (university studies or not) and employment status (working full-time or not).

Zimbardo time perspective inventory

The instrument used to measure time perception was the Zimbardo Time Perspective Inventory, developed by Zimbardo and Boyd (1999), and adapted for the Portuguese population in 2009 by Ortuño and Gamba. The aim of the instrument is to assess the centrality of each individual in each of the temporal dimensions and/or to evaluate the profile of cognitive and emotional functions to identify each temporal dimension. The original version (Zimbardo & Boyd, 1999) consists of 56 items; however, the Portuguese version has only 25 items, with responses in a 5-point Likert format, where 1 corresponds to "not at all," 2 to "a little," 3 to "neither much nor little," 4 represents "very much," and 5 to "completely" (Ortuño et al., 2017). This is the only instrument validated for the Portuguese population on this topic.The Zimbardo Time Perspective Inventory represents the following temporal dimensions: Past positive (pleasant attitudes about the past), Past negative (distress and aversion attitudes about the past), Present hedonistic (tendency towards the pursuit of immediate pleasure), Present fatalistic (attitude of defeat and hopelessness in life), and Future (tendency towards the need to create future goals). The scoring of the Zimbardo Time Perspective Inventory is done by calculating the average value of each of the dimensions, which allows for obtaining five scores that make up the temporal profile of the participant. The higher the value obtained in each of the dimensions, the greater the participant's propensity to exhibit cognitive functioning focused on the temporal dimension (Ortuño et al., 2017). To calculate the average values, it is necessary to reverse the response value of item 11 (Ortuño et al., 2017; Zimbardo & Boyd, 1999).

The psychometric properties of the instrument suggest moderate to high internal consistency. The Past positive dimension haspresents a Cronbach's alpha of 0.68, Past negative 0.80, Present fatalistic 0.66, Present hedonistic 0.79, and Future 0.74 (Ortuño et al., 2017). Most correlations between the five dimensions of the Zimbardo Time Perspective Inventory are significant ($p < .01$), indicating that they are distinct constructs but are related to each other (Ortuño & Gamboa, 2009). Thus, the factorial structure of the version adapted for the Portuguese population is similar to the original version. In the collected sample, according to Fortin (2009), the Cronbach's alpha of the dimensions suggests acceptable to good internal consistency, similar to the version by Ortuño and Gamboa (2009), with values ranging from 0.69 (Present fatalistic) to 0.84 (Past negative). Since the correlations between the subscales of the Zimbardo Time Perspective Inventory are low and moderated (between $r = -.111$ [Future and Past negative] and $r = -.466$ [Past positive and Past negative]), we opted to use the subscales separately.

Psychological well-being scale

Well-being was assessed using the Psychological Well-Being Scale, developed by Boylan and Ryff in 2015, which was later validated for the Portuguese population by Freire et al. (2019). The Psychological Well-Being Scale consists of statements related to favorable or unfavorable aspects of psychological well-being. This instrument comprises 42 items distributed across six dimensions: Autonomy, Self-acceptance, Environmental mastery, Life purpose, Positive relationships with others, and personal growth. Each dimension contains half of the items phrased positively and the other half negatively. The instrument is self-administered, using a 6-point Likert scale, where 1 corresponds to "strongly disagree," 2 to "mostly disagree," 3 to "partially disagree," 4 to "partially agree," 5 represents "mostly

agree," and finally, 6 represents "strongly agree." The score for each dimension is calculated by summing the scores of the items that comprise it. The items presented negatively must be reversed before performing the calculation. Thus, each dimension ranges from 7 to 42 points. According to the authors, a higher score suggests a greater perception of psychological well-being in that domain (Freire et al., 2019). Regarding the psychometric properties, the Cronbach's alpha coefficient for each dimension varies between 0.71 and 0.82, indicating internal consistency ranging from reasonable to good. The dimension with the highest Cronbach's alpha is Self-acceptance, at 0.82; the Life purpose dimension has 0.80, the Environmental mastery dimension has 0.77, the Positive relationships with others dimension has a Cronbach's alpha of 0.74, the Autonomy dimension has 0.72, and finally, the dimension of Personal growth has the lowest Cronbach's alpha at 0.71 (Freire et al., 2019). In the collected sample, the dimensions of Self-acceptance (0.86) and Personal Growth (0.85) show Cronbach's alpha values considered excellent, while the dimensions of Life purpose (0.82), Positive relationships (0.82), and autonomy (0.82) present values indicating good internal consistency. In contrast, the Environmental mastery dimension (0.60) exhibits low internal consistency, according to Fortin (2009). Since the correlations between the subscales of the Psychological Well-Being Scale are quite high (between $r = .540$ [environmental mastery and autonomy] and $r = .796$ [purpose in life and personal growth]), we opted to use only the total scale.

Subjective happiness scale

The Subjective Happiness Scale, originally developed by Lyubomirsky and Lepper in 1999, aims to assess overall "subjective happiness." The Portuguese version of this instrument was created by José Luís Pais-Ribeiro in 2012. The scale consists of 4 items, where items 2 and 3 ask participants to compare themselves with their peers, and the other 2 items relate to descriptions of happiness and unhappiness. Each item is rated on a 7-point scale. Item 1 is measured on a 7-point scale where 1 corresponds to "A person who is not very happy" and 7 corresponds to "A very happy person." Item 2 is also on a 7-point scale where 1 corresponds to "Less happy" and 7 to "Happier." Items 3 and 4 are rated on a 7-point scale where 1 corresponds to "Not at all" and 7 to "Very much" (Pais-Ribeiro, 2012). Item 4 is reverse-scored. The total score is calculated by summing the weighted responses of the 4 items, with higher scores reflecting greater levels of subjective happiness (Freire et al., 2019). Regarding the psychometric properties of the Portuguese version of the Subjective Happiness Scale, it shows an internal consistency with a Cronbach's alpha value of 0.76 (Pais-Ribeiro, 2012). In this study, valid results for internal consistency were obtained, as the Cronbach's alpha values were equal to or greater than 0.70 (Field, 2009). According to Fortin (2009), the Subjective Happiness Scale (Cronbach's alpha = 0.79) demonstrates good internal consistency.

Mental health inventory

The instrument used to measure mental health was the Mental Health Inventory, originally developed by the Rand Corporation for the Rand Health Insurance Experiment in 1975 and validated for the Portuguese population by Pais-Ribeiro (2001). The purpose of this instrument is to assess mental health, focusing on both positive and negative aspects. The Mental Health Inventory consists of 38 self-report items. These 38 items are distributed across five scales: Anxiety (10 items), Depression (5 items), Loss of emotional/behavioral control (9 items), Positive affect (11 items), and Emotional bounds (3 items). These scales are grouped into two major dimensions: Psychological distress and Psychological well-being. Each item is answered using a 5-point (only items 9 and 28) or 6-point ordinal scale. Item 1 is rated on a 6-point scale, where 1 corresponds to "extremely happy, no one could be happier or more satisfied," 2 to "very happy and satisfied most of the time," 3 to "generally satisfied and happy," 4 to "sometimes slightly satisfied, sometimes slightly unhappy," 5 to "generally dissatisfied, unhappy," and 6 to "very dissatisfied, and unhappy most of the time." Responses to items 2, 10, 11, 13, 17, 18, 19, 22, 23, 26, 29, 30, 31, 34, and 36 use a scale where 1 represents "always," 2 "almost always," 3 "most of the time," 4 "sometimes," 5 "almost never," and 6 "never." Items 3, 4, 5, 6, 7, 12, 15, 16, 20, 21, 24, 27, 32, and 35 are answered on the following scale: 1 corresponds to "always," 2 to "very often," 3 to "frequently," 4 to "infrequently," 5 to "almost never," and 6 to "never." The remaining items have their own specific response scales. Item 8 is answered on a 6-point Likert scale, where 1 represents "no, never" and 6 corresponds to "yes, and I'm very worried about it." Item 9 uses a 6-point Likert scale, where 1 represents "yes, to the point of not caring about anything for days" and 5 represents "no, I never feel depressed." Item 14 is answered on a scale where 1 represents "yes, completely" and 6 "no, and I'm very disturbed by it." Item 25 uses a 6-point response scale, where 1 represents "extremely, to the point of not doing what I should" and 6 represents "not bothered at all." Item 28 is rated on a 5-point scale, where 1 represents "yes, very often," and 5 represents "no, never." Item 33 is answered on a 6-point Likert scale, where 1 represents "yes, extremely, almost to the point of getting sick," and 6 represents "no, not at all." Item 37 is rated on a 6-point Likert scale, where 1 corresponds to "always, every day," and 6 represents "never." Lastly, item 38 is rated on a scale where 1 represents "yes,

almost to my limits," and 6 represents "no, not at all" (Pais-Ribeiro, 2001). The total score is the sum of the raw item scores that make up each scale, where higher scores correspond to better mental health (lower Psychological distress, anxiety, depression, and Loss of emotional/behavioral control, and higher Psychological well-being, Positive affect, and Emotional bounds). Items 2, 3, 9, 11, 13, 15, 16, 19, 20, 21, 24, 25, 27, 28, 29, 30, 32, 33, 35, 36, and 38 should be reverse-scored. The total score of the Mental Health Inventory should be converted from 0 to 100 using the following algorithm: New score = 100 x (raw score – lowest possible score) / (score range = highest possible score – lowest possible score) (Pais-Ribeiro, 2011). Regarding the psychometric properties, the total scale shows a Cronbach's alpha value of 0.96. The Psychological distress scale has a Cronbach's alpha of 0.95, with Anxiety being the dimension with the highest internal consistency (0.91), followed by Loss of emotional/behavioral control (0.87), and finally, Depression (0.85). The Psychological well-being scale has an internal consistency of 0.91, with the dimensions of Emotional Tiesbounds (0.72) and Positive affect (0.91). In the collected sample, the Mental Health Inventory showed excellent internal consistency across all subscales and dimensions, except for the Emotional bounds dimension, which had a Cronbach's alpha of 0.75, considered good (Fortin, 2009). Since the correlations between the subscales of the Mental Health Inventory are quite high (between r = .524 [emotional bonds and anxiety] and r = .965 [distress and anxiety]), we opted to use only the total scale.

Data analysis

Descriptive statistics were performed to characterize the sample, including frequencies, percentages, means, standard deviations, minimum, and maximum values. Additionally, correlations were calculated to examine the strength and direction of the associations between variables. Pearson's correlation coefficient (r), which ranges from −1 to +1, was used. An r value of +1 indicates a perfect positive correlation, −1 indicates a perfect negative correlation, and 0 indicates no correlation. Statistical significance was assessed using a p-value, with $p < .05$ indicating a statistically significant association.

A sensitivity power analysis was conducted using G*Power 3.1 to determine the minimum effect size detectable given our sample size. With an α of 0.05, power of 0.80, 5 predictors, and a sample size of 428, the analysis indicated that the model could detect a minimum effect size of $f^2 = 0.023538$, corresponding to an R^2 increase of approximately 2.3%. This is considered a small effect according to Cohen's (1988) conventions. Therefore, the study was sufficiently powered to detect even small effects, increasing confidence that non-significant findings are unlikely to be due to insufficient statistical power.

To ensure the robustness of all statistical analyses, the assumptions for both the standard multiple linear regressions and the moderation models were rigorously tested. For all analyses, the independence of errors was verified using the Durbin–Watson statistic. The normality of residuals was assessed through visual inspection of histograms and normal probability plots (P–P plots), and homoscedasticity was evaluated by examining scatterplots of standardized predicted values against standardized residuals. The absence of excessive multicollinearity among the variables included in the models was confirmed by reviewing tolerance values and the Variance Inflation Factor (VIF). For the moderation analyses specifically, an additional step was taken to address the inherent multicollinearity associated with interaction terms: the predictor and moderator variables were mean-centered before creating the product terms. The linearity of the associations was assessed via partial regression plots across all models. Finally, casewise diagnostics were examined to identify any influential outliers that might disproportionately affect the model parameters.

To complement null hypothesis significance testing and provide a measure of practical significance, the effect size for each variable in the multiple regression analyses was assessed using Cohen's f^2. This statistic quantifies the unique proportion of variance in the outcome variable associated with a specific predictor, over and above the variance explained by the other variables in the model. It is calculated as the increase in R^2 when the predictor is added to the model, divided by the unexplained variance prior to its inclusion. Following Cohen's (1988) conventions, f^2 values of 0.02, 0.15, and 0.35 are typically interpreted as benchmarks for small, medium, and large effect sizes, respectively. For the moderation analyses, f^2 was used to evaluate the magnitude of the interaction effects, providing insight into the practical relevance of the moderating relationships beyond their statistical significance.

Hierarchical regression analysis was employed to examine the associations between the outcome variables and the independent variables while accounting for the contribution of other variables. The change in R^2 between steps indicates the incremental variance associated with adding new variables, helping to clarify the contribution of the main variables after controlling for sociodemographic factors. Moderation analysis was performed using Model 1 of the PROCESS macro for SPSS (Hayes, 2013). This analysis involved examining the interaction term between the predictor and the moderator to assess whether a moderation effect was present.

Sample

The sample includes 428 Portuguese participants, of whom 327 (76.6%) are women, with an average age of 33.24 years (*SD* = 11.08; *Min* = 18 and *Max* = 50). More than half of the sample has a university education (237, 55.4%), works full-time (240, 56.1%), and is not married (254, 59.3%).

Results

Correlations

Concerning adaptive time perspectives, a Positive Past and a Future-Oriented perspective were positively associated with happiness, mental health, and psychological well-being. Regarding maladaptive time perspectives, a Negative Past and a Fatalistic Present perspective were associated with lower well-being and poorer mental health. In turn, a hedonistic present orientation appeared to be largely unrelated to overall well-being in this analysis and showed a slight negative association with mental health (Table 1).

Regressions

Age, marital status, and professional status did not account for significant unique variance in any time perspective dimension. The assumptions of multiple linear regression were tested for all five models (Past Positive, Past Negative, Present Hedonistic, Present Fatalistic, and Future time perspectives) and were adequately met. Across all models, the Durbin–Watson statistics were close to the ideal value of 2 (range: 1.879–2.078), supporting the independence of residuals. Residual statistics and visual inspection of histograms and P–P plots supported normality. Homoscedasticity was observed in all cases, and multicollinearity was not a concern (Tolerance > 0.50, VIF < 2, maximum condition index = 19.5). A small number of outliers were identified (e.g., one case with a residual of −3.236 in the Present Hedonistic model, two in the Past Negative model) but given the sample size (N = 428), these cases did not exert undue influence. The Future model also met all assumptions (VIF max = 1.910; tolerance min = 0.523). Collectively, these indicators support the robustness of the analyses.

Past positive

The model for Past Positive time perspective was statistically significant, $F(5, 422) = 22.191$, $p < .001$, accounting for 20.8% of the variance (Adj. $R^2 = 0.199$). Subjective_Happiness showed a significant positive association ($\beta = 0.307$, $p < .001$; $f^2 = 0.062$), and Mental_Health_Inventory_Total also showed a significant positive association ($\beta = 0.127$, $p < .05$; $f^2 = 0.010$). Gender and Education were not significantly associated with Past Positive scores.

Past negative

The model for Past Negative was statistically significant, $F(5, 422) = 59.999$, $p < .001$, accounting for 41.6% of the variance (Adj. $R^2 = 0.409$). Mental Health Inventory Total showed the strongest negative association ($\beta = –0.481$, $p < .001$; $f^2 = 0.206$). Subjective_Happiness also showed a significant negative association ($\beta = –0.176$, $p < .001$; $f^2 = 0.025$). Gender and Education were not significantly associated with Past Negative scores.

Present hedonistic

The model for Present Hedonistic was statistically significant, $F(5, 422) = 8.405$, $p < .001$, accounting for 9.1% of the variance (Adj. $R^2 = 0.080$). Mental Health Inventory Total showed a significant negative association ($\beta = –0.336$, $p < .001$; $f^2 = 0.063$), while Subjective_Happiness showed a significant positive association ($\beta = 0.213$, $p < .001$; $f^2 = 0.024$). Higher Education was also negatively associated with Present Hedonistic scores ($\beta = –0.149$, $p < .05$; $f^2 = 0.022$).

Present fatalistic

The model for Present Fatalistic was statistically significant, $F(5, 422) = 20.912$, $p < .001$, accounting for 19.9% of the variance (Adj. $R^2 = 0.189$). Mental Health Inventory Total ($\beta = –0.241$, $p < .001$; $f^2 = 0.031$) and Subjective_Happiness ($\beta = –0.185$, $p < .01$; $f^2 = 0.029$) both showed significant

Table 1 Pearson correlations between zimbardo time perspective inventory and subjective happiness scale, psychological well-being scale and mental health inventory

Subjective_Happiness	Past_Positive_ZTPI	Past_Negative_ZTPI	Present_Hedonistic_ZTPI	Present_Fatalistic_ZTPI	Future_ZTPI
	0.228**	−0.265**	0.011	−0.167**	0.246**
Mental_Health_Inventory_Total	0.373**	−0.623**	−0.197**	−0.379**	0.176**
Psychological Well-Being Scale _Total	0.428**	−0.525**	−0.016	−0.371**	0.229**

Note. **significant at 0.010 level; *significant at 0.050 level

negative associations. Higher Education was also negatively associated (β = –0.146, $p < .01$; $f^2 = 0.026$), while Gender showed a small positive association (β = 0.097, $p < .05$; $f^2 = 0.013$).

Future

The model for Future time perspective was statistically significant, $F(5, 422) = 8.932$, $p < .001$, accounting for 9.6% of the variance (Adj. $R^2 = 0.085$). PWBS_Total showed a significant positive association (β = 0.191, $p < .001$; $f^2 = 0.035$), and Subjective_Happiness also showed a significant positive association (β = 0.147, $p < .05$; $f^2 = 0.013$). Mental_Health_Inventory_Total, Gender, and Education were not significantly associated with Future scores (Table 2).

Moderations

Before interpreting the moderation analyses, assumptions for multiple linear regression were tested for all six models. Durbin–Watson statistics (range: 1.869–2.130) supported independence of errors. Histograms, P–P plots, and residual scatterplots supported normality and homoscedasticity. Although interaction terms increased multicollinearity (maximum VIF = 11.64), condition indices (max = 61.77) remained interpretable, and the main effects were stable, indicating that multicollinearity did not substantially bias the results.

A series of moderation analyses (PROCESS Model 1) identified several statistically significant interactions between sociodemographic variables and psychological resources in their associations with time perspectives. Gender moderated the PWBS–Past Positive association, which was significant only for women. Education moderated both the PWBS–Present Hedonistic association (marginally significant for non-university individuals) and the MHI–Present Hedonistic association (significant only for university-educated individuals). Age, marital status, and professional status all moderated the MHI–Future association. Specifically, the positive association between mental health and future orientation was strongest among younger, unmarried, and non-full-time employed individuals (Table 3).

Cohen's f^2 was calculated for each significant interaction term to assess practical significance. All interaction effects were statistically significant ($p < .05$) but very small in magnitude ($f^2 \leq 0.005$), falling below Cohen's threshold for a small effect ($f^2 = 0.02$). This indicates that although detectable, sociodemographic variables accounted for only minimal unique variance as moderators of the associations between psychological resources (PWBS and MHI) and time perspectives.

Table 2 Variables that contribute to explain time perspective

	Past positive				Past negative				Present hedonistic				Present fatalistic				Future			
	B	SE	β	f^2	B	SE	β	f^2	B	SE	β	f^2	B	SE	β	f^2	B	SE	β	f^2
Gender	.127	.078	.071	.006	-.010	.079	-.005	.002	-.082	.082	-.047	.000	**.170**	**.077**	**.097***	**.013**	-.118	.071	-.078	.007
Education	.073	.067	.048	.003	-.131	.068	-.073	.007	**-.222**	**.070**	**-.149***	**.022**	**-.217**	**.065**	**-.146****	**.026**	.095	.060	.074	.007
PWBS_Total	.009	.005	.082	.008	-.006	.005	-.048	.002	.005	.005	.048	.000	-.003	.005	-.024	.001	**.018**	**.005**	**.191****	**.035**
Subjective_Happiness	**.207**	**.040**	**.307****	**.062**	**-.140**	**.041**	**-.176****	**.025**	**.141**	**.042**	**.213****	**.024**	**-.122**	**.040**	**-.185***	**.029**	**.084**	**.037**	**.147***	**.013**
MHI_Total	**.003**	**.001**	**.127***	**.010**	**-.014**	**.001**	**-.481****	**.206**	**-.008**	**.002**	**-.336****	**.063**	**-.006**	**.001**	**-.241****	**.031**	.000	.001	.015	.000
R^2 (R^2 Adj.)	.208 (**.199**)				.416 (**.409**)				.091 (**.080**)				.199 (**.189**)				.096 (**.085**)			
F for change in R^2	22.191**				59.999**				8.405**				20.912**				8.932**			

Note. R^2 = R squared; R^2 Adj. = R squared adjusted; B = unstandardized regression coefficients; SE = unstandardized error of B; β = standardized regressioncoefficients; f^2 = size effect Cohen; ** $p < 0.01$; †gender codification: women = 0, men = 1; marital status codification: not married = 0, married = 1;education codification: no university studies = 1, university studies = 2; professional status codification: not working full time = 0, working full time = 1; **bold** =variables that contribute significantly to the model

Table 3 Sociodemographic moderators in the relationship between PWBS, MHI and ZTPI

Predictor	Moderator	Dependent	F(3, 424)	*p*	β	95% CI	t	*p*	Variance %	f^2	Moderator Option	β	*p*
PWBS/ MHI	**Sociodemographics**	**ZTPI**											
PWBS	Gender	Past positive	10.468	<0.001	-0.024	-0.048, -0.003	-1.993	0.047	6.90	0.004	Women	0.031	**<0.001**
Total											Men	0.007	0.518
PWBS	Education	Present hedonistic	5.143	0.017	-0.029	-0.043, -0.001	-2.082	0.038	3.50	0.004	No university studies	0.014	0.079
Total											University studies	0.008	0.255
Mental health	Education	Present hedonistic	10.196	<0.001	-0.005	-0.009, -0.002	-2.039	0.042	6.73	0.004	No university studies	-0.002	0.176
Total											University studies	-0.007	**<0.001**
Mental health	Age	Future	7.236	<0.001	-0.002	-0.004, -0.001	-2.769	0.005	16.76	0.005	< 40	0.002	**0.028**
Total											> 40	0.002	0.081
Mental health	Marital Status	Future	8.534	<0.001	-0.006	-0.010, -0.002	-3.002	0.002	5.69	0.005	Not married	0.006	**<0.001**
Total											Married	-0.001	0.938
Mental health	Professional status	Future	6.681	0.002	-0.005	-0.009, -0.001	-2.498	0.013	4.51	0.004	Not full time	0.006	**<0.001**
Total											Full time	0.001	0.347

Note. F = F distribution; p = p-value; β = standardized beta; CI = confidence interval; t = t-test; f^2 = Cohen's size effect

Discussion

The results are consistent with the study's core premise: psychological resources (happiness, mental health, and psychological well-being) show significant associations with an individual's time perspective. Furthermore, the findings indicate that these associations are not uniform but vary subtly across sociodemographic groups, although the practical significance of these moderations is minimal. The analysis was methodologically robust, with all statistical assumptions met, providing high confidence in the reliability of the observed patterns.

Correlations: confirming established patterns

The correlation results closely align with the extensive body of research cited in the introduction. The positive associations between a Positive Past and a Future-Oriented perspective with well-being measures are consistent with classic indicators of a healthy temporal profile, as described in foundational work such as Zimbardo and Boyd (1999) and later syntheses like Stolarski (2016). This pattern aligns with the idea that a balanced and positive time perspective is typically associated with good psychological functioning. Conversely, the strong negative associations of a Negative Past and a Fatalistic Present with well-being reflect the findings of researchers such as Diaconu-Gherasim et al. (2023) and Kuan and Zhang (2022), indicating that these perspectives are robust correlates of poorer psychological outcomes. The finding that a Hedonistic Present orientation is largely unrelated to overall well-being offers a nuanced perspective. It suggests that pure pleasure-seeking, without balance, does not appear to be strongly associated with lasting happiness, a pattern that aligns with the concept of the Balanced Time Perspective (BTP) discussed by authors such as Stolarski (2016) and Pfund et al. (2022), where hedonism is considered adaptive primarily when integrated with other temporal orientations.

Regression analyses: psychological resources as drivers of time perspective

This analysis directly examines the study's central proposition, building on the alternative model suggested by researchers such as Diaconu-Gherasim & Mardari (2022) and Pfund et al. (2022), which proposes that psychological resources may be linked to temporal outlook. The finding that Subjective Happiness showed the strongest association with a Positive Past perspective is coherent. A higher score on the Subjective Happiness Scale was positively associated with a Past-Positive time perspective, indicating a correlation between greater happiness and a more favourable view

of one's personal history. The strong negative association observed for Mental Health (as measured by the Rand Corporation's MHI and validated by Pais-Ribeiro, 2001) indicates that poorer mental health is associated with a more negative, ruminative focus on the past. This pattern is consistent with prior research that has reported similar correlations between poorer mental health (a key component of which is depression) and a more negative focus on the past.

The dual pattern observed for present hedonism - negatively associated with Mental Health but positively associated with Subjective Happiness - adds depth to the understanding of this construct as measured by the Zimbardo Time Perspective Inventory (ZTPI). This pattern may reflect a distinction between unhealthy escapism (associated with distress) and a healthy capacity for joy (associated with happiness), a possibility that future research could explore further.

The finding that Psychological Well-Being (PWBS), assessed via Ryff's scale (Boylan & Ryff, 2015), showed the strongest association with Future orientation - rather than merely the absence of distress - is noteworthy. This finding is consistent with the idea that future orientation is associated with positive psychological assets such as purpose in life and personal growth (core dimensions of Ryff's model), rather than solely the absence of mental health symptoms.

The observation that Past-Negative, Past-Positive, and Present-Fatalistic time perspectives accounted for the greatest proportion of variance in the model, compared with Present-Hedonistic and Future orientations, is consistent with existing theoretical accounts. As articulated by Zimbardo and Boyd (2008), the emotional potency and relative stability of one's view of the past play a central role in mental health. In these data, a Past-Negative orientation - characterized by a focus on aversive past experiences such as trauma or regret - was associated with a pattern of correlations with psychopathology indicators, including depression, anxiety, and PTSD, making it a robust correlate of poorer well-being. In contrast, a Past-Positive perspective was associated with security and resilience, showing a pattern of positive correlations with better mental health. Similarly, a Present-Fatalistic outlook, defined by beliefs in external control and helplessness, was associated with patterns of hopelessness and an external locus of control, which in turn were related to lower subjective happiness and psychological well-being.

The more modest contribution of Present-Hedonistic and Future orientations may be understood in terms of their contextual dependency and functional complexity. Boniwell and Zimbardo (2004) note that the associations of a Present-Hedonistic orientation (though correlated with pleasure and spontaneity) may be diluted by its dual potential for both positive engagement and negative risk-taking or impulsivity. Likewise, Future orientation, although generally associated with adaptive functioning, can operate as a "double-edged sword"; as Zimbardo and Boyd suggest, an excessive focus on future goals may correlate with anxiety, workaholism, and reduced satisfaction with the present. Moreover, the association of Future orientation with well-being depends heavily on whether goals are intrinsically or extrinsically motivated, introducing nuance that may reduce its uniform correlation with well-being in aggregate models. Thus, the robust associations of past-related and fatalistic perspectives highlight their central role, while the more variable associations of present-hedonistic and future orientations reflect their context-dependent nature.

Moderation analyses: the contextual nuance guided by theory

The investigation of moderations is explicitly guided by Bronfenbrenner's (1979) ecological systems theory, which emphasizes that individual development is embedded within broader social contexts. The findings show patterns that are consistent with the hypotheses drawn from the literature.

The pattern in which the association between mental health and future orientation was stronger for younger participants is consistent with the literature reviewed (e.g., Mello et al., 2022; Kuan, 2023), which suggests that future orientation may be a more salient domain for younger adults in general. The observation that the well-being–positive past association was statistically significant only for women is consistent with the theoretical suggestions of Fuentes et al. (2022) and Bodecka et al. (2021), who propose that women's well-being may show a stronger correlation with relational and past-oriented perspectives. The moderating role of education in the well-being–hedonism association aligns with the views of Burger and Strassmann Rocha (2024) and Gao et al. (2025), who describe education as a "resource multiplier" that may shape how psychological states relate to behavioral tendencies. The patterns observed for unmarried and non-full-time employed individuals also align with hypotheses regarding the structural and relational contexts associated with these factors, as discussed by Angelova and Trencheva (2017) and Adams and Nettle (2009).

Although these moderations were statistically significant and theoretically coherent, the effect sizes ($f^2 \leq 0.005$) were very small. This suggests that while the contextual influences proposed by Bronfenbrenner (1979) are detectable, the primary associations between psychological resources and time perspectives are substantially stronger. The key implication is not that context is irrelevant, but that the associations between internal psychological well-being and temporal orientations appear relatively consistent across demographic groups. This pattern may be interpreted as

encouraging: fostering psychological health is associated with healthier time perspectives for individuals across a wide range of sociodemographic backgrounds.

The Portuguese context

The regression results, which position psychological resources as strongly associated with time perspective, take on particular relevance when interpreted within the context of contemporary Portuguese society. The strong association between mental health and a Negative Past perspective ($\beta = -0.481$) was observed in this Portuguese sample. For many Portuguese citizens, particularly older generations, the recent past has been associated with economic hardship and emigration. In this context, the association between psychological well-being and more positive interpretations of the past was observed alongside individual processes, showing a pattern that may be culturally relevant. This interpretation is further supported by the association between well-being and a Future-Oriented perspective. In a country marked by persistent youth emigration ("brain drain") and job insecurity, the observed correlation between a positive and purposeful future outlook and current psychological resources was present, especially in contexts where traditional structural assurances have weakened.

The specific pattern of moderations, although small in effect size, offers a detailed view of these dynamics. The observation that the mental health–future orientation association was strongest for younger, unmarried, and non-full-time employed individuals was observed in this sample. For these groups - those most affected by precariedade (precariousness) - psychological health showed a stronger association with future planning. Conversely, the moderating role of education - where higher education weakened the association between mental health and a Hedonistic Present orientation - highlights an important pattern. Although the Portuguese education system has expanded significantly, the returns on university degrees are often lower than expected. Nevertheless, in these data, education was associated with patterns suggesting that cognitive resources may correlate with reduced fatalism or excessive present-focused escapism, even in the face of economic disappointment. Taken together, these moderations illustrate how, in this Portuguese sample, socio-economic conditions were associated with the ways psychological well-being and temporal orientations were connected.

Limitations

The most significant limitation of this study is that the data are correlational. Although the analyses were structured to examine associations between well-being and time perspective, alternative explanations, such as reverse associations or the influence of unmeasured third variables, remain plausible. Longitudinal or experimental designs would be required to clarify temporal ordering and strengthen causal inferences.

The moderation effects, while theoretically meaningful, were very small in magnitude, which limits their practical relevance for targeted interventions. The primary implication is that psychological resources show consistent associations with time perspectives across demographic groups, although the strength of these associations varies only minimally. The use of a Portuguese sample and specific validated instruments also means that generalization to other cultural contexts should be approached with caution.

This study employed a cross-sectional design, capturing data at a single point in time. This limits the ability to determine how time perspectives and mental health indicators relate to one another over time. Longitudinal research would allow for a clearer understanding of how changes in one domain correspond to changes in the other. Additionally, the reliance on self-reported measures may introduce bias, as participants may respond in ways they perceive as socially desirable rather than fully reflecting their internal experiences. Such tendencies could influence the observed associations.

Time perspectives can vary substantially across cultures, and the findings may not generalize to populations with different cultural backgrounds. The sample in this study was skewed toward university-educated, unmarried participants under age 40, which diverges from national census distributions for age, marital status, and educational attainment. As confirmed by Chi-square goodness-of-fit tests, all categorical variables were unevenly distributed: the sample included significantly more women than men, more unmarried than married participants, and a slightly higher proportion of individuals with university education and full-time employment. These characteristics should be considered when interpreting the results, as the findings may reflect dynamics specific to this demographic profile. Cross-validation in nationally representative samples would be valuable for assessing the stability of these interaction patterns.

Finally, mental health is influenced by numerous biological, environmental, and social factors beyond time perspective. Focusing primarily on temporal orientations may oversimplify the complex interplay of determinants that contribute to psychological well-being. Addressing these limitations in future research would deepen understanding of the multifaceted relationships between time perspectives and mental health, ultimately informing interventions aimed at supporting psychological well-being (Griffin & Wildbur, 2020).

Conclusion and implications

In summary, these results contribute to reframing the relationship between well-being and time perspective by offering empirical patterns consistent with the alternative model proposed by contemporary researchers. The findings, generated using well-validated instruments such as the ZTPI (Zimbardo & Boyd, 1999), the PWBS (Ryff, 1989), the SHS (Lyubomirsky & Lepper, 1999), and the MHI (Rand Corporation), indicate that internal psychological resources show strong associations with healthier time perspectives. While the study also shows that sociodemographic contexts, as theorized by Bronfenbrenner (1979), are associated with statistically significant moderation effects, their practical impact is minimal. The broader implication is that interventions aimed at enhancing psychological well-being—drawing on the models proposed by the authors cited—may be a promising and widely applicable approach for supporting balanced and adaptive time perspectives across diverse populations.

The novelty of this study lies in moving beyond the well-established correlations between time perspective and well-being to explore potential mechanisms and contextual boundaries. The findings provide empirical patterns consistent with a correlational relationship between psychological resources and temporal profiles. Moreover, by identifying sociodemographic moderators, the study highlights that these associations are not entirely uniform but vary subtly according to life circumstances—for example, the mental health–future orientation association appeared most pronounced among younger, unmarried individuals in this sample. This contextualization represents an important step toward a more nuanced, ecological understanding of how time perspectives relate to psychological functioning.

Authors' contributions All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Armanda Gonçalves, Inês Ferreira, Júlia Cunha and Lara Igreja. The first draft of the manuscript was written by Armanda Gonçalves and Ângela Leite. All authors commented on previous versions of the manuscript. The final version was supervised by Ângela Leite. All authors read and approved the final manuscript.

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Declarations

Ethical approval Ethical approval was secured from the Scientific Council of the Universidade Católica Portuguesa (Report Number: 2024/UCP/028). The research adhered to the principles of the Helsinki Declaration.

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

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