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Does time matter? The role of time perspective and ageism in mental health along the lifespan

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Abstract

Time perspective is a consistent personal viewpoint which evolves with age and may influence mental health across the lifespan. This study aims to: (1) compare time perspective, perceived ageism and mental health indicators, in three age cohorts across the lifespan; (2) examine the influence of time perspective on mental health indicators (depression, anxiety, and stress); and (3) assess whether ageism serves as a moderating factor between time perspective and mental health indicators. 1311 participants from three distinct age groups (18–39, 40–59, and 60+) participated in this cross-sectional study. The following instruments were used: (a) Future Time Perspective Scale (FTPS); (b) Perceived Ageism Questionnaire (PAQ); (c) Depression, Anxiety, and Stress Scales (DASS-21); and (d) a sociodemographic, health and lifestyle questionnaire. MANOVAs and moderated regression analyses were performed on the data. Results indicated the highest levels of stress, anxiety and perceived ageism among younger and older participants. A decrease in FTP-Opportunity and an increase of FTP-Limitation, and the perception of increased positive ageism were found throughout the life cycle. FTP-Opportunity was found to negatively impact stress, anxiety, and depression, whereas FTP-Limitation showed a positive effect. Positive ageism also moderated the effects of FTP-Opportunity on anxiety and depression. This study unveils the intricate relationship between time perspective, mental health, and ageism, indicating that time perspective significantly influences mental health outcomes such as depression, anxiety, and stress. Addressing ageism emerges as a crucial component in enhancing mental health in individuals of all ages.

Keywords Mental health · Anxiety · Depression · Stress · Time perspective · Ageism · Lifespan · Age groups

Introduction

A novel approach to mental health is crucial, considering the widespread impact of mental illnesses across the lifespan and the increasing importance of healthy lifestyles as people live longer (Curran et al., 2020; Moon et al., 2023). Physical and mental well-being are deeply interconnected components of perceived health. Mental health encompasses emotional, psychological, and social dimensions, all of which significantly influence how individuals feel, think, behave, handle stress, interact with others, and make decisions (WHO, 2022a).

Depression affects over 280 million people globally, accounting for 3.8% of the population and rising to 5.7% among those aged 60 and older (Institute of Health Metrics and Evaluation, 2019). Anxiety disorders are the most prevalent mental health conditions worldwide, impacting 301 million individuals in 2019 (WHO, 2023). In 2022, 40% of adults globally reported high stress levels, with 60% feeling overwhelmed by stress at least once in the past year (Boyon & Mendez, 2022; Elflein, 2024). Psychological distress is particularly pronounced in individuals with prior mental health diagnoses and is influenced by loneliness, low resilience, poor sleep, and younger age, making younger populations more susceptible to stress, depression, and anxiety (Varma et al., 2021). Depression increases the risk of chronic illnesses like heart disease, diabetes, and

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stroke, while chronic conditions exacerbate mental health issues (National Institute of Mental Health, 2021). Anxiety and depression often share symptoms and mechanisms, significantly impacting older adults' quality of life (Curran et al., 2020). The COVID-19 pandemic further heightened mental health challenges, increasing anxiety and depression rates globally by 25% in its first year, with younger individuals more affected despite older adults being more vulnerable to infection (WHO, 2022b).

Time perspective encompasses one's views and emotions about the past, present, and future (Laureiro-Martinez et al., 2017; Mello, 2019; Mello & Worrell, 2015). While generally stable, it likely evolves with age (Zimbardo & Boyd, 1999), as older adults perceive their remaining time as more limited, prompting a shift from knowledge-oriented to emotion-focused goals to maintain well-being (Carstensen, 2006; Lang & Carstensen, 2002). Future time perspective (FTP) explores how people subjectively view their lives, particularly how much they believe that the future is either restricted and confined or open-ended and full of opportunity (Carstensen et al., 1999; Zhang et al., 2019). Older adults typically report lower FTP, but this does not necessarily relate to reduced emotional functioning or well-being (Grühn et al., 2016). Interestingly, FTP opportunities and limitations were connected to higher well-being in older persons with less unfavorable age stereotype perceptions (Zhang et al., 2019). More recently, a time perspective model created by Mello and colleagues (Mello, 2019; Mello & Worrell, 2015) highlighted dimensions like frequency, orientation, and emotional valence, emphasizing how planning and anticipating desirable outcomes influence motivation, behavior, and well-being. Time perspective significantly correlates with outcomes such as well-being, adjustment to aging, health behavior, and retirement planning (Kooij et al., 2018; von Humboldt et al., 2013a, b, 2014; von Humboldt & Leal, 2014, 2016, 2017).

Ageism refers to stereotypes, prejudices, and discrimination based on age, affecting individuals regardless of unique traits (Ayalon & Tesch-Römer, 2018; Kornadt et al., 2021). It is the most prevalent form of bias, impacting both younger and older adults but in distinct ways. Middle-aged and older adults often encounter social and physical stereotypes, while younger adults face assumptions about cognitive capacities and patronizing treatment (Bratt et al., 2020; Chasteen et al., 2021). Younger adults are also more likely to report experiencing age discrimination than older individuals (Bratt et al., 2018). Studies reveal that middle-aged individuals are more likely to display ageist behaviors (Fowler & Gasiorek, 2023), while preconceived notions about younger workers contribute to workplace and consumer discrimination (Chasteen et al., 2021; Gargouri & Guaman, 2017). Higher levels of age discrimination in the workplace are also perceived by older workers (von Humboldt et al., 2022a, b). Numerous studies have shown that age discrimination against older individuals has increased (Ayalon & Tesch-Römer, 2018; Banerjee, 2020; Bratt et al., 2018; Neumark, 2022; Palmore, 2015) and the health, subjective age and well-being of older persons may be negatively influenced by their perception and experience of ageism (Chang et al., 2020; Kornadt et al., 2021; Miguel et al., 2024; Monahan et al., 2020; von Humboldt et al., 2019, 2020, 2022a, b). Older adults are frequently the least prioritized for medical care, often subjected to neglect and age-based discrimination (Monahan et al., 2020). Additionally, ageism has been linked to substantial effects on mental health, particularly regarding anxiety and depression symptoms experienced over a lifetime (Ribeiro-Gonçalves et al., 2023; Teaster & Giwa, 2023). Notwithstanding, while predominantly negative, ageism may also include positive stereotypes, such as the perception of older adults as wise and capable of navigating complex social situations. This "positive ageism" can have divergent effects on mental health and well-being (Brinkhof et al., 2022; Fasel et al., 2021; Levy et al., 2022).

Previous studies have indicated positive correlations between self-esteem and time perspective (Webster, 2011). Moreover, throughout life, self-esteem has a significant impact on mental health (Henriksen et al., 2017). Negative correlations have also been observed between time perspective and symptoms of anxiety and depression (Moon et al., 2023). Higher levels of depressive symptoms have been linked to emotions about negative or less optimistic past and present (Carpenter et al., 2022; Kaya Lefèvre et al., 2019; Micillo et al., 2022; Wang et al., 2021) and a reduced focus on the future (Kooij et al., 2018). Literature has indicated that anxiety is positively correlated with negative emotions on the past and future (Anagnostopoulos & Griva, 2012; Åström et al., 2014) and fewer pleasant emotions about the past and future (Åström et al., 2018). Moreover, a meta-analysis showed that anxiety was inversely correlated with giving the future a greater significance (Kooij et al., 2018). While individuals generally report more positive than negative feelings about time periods, negative perceptions are linked to undesirable outcomes, including heightened stress, psychosocial imbalance, and risky behaviors (McKay et al., 2021; Moon et al., 2023).

The literature underscores the importance of addressing time perspective in mental health interventions for adults. Adults with heightened rumination tendencies often report negative associations with time periods and frequent thoughts about the past. This relationship between time perspective, anxiety, and depressive symptoms has been consistently observed (Moon et al., 2023). Despite its significance, research examining time perspective across the life cycle remains sparse, with limited studies exploring its

role in mental health across the adult lifespan. Moreover, the influence of societal biases, such as ageism, on time perspective is underexplored (Barber & Tan, 2018; Kooij et al., 2018). There is also a lack of studies that compare ageism and time perspective within a sample spanning from early adulthood to the later stages of life. This dearth of research underscores the need for more comprehensive research into the interplay between time perspective, ageism and mental health throughout the lifespan. In this context, this study aims to: (1) compare time perspective, perceived ageism and mental health indicators in three age cohorts (18–39, 40–659, and 60 + years) across the lifespan, (2) examine the influence of time perspective on mental health indicators (depression, anxiety, and stress), and (3) investigate whether ageism serves as a moderating factor between time perspective and mental health indicators (depression, anxiety, and stress).

Method

Participants

This study included 1311 Portuguese participants, ages ranging from 18 to 91 ($M = 43.59$; $SD = 16.67$). Participants' socio-demographic characteristics are shown in Table 1. Participants were categorized into three age groups: younger adults (18–39 years), adults (40–59 years), and older adults (60 years and older). By including individuals aged 60 and older in the older adult category we aim to capture the aging process as people enter the early stages of older adulthood, and in this way, to assess to a broader range of experiences related to time perspective and ageism among the older sample. All participants were living in the community and were eighteen years old and older.

Results of an a priori power analysis with G*Power indicated the required sample size to achieve 95% power for detecting a medium effect, at a significance criterion of $\alpha = 0.05$, was $n = 153$. However, a large sample size of 1311 was used to account for potential population heterogeneity, conduct planned subgroup analyses (e.g., age group comparisons), and ensure adequate statistical power for secondary outcomes. Practical considerations such as participant recruitment and data collection efficiency also influenced the final sample size.

Table 1 Sociodemographic characteristics of the participants

Characteristics	Frequency (*n*)	Percentage (%)
Total (overall)	1311	100
Gender		
Male	612	46.7
Female	684	52.2
Other	15	1.1
Age group		
18–39 years	530	40.4
40–59 years	552	42.1
60 + years	229	17.5
Educational level*		
< Secondary	236	18.0
Secondary	405	30.9
> Secondary	639	48.7
Marital status		
Single	458	34.9
Married/*de facto* union	639	48.7
Divorced/separated	137	10.5
Widow	77	5.9

*31 participants did not report on their level of education

Materials

Sociodemographic questionnaire

The sociodemographic questionnaire collected participants' information including age, gender, level of education, and marital status. Descriptive statistics were used to characterize the sample.

Future Time Perspective Scale (FTPS)

FTP was assessed with the 10-item version of the Future Time Perspective Scale (FTPS; Rohr et al., 2017), which measures respondents' perceptions of their remaining time in life, specifically the extent to which the future is perceived as open-ended and holding opportunities (e.g., "My future is filled with possibilities"), or as being limited and closed in nature (e.g., "I have the sense that time is running out"). Participants rated items on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A confirmatory factor analysis showed that the two-factor solution for the 10 items provided satisfactory fit to the data of the current sample, $\chi^2(34) = 501.389$, $p < .001$; CFI = 0.93, TLI = 0.90, RMSEA = 0.10, 90% CI = [0.09–0.11]; SRMR = 0.05. Item standardized loadings were all high, ranging from 0.53 to 0.89 in the FTP-Opportunity subscale, and 0.68 to 0.81 in the FTP-Limitation subscale. Internal consistency for the current sample was also satisfactory (Cronbach's $\alpha = 0.90$ for FTP-Opportunity; Cronbach's $\alpha = 0.78$ for FTP-Limitation).

Perceived Ageism Questionnaire (PAQ)

Perceived ageism was assessed using the 8-item version of the Perceived Ageism Questionnaire (PAQ-8; Brinkhof et al., 2022), which enables individuals to quantify the level of perceived and experienced ageism, including both negative (e.g., "… people hold negative prejudices or exaggerated

stereotypes (e.g., weak, vulnerable, dull, slow) about you because of your age?") and positive (e.g., "People value your advice and contribution to a conversation because of your life experience?") forms of ageism. Participants are asked to report how many times positive and negative situations have occurred in the past year using a 5-point Likert scale ranging from 1 (*never*) to 5 (*very often*). A confirmatory factor analysis showed that the two-factor solution for the 10 items provided satisfactory fit to the data of the current sample, $\chi^2(19)=162.084$, $p<.001$; CFI = 0.97, TLI = 0.95, RMSEA = 0.07, 90% CI = [0.06–0.08]; SRMR = 0.04. Item standardized loadings were all high, ranging from 0.54 to 0.89. In the present study, subscales presented adequate reliability, with Cronbach alpha coefficients of 0.89 for the perceived negative ageism, and 0.73 for perceived positive ageism.

Depression Anxiety Stress Scales (DASS-21)

Negative emotional states were assessed with the Portuguese version (Pais-Ribeiro et al., 2004) of the Depression Anxiety Stress Scale −21 (DASS-21; Lovibond & Lovibond, 1995). The 21 items on the questionnaire comprise a set of 3 self-reported scales designed to assess depression (e.g., "I couldn't seem to experience any positive feeling at all"), anxiety (e.g., "I was worried about situations in which I might panic and make a fool of myself") and stress (e.g., "I found myself getting agitated"). The degree to which respondents endorsed the symptoms over the course of the last week is rated on a Likert scale ranging from 0 (*Did not apply to me at all*) to 3 (*Applied to me very much or most of the time*). Higher scores reflect higher levels of symptom endorsement. A confirmatory factor analysis showed that the three-factor solution for the 21 items provided fair fit to the data of the current sample, $\chi^2(186)=1224.168$, $p<.001$; CFI = 0.95, TLI = 0.95, RMSEA = 0.06, 90% CI = [0.06–0.06]; SRMR = 0.03. All items had high standardized factor loadings, ranging from 0.71 to 0.86 in the stress subscale, from 0.71 to 0.86 in the anxiety subscale, and from 0.73 to 0.86 in the depression subscale. Internal consistency for the current sample was also very satisfactory ($\alpha=0.935$, $\alpha=0.932$, $\alpha=0.924$, respectively for stress, anxiety and depression).

Procedure

All participants were provided with research details and asked to complete an informed consent form. Inclusion criteria were being 18 years-old or older, living in the community, and being able to autonomously complete the online survey. Phone or online assistance was offered. To obtain a larger and more diverse sample, the questionnaire link was shared via email and social/personal networks. Optimizing the possibility for mobile online responses allowed a wider access and representation of participants. To mitigate potential biases from social network sampling, an adaptive approach helped in balancing the sample and mitigating biases that might arise from over-reliance on particular social networks: first, recruitment was initiated through multiple independent sources, thereby increasing the likelihood that the network of participants included individuals with varied backgrounds and experiences; second, throughout the recruitment process, demographic data was continuously monitored to ensure diversity goals were being met. When certain groups were underrepresented, targeted efforts were intensified to recruit more participants from those populations. Participants were made aware that they might end their involvement at any moment and that it was entirely voluntary. Data anonymity and confidentiality were guaranteed. The period of data collecting in 2023 was from March to May. The William James Center for Research and ISPA, Instituto Universitário, gave approval to all procedures. Protocols for human subject's research were conducted in accordance with the Portuguese Psychologists' Code of Ethics and the Helsinki Declaration on Ethical Guidelines. Following their completion of the surveys, participants received no payment.

Survey data were entered into a database and analyzed using SPSS statistical software– Statistical Package for the Social Sciences. Descriptive analyses were carried out to characterize the sample and the variables under study. Construct validity was assessed by confirmatory factor analyses (CFA). The reliability of each scale was verified by the Cronbach's alpha coefficient. Multivariate analyses of variance (MANOVAs) were performed with study variables (FTP, perceived ageism, depression, anxiety and stress), as dependent variables, and age cohort (18–39 years of age, 40–59 years of age, and 60 years of age and older) and gender as independent variables. MANOVAs were used to decrease the chance of Type I error associated with multiple significance testing with correlated outcome variables. Identified differences were further explored with univariate tests. Tukey's HSD test was used for post-hoc comparisons. PROCESS procedure created by Hayes (2013) was used for regression analysis on moderating effects, taking FTP as independent variable, perceived ageism as moderator, and depression, anxiety and stress as dependent variables. Age and gender were introduced as covariates. Results considered statistically significant were identified, with $p<.05$ as the threshold.

Results

Preliminary analyses

A MANOVA identified a significant multivariate effect of gender on negative emotional states [*Wilk's Λ*=0.984; *F*(6, 2613)=3.604, *p*<.001; *partial η2*=0.008]. Further univariate analyses showed significant differences between means in depression [*F* (1, 1308)=3.827, *p*=.022; *partial η2*=0.006], and anxiety [*F* (1, 1308)=3.568, *p*=.028; *partial η2*=0.005]. Men reported higher levels of depression (*M*=0.99) and anxiety (*M*=0.95) when compared to women ($M_{depression}$ = 0.94; $M_{anxiety}$ = 0.89). In addition, a multivariate effect of gender was found in perceived ageism [*Wilk's Λ*=0.986; *F* (4, 2614)=5.599, *p*<.001; *partial η2*=0.007]. Again, subsequent univariate tests showed significant differences in perceived negative ageism [*F* (2, 1308)=6.144, *p*=.002; *partial η2*=0.009]: men report higher levels of perceived negative ageism *(M*=2.07) when compared to women (*M*=1.90). No effects of gender on FTP were identified.

Future time perspective, perceived ageism, depression, anxiety and stress: differences between age groups

Table 2 presents the results of age group comparisons across FTP, perceived ageism, stress, anxiety, and depression. A significant multivariate effect of age group on negative emotional states [*Wilk's Λ*=0.711 *F* (14, 2604)=34.54, *p*<.001; *partial η2*=0.157] was identified by MANOVA analyses. Findings indicated that FTP-Opportunity decreased with age [$F_{(2, 1308)}$=85.262, *p*<.001; *partial η2*=0.115], with younger participants showing higher levels of FTP-Opportunity (*M*=3.56), when compared to middle-aged (*M*=3.14) and older participants (*M*=2.73). Conversely, FTP-Limitation increased with age [$F_{(2, 1308)}$=26.794, *p*<.001; *partial η2*=0.039], as it was perceived as a limitation only in the older group (*M*=3.23). Negative ageism was mostly perceived by the younger (*M*=2.14) and the older (*M*=2.47) groups of participants [$F_{(2, 1308)}$=88.293, *p*<.001; *partial η2*=0.119]. Positive ageism seems to increase steadily with age [$F_{(2, 1308)}$=26.262, *p*<.001; *partial η2*=0.039], with older participants presenting the higher scores (*M*=3.32), followed by middle-aged (*M*=3.11) and younger participants (*M*=2.86). In terms of stress, anxiety, and depression, scores exhibit a U-shaped pattern across age groups [Stress: $F_{(2, 1308)}$=17.772, *p*<.001; *partial η2*=0.026; Anxiety: $F_{(2, 1308)}$=26.469, *p*<.001; *partial η2*=0.039; Depression: $F_{(2, 1308)}$=22.459, *p*<.001; *partial η2*=0.033]. Older adults (≥60 years) report the highest levels of stress (*M*=1.35), anxiety (*M*=1.13) and depression (*M*=1.14), followed by the younger adults (18–39 years) who report slightly elevated levels of stress (*M*=1.33), anxiety (*M*=1.04) and depression (*M*=1.08). The middle-aged group (40–59 years) consistently reports the lowest levels of stress (*M*=1.07), anxiety (*M*=0.73) and depression (*M*=0.79).

Table 2 Future time perspective, perceived ageism, stress, anxiety and depression: descriptives per age group and univariate tests

	18–39 years	40–59 years	≥60 years		
	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)	*F*	*P*
FTP - Opportunity	3.56 (0.85) *a*	3.14 (0.82) *b*	2.73 (0.84) *c*	85.262	<0.001
FTP - Limitation	2.79 (0.94) *a*	2.70 (0.92) *a*	3.23 (1.02) *b*	26.794	<0.001
Perceived negative ageism	2.14 (0.87) *a*	1.64 (0.81) *b*	2.47 (1.01) *c*	88.293	<0.001
Perceived positive ageism	2.86 (0.80) *a*	3.11 (0.89) *b*	3.32 (0.87) *c*	26.262	<0.001
Stress	1.33 (0.79) *a*	1.07 (0.80) *b*	1.35 (0.84) *a*	17.772	<0.001
Anxiety	1.04 (0.83) *a*	0.73 (0.83) *b*	1.13 (0.84) *a*	26.469	<0.001
Depression	1.08 (0.85) *a*	0.79 (0.82) *b*	1.14 (0.86) *a*	22.459	<0.001

Measures marked with different letters differ statistically between age categories, at the level of α<0.05, according to the Tukey HSD test

Relations between future time perspective, depression, anxiety and stress: the moderating role of perceived ageism

Moderation models were tested to investigate whether the association between FTP (opportunity and limitation) and stress, anxiety and depression depends on perceived ageism (negative and positive). As shown in Table 3, results overall indicated that FTP-Limitation is a positive and statistically significant predictor of stress, anxiety and depression. Conversely, greater levels of FTP-Opportunity are negatively associated to stress, anxiety and depression. Also, while perceived negative ageism is significant in predicting stress, anxiety and depression, positive ageism was only negatively associated to depression. The moderating effect of perceived positive ageism (*b*=0.067, *p*=.014) on the relationship between FTP-Opportunity and anxiety was statistically significant, suggesting that the effect of FTP-Opportunity on anxiety depends on the level of perceived positive ageism. Simple slope for the association between FTP-Opportunity and anxiety was tested for low (−1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of perceived positive ageism: the negative effect of FTP-Opportunity is significant for low (*b*=−0.136, *p*<.001), and

Table 3 Summary of moderated regression analyses predicting stress, anxiety and depression

	Stress		Anxiety		Depression	
	b (SE)	95% CI	*B (SE)*	95% CI	*B (SE)*	95% CI
FTP-Opportunity (X)	−0.050 (0.025)	[−0.099; −0.001]	−0.063 (0.024)	[−0.110; −0.016]	−0.135 (0.024)	[−0.183; −0.088]
Perceived negative ageism (W)	0.378 (0.022)	[0.334; 0.421]	0.496 (0.022)	[0.454; 0.538]	0.480 (0.022)	[0.437; 0.523]
X x W	0.043 (0.022)	[0.000; 0.087]	0.037 (0.022)	[−0.005; 0.079]	0.034 (0.022)	[−0.009; 0.077]
Age (covariate)	−0.004 (0.001)	[−0.007; −0.002]	−0.003 (0.001)	[−0.006; −0.001]	−0.005 (0.001)	[−0.008; −0.003)
Gender (covariate)	−0.102 (0.041)	[−0.183; −0.022]	−0.027 (0.040)	[−0.105; 0.051]	−0.029 (0.040)	[−0.108; 0.050]
F		63.11***		113.06***		108.24***
R^2		0.197		0.305		0.296
FTP-Limitation (X)	0.135 (0.023)	[0.090; 0.179]	0.089 (0.022)	[0.046; 0.132]	1.139 (0.022)	[0.107; 0.195]
Perceived negative ageism (W)	0.337 (0.025)	[0.288; 0.387]	0.477 (0.025)	[0.429; 0.526]	0.442 (0.025)	[0.393; 0.491]
X x W	−0.011 (0.021)	[−0.053; 0.030]	−0.024 (0.020)	[−0.064; 0.016]	−0.031 (0.021)	[−0.072; 0.010]
Age (covariate)	−0.004 (0.001)	[−0.006; −0.002]	−0.002 (0.001)	[−0.005; 0.000]	−0.003 (0.001)	[-,006; −0.001]
Gender (covariate)	−0.109 (0.041)	[−0.188; −0.029]	−0.033 (0.039)	[−0.111; 0.044]	−0.036 (0.040)	[−0.115; 0.043]
F		69.998***		115.389***		112.33***
R^2		0.213		0.309		0.303
FTP-Opportunity (X)	−0.072 (0.028)	[−0.128; −0.016]	−0.079 (0.029)	[−0.137; −0.021]	−0.148 (0.030)	[-,206; −0.090]
Perceived Positive Ageism (W)	0.047 (0.028)	[−0.007; 0.102]	0.022 (0.029)	[−0.034; 0.078]	0.010 (0.029)	[−0.047; 0.066]
X x W	0.008 (0.026)	[−0.043; 0.059]	0.067 (0.027)	[0.014; 0.120]	0.055 (0.027)	[0.002; 0.108]
Age (covariate)	−0.004 (0.002)	[−0.007; −0.001]	−0.003 (0.002)	[−0.006; 0.000]	−0.005 (0.002)	[−0.008; −0.001]
Gender (covariate)	−0.043 (0.045)	[−0.132; 0.046]	0.051 (0.047)	[−0.041; 0.144]	0.047 (0.047)	[−0.046; 0.139]
F		2.329*		3.133**		6.645***
R^2		0.009		0.012		0.025
FTP-Limitation (X)	1.430 (0.023)	[0.208; 0.298]	0.256 (0.024)	[0.209; 0.303]	0.308 (0.024)	[0.262; 0.355]
Perceived Positive Ageism (W)	−0.007 (0.026)	[−0.057; 0.044]	−0.030 (0.027)	[−0.083; 0.023]	−0.066 (0.027)	[−0.119; −0.014]
X x W	0.017 (0.023)	[−0.028; 0.062]	0.040 (0.024)	[−0.007; 0.086]	0.044 (0.023)	[−0.001; 0.090]
Age (covariate)	−0.004 (0.001)	[−0.007; −0.002]	−0.003 (0.001)	[−0.005; 0.000]	−0.003 (0.001)	[−0.006; 0.000]
Gender (covariate)	−0.061 (0.043)	[−0.146; 0.024]	0.033 (0.045)	[−0.056; 0.122]	0.023 (0.045)	[−0.064; 0.111}
F		26.039***		24.951***		36.766***
R^2		0.092		0.088		0.125

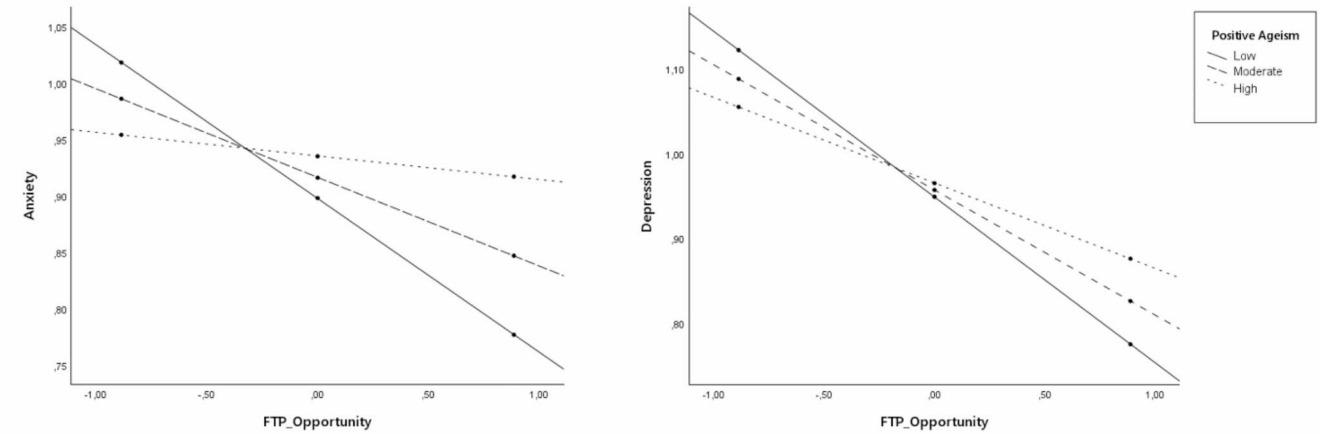

Fig. 1 The relationship between FTP-Opportunity, anxiety and depression, moderated by perceived positive ageism

moderate ($b = -0.079$, $p = .008$) levels of perceived positive ageism, but not for high ($b = -0.021$, $p = .584$) levels of perceived positive ageism (Fig. 1). Finally, results also show that the effect of FTP-Opportunity on depression depends on the level of perceived positive ageism ($b = -0.055$, $p = .043$). Each of the simple slope tests revealed a significant negative association between FTP-Opportunity and depression, but FTP-Opportunity was more strongly related to depression for low levels of perceived positive ageism ($b = -0.196$, $p < .001$), than for moderate ($b = -0.148$, $p < .001$) or high levels ($b = -0.101$, $p = .009$) of perceived positive ageism (see Fig. 1).

Discussion

The present study aimed to compare time perspective, perceived ageism and mental health indicators in three age cohorts across the lifespan, while also examining the influence of time perspective on mental health indicators (depression, anxiety, and stress) and the moderating role of perceived ageism. Findings shed light on FTP, perceived ageism, and psychological distress across different age groups. The decrease in FTP-Opportunity throughout the life cycle suggests a shift in perspective, as individuals age. Younger adults may be more optimistic about future opportunities (Keating & Melis, 2022), which was reflected in their higher scores, while older adults may perceive fewer opportunities, potentially due to factors such as retirement or health concerns (Barbaccia et al., 2022).

The perception of FTP as a limitation increased with age and was found predominantly among older people, which may indicate that as individuals age, they may become increasingly aware of limitations and constraints on their future activities and opportunities. This could be influenced by factors such as declining health or less social opportunities while aging (Durbin et al., 2019).

The findings also reveal reverse ageism, indicating discrimination towards younger adults (aged 18–39) (Raymer et al., 2017), also known as youngism (Francioli & North, 2021). Literature suggests that younger adults commonly feel undervalued, encounter disparaging comments, and are perceived as incompetent due to their youthful appearance, receive fewer chances for professional growth (de la Fuente-Núñez et al., 2021). Additionally, ageism towards older individuals was evident, showing that both younger and older individuals experience significant perceptions of negative ageism or oldism. Older adults are often seen as passive receivers of assistance and may be labeled as burdens on younger generations, fostering ageist beliefs (Kang & Kim, 2022).

Contrastingly, the perception of positive ageism increases throughout the life cycle, indicating that individuals may become more aware of and appreciate the positive aspects of aging as they grow older. This could be attributed to personal experiences, societal changes, or a shift in attitudes towards aging (Li et al., 2023).

Younger people (18–39) and older people (60+) reported the highest levels of stress, anxiety, and depression, which aligns with the idea that middle age years are often considered the golden years (Li et al., 2023). Younger adults may experience stress related to career advancement, financial stability, and societal expectations (Li et al., 2023), while older adults may face stressors such as health concerns, retirement, and caregiving responsibilities (Dow & Meyer, 2010). Moreover, Kang and Kim (2022) found that older adults with greater well-being may be less affected by ageism, especially if they exhibit pride in their age group and optimism about aging and the future. Middle-aged individuals (40–59) reporting lower levels of stress, anxiety and depression may reflect a stage of life where individuals have established careers, financial stability, and familial support networks (Lachman et al., 2015).

Perceived negative ageism showed a direct effect on stress, anxiety, and depression. Additionally, FTP-Opportunity was inversely related to these mental health variables. While individuals may encounter constraints on their FTP, hindering future envisioning (Barber & Strickland-Hughes, 2019), they may also encounter opportunities to expand it, and report positive emotions (Barber & Tan, 2018). In line with these results, FTP-Limitation was directly associated to stress, anxiety and depression. Not surprisingly, in a context of negative ageism, the FTP-Limitation tends to have a significant negative impact on mental health variables like stress, anxiety, and depression, compared to the positive influence of FTP-Opportunity, which corroborates previous literature (Barber & Strickland-Hughes, 2019; Kang & Kim, 2022).

Results also indicated that perceived positive ageism shows a negative effect only on depression and that FTP-Opportunity shows a negative effect on the mental health variables. Research indicates that perceived chances to enhance individuals' FTP, is associated with optimism (Windsor et al., 2012). Conversely, FTP-Limitation is directly related to stress, depression and anxiety. Although positive ageism itself may not directly affect stress and anxiety, FTP-Limitation in a context of positive ageism can negatively affect mental health (Coudin & Lima, 2011). Results show that negative ageism has a more intense effect on mental health than positive ageism. Previous studies indicate that individuals confront their limitations towards the future, within a positive ageism framework, potentially hindering their ability to embrace future possibilities, and given the emphasis on past events (Nuttin, 2014). Moreover, positive ageism and embracing a time perspective can lead to better mental and physical health (Hall & Fong, 2003).

Results also showed that the effects of FTP-Opportunity on mental health variables depended on perceived ageism. Specifically, for participants perceiving low positive ageism, FTP-Opportunity had a stronger negative effect on anxiety and depression, whereas for participants perceiving high positive ageism, FTP-Opportunity's negative effect became weaker on depression, and even detrimental on anxiety. In other words, participants who perceive future time as an opportunity and feel less socially valued due to their age, tend to present lower levels of anxiety and depression. Previous research has been consistent in showing that experiences of negative age discrimination are associated

with an increase in depressive symptoms, as well as stress and anxiety (Kang & Kim, 2022; Lyons et al., 2018; Zhang et al., 2019), while positive ageism has shown different, and possibly even opposite, effects on mental health (Fasel et al., 2021; Levy et al., 2022). By showing that lower the levels of perceived positive ageism are associated to stronger negative effects of FTP-Opportunity on anxiety and depression, these results highlight the need to consider that the effects of ageism may not be so straightforward. Indeed, results suggest that high levels of positive ageism might pose some threat to well-being, as they might probably be perceived as an increased social pressure for individuals. As previously suggested, recognizing the distinction between negative and positive ageism is critical (Brinkhof et al., 2022).

Moreover, positive ageism, which includes societal beliefs that individuals possess valuable attributes such as increased wisdom and experience, could enhance mental health outcomes by fostering a sense of purpose and self-worth among these, as age increases (Zadworna, 2023). This positive perception may buffer against the negative effects of a limited FTP by reinforcing a more optimistic outlook on aging and future opportunities. For instance, if older adults perceive themselves as respected and valued, they may be more likely to engage in proactive behaviors and maintain a positive future orientation, which in turn, can mitigate stress, anxiety, and depression.

The observed gender differences in depression, anxiety, and perceived ageism prompt a critical examination of potential underlying factors. Men's higher levels of depression and anxiety, alongside increased perceptions of negative ageism, may be influenced by a range of socio-cultural and psychological variables. Indeed, men may face specific societal expectations and pressures, such as performing a masculine role or being the main breadwinner for the household, which may influence their mental health and their perceived ageism (Åberg et al., 2020). Additionally, traditional gender roles could affect how men and women cope with stress and manage emotional responses, potentially leading to variations in reported symptoms (Mayor, 2015). Furthermore, men might be more likely to experience and report negative ageism due to societal attitudes and stereotypes that affect their self-perception and mental well-being, due to rigid and inflexible social expectations (Mayor, 2015). Understanding how these gender differences interact with variables such as age and time perspective could provide deeper insights into the mechanisms driving these disparities and help tailor more effective interventions.

Limitations

This study comprises a number of limitations. First, while efforts were made to capture a diverse sample representing different age groups, regions, and backgrounds, these results cannot be generalized to all populations due to potential cultural, societal, or geographical variations. Another limitation is the reliance on self-reported measures for variables such as time perspective and experiences of ageism may introduce bias or inaccuracies, and influencing the reliability of the results. Also, the use of an online survey for data collection may have introduced the possibility of selection bias, as individuals who are more comfortable with or have easier access to technology may be overrepresented, potentially excluding those with limited internet access, lower digital literacy, or preferences for in-person interactions. Despite the targeted efforts to reach older individuals, participants aged sixty and older are less represented in the sample, which represents a further limitation. Moreover, the cross-sectional nature of the study limits our ability to infer causality or examine long-term trajectories, warranting future longitudinal research to elucidate the temporal dynamics of these relationships. Last, the focus on specific mental health outcomes such as anxiety, depression, and stress may overlook other important dimensions of mental health, suggesting the need for broader assessments encompassing a wider array of psychological states.

Contributions and implications of findings

Despite these limitations, this study offers valuable insights into the complex interrelationships between time perspective, ageism, and mental health. By comparing time perspective, perceived ageism, and mental health indicators across three age cohorts, the study provides valuable insights into how these variables differ across the lifespan. This helps in identifying age-related trends and potential vulnerabilities in mental health that are specific to certain age groups. Also, by assessing whether perceived ageism moderates the relationship between time perspective and mental health indicators, the study explores the complex interplay between societal attitudes towards aging and individual psychological outcomes. This can help in understanding how ageism might exacerbate or buffer the effects of time perspective on mental health, leading to better-targeted strategies to combat the negative effects of ageism.

These contributions lay ground for further exploration and may inform interventions. Overall, the results are consistent with the idea that focusing mental health interventions on time perspective may be beneficial. The implications of this study are multifaceted and extend across various domains. First, by highlighting the intricate connections between time perspective, ageism, and mental health, findings underscore the importance of considering these factors in comprehensive approaches to mental health care across the lifespan. Understanding how individuals perceive and

experience time, as well as the impact of age-related biases, can inform tailored interventions aimed at promoting well-being and mitigating age-related disparities in mental health outcomes. Additionally, the study's identification of potential risk factors and protective factors related to time perspective and ageism offers valuable insights for developing targeted interventions and support programs for individuals at risk of mental health challenges. Encouraging individuals to think about long-term goals and the implications of their actions could help develop a future-oriented time perspective. Actions could include school and university courses on financial literacy, career planning, or the importance of sustainability, or public health initiatives that could encourage young adults to adopt healthier lifestyles by framing exercise and healthy eating as investments in their future well-being. Furthermore, the recognition of the role of societal attitudes and stereotypes in shaping mental health outcomes highlights the need for broader societal interventions aimed at challenging ageist beliefs and promoting age-inclusive environments.

Public awareness campaigns aimed at changing societal perceptions of aging could be launched to challenge negative stereotypes, and demonstrate that aging does not equate to decline but rather offers opportunities for continued growth and contribution. Also, implementing mandatory age diversity training for all employees and anti-discrimination laws to better protect older individuals from ageism in diverse contexts (e.g., workplace, health care) can help reduce ageist attitudes. Activities promoting lifelong learning and active engagement for older adults could also help combat ageism by showcasing the ongoing contributions of older individuals. The implications of this study underscore the importance of addressing time perspective and ageism in mental health research, policy, and practice, to foster healthier aging and enhance the well-being across the lifespan.

In conclusion, the present study sheds light on the complex interplay between time perspective, ageism, and mental health, underscoring their significant implications for individuals' well-being across the lifespan. The results highlight the importance of considering temporal perceptions and societal attitudes in understanding mental health outcomes and designing targeted interventions. While further longitudinal research is needed to elucidate the causal pathways and long-term effects of these relationships, this study lays a foundation for future investigations into the mechanisms underlying age-related disparities in mental health. Ultimately, addressing ageism and promoting healthy time perspectives may hold promise for enhancing mental health outcomes and fostering resilience in the face of aging-related challenges. This study emphasizes the urgency of developing age-inclusive policies and interventions that prioritize mental health across the lifespan, ultimately contributing to a more equitable and supportive society for individuals of all ages.

Authors' contributions IM: study concept and design, analysis and interpretation of data; recruitment of subjects, preparation of manuscript; SVH: study concept and design, analysis and interpretation of data, preparation of manuscript; IL: study concept and design, interpretation of data. All authors read and approved the final manuscript.

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Data availability The data are available from the authors upon request.

Declarations

Ethics approval and consent to participate Ethical review and approval were waived for this study, due to involving anonymous, non-sensitive self-reported data from adult participants, ensuring confidentiality. Questions focused solely on general perceptions and experiences and did not request sensitive or private information, with voluntary participation and the option to withdraw at any time. The research did not involve vulnerable populations. Informed consent was obtained, detailing the study's purpose, anonymity, and voluntary nature. The study ensured that participants' rights and well-being were protected.

Consent for publication Not applicable.

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