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The association between Time Perspective and Death Anxiety in Elderly: a systematic review of quantitative studies

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ABSTRACT. This systematic review aims to investigate the literature on the relationship between time perspective and death anxiety in the elderly population. Time perspective is a fundamental process by which the flow of personal experiences is categorized into temporal dimensions, while death anxiety refers to the fear associated with the inevitability of death. The review systematically assesses and critically discusses the literature on time perspective and death anxiety and highlights the implications for future research and practice. A comprehensive search of relevant databases (PubMed, Web of Science, Scopus, Science Direct) was conducted to identify quantitative studies published up to date in this review. The initial search yielded a considerable number of studies (N=401). After applying rigorous inclusion criteria, a final selection of studies (N=5) was examined in detail. Results of our systematic review show that time perspective is related to death anxiety in some circumstances, but extensive research is needed to explore this relationship. Future research efforts should focus on refining assessment methodologies from time perspective and investigating potential interventions that can alleviate death anxiety among the elderly population. Understanding the interplay between time perspective and death anxiety may hold valuable implications for mental health interventions and geriatric care, promoting enhanced well-being and psychological resilience in later life.

Keywords: time perspective, death-anxiety, elderly, old age

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Introduction

Although the relationship between time perspective and death anxiety among the elderly has been discussed for several decades (Dickstein et al., 1966; Bascue et al., 1977; Quinn and Reznikoff, 1985; Martz et al., 2003; Chen, 2011; Barber, 2018), there is still ambiguity on this topic, both in terms of the constructs and the relationship between them. Studying the relationship between time perspective and death anxiety is important because it may lead to the development of new strategies to cope with this type of anxiety and improve our understanding of how individuals cope with the inevitability of death enabling us to enhance mental health support and overall well-being (Chen, 2011; Fortner & Neimeyer, 1999).

Methodologically, the study of time perception in relation to age began around the 1970s with the introduction of the concept of time perception, investigated using the Lines test, developed to measure a person's perceived position across the lifespan (Cottle, 1976). Subsequently, other instruments measuring time perception were developed to assess past, present and future dimensions (Jones, 1988). At the same time, other studies were published aiming to measure new constructs related to time perception, such as subjective age or future time perspective (Brandtstädter & Rothermund, 2003; Lang & Carstensen, 2002; Montepare, 2009).

Although numerous assessment and measurement tools are currently available, results on age-related perception of time generally support the idea that as people advance in age, the perspective on future time becomes limited (Brandtstädter et al., 2010; Carstensen, 2006; Guy et al., 1994; James, 1950). As people age, they become less future-oriented and more present-oriented (Cameron et al., 1978; Ebner et al., 2006). Despite this consensus, however, there is debate about the adaptive nature of perceptions of time. They may be associated with high well-being or with other variables such as depression, anxiety or degree of religiosity (Fung & Isaacowitz, 2016). Moreover, these directions also raise a number of questions about the degree to which perceptions of time may undergo changes and the extent to which these changes have an effect in relation to other variables that may affect psychological functioning (Fung & Isaacowitz, 2016).

According to Chen's (2011) research, having a future temporal orientation does not seem to be linked to death anxiety. However, feeling negatively about the past or having a hedonistic perspective about the present appears to be positively associated with anxiety about what occurs after death. Another study aimed to test whether the relationships between age, gender and death anxiety are mediated by trait anxiety, future orientation, religiosity, spirituality and

religious doubt. While results showed that younger adults had a broader time perspective than middle-aged and older adults, time perspective was a non-significant predictor of anxiety (Henrie, 2010).

Another study sought to capture the link between participants' level of anxiety about death and their perceived sense of their own life and experience of time. The results showed a direct relationship between anxiety about death and respondents' responses to feeling harassed by the passage of time (Quinn & Reznikoff, 1985). At the same time, there was also an inverse relationship between the existence of a long-term personal direction and anxiety about death (Quin & Reznikoff, 1985). Furthermore, respondents with high levels of anxiety about death were less likely to plan and organize their time (Quin & Reznikoff, 1985). Also, participants who scored higher on death anxiety were more likely to describe themselves as changeable and unpredictable (Quin & Reznikoff, 1985).

In another study, Bascue and Lawrence (1977) observed a positive correlation between future time perspective and death anxiety among the elderly. One possible explanation for this lies in the tendency not to look to the future as a form of control of death anxiety. In another study, Rappaport et al., (1993) found that purpose in life and death anxiety correlated negatively, purpose in life was positively associated with projection into the future, while death anxiety correlated positively more with the present. As some studies show, it appears that the outlook on the future time changes with age, meaning that older people see the future as having fewer opportunities (Barber et al., 2018). This has an impact on their emotional state, affecting their well-being (Barber et al., 2018).

To our knowledge, no previous systematic review has attempted to capture the relationship between time perspective and death anxiety in older people. Given this gap in the literature, the need to systematize studies that consider the proposed variables becomes evident. With this in mind, the aim of this systematic review is to clarify the role of time perspective on death anxiety in the elderly. Also, the objective of this study is to assess and gather all relevant resources and empirical evidence regarding the relationship between time perspective and death anxiety among the elderly.

The importance and necessity of this systematic review of the literature on the relationship between time perspective constructs and death anxiety among older people lies in identifying and summarizing existing research and results in the field, which contributes to drawing conclusions about the current state of research on the topic. Moreover, this systematic review can be useful in identifying a number of gaps in the literature in the sense that it can suggest relevant research directions that contribute to the development of knowledge

in the area. On the other hand, the conclusions drawn through a systematic review can be used to develop methods of psychological intervention for coping whith death anxiety among the elderly. In this sense, part of this information can contribute to providing evidence-based recommendations for managing death anxiety and understanding the role that time perspective plays in relation to this variable.

Methodology and sampling

Inclusion criteria

We included those quantitative studies that examined time perspective on death anxiety in older adults using appropriate psychometric instruments. Older adults are commonly considered those over 60 years of age, but we are aware that this may be conceptualized differently in other cultures or countries. Other studies that included adults across the lifespan were only considered if there was differentiation between age groups and included the older adult population. All selected studies were published in English in peer-reviewed journals. Given that the literature on this topic is quite underdeveloped, there was no restriction on the time range of the publications included.

Exclusion criteria

Because the study focuses on quantitative research that measured death anxiety and time perspective, qualitative studies, review studies, editorials, conference papers, abstracts, book chapters, or unpublished theses, and studies that do not fit the characteristics of the study sample were excluded.

Literature search

To systematize the literature on time perspective and death anxiety in older adults, a search of the following databases was conducted: PubMed, Web of Science, Scopus, and Science Direct. The search was performed using the following keywords with Boolean operators, adapted according to the database searched: (time perspective OR time orientation OR time perception OR subjective time perception) AND (death anxiety OR fear of death OR fear of dying OR death attitude) AND (older adults OR elderly OR old age OR gerontology or old people).

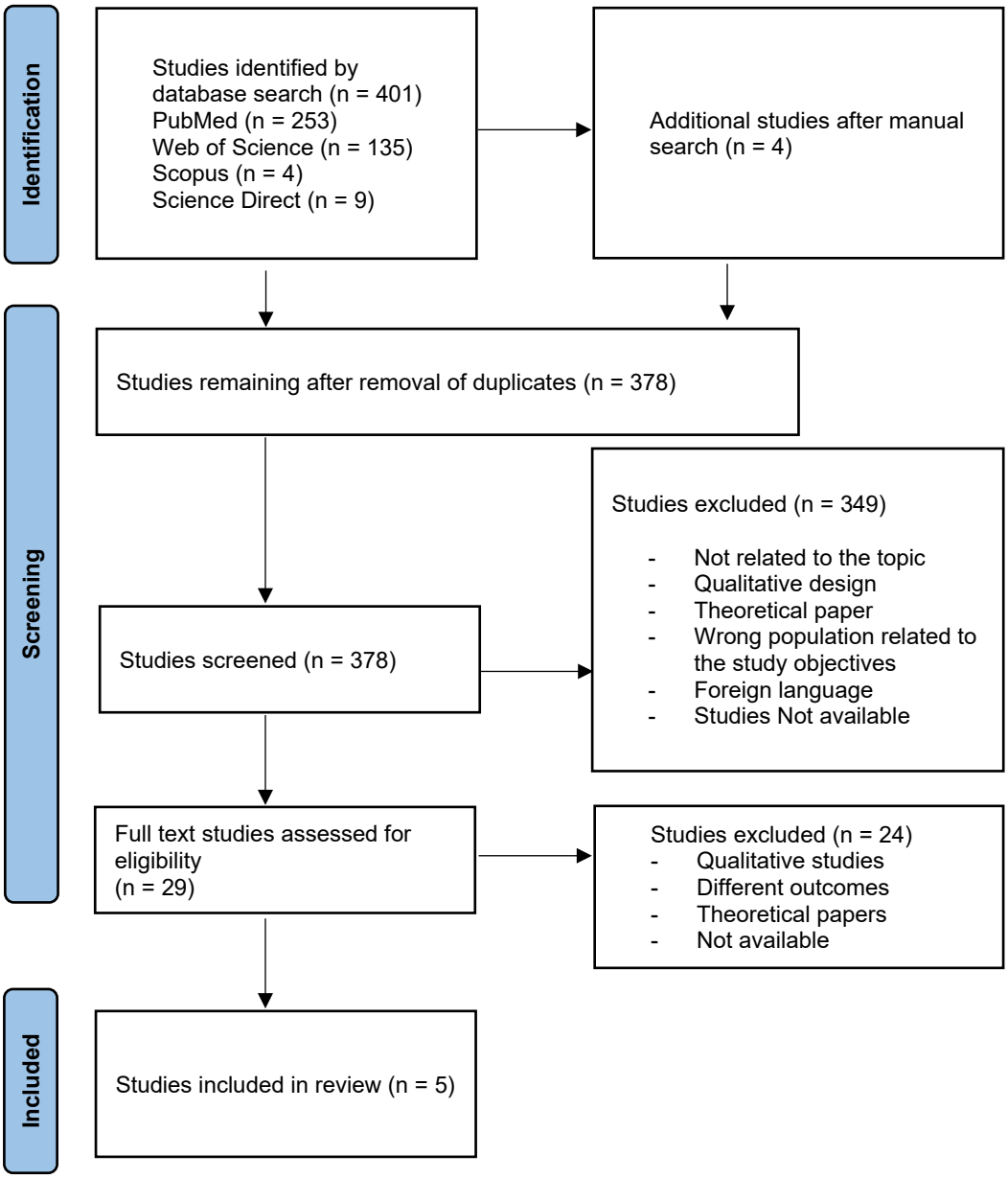

Figure 1. PRISMA diagram illustrating the study selection process

At the same time, we also carried out a manual search in the reference lists of relevant articles. At the same time, the search was limited to publications in English, and to exclude low-quality publications, we decided to include only articles published in peer-reviewed journals.

After identifying studies in the databases, we used Rayyan software to export articles from the databases and remove duplicates. To report this systematization of the literature, we used the Prisma 2020 checklist and Prisma 2020 flow diagram (Figure 1). The database searches resulted in 401 titles and 4 titles identified after manually searching the references of other relevant articles. After removing duplicates, we screened 378 studies based on abstracts and individual article assessment, resulting in the exclusion of 349 studies. Ultimately, only 5 studies met the established criteria for inclusion.

Relevant data and descriptive information were extracted from the studies and organized in a table containing the following categories (Table 1):

- study identification data: authors; article title.
- sample characteristics: sample size, age mean.
- research design
- main results.

A summary of the studies that were selected can be found in Table 1. Within the summary of each article, data on the authors of each article, article title, study objectives, instruments used, participants, type of design and main results were included.

Results

Time perception and death anxiety

In terms of research results, the study of Bascue & Lawrance's (1977) showed that there is a positive correlation between future orientation and death anxiety ($r = .23$, $p < .05$), which indicates that as death anxiety is higher, the future orientation score increases. At the same time, regarding the second research question the results showed that time anxiety ($r = .26$, $p < .05$), time submissiveness ($r = .26$, $p < .05$) and time possessiveness ($r = .28$, $p < .05$) correlated positively with death anxiety, unlike time flexibility which did not correlate with death anxiety (Bascue & Lawrance, 1977). Although the nature of the study did not allow for the determination of causality between variables, it did confirm the existence of associations between certain attitudes toward time and participants' anxiety about death (Bascue & Lawrance, 1977).

Table 1. Summary of studies addressing the relationship between time perspective and death anxiety in the elderly

Authors	Title	Objectives	Instruments	Participants	Research design	Main results
Bascue & Lawrence (1977)	A study of subjective time and death anxiety in the elderly	Investigating the relationship between subjective perceived time and death anxiety in the elderly. The study attempted to answer 2 questions: a) is death anxiety higher in older people who are oriented on future than in those who are oriented on past or present; b) does death anxiety vary according to participants' attitudes towards time?	DAS; JSRD; TRI; TAS;	N = 88 female participants, aged over 62 years (M = 77.15 years), living in apartment complexes exclusively for older people only	Quantitative, cross-sectional study	Research results show that older people tend to avoid focusing on the future as a way of controlling death anxiety. Positive correlation between *future orientation* and *death anxiety* (r = .23*) Positive correlations of the variables *time anxiety* (r = .26*), *time submissiveness* (r = .26*) and *time possessiveness* (r = .28*) with *death anxiety*.
Quinn & Reznikoff (1985)	The relationship between death anxiety and the subjective experience of time in the elderly	The study explored the relationship between level of anxiety about death, sense of purpose in life and personal experience in relation to time controlling for the effects of participants' general anxiety and social desirability	DAS The Time Metaphors Test The Ricks-Epley-Wessman Temporal Experience Questionnaire	N = 145 female participants, ages 60 to 85, members of senior clubs in suburban New Jersey	Quantitative, cross-sectional study	Participants with high scores on death anxiety expressed increased sensitivity to the passage of time. An inverse relationship was found between death anxiety and sense of continuity of one's life. Statistically significant correlations between *death anxiety* and *the passage of time* (r = .20**); between *death anxiety* and feeling harassed about the *passage of time* (r =

						.34**); *death anxiety* and *immediate time pressure* (r = .-27**); *death anxiety* and *time utilization* (r = .-16*) and between *death anxiety* and *personal inconsistency* (r = .29**).
Rappaport et al. (1993)	Future time, death anxiety, and life purpose among older adults	The study aimed to explore the level of association between temporality, death anxiety and purpose in life	DAS; P-i-L; RTL	N = 58 participants (8 male and 50 female), aged 52 to 94 years (M = 73.4), residing in a senior community and living independently.	Quantitative, cross-sectional study	Death anxiety correlated positively with the density of present events. There was no statistically significant correlation between death anxiety and temporal extension into the future (r = .06*). Significant correlation between death anxiety and temporal density in the present (r = .21*).
Moreno et al. (2009)	Death anxiety in institutionalized an non-institutionalized elderly people in Spain	The study explored the relationship between cognitive-affective reactions to death and perception of the passage of time and variables such as residence, age, gender, reflection on one's own life, health and psychological disorders, religious aspects and socio-demographic characteristics.	Qestionnaire developed by the authors measuring variables such as: reflection on one's own life, sense of fulfilment, loneliness and suffering, health issues, subjective perception of time, avoidance of thinking about death, religious issues, beliefs in the afterlife, socio-demographic factors, and the number of visits they received	N = 105 older adults institutionalized in public nursing homes, aged 66-97 years (M = 83.28); 122 older adults living at home, age range 65-93 years (M = 70.65)	Quantitative, cross-sectional study	The results show that the elderly who do not experience the passage of time have less death anxiety than those who experience the rapid passage of time F(2,205) = 5.29*. A high degree of anxiety was found in those who wanted to live as long as possible and in those who wanted to live as long as God wanted F(5, 215) = 2.60*.

			Perception of time was measured by a question, "How do you feel about the passing of time?" DAS			
Rupprecht et al. (2022)	COVID-19 and perceiving finitude: Associations with future time perspective, death anxiety, and ideal life expectancy	The extent to which perceptions of the pandemic (severity, susceptibility, social and financial constraints) affect how people perceive the finitude of their own lives. Different psychological constructs were included to assess perceptions of the finiteness of life (e.g., future time perspective with a number of subcomponents such as, future time opportunity, future time extension and future time constraint, death anxiety and life expectancy.	Future time perspective was assessed using the 10-item scale developed by Carstensen & Lang (1996). Death anxiety was assessed using a single item: "When I think of my own death, I become fearful". Ideal life expectancy was assessed with the question: "To what age would you like to live?".	N = 1042 adults aged 18 to 95 years (M = 59.1, SD = 16.8) of which 68% were female participants.	Longitudinal study	In relation to the pandemic, the future time opportunity has decreased only among the elderly. A limited perspective on the future correlated with older age. Older age correlated with limited future time opportunity, weaker future time extension, stronger future time constraint and lower death anxiety.

Note. DAS: Death Anxiety Scale (Templer, 1970); JSRD: Josey Scale of Religious Development (Josey, 1950); TRI: The Time Reference Inventory (Ross, 1964); TAS (Bascue & Lawrence, 1977); P-i-L: The Purpose-in-Life Test (Crumbaugh & Maholick, 1964); RTL: The Rappaport Time Line (Rappaport et al., 1985).
*p < .05; **p < .01

Quinn and Reznikoff's (1985) study showed significant correlations between death anxiety and the passage of time ($r = .20$, $p < .01$) as measured by the Time Metaphors Test Scores construct (Quinn and Reznikoff, 1985). Significant correlations were also obtained for the constructs assessed by the Ricks-Epley-Wessman Temporal Experience Questionnaire (Quinn and Reznikoff, 1985). Specifically, a positive association was found between a high level of anxiety and feeling "harassed" about the perception of the passage of time ($r = .34$, $p < .01$) as measured by Factor I: "Immediate Time Pressure". At the same time, an inverse correlation was also obtained between scores on death anxiety and factor II: "Long Term Personal Direction" ($r = .-27$, $p < .01$) which measures the feeling of continuity in personal life (Quinn and Reznikoff, 1985). Moreover, a negative correlation was obtained between death anxiety and factor III: "Time Utilization" ($r = -.16$, $p < .05$), which translates into a lower capacity for organization and planning for those with high levels of death anxiety (Quinn and Reznikoff, 1985). Finally, the study also confirmed the existence of an association between death anxiety and participants' perceptions of being unpredictable and changeable ($r = .29$, $p < .01$), variables categorized under Factor IV: "Personal Inconsistency" (Quinn and Reznikoff, 1985). However, it should be noted that the association between the variables is weak, the most consistent being anxiety about death in relation to feeling "harassed" by time.

Regarding the hypotheses proposed by Rappaport et al. (1993) concerning the link between temporal perspective and death anxiety, they considered the existence of a negative correlation between death anxiety and temporal extension in the past and future, and the existence of a positive correlation between death anxiety and temporal density in the present. Results showed that there was no statistically significant correlation between death anxiety and temporal extension in the future ($r = .06$, $p > .05$), but there was a significant correlation between death anxiety and temporal density in the present ($r = .21$, $p < .05$). However, the sample of this study is quite small, which requires caution in extrapolating results.

Moreno et alii (2008) study investigated death anxiety in institutionalized and non-institutionalised older people in relation to a range of cognitive-affective reactions and perceptions of the passage of time and other variables such as residence, age, gender, reflection on one's own life, health status, psychological problems, religious aspects and socio-demographic characteristics.

On the question "How do you feel about the passage of time?" and death anxiety, the results showed that older adults who do not observe the passage of time have lower levels of death anxiety than those who perceive time as passing quickly $F(2,205) = 5.29$, $p < .05$ (Moreno et al., 2008). In addition, there were other questions that on issues related to the perception of the passage of time and relating to time in general. For example, in relation to the question "How

long would you like to live for", the data showed that those with the lowest anxiety levels were those who did not want to live longer (Moreno et al., 2008). Those with the highest anxiety levels were those who wanted to live as long as possible and those who wanted to live as long as God wanted $F(5, 215) = 2.60$, $p < .05$ (Moreno et al., 2008).

Another variable related to the perception of time refers to reflection on one's own life, and being measured by the question "Have you really done what you wanted to do throughout your life?". Post-hoc analysis revealed that those who answered yes had lower levels of anxiety about death than those who answered "sometimes" $F(2, 205) = 4.72$, $p < .01$ (Moreno et al., 2008). Furthermore, those who said they did what they wanted to do also reported that they felt they had a happier life and did not feel sad (Moreno et al., 2008). In relation to the differences between institutionalized and non-institutionalised, the results showed significant differences in that institutionalized older people had lower levels of anxiety about death.

In the systematic review we decided to include the study by Rupprecht et al. (2022). The article does not explore only the elderly population, but includes a wide range in terms of the age of participants (18-95) years, and the segmentation by age range helps us to draw some conclusions about the variables that are the subject of this systematic review. At the same time, as mentioned by the authors, one of the aims of the study was to explore the relationships between a series of psychological constructs that concern the finitude of life such as: perspective on temporality, anxiety about death and life expectancy in the context of the Covid-19 pandemic. Results showed that older age was correlated with a lower perception of future time opportunities and also with a lower perception of future time extension and a higher perception of future time constraint, lower death anxiety and higher life expectancy. The results of the study and specific analyses by age group showed that at older ages, the study participants seemed to be able to accommodate the finitude of life.

Instruments used

In Bascue & Lawrence's (1977) study, time perspective/orientation was measured using The Time Reference Inventory (TRI). The instrument consists of thirty statements that respondents can assign to a time orientation: past, present, or future. In addition to this questionnaire, the TAS was also used, about which the authors did not provide details except that it assesses attitudes about time: time anxiety, which refers to the need to control time and dependence on objective measures of time; time submissiveness, which indicates conformity and time orientation; time possessiveness - indicating that people are bothered by the rapid passage of time and need to know what the future may bring; and time flexibility - which refers to the attitude that people would feel comfortable

and have less anxiety if they lost track of objective time (Bascue & Lawrance, 1977. As for death anxiety, it was assessed with the scale developed by Templer - Death Anxiety Scale (DAS), widely used to assess this variable (Bascue & Lawrance, 1977).

In Quinn and Reznikoff's (1985) study, death anxiety was measured with the Templer Death Anxiety Scale. The scale consists of 15 items to which participants are given the opportunity to answer true or false depending on their agreement with the item. Two scales were used to measure perception of time: The Time Metaphors Test and The Ricks-Epley-Wessman Temporal Experience Questionnaire. With regard to the first instrument, it uses a series of 14 metaphors through which participants reflect on the tendency to orient (directional movement) towards the future. Seven of these metaphors reflect the direction towards the future and the other seven the preference to remain static.

The Ricks-Epley-Wessman Temporal Experience Questionnaire is an 80-item Likert-type scale that measures personal experience in relation to time and includes a series of 20 items for the four factors it measures that were described above. However, in Quinn and Reznikoff's (1985) research they do not provide details of the psychometric properties of the instruments used, so we do not have a clear picture of how well these instruments measure the constructs assessed, which is likely to be reflected in the results obtained.

In this respect, as the authors mention in relation to the results obtained, although they are statistically significant there is a risk that due to the modest values they are subject to possible prediction errors (Quinn & Reznikoff, 1985). Taking into account the sample size (N=145), the results should be interpreted with caution because a limiting aspect is mentioned, which concerns the variance that was not explained by the relationship between the variables (Quinn, 1985). In other words, we must bear in mind that there are other factors that may influence the relationship between the variables studied, which may affect the significance and generalizability of the results.

In the study by Moreno et al. (2008) death anxiety was measured using the Templer Death Anxiety (DAS) instrument. As for perception of time, there was no instrument, but a series of questions targeting this variable such as: "How do you feel about the passage of time?", "For how long would you like to live?", "Have you really done what you wanted to do throughout your life?"

In Rupprecht et al.'s (2022) study, the time perspective on the future comprised three subcomponents - future time opportunity, future time extension, and future time constraint and was assessed using the 10-item scale developed by Carsten & Lang (Carstensen and Lang, 1996; Rupprecht et al., 2022). There was also an item measuring life expectancy, assessed by a single item "Until what age do you want to live:". Anxiety about death was assessed by a single item "When I think about my own death, I become fearful" to which respondents answered on a Likert-type scale (agree-disagree) with 7 response options. One

limitation of the study concerns the instruments used, such as the use of single-item measures for death anxiety, which, as noted by the authors, have not been validated in previous research (Rupprecht et al., 2022). Additionally, there were issues with the validity indicators for future time extension (Rupprecht et al., 2022).

Related to the study conducted by Rappaport et al. (1993), death anxiety was assessed using the Templer Death Anxiety Scale, and time perspective using The Rappaport Time Line (RTL) (Rappaport et al., 1985). As described by the authors, the RTL is a minimally structured pencil-and-paper instrument in which the participant constructs a spatial representation of his or her life that he or she categorizes according to the most significant life experiences associated with temporal categories: past, present, and future (Rappaport et al., 1993). On the strip of paper he or she receives, the participant determines the present by indicating a guide point called "now" and brackets delimiting this point. Thus, the past extends from the first experience that the participant notes on this line to the first bracket in the present area, and the future begins with the outer bracket in the present area extending to the last mark made by the participant (Rappaport et al., 1993, p. 373). According to the authors, RTL provides not only an estimate of the temporal extent in the past, (the number of years from the present to the first marked experience), and the future (the number of years starting from the present to the last marked experience), but also an estimate of the temporal density (he number of events noted by the person in each temporal category) (Rappaport et al. 1993, p. 373). This tool is an operationalization of the concept of temporal extent proposed by Kastenbaum (1961) which refers to the degree to which a person can project into the future or past, and temporal density to the degree to which a given time interval is filled with events, thoughts or plans. In terms of psychometric indicators of the instrument, Rappaport et al. (1993) report a fidelity coefficient of .92 for past temporal extension and .81 for temporal density.

Conclusions

A number of the studies analyzed have shown that future orientation is associated with anxiety about dying in adulthood (Bascue & Lawrance, 1977; Moreno et al., 2008) and awareness that time is passing or feeling "harassed about time" is associated with death anxiety (Quinn & Reznikoff, 1985). However, the results obtained by Rappaport et al. (1993) did not confirm a link between future reporting and death anxiety, but rather an association of death anxiety with the present. Similarly, the study by Rupprecht et al. (2022) in the context of the pandemic did not find associations between the future orientation and

increased death anxiety. Other studies have shown that with advancing age, older people seem to focus less on negative events in the past and approach the present in a less hedonistic manner (Laureiro-Martinez, 2017).

Concerning the instruments used, the use of self-report measures implies that participants may provide socially desirable responses but could also be affected by certain emotional biases since some of the constructs associated with time-honored perspective are not stable traits, but rather induced emotional states (Ortuño et al., 2017). At the level of these temporal variables, there is a need for uniformity of concepts as there is no absolute understanding of whether there is a single instrument to measure them (Laureiro-Martinez, 2017).

Another aspect that stands out at the conceptual level refers to the need to look for similarities and differences between temporal concepts, as there is some confusion in this direction and overlap between them (Ortuño et al., 2017). As Ortuño et al. (2017) also mention, in this direction most of the studies are cross-sectional, given the methodological, economic, and time constraints, and this means that there are very few longitudinal or even place-based studies in this age segment. Moreover, there is also a potential cultural variation that is reflected in the representations concerning time, which in most cases is not taken into account and can produce significant differences in the results (Ortuño et al., 2017).

Future research directions should consider the use of valid instruments that measure the concept of perspective over time. Although the concept is a difficult one to capture, several instruments are widely used and could also be relevant to the older population. Furthermore, it is important that future studies also identify differences in culture as this factor can also influence the relationship between these variables.

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