REFERENCE:

Willoch, T.C.F. & McDermott, M.R. (in press). Psychological predictors of mortality awareness: Time perspective, contentment with age & paternal antipathy and neglect. *Omega: Journal of Death & Dying*

TITLE PAGE:

Psychological predictors of mortality awareness: Time perspective, contentment with age & paternal antipathy and neglect.

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Key words: mortality, time, age, parenting

Abstract

Much research has focused upon the association between mortality awareness and mental ill-health. In this study we attempt to explore positive as well as negative psychological concomitants of mortality awareness. 170 participants were recruited in an online questionnaire study, measuring seven independent variables - marginalisation, childhood adversity, rebelliousness, time perspective, attitudes toward age and stage of life, health attitudes and demographics - and five dependent variables, specifically mortality legacy, mortality fearfulness, mortality acceptance, mortality disempowerment and mortality disengagement. Several significant bivariate associations were found. Follow-up regression analysis observed combined effects of variables accounting for 28% of variance in mortality legacy, 27% for mortality fearfulness, 13% for mortality acceptance, 42% for mortality disempowerment and 25% for mortality disengagement. Time perspective, contentment with age, and paternal antipathy and neglect were the most notable independent predictors. It was concluded that attitudes towards health, stage of life and childhood experiences significantly predict mortality awareness.

Introduction

In 2016, the World Health Organisation reported the highest rise in life expectancy since the 1960s (WHO, 2016). People live longer and healthier lives, but still the fear of dying remains a great cause of poor mental health (Greenberg, Solomon & Pyszczynski, 1997). Death has become a topic which is rarely talked about freely and is most often considered a subject to be avoided (Lindsay, 2016). Throughout history, civilisations have not been aligned with attitudes toward mortality. Observing different historical epochs illustrates a prominent change in attitudes toward the dying and to death (Jupp & Howarth, 1997): in the medieval ages, death was the collective destiny of humanity, whilst in the twenty first century death is more closely associated with the keeping of a disconcerting family secret (Ariés, 1976). Some suggest that it is part of human nature to fear death (Becker, 2011), whilst others suggest that being aware of one's own mortality is essential to being able to live a fulfilling life (Yalom, 1998). Studies looking at mortality awareness and culture have also commented on the biological aspect of life. Our biological nature is set to 'survival' whilst our consciousness makes us aware from an early age that we are all, at some point, going to die (Solomon, Greenberg, Schimel, Arndt & Pyszczynski, 2004). Researchers suggest that without the right psychological buffers in place, this awareness or knowledge, can cause anxiety and poor mental health (Greenberg et al., 1997). The purpose of the present study is to explore positive as well as negative psychological variables as they relate to the positive and negative concepts of mortality awareness.

Mortality awareness

Research examining mortality awareness has extensively focused on the potential terrors created by being cognisant of the inevitability of death, and its potential to cause anxiety and decreased

psychological well-being (Greenberg et al., 1997). Terror management theory suggests that cultural worldviews and self-esteem provide protection against death awareness by reducing potential anxiety related thoughts about one's own mortality (Pyszczynski, Greenberg, Solomon & Maxfield, 2006). In support of this theory, recent research looking at the relationship between mortality awareness and decreased well-being has found that heightening mortality awareness has a negative effect on individuals who lack appropriate psychological buffers (Juhl & Routledge, 2016). In contrast to these findings, Yalom (1998) proposed that death plays an important part in everyday life by comparing it to learning the value of something important: by being aware of one's' own mortality, one is more likely to value living, using mortality awareness as a form of motivation to do so (McEwan, McDermott & Hefferon, 2018). Furthermore, research suggests that individuals who have failed attempted suicide, later look at life and death from a different perspective, granting such individuals a fresh start and the opportunity to live life to its fullest (Tassell-Matamua & Lindsay, 2016; Yalom, 1998). It might be argued that such people come to understand the value of living by becoming aware of life's limitations, or in other words, by becoming aware of their own mortality. Thus, those who have come to accept their own mortality after specific event raising mortality awareness (Tedeschi & Calhoun, 1996), may not need to deny their vulnerability to dying or push thoughts of death into the distant future, as suggested by the terror management theory (Pyszczynski et al., 2006).

The ability to look back on one's life and reflect on past actions and choices has been argued to allow individuals to strive towards and reach long-term goals (Solomon et al., 2004). Others imply that it is death awareness which individuals try to repress that motivates us to set and reach goals, based on the belief that 'even though a physical body cannot live forever, the soul can'. Becker (2011) infers to this notion of immortality, a concept which may suggest that

humans have a wish to leave something permanent behind after we pass on, which is motivated and created by our natural fear of dying. Whilst, terror management theory is linked to the fear of dying and of not leaving a legacy, Levasseur, McDermott & Lafreniere (2015) have developed a multidimensional mortality awareness model and measure to look at other more positive attitudes to death, for example acceptance and legacy. Such attitudes find expression, for instance, in how some individuals show a willingness to change occupation to contribute to other people's lives after exposure to death, whilst others display increased bonding when caught in life-threatening situations (Grant & Wade-Benzoni, 2009). This illustrates the importance of studying positive attitudes towards mortality awareness and supports the notion that individuals' motivations and behaviours have unique and surprisingly powerful associations with such awareness (Pyszczynski, Solomon & Greenberg, 2003).

Self-perceived attitudes toward health, stage of life and past experience

The overall theme associated with mortality awareness and vulnerability to poorer mental well-being is the individual's ability to buffer or cope with the realisation of their own mortality (McEwan et al., 2018; Pyszczynski, et al., 2003). McEwan et al. (2018) found that one way of coping with mortality awareness is by finding meaning and value to life. Their findings support Erikson and Erikson's (1998) theory based on psychological stages of life and the developmental crises at each stage: it was proposed there that in life's last stages, individuals contemplate their accomplishments in life and the results of this reflection is either ego integrity or despair, this relationship being mediated by other variables such as self-esteem. The first suggests that the person has found contentment and meaning with life and accepted mortality, whilst the later leads to fear of death and non-acceptance of mortality (Brown & Lowis, 2003). Furthermore, the theory explores the importance of mental health and age in relation to mortality awareness and

how individuals add meaning and make sense of our existence (Brown & Lowis, 2003; Erikson & Erikson, 1998). Research on age perception and attitudes towards aging suggest that older adults with a negative attitude towards aging suffer from poorer mental health, compared to individuals with a positive attitude towards aging (Mock & Eibach, 2011). In a similar fashion, individuals with a negative attitude towards aging have been linked to a reduced will to live amongst older adults (Levy, Ashman & Dror, 2000). Given that mortality awareness is associated with either fear or acceptance, an exploration is warranted to whether contentment with age might differentially predict positive and negative aspects of mortality awareness.

Compared to chronological age, however, Carstens (2006) research suggests that the perception of time is a better predictor of cognitive, emotional and motivational development. In contrast, others suggest that chronological age is associated with different stages of time perspective (Fingerman & Perlmutter, 1995), where a younger age group would report thinking about distant future events, whilst their older counterparts do not (Fingerman & Perlmutter, 1995). Even though temporal perspective has been found to remain stable over time and used to predict mental well-being (Boniwell, Osin, Linley & Ivanchenko, 2010), its relationship to mortality awareness is still unclear as little research has yet to directly broach this topic. Since individuals perceive time differently with age, it could be inferred that this could be a cause of differential awareness of one's own stage of life, the limitations of time left, of physical abilities, opportunities available and impending mortality.

Terror management theory suggests that an alternative way of coping with mortality awareness is largely influenced by an individuals' cultural worldviews. Cultural worldviews have been found to be impactful because they are about a person's self-perceived worth and perception of how they fit in with society and are central to or at the margins of it (Solomon,

Greenberg & Pyszczynski, 2000). Individuals who perceive themselves as unable to live up to the standards of their own cultural worldview might experience poor self-esteem (Maxfield, John & Pyszczynski, 2014). Research suggests, however, that some individuals may not learn how to use self-esteem to buffer anxiety, especially if it is not properly developed during childhood through the effects of insecure attachments, childhood adversity or other difficulties early in life (Bowlby, 1978; Felitti, et al., 1998). Individuals who experience interpersonal frustration (through childhood adversity), indignity or disappointment, often feel the need to oppose perceived acts of unfair treatment as a reaction to feelings of disempowerment (McDermott & Barik, 2014; McDermott, 2001). So, some older adults may experience a form of reactive rebellion in relation to their own mortality, a defiant negation of their own inevitable demise. Studies looking at adolescence on the other hand suggest that youth might experience proactive rebellion, oppositional risk-taking behaviour motivated by excitement-seeking (Klabbers et al., 2009). An examination of mortality awareness and risk taking in adolescence reveals a complex relationship which is strongly affected by gender and type of activity, for example an increase in mortality awareness was associated with decreased sexual risk taking in men but not women, whilst an increase in mortality awareness for women was associated with increased drug use, but not for men (Word, 1996). Unconscious thoughts and type of activity play an important part in individuals' motivations and behaviours to prevent death in everyday life (Goldenberg & Arndt, 2008; McEwan et al., 2018). It is apparent that further empirical examination of the combined role of self-perceived rebelliousness, childhood adversity and marginalisation is needed.

McEwan et al. (2018) suggest that physical activity and healthy eating may be coping strategies utilised as protective behaviours to feel more in control of one's own mortality. Staying physically active has been linked to improved physical and mental health (Costigan et

al., 2017; Bellvia et al., 2013; Dotson & McShan, 2017). Furthermore, research suggests that the most prominent link between mortality awareness and self-reported health is through an awareness of one's own biological functioning (Jylhä, 2009). The human body can provide information through internal sensation, this information signalling possibly important physiological dysregulations to the brain (Jylhä, 2009). This in turn may heighten awareness of aging and the possibility of imminent demise. However, socioeconomic and cultural differences may play an important role in people's perception of what are considered healthy behaviours and sensations (Steptoe & Wardle, 2001; Wardle & Steptoe, 2003). Thus, exploring the association of personal orientations toward health and illness with mortality awareness would appear to be a potentially useful research direction to follow.

Present study

Expanding on the proposition that there are several dimensions of mortality awareness (Levasseur, McDermott & Lafreniere, 2015), the present study aims to look at the predictive utility of self-perceived attitudes toward health, stage of life and past experience in relation to such dimensions. Understanding the concomitants of mortality awareness may play an important role in supporting healthier and prolonged lifestyles. Through the provision of such insights, it may be possible to suggest how mortality awareness can be addressed productively when working with mortality related mental health issues.

In the following hypotheses the direction of the expected relationship is indicated in parentheses after each independent variable. It was hypothesised that there would be statistically significant relationships between mortality legacy and past negative (- ve), past positive (+ ve), and future time perspectives (+ ve), with proactive rebelliousness (- ve), marginalisation (- ve),

contentment with age (+ ve) and health behaviours (+ ve). For mortality acceptance it was hypothesised that there would be a statistically significant relationships with present hedonistic (+ ve), present fatalistic (+ ve) and past-negative (- ve) time perspectives, with positive attitude to health behaviours (+ ve) and contentment with age (+ ve).

For mortality fearfulness it was hypothesised that there would be statistically significant relationships with childhood adversity (parental antipathy and neglect) (+ ve), with past negative (+ ve) time perspective, with positive health attitudes and behaviours (- ve), reactive rebelliousness (+ ve), self-perceived marginalisation (+ ve), and positive attitudes towards age and ageing (- ve). For mortality disempowerment it was hypothesised that there would be statistically significant relationships with past-negative (+ ve) and past-positive (- ve) time perspective, reactive (+ ve) and proactive (- ve) rebelliousness, parental neglect (+ ve) and marginalisation (+ ve). For mortality disengagement it was hypothesised that there would be statistically significant relationships with marginalisation (- ve), proactive (+ ve) and reactive (- ve) rebelliousness, present fatalistic (+ ve) time perspective, and positive attitudes towards health and stage of life (- ve).

More generally, it was hypothesised that the significant relationships from the above-mentioned hypotheses would independently predict variance in the five forms of mortality awareness.

Method

Design

The study used a cross-sectional correlational design consisting of seven independent variables - marginalisation, childhood adversity, rebelliousness, time perspective, attitudes

toward age and stage of life, health attitudes and demographics and five dependent variables comprised of mortality awareness - mortality legacy, mortality fearfulness, mortality acceptance, mortality disempowerment and mortality disengagement. For analysing the data, a bivariate correlational and multivariate regression analyses were used.

Participants

170 individuals (76 males, 91 females, & 3 other) aged between 18 and 82, with a mean age of 34.89 (*SD* = 13.19, *M = 22)* were recruited for the study through the online questionnaire platform Qualtrics. Of the participants, 37% were aged between 18 to 25, 32% were aged between 26 to 41, and 32% were aged between 42 to 82 years old, with four of these participants being above 62 years. The survey was made available via a shared weblink on various social media pages over a three-month period from November 2016 to January 2017. Of these 88% self-identified as 'White/European' and 71% had obtained a higher level of education (i.e. university level or equivalent). The majority of participants were either single (44%) or married (34%) and had at least one child (58%). Further, over 50% of participants self-identified as employed full time, and almost 30% were full-time students. The median pre-tax annual earnings were £26,000 to £30,000. However, 29% of the sample earned over £46,000 while 33% of the sample earnt under £15,000 per year. The sample consisted of participants from over nineteen different countries. No rewards were given or offered for participation.

Measures

To measure marginalisation, the study used the 'Self-perceived Marginalization Questionnaire' as published in Stone, McDermott, Abdi et al (2016) in which validity and reliability were

demonstrated during the course of a study of anomalistic beliefs. The questionnaire contains twelve items comprising one factor, with five items requiring reverse scoring, each aligned with a five-point response scale with endpoints labelled `1 (Strongly disagree)' and `5 (Strongly agree)'. An example item is *'there are many barriers for me to achieving success'* and an example item requiring reverse scoring is *'I think I am someone who is part of mainstream society'*.

For Childhood Adversity, 'The Childhood Experience of Care and Abuse Questionnaire (CECA.Q)' by Bifulco (2011) was employed. The 64 item questionnaire consists of six sections with topics, (1) Upbringing and loss of parent, (2) Remembering your mother figure, (3) Remembering your father figure, (4) Close relationships in childhood, (5) Physical punishment, and (6) Unwanted sexual experiences. Section 5 and 6 were edited to ask whether respondents had experienced physical or sexual abuse. Validity was demonstrated by Kaess, et al. (2011) during an investigation of adverse childhood experiences and suicidal behaviour, where they found that suicidal behaviour was significantly associated with all adverse childhood experiences, and that the measure assesses a broad spectrum of childhood experiences including negative bonding.

The 'Social Reactivity Scale' (McDermott & Apter, 1987) was used to measure rebelliousness. Klabbers, Bosma, van den Akker et al (2009) demonstrated the reliability and validity of the measure in a study of rebelliousness and health behaviour and outcomes. They found rebelliousness to be associated with lower perceived control, more hostility and paradoxical health behaviours, with Cronbach's alpha being 0.60 for reactive rebelliousness and for proactive rebelliousness. McDermott (1986) has found that scores on this questionnaire also predict non-excused absence from secondary school. The questionnaire has 18 items with two

subscales: proactive rebelliousness (seven items) and reactive rebelliousness (seven items), as well as four filler items. All questions included three alternative responses, all items containing a *'not sure'* response, whilst the remaining two responses represented a forced choice between a rebellious and a conformist response. A typical item for proactive rebelliousness is *'How often do you do something you shouldn't just to get some excitement?'*, and an example of an item for reactive rebelliousness is *'If people are unkind to you, do you feel you should be'*.

For time perspective, the study used the 'Zimbardo Time Perspective Inventory (ZTPI)' as published in Zimbardo and Boyd (1999). Significant relationships between psychopathology and individuals perception of time have been found (van Beek, Berghuis, Kerkhof & Beekman, 2010), whilst another study examining data from twenty-four countries found Cronbach's alphas ranging from 0.58 to 0.86 for the inventory's subscales (Sircova, et al., 2014), indicating acceptable levels of reliability. The ZTPI consists of fifty-six items with five subscales: (1) Past Negative (10 items), a typical item being *'I think about the bad things that have happened to me in the past.'*; (2) Present Hedonistic (15 items), a typical one being *'It is important to put excitement in my life.'*; (3) Future (13 items), a typical item being *'Meeting tomorrow's deadline and doing other necessary work comes before tonight's play.'*; (4) Past Positive (9 items), a typical item being *'It gives me pleasure to think about my past.'*; and (5) Present Fatalistic (9 items), a typical item being *'Since whatever will be will be, it doesn't really matter what I do.'*, all scored on a 1-5 response scale (from very untrue to very true).

The 'Reported Health Behaviours Checklist' by Prohaska et al. (1985) has been used to measure health attitudes. The checklist consists of 21 statements scored on a five-point likert scale ranging from 1 (never) to 5 (always), which distinguish between preventative health actions and positive cognitive-affective health behaviours. Two examples of typical items are *'I do*

regular aerobic or strenuous exercise' and *'I avoid harmful health habits like smoking and excessive drinking'*. Huxley & Grogan (2005) obtained an alpha coefficient score of 0.73, during a study exploring the relationship between health behaviours and tattooing and piercing, in which it was found that such people had relatively little concern for the associated health risks.

An author generated measure was used to assess 'Attitudes Towards Age and Stage of Life' to as an index of an individual's perception and attitude towards age. The questionnaire consisted of two questions (one about perceived mental age in years and another about perceived physical age in years) and eleven statements, the latter scored on a five-point response scale from 'Strongly Agree' (5) to 'Strongly Disagree' (1), with six of these items needing reverse scoring. A typical statement is *'I never worry about getting old*', and (for the reverse scoring) *'There is not much left in life to experience'*.

To measure the dependent variable, the study used 'The Multidimensional Mortality Awareness Measure'(MMAM) by Levasseur & McDermott (2013) as published in Levasseur, McDermott & Lafreniere (2015), wherein reported coefficients of internal reliability range from 0.59 to 0.87 for the five subscales. In the same study associations of the five forms with mortality awareness were reported with risk taking, rebelliousness, and health attitudes and behaviours**.** The five subscales of the MMAM are as follows: (1) Mortality Legacy - made up of ten items with a typical item being *'I would like to create something that will outlive me.'*; (2) Mortality Fearfulness - consisting of ten items, a typical item being *'I think of death as a negative thing.'*; (3) Mortality Acceptance - consist of five items, a typical item being *'I am aware that death is part of life.'*; (4) Mortality Disempowerment - made up of six items, where a typical item is *'Nothing matters to me because we will all die in the end.'*; and finally, (5) Mortality Disengagement - consisting of five items, where a typical item is *'I sometimes forget that I will*

die.'. Collectively this measure consists of thirty-six items with a seven-point scale, 1 (Strongly Disagree) to 7 (Strongly Agree).

Procedure

Ethical approval was obtained from the University's School of Psychology ethics committee. Participants were presented with a letter of information and had to fill out a consent form in order to proceed on to the survey. The participants were then directed through the survey as follows; 1. Marginalisation Questionnaire (McDermott, 2015 in Stone, McDermott, Abdi et al, 2015), 2. Reported Health Behaviours Checklist (Prohaska, et al., 1985), 3. MMAM (Levasseur & McDermott, 2013), 4. The Zimbardo Time Perspective Inventory (ZTPI)' (Zimbardo, 1997), 5. CECA.Q (Bifulco, 2011), 6. Social Reactivity Scale (McDermott & Apter, 1987), 7. Attitude Towards Age and Stage of Life and 8. demographics. The titles of all the measures included in the survey were edited to mitigate, and each section included clear instructions on how to respond. Upon completion of the survey, participants were presented with a debriefing letter and contact details.

Results

Data Preparation

All data transferred from the Qualtrics platform to the Statistical Package for the Social Sciences (SPSS) for analysis. On SPSS, the data were summed together in accordance with scoring guidelines and subscales computed for each individual questionnaire.

For the questionnaires 'Attitude Towards Age and Stage of Life' and 'Reported Health Behaviour Checklist', the researchers conducted factor analysis. After initial scree analysis

(Cattell, 1966), a three-factor principal component analysis of the items in the attitude questionnaire, using varimax with kaiser normalization rotation, was conducted. Results showed three clear factors which were named: contentment with age, positive attitude to self-perceived physical age and positive orientation towards aging. A similar analysis was conducted for the reported health behaviour checklist in the absence of specific scoring guidelines given by Prohaska et al (1985) who analysed results for each item separately - an approach not feasible here. To confirm the two-part conceptual scheme articulated by Prohaska et al. (1985), scree analysis and subsequent two-factor principal components analysis was employed and confirmed the presence of the two dimensions: preventative health actions and positive cognitive-affective health behaviours. However, some health action items (Q4, Q7, Q13 and Q15) did not load significantly (> .4) on the first factor and so were excluded from the computation of this variable. One item (Q16) did not load significantly on the second factor and was therefore excluded from this subscale computation.

Bivariate correlation analysis

Overall totals for all variables were used in bivariate, one tailed Pearson's r correlations, to examine relationships between the independent variables and the dependent variables. All significant correlates were then used in a multivariate regression analysis. The analyses also included the following demographic variables: gender, age (in years), highest level of education obtained and annual earnings (before tax). Below Table 1 shows the bivariate correlations between the independent and dependent variables. All significant correlations were used in the regression analysis.

Table 1. *Bivariate correlations between independent and dependent variables*

	Mortality Legacy	Mortality Fearfulness	Mortality Acceptance	Mortality Disempowerment	Mortality Disengagement
Mother Antipathy (CECA.Q)	.03	.11	-.16*	.26**	-.31**
Mother Neglect (CECA.Q)	-.06	-.06	-.04	.18*	-.26**
Father Antipathy (CECA.Q)	0.2	.14*	-.14*	.35**	-.17*
Father Neglect (CECA.Q)	-.04	.07	-.07	.24**	-.29**
Past Negative (CECA.Q)	.27**	.32**	-.20**	.39**	-.34**
Present Hedonistic (ZTPI)	.24**	.00	.09	-.21**	.18**
Future Time Orientation (ZTPI)	.23**	.02	.07	-.12	.13*
Past Positive (ZTPI)	.35**	.25**	-.06	-.22**	.13
Present Fatalistic (ZTPI)	.10	.23**	-.22**	.50**	-.25**
Positive Cognitive-Affective Health Behaviours	-.02	-.27**	.29**	-.43**	.44**
Preventative Health Actions	.21**	.03	.04	-.11*	.11
Reactive Rebelliousness	-.05	.01	.07	.10	-.09
Proactive Rebelliousness	.08	-.10	.05	.18**	-.16*
Marginalisation	.03	.12	-.28**	.44**	-.37**
Contentment with Age	-.07	-.35**	.28**	-.25**	.20**
Positive Attitude to Self-Perceived Physical Age	.07	-.06	.16*	-.38**	.22**
Positive Orientation Toward Aging	-.12	-.15*	.03	-.30**	.18*
Annual Earnings (Before Tax)	-.15*	-.16*	.21**	-.21**	.25**
Highest Level of Education	.10	-.12	.11	-.15*	.20**
Gender	.10	.26**	-.22**	.06	-.24**
Age	-.09	-.22**	.12	-.17*	.10

*Note: *. p < .05, **. P < .01. (N = 170); The Childhood Experience of Care and Abuse Questionnaire (CECA.Q); The Zimbardo Time Perspective Inventory (ZTPI).*

A significant correlation was found between mortality legacy and independent six variables. These include past negative time perspective, present hedonistic time perspective, future time perspective, past positive time perspective, preventative health actions and annual earnings.

For mortality fearfulness, ten significant correlations were found: father antipathy, past

negative time perspective, present fatalistic time perspective, positive cognitive-affective health behaviours, marginalisation, contentment with age, positive orientation towards aging, annual earnings, gender and age.

A significant correlation was found between mortality acceptance and the following variables: mother antipathy, father antipathy, past negative time perspective, present fatalistic time perspective, positive cognitive-affective health behaviours, marginalisation, contentment with age, positive attitude to self-perceived physical age, annual earnings and gender.

Mortality disempowerment had a total of eighteen significant correlates: mother antipathy, mother neglect, father antipathy, father neglect, past negative time perspective, present hedonistic time perspective, past positive time perspective, present fatalistic time perspective, positive mental orientation for health, preventative health actions, proactive rebelliousness, marginalisation, contentment with age, positive attitude to self-perceived physical age, positive orientation towards aging, annual earnings, highest level of education, and age.

For the last dependent variable, mortality disengagement, a total of eighteen significant correlates were found: mother antipathy, mother neglect, father antipathy, father neglect, total abuse, past negative time perspective, present hedonistic time perspective, future time perspective, present fatalistic time perspective, positive cognitive-affective health behaviours, proactive rebelliousness, marginalisation, contentment with age, positive attitude to self-perceived physical age, positive orientation toward aging, annual earnings, highest level of education, and gender.

Multivariate regression analysis

Significant correlates of each of the five forms of mortality awareness were entered as predictor

variables in five subsequent regression analyses to discern which independent variables would, independently of each other, significantly predict the dependent variables. Table 2 below presents the results of these analyses.

It was found that preventative health actions, past negative time perspective, present hedonistic time perspective, past positive time perspective, and annual earnings individually and independently predict mortality legacy. Collectively all six variables explained a significant amount of the variance (28%) in mortality legacy awareness.

Only past positive time perspective and contentment with age significantly predicted mortality fearfulness independently of each other and of other variables. However, collectively the variables explained a significant amount of the variance in mortality fearfulness (27%).

Of the ten variables that significantly correlated with mortality acceptance, only two, contentment with age and gender, independently predicted mortality acceptance in the associated regression analysis. Nevertheless, collectively all the variables explained a statistically significant amount of the variance in mortality acceptance (13%).

Of eighteen variables included, only father antipathy, present fatalistic time perspective and positive attitude to self-perceived physical age were found to be independently predictive of mortality disempowerment. However, collectively all variables explained a significant amount of variance in mortality disempowerment (42%).

It was found that only father neglect and positive cognitive-affective health behaviours

Table 2. *Coefficients table of variable accounted for by independent variables in dependent variables*

Independent Variables	β	t	p
Dependant variable: Mortality legacy			
Preventative health actions	.20	2.77	.006
Past negative time perspective (ZTPI)	.28	3.88	.001
Present hedonistic time perspective (ZTPI)	.19	2.71	.007
Future time perspective (ZTPI)	.13	1.86	.06
Past positive time perspective (ZTPI)	.27	3.80	.001
Annual earnings (Before tax)	-.16	-2.11	.04
	$F(6,163) = 12.03$, $p < .001$, $R^2 = .55$, R^2 Adjusted = .28		
Dependant variable: Mortality fearfulness			
Father antipathy (CECA.Q)	.06	0.86	.39
Past negative time perspective (ZTPI)	.05	0.50	.62
Past positive time perspective (ZTPI)	.35	4.74	.001
Present fatalistic time perspective (ZTPI)	.05	0.65	.52
Positive cognitive-affective health behaviours	-.14	-1.54	.13
Positive orientation toward aging	-.03	-0.41	.69
Contentment with age	-.29	-3.67	.001
Age	-.14	-1.65	.10
Gender	.11	1.56	.12
Annual earnings (before tax)	.06	0.64	.52
	$F(10, 159) = 7.35$, $p < .001$, $R^2 = .56$, R^2 Adjusted = .27		
Dependant variable: Mortality acceptance			
Mother antipathy (CECA.Q)	-.02	-0.27	.79
Father antipathy (CECA.Q)	-.05	-0.67	.50
Positive orientation for health	.08	0.81	.42
Marginalisation	-.10	-1.03	.31
Past negative time perspective (ZTPI)	.14	1.43	.15
Present fatalistic time perspective (ZTPI)	-.10	-1.26	.21
Contentment with age	.22	2.59	.01
Positive attitude to self-perceived physical age	.06	0.82	.42
Gender	-.15	-1.98	.05
Annual earnings (before tax)	.11	1.29	.20
	$F(10, 159) = 3.59$, $p < .001$, $R^2 = .43$, R^2 Adjusted = .13		
Dependant variable: Mortality disempowerment			
Mother antipathy (CECA.Q)	.04	.41	.68
Mother neglect (CECA.Q)	-.05	-.63	.53
Father antipathy (CECA.Q)	.17	2.04	.04
Father neglect (CECA.Q)	.04	.48	.63
Positive cognitive-affective health behaviours	.02	.21	.83
Preventative health actions	-.03	-.40	.69
Proactive rebelliousness	.02	.37	.71
Marginalisation	.09	1.06	.29
Past negative time perspective (ZTPI)	.08	.90	.37
Present hedonistic time perspective (ZTPI)	-.13	-1.82	.07
Past positive time perspective (ZTPI)	-.12	-1.72	.09
Present fatalistic time perspective (ZTPI)	.40	5.41	.001

(Continued)

Table 2.
Continued

	β	t	p
Contentment with age	-.06	-.79	.43
Positive attitude to self-perceived physical age	-.14	-2.02	.045
Positive orientation toward aging	-.06	-.79	.43
Age	.01	.02	.86
Highest level of education	-.05	-.74	.46
Annual earnings (before tax)	-.00	-.03	.97
	F (18, 151) = 7.80, p < .001, R^2 =.69, R^2 Adjusted = .42		
Dependant variable: Mortality disengagement			
Mother antipathy (CECA.Q)	-.16	-1.63	.11
Mother neglect (CECA.Q)	.02	.19	.85
Father antipathy (CECA.Q)	.11	1.20	.27
Father neglect (CECA.Q)	-.24	-2.54	.012
Positive cognitive-affective health behaviours	.21	1.96	.052
Proactive rebelliousness	-.08	-1.12	.26
Marginalisation	-.08	-.89	.38
Past negative time perspective	-.06	-.58	.57
Present hedonistic time perspective (ZTPI)	.10	1.17	.24
Future time perspective (ZTPI)	-.05	-.59	.56
Present fatalistic time perspective (ZTPI)	-.10	-1.22	.22
Contentment with age	-.04	-.54	.59
Positive attitude to self-perceived physical age	.03	.37	.71
Positive orientation toward aging	-.06	-.73	.47
Gender	-.12	-1.65	.10
Highest level of education	.10	1.35	.18
Annual earnings (before tax)	.03	.36	.72
	F (18, 151) = 4.20, p < .001, R^2 = .58, R^2 Adjusted = .25		

Note: The Childhood Experience of Care and Abuse Questionnaire (CECA.Q). The Zimbardo Time Perspective Inventory (ZTPI).

significantly predicted mortality disengagement, the eighteen independent variables in combination accounting for 25% of the variance in this dependent variable.

Overall, various forms of time perspective can be observed to be predictive of four out of five forms of mortality awareness. Also, for three out of four of the dependent variables, attitude towards aspects of perceived age significantly predicts scores. Notably for two forms of mortality awareness, childhood adversity associated with paternal parenting can be observed to be a significant predictor.

Discussion

Summary of the main findings

As predicted all candidate variables predicted significant levels of variance in mortality awareness. However, in the bivariate correlation analysis it was found that neither reactive rebelliousness, sexual abuse, nor physical abuse significantly correlated with any of the mortality subscales. Furthermore, the regression analysis found that time perspective, contentment with age, and paternal neglect and antipathy, significantly predicted variance independently in more than one dimension of mortality awareness.

A total of six variables significantly correlated with mortality legacy; preventative health actions, past negative time perspective, present hedonistic time perspective, future time perspective, and past positive time perspective were positively associated with mortality legacy, whilst annual earnings (before tax) was negatively associated with mortality legacy. However, all variables except for future time perspective, predicted significant levels of mortality legacy independently of the other variables. These findings suggest that if one is inclined to look back on the past, whether with a positive or negative attitude, one is also more likely to experience an awareness of mortality legacy.

The bivariate correlation analysis found that a total of ten variables significantly correlated with mortality fearfulness. However, in the regression analysis, only past positive time perspective and contentment with age predicted significant amounts of variance in mortality fearfulness. This suggest that, the more one looks back on the past with a positive attitude, the more one is likely to fear mortality, whilst, the more one is content with one's chronological age, the less likely one is to experience mortality fearfulness.

Results from the bivariate correlation analysis found ten variables significantly related to mortality acceptance. However, as per the regression analysis, only contentment with age and gender accounted for a significant amount of mortality acceptance independently of the other variables. This suggests that the more content one is with chronological age, the more acceptant a person is about their own mortality.

The bivariate correlation analysis found that in total eighteen variables were significantly related to mortality disempowerment. However, only three of the eighteen variables predicted significant levels of mortality disempowerment independently of the other variables. These were: father antipathy, present fatalistic time perspective, and positive attitude to self-perceived physical age. This suggests that the more one experiences father antipathy, or believes that one cannot change the future, the more likely one is to experience an awareness of mortality disempowerment. Conversely, the more one has a positive attitude to self-perceived physical age, the less likely one is to experience mortality disempowerment.

For the last dependant variable, the regression analysis showed that out of eighteen variables which significantly correlated with mortality disengagement, individually, only father neglect and positive cognitive-affective health behaviours accounted for a significant amount of variance. This suggests that the more feelings of disengagement experienced, the less likely one is to experience father neglect, and vice versa. In contrast, the more one experiences positive cognitive-affective health behaviours, the more likely one is to experience feelings of mortality disengagement. Nevertheless, it is important to note that because only one of the eighteen variables predicted mortality disengagement, it is possible that the items used to measure this dependant variable are not sufficiently representative of this construct as originally suggested (Levasseur, McDermott & Lafreniere, 2015).

How findings align with previous research

In relation to the individual independent variables, several relationships align with previous research. Contentment with age and mortality acceptance and fearfulness supports findings (Erikson, 1998; Brown & Lowis, 2003; McEwan et al.,2018) that highlighted the importance of contentment with life in relation to mortality acceptance. Mortality acceptance and contentment with life are associated with ego integrity, and lower levels of contentment are associated with higher levels of mortality fearfulness. Studies looking at attitudes towards age suggest that having a negative attitude towards aging have been associated with reduced will to live and poor mental health (Levy et al., 2000; Mock & Eibach, 2011). Furthermore, the terror management theory suggests that fear of death in individuals lacking appropriate psychological buffers may cause poor mental health (Greenberg et al., 1997). Thus, this study's findings on the relationship between positive attitude toward aging, contentment with life, mortality acceptance and mortality fearfulness are consistent with the findings of previous research.

Research examining time perspective suggests that being able to reflect on one's past allows the individual to set new goals (Solomon et al., 2004). This idea has been linked to the fear of not leaving something behind (Becker, 2011). These findings support the relationship found in the present study between past positive and past negative time perspective and mortality legacy. The more one thinks about the past, the more likely one is to want to leave a legacy. However, the study here also found a significant relationship between mortality fearfulness and past positive time perspective, which suggests that the more positive one is about the past, the more mortality fearfulness will be experienced. This is consistent with previous findings reported by Becker (2011), who suggests that the desire to leave something behind is motivated by humans' 'natural' fear of dying.

The study found that the more antipathy or neglect one has experienced during childhood, the more likely one is to experience a sense of mortality disempowerment through mortality awareness. Childhood adversity has been linked to lack of appropriate psychological buffers in later life, which can lead to anxiety (Bowlby, 1978; Felitti et al., 1998). Our consciousness internalises the realisation from an early age that we are all going to die (Solomon et al., 2004), with individuals lacking appropriate psychological buffers being more prone to experiencing poor mental health (Greenberg et al., 1997). These findings suggest that feelings of disempowerment might be linked to low self-esteem. However, more recent research looking at childhood adversity has found such to predict rebelliousness in adolescence (McDermott & Barik, 2014) and that feelings of disempowerment might lead an individual to rebel against these feelings (McDermott, 2001). Yet, reactive rebelliousness was not found to be associated with mortality awareness. Nor did proactive rebelliousness individually account for significant amounts of variance in mortality disengagement or disempowerment, which implies that other variables account for such variance.

Expressing a positive attitude towards health and preventative health actions were found to predict significant levels of variance in mortality awareness. Furthermore, positive cognitive-affective health behaviours have been associated with decreased feelings of mortality fearfulness and disempowerment, and increased mortality acceptance and disengagement. These findings are in line with previous research which suggest that obtaining appropriate psychological buffers such as a positive orientation to health, protects against negative death awareness and poor mental health (Pyszczynski et al., 2006). Studies on socioeconomic differences suggest that national and cultural differences might play an important role in perceived health (Steptoe & Wardle, 2001; Wardle & Steptoe, 2003).

Previous studies have expressed the importance of cultural worldviews in relation to mortality awareness (Pyszczynski et al., 2006). The present study found that higher levels of self-perceived marginalisation were associated with mortality disempowerment. Thus, the more one feels insignificant or outside of a group, the more likely one is to experience mortality disempowerment. Marginalisation was also negatively associated with mortality acceptance and disengagement, which suggest that the more one feels marginalised, the less likely one is to be acceptant of mortality or to feel mortality disengagement. These findings support previous research which suggests that individuals who perceive themselves as living outside of the social norms and cultural standards might experience poor self-esteem (Maxfield et al., 2014).

Overall, these findings support the importance mortality awareness plays in individuals lives as suggested by previous studies (Becker, 2011; McEwan et al., 2018; Pyszczynski et al., 2003; Yalom, 1998), and that life contentment is an important factor on several different levels, as a concomitant of attitudes towards health, stage of life, and social experiences. Furthermore, they support the multidimensional nature of MA (Levasseur, McDermott & Lafreniere, 2015), and that engagement with MA may not only or always be associated with fear. However, most prominent of all the findings is the importance of time perspective, lifetime contentment, and paternal relationships and their implications for attitudes toward mortality awareness.

A limitation of the present study was its length. Over four-hundred potential participants started the survey, but only 170 gave complete answers. Even though the present study accounted for significant levels of variance in mortality awareness, there is still a lot of variance unaccounted for thus, other predictor variables not included in this study should be identified. Furthermore, it did not measure social desirability which may have affected responding. In the future, the focus of studies should explore the relationship between the

independent and dependent variables in a larger sample to detect difficult to observe relationships. Future studies may also focus on how types of mortality awareness change with time and in relation to life events, a longitudinal study being needed.

The results suggest that three predictor variables should be explored further, given possible implications for understanding overall life satisfaction: firstly, the impact and influence of time perspective on mortality awareness; secondly, contentment with age, given it was found to predict three forms of mortality awareness, and to have a greater impact on individuals self-perceived attitude towards mortality awareness than chronological age; and thirdly, paternal influence, in contrast to maternal, given it was found to predict two forms of mortality awareness (disempowerment and disengagement). Through developing a better understanding here of how specific factors influence individuals' perceptions of their mortality, these findings can inform end of life support and how to promote improved mental health in later years.

Conclusion

Mortality awareness has unique and surprisingly powerful relationships with people's motivations and behaviours, with attitudes towards health, stage of life and social experiences. The present study further supports the idea that there are adaptive ways of orienting toward mortality awareness, and that engagement with mortality awareness might not always be associated with fear resulting in anxiety, but rather a positive engagement is possible. The study highlights the importance of time perspective, contentment with life and paternal neglect and antipathy, in relation to mortality awareness. Future research should further explore the relationship between mortality awareness and different aspects of psychological life to better delineate public understanding of this universal existential issue.

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