

The effects of Age on Psychopathology, Well-being and Repressive Coping

James A.K. Erskine and Lia Kvavilashvili,

University of Hertfordshire

Martin A. Conway

University of Leeds

Lynn Myers

Brunel University

Address for correspondence

James Erskine

University of Hertfordshire

School of Psychology

College Lane, Hatfield

Herts, AL10 9AB

United Kingdom

Telephone number: 01707 284641

Fax number: 01707 285073

E-mail: J.A.K.Erskine@herts.ac.uk

Abstract

The present study was conducted to test the hypothesis that the increased psychological well-being and positivity effect in old age can be related to a high prevalence of repressive coping in healthy older adults. Both older (mean age 73) and younger (mean age 20) adults completed a range of indices measuring psychopathology and repressive coping. Results showed that older adults scored lower than younger adults on almost all indices of psychopathology, and were more likely to be classed as repressive copers than younger adults (41% versus 11%, respectively). Furthermore, when the repressive copers and borderline repressors were removed from both samples, age effects on several, but not all, measures of psychopathology disappeared indicating that even older non-repressors showed better mental health than young non-repressors. Possible mechanisms of increased positivity, in terms of repressive coping and reductions in intrusive thoughts and rumination in old age, are discussed.

Keywords: Aging, Psychopathology, Well-Being, Repressive Coping, Mental Control.

The effects of Age on Psychopathology, Well-being and Repressive Coping

Aging, decline and eventual death are all incontrovertible features of our existential path. Yet, far from imbuing older adults with anxiety and foreboding, research is converging on the idea that later life is characterised by good mental health and levels of well-being which are comparable to and possibly exceed those of younger adults (Diener & Suh, 1997). Several studies have shown that older adults often demonstrate high life satisfaction and happiness (Diener & Diener, 1996; Herzog & Rodgers, 1981), less negative emotions (Carstensen, Pasupathi, Mayr & Nesselrode, 2000) and experience positive affect as frequently or more frequently than younger adults (Carstensen et al., 2000; Mroczek & Kolarz, 1998). Moreover, research on psychiatric disorders in the general population has shown older adults to display lower levels of depression and anxiety compared to younger adults (George, Blazer, Winfield-Laird, Leaf & Fischback, 1988).

It is interesting that this enhanced positivity in old age is also accompanied by various cognitive biases in how older adults tend to process negative information. For example, in their study of episodic memory, Charles, Mather and Carstensen, (2003) found that older adults recalled significantly fewer negative images than younger adults, even when controlling for the influence of mood. Broadly similar findings were obtained for *involuntary autobiographical memories* in a diary study of Schlagman, Schulz and Kvavilashvili (2006). A content analysis of the recorded involuntary memories indicated that while older adults recorded a similar percentage of memories of typically positive events, they recalled significantly fewer memories of typically negative events (e.g. accidents/illnesses, stressful situations) than younger adults. Finally, attentional biases in older adults were demonstrated by Mather and Carstensen (2003). In this study older adults were significantly faster to respond to a dot presented

behind happy faces than sad or angry faces, indicating that they had an increased tendency to attending to the happy than negative faces.

All of the forgoing research suggests that older adults demonstrate a strong bias towards the positive and/or an avoidance of negative information. This results in biased personal memory recall and greater overall positivity and subjective well-being. One of the most consistent explanations of the positivity effect in older adults is the Socioemotional Selectivity Theory of Carstensen and her colleagues (Carstensen, Fung, & Charles, 2003). According to this theory, the perception that time is running out causes a fundamental shift in motivation. In young adults, when time is perceived as expansive, goals are oriented towards acquiring knowledge and undertaking tasks with potential future payoffs such as forming new relationships. In contrast, when time is perceived as limited, as at the end of life, goals and motivations shift away from obtaining knowledge and expanding one's horizons towards emotional satisfaction and maximising harmony in significant personal interactions. These motivational shifts have been used to explain why older adults come to have cognitive biases towards avoiding negative information and construing the past in an unduly favourable way. Thus, as people approach the end of life they "attend to the positive, forget the negative, and focus on the present experience." (p.108; Carstensen et al., 2003).

Although the motivational shifts suggested to occur in older adults provide some explanation of the data concerning the positivity effect and the success older adults report with emotional regulation, Carstensen and her colleagues have pointed out that "understanding the processes by which this is accomplished is sorely lacking" (p. 311; Charles et al., 2003). Thus, questions of exactly how older adults selectively avoid negative information and focus on the positive side of life remain unanswered. The aim of the present paper is to provide some initial answers to this important question by

examining the prevalence of repressive coping in older adults and its relation to psychopathology and well-being in this population.

Repressive coping refers to a particular style of interacting with the world whereby negative stimuli and emotions are automatically avoided (Myers, 2000; Weinberger, 1990). Weinberger, Schwartz, & Davidson (1979) were first to propose a classification system that allowed for a relatively simple identification of repressive copers. Under this system repressive copers are individuals who score low on anxiety inventories (e.g. Bendig short version of the Taylor Manifest Anxiety Scale, Bendig, 1956; Spielberger Trait Anxiety Inventory, Spielberger, Gorsuch, & Lushene, 1983) and high on measures of defensiveness (e.g. the Marlowe Crowne Social Desirability Scale, Crowne & Marlowe, 1964). The Marlowe Crown scale was originally designed as a measure of socially desirable responding, but Crown and Marlowe (1964) suggest it more accurately measures affect inhibition and defensiveness.

An important finding that emerged from using this method is that individuals who are classified as repressors show high physiological reactivity to stressors while simultaneously reporting low levels of distress. Non-repressors do not show these discrepancies (e.g. Asendorpf & Scheerer, 1983; Derakshan & Eysenck, 2001). Moreover, studies that have implemented procedures such as the bogus pipeline (where participants are led to believe that sophisticated electronic equipment they are hooked up to can detect false responses) show that repressors still respond in the same defensive way, indicative of self-deception rather than impression management (Derakshan & Eysenck, 1999). Therefore, repressive coping is viewed as an automatic and non-conscious form of avoidant behaviour (Weinberger, 1990; Myers, 2000).

Research on repressive coping has been conducted almost exclusively on young undergraduates with repressors constituting 10 to 20 % of this population (Myers & Reynolds, 2000; Phipps & Srivastava, 1997). Yet, certain similarities between older

adults and young repressive copers are striking. For example, similar to older adults, young repressive copers show systematic avoidance of negative words in dot probe tasks (Fox, 1993), recall significantly fewer negative childhood memories when asked to do so and take longer to recall negative memories to negative cue words in comparison to non-repressors (Myers, Brewin, & Power, 1992). Importantly, young repressors show low scores on inventories measuring various psychopathologies such as anxiety, even under the bogus pipeline condition deliberately designed to minimise misreporting (Derakshan & Eysenck, 1999), and report experiencing less negative affect in everyday life than non-repressors (Cutler, Larsen, & Bunce, 1996).

The similarities between young repressive copers and older adults suggests that the positivity effect and cognitive biases in old age may be related to an increased frequency of repressive coping style in older adults. Initial support for this idea comes from an unpublished study by Champion (1998) in which the percentage of repressors was found to linearly increase in samples of young, middle-aged and older adults (26%, 40% and 60% respectively). However, Champion's study used small participant numbers and did not examine the positivity effect in old age.

The present study had three main aims. The first was to investigate and compare the prevalence of repressive coping in an older and a younger adult sample. The second aim was to assess psychological well-being by examining a variety of measures of psychopathology in both young and old samples. Previous studies on well-being in older adults have tended to focus on anxiety, depression and neuroticism (George et al., 1988). The current study wanted to replicate and extend these findings, by examining a number of previously uninvestigated variables - psychoticism, schizotypal personality, attitudes towards illness, rumination, thought suppression and measures of happiness and unhappiness. The rationale behind the inclusion of these measures concerned attempting to delimit the extent of the positivity effect in old age. For example, would the positivity

effect extend to schizotypal personality or psychoticism, manifesting as reduced levels in older adults? The Illness Attitude Scale (Kellner, 1987) was included because it contains subscales on fear of death, hypochondria and health worries. Theoretically, older adults should have higher scores on these scales but, if a positivity effect is in operation, then it is possible that no age effects will be observed.

Mental control was examined via inventories of rumination and thought suppression. These variables represent two common responses to unwanted or intrusive thoughts, and have both been implicated in the development and exacerbation of psychopathology (Nolen-Hoeksema, 2000; Purdon, 1999). However, these variables have not been investigated in older adults. Finally, having participants rate the amount of time they reported feeling happy, unhappy or neutral was included as a further source of confirmatory evidence regarding the positivity effect in old age.

The third aim was to investigate participants' strategies for consciously controlling the content of their own minds, by administering the Thought Control Questionnaire (Wells & Davies, 1994) which measures the extent to which people use the following five strategies of dealing with negative thoughts: distraction, social control, worry, punishment and reappraisal. Research has shown that some control strategies appear adaptive, such as reappraisal of the negative thought (Gross, & John, 2003), and others may be maladaptive, like punishing oneself or worrying about other things (Roemer & Borkovec, 1993).

It was predicted that older adults would demonstrate significantly less psychopathology on most of the indices chosen than younger adults while simultaneously showing greater well-being (as assessed by self-rated happiness). Furthermore, it was hypothesised that these changes could be related to a higher prevalence of repressive coping in older adults. It was also predicted that older adults would show greater use of adaptive strategies of mental control as a result of life experience and less use of the potentially maladaptive strategies such as punishment and worry.

Method

Participants

In total, 149 participants took part in the study. Eighty-four were university undergraduates (69 females and 15 males) with a mean age of 20.40 years ($SD=2.99$; range 18–30 years), and 65 were community dwelling older adults (33 males, 32 females) with a mean age of 73.64 years ($SD=5.60$; Range 64–84 years). All participants reported English as their first language. The younger participants completed all inventories correctly, however, in the older sample, two participants completed several of the questionnaires incorrectly, and their data were removed from all analyses.

The older participants were retired, healthy community dwelling adults who did not report any vision, hearing or physical mobility problems nor any of the following: stroke, mental health and/or memory problems that had been diagnosed by their physician. They were recruited from a participant pool of 122 older adults who had taken part in a previous study of Kvavilashvili, Kornbrot, Mash, Cockburn & Milne (in preparation). The 65 older adults who took part in the present study did not reliably differ from the remaining pool of older adults ($N=57$) who did not volunteer, in terms of their mean age ($M_1=73.12$, $M_2=73.62$), years of education ($M_1=12.00$, $M_2=11.96$), cognitive status as measured by Mini Mental State Examination ($M_1=27.82$, $M_2=27.99$) and the occupation prior to retirement. Out of our 65 old participants, the majority had previously been skilled workers (55%) and professionals (28%) with the remaining participants being unskilled workers (14%) and housewives (3%).

Materials

Measures assessing repressive coping

The Spielberger Trait Anxiety Inventory (STAI – Spielberger et al., 1983) is a 20-item measure of trait anxiety. Items include “I feel pleasant” and “I am tense”.

Ratings are made on a 4-point scale from “not at all” to “very much so”. Scores can range from 20 to 80, with higher scores indicating greater anxiety.

Marlowe Crowne Social Desirability Scale (MC - Crowne & Marlowe, 1964) is a 33-item measure of defensiveness with high scores indicating greater defensiveness. The Marlowe Crowne uses a true/false response format. Typical items include “I’m always willing to admit it when I make a mistake”, or “I have never intensely disliked someone”, The Marlowe Crowne Scale in conjunction with the Spielberger Trait Anxiety Inventory is used to assess a repressive coping style (Weinberger et al., 1979).

Measures of psychopathology and well-being

The Beck Depression Inventory (BDI - Beck, Rush, Shaw, & Emery, 1979, 13-item short form) measures participants’ level of depression. The participant reads a series of statements and is asked to circle any they feel apply to them (e.g., “I feel discouraged about the future” or, “I don’t feel disappointed in myself”). High scores indicate a greater level of depression. Scores can range from 0 to 39.

The Eysenck Personality Questionnaire (EPQ-R - Eysenck, Eysenck, & Barrett, 1985) has three sub scales each containing 12 items, measuring the personality dimensions of introversion/extraversion, neuroticism and psychoticism. Responses are made by circling “Yes” or “No” to each item. For the purposes of the present study only the neuroticism and psychoticism subscales were of interest.

The Schizotypal Personality Questionnaire (SPQ - Raine, 1991) is a 74-item scale designed to assess schizotypal personality as defined by DSM III-R. An overall SPQ score is computed by summing the scale values. Higher values indicate a greater tendency towards schizotypal personality. The scale contains items like “I tend to avoid eye contact when conversing with others” responses are either yes or no. Three global subscales can be computed measuring (1) Cognitive perceptual deficits, (2) Interpersonal deficits, and (3) Disorganisation.

The Illness Attitude Scale (IAS - Kellner, 1987) is a self-rated inventory consisting of eight subscales designed to assess fears, attitudes and beliefs associated with hypochondriacal concerns and abnormal illness behaviour. Each scale consists of three questions. Ratings are made on a 5-point scale ranging from “no” through “sometimes” to “most of the time”. An overall scale score is created by summing all the scores from each of the subscales and can range from 0 to 108. The subscales include measures of (1) worry about illness, (2) concerns about pain, (3) health habits, (4) hypochondriasis, (5) thanatophobia, (6) disease phobia, (7) bodily preoccupations, and (8) treatment experience. In the current study three particular subscales were of interest, these were: (1) worry about illness, which included items such as “Are you worried that you may get a serious illness in the future?”; (2) concern about pain, which included items such as “If a pain lasts a week or more, do you believe that you have a serious illness?” and (3) thanatophobia, including items such as “Are you afraid of news which reminds you of death, such as funerals or obituary notices?”.

Fordyce Happiness Index (Fordyce, 1988) asks participants to rate the percentage of time in everyday life they feel happy, unhappy and neutral with the constraint that the percentages must add up to 100%.

Measures of mental control

Rumination Inventory (McIntosh & Martin, 1992) is a 10-item scale that assesses participants’ tendency to ruminate or experience repetitive uncontrollable thoughts. Items include “When I have a problem, I tend to think about it a lot of the time”, or “Sometimes I feel like I have no control over my thoughts” . Ratings are made on a 7-point scale (1= “does not describe me well” to 7=“describes me well”). Scores range from 10 to 70. Higher scores indicate a greater tendency to ruminate.

The White Bear Suppression Inventory (WBSI - Wegner & Zanakos, 1994) is a 15-item questionnaire measuring the propensity to use thought suppression in everyday

life, and contains statements like “I always try to put problems out of mind” or “I have thoughts I cannot stop”. Ratings are made on a five point scale ranging from “strongly disagree” to “strongly agree”. Scores can range from 15 to 75 with higher scores indicating a greater tendency to suppress one’s thoughts in everyday life.

Thought Control Questionnaire (TCQ - Wells & Davies, 1994) has 5 subscales designed to assess peoples’ tendency to use a variety of thought control strategies in everyday life such as self punishment (“I slap or pinch myself to stop the thought”); re-appraisal (“I try to reinterpret the thought”); distraction (“I occupy myself with work instead”); worrying (“I worry about minor things instead”); and social methods of control (“I talk to a friend about the thought”). A total TCQ score can be computed by summing the scores on the individual subscales, and can range from 30 to 120. Higher scores indicate a greater variety of mental control strategies being used.

Procedure

The study was introduced to participants as an investigation of people’s ability to control their thoughts and its relation to personality. For young participants, the study consisted of two 1-hour sessions in which they first completed the standard laboratory thought suppression task developed by Wegner et al. (1987) (the results of this task are reported elsewhere, see Erskine, 2004). At the end of each session participants were provided with a questionnaire packet with the instruction to complete the questionnaires in the order provided. Each questionnaire started with written instructions about how to fill them in so that no further explanation was needed from the experimenter. At the end of session 1, young participants completed the Triat Anxiety Inventory, Marlowe Crowne Scale, Beck Depression Inventory, Eysenck Personality Inventory, White Bear Suppression Inventory and Thought Control Questionnaire. At the end of session 2, they completed the Rumination Inventory and Fordyce Happiness Index. The sample size for the Schizotypal Personality Questionnaire and the Illness Attitude Scale is smaller due

to participants taking these questionnaires home and mailing them back to the experimenter. Out of 84 young participants, only 50 (60%) returned these two questionnaires. However, there were no statistically significant differences between those young participants who returned the questionnaires and those who did not in all the other questionnaire measures obtained in the study (see materials section above).

For the older adults, questionnaire packets containing the same inventories used with the younger sample were sent to 122 members of an existing participant pool of older adults. All older adults were asked to fill in the inventories in the same order as the younger participants, and then mail them back to the experimenter.

The assessment of repressive coping

Several different methods of classifying participants as repressors exist in the literature. Where the comparison of interest concerns repressors versus non-repressors, researchers have used median splits on both a trait anxiety measure and the Marlowe Crown scale, with repressors being participants who score above the median on the Marlowe Crowne Scale and below the median on trait anxiety (Baumeister & Cairns, 1992; Boden & Baumeister, 1997). In other studies that follow the original Weinberger et al. (1979) method more closely, the quartile splits have been used with repressors being participants who score above the upper quartile on the Marlowe Crowne Scale and below the lower quartile on trait anxiety. This method also identifies three other extreme groups classed as low anxious (below the lower quartiles on both anxiety and defensiveness), high anxious (above the upper quartile on anxiety but below the lower quartile on defensiveness) and defensive high anxious (above the upper quartiles on both scales). The disadvantage of this latter method is that it excludes a large number of participants who score in the middle of the scales and therefore requires a pre-screening of large participant numbers (Myers & Derakshan, 2000). Sometimes this method is adapted so that quartile splits on the Marlowe Crowne Scale but median splits on the trait

anxiety measure are used (Kline, Bell, Schwartz, Hau & Davis, 1998). Importantly, Boden and Baumeister (1997) suggest that, despite the variety of classification methods, similar findings usually emerge irrespective of the method chosen.

To our knowledge, no previous published study has compared repressive copers in young and older adults. If older sample consists of higher percentage of repressors then they will score reliably lower on trait anxiety and higher on defensiveness than the young sample (see results section), and this inevitably raises issues of which cut off points to use when making this comparison. One possibility is to use the whole sample's (pooled across two age groups) median splits (in our study, cut off points of 39 for trait anxiety and 18 for Marlowe Crowne) or quartile splits (cut off points of 33 for trait anxiety and 20 for the Marlowe Crowne) when classifying repressors in both young and old samples. While median splits would be relatively lenient, resulting in a fairly high number of repressive copers, the quartile splits would be too conservative when compared to the cut off points (usually between 16 to 18 on the Marlowe Crowne Scale) used in current research on repressive coping (Myers & Derakshan, 2000; Vetere & Myers 2002). Therefore, it was decided to use quartile split measures of the young sample (36 on trait anxiety and 19 on Marlowe Crowne) for both younger and older groups. This was deemed acceptable given that we were interested in the percentage of repressors in older participants relative to the younger sample.

Results

Screening for outliers

All of the variables were examined for outliers and extreme cases. One extreme case falling more than three standard deviations from the mean of psychoticism was found in the older sample and removed from all comparisons involving psychoticism. There were also three outliers on rumination in the older group, however these did not

change the results significantly and were retained. There were no multivariate outliers in either sample. The final samples consisted of 84 young and 63 older participants.

Details of analyses

Unless otherwise specified, all between group comparisons were made using a one-way analysis of variance with age as an independent variable, with significance levels set at $p < .05$. The effect sizes were estimated by the partial eta-squared (η^2) with .01, .06, and .16 defined as small, medium and large effects, respectively (Cohen, 1977).

Effects of age on all variables

Table 1 presents the mean scores of the young and older samples on all of the inventories and relevant subscales. It also presents significance tests on the differences between the scores, effect sizes and post hoc power for each comparison.

Effects of age on measures of psychopathology

From Table 1 it is clear that older adults scored significantly lower on virtually all measures of psychopathology than younger adults. Thus, older adults reported significantly less trait anxiety, depression, neuroticism, psychoticism, schizotypy, and unhappiness than younger adults with impressive effect sizes varying from medium to large. Interestingly, older adults did not differ from younger adults significantly on the percentage of time they reported feeling happy or neutral in everyday life. Contrary to expectations, older adults did not demonstrate higher scores on the overall Illness Attitude Scale or its subscales of 'worry about pain' and 'concern about illness'. In fact, the subscale for thanatophobia indicated that older adults were significantly less afraid of death than younger adults.

Effects of age on mental control

Age effects on mental control also emerged. In particular, older adults reported significantly less rumination (repetitive, intrusive thoughts) than younger adults as well as scored significantly lower on the tendency to suppress thoughts (WBSI) and the use

of strategies to control unwanted negative thoughts (TCQ overall). The TCQ subscales indicated that older adults reported using negative strategies of worry and punishment reliably less frequently than young adults. However, contrary to predictions, they also used reliably less positive strategies of social sharing and re-appraisal.

Prevalence of repressive coping in young and old adults

In comparison to young participants, older adults showed a pattern of reliably lower scores on trait anxiety while simultaneously having reliably higher scores on defensiveness (measured by the Marlowe Crowne Scale) (see Table 1), supporting the idea that the older group could contain higher proportion of repressive copers. The next analysis examined the proportions of repressors in the older and younger adult samples. Using the cut off points outlined in the method section, only 9 (11%) young participants were classed as repressive copers, whereas 26 (41%) older participants were classified as repressive copers, indicating a significant age effect $\chi^2(1) = 18.53, p < .0001$ with repressive coping being much more common in the older than younger adult sample. These findings remained significant even when we used quartile splits on the whole sample with stringent cut off points (33 or below on trait anxiety and 20 or above on Marlowe Crowne).

Effects of repressive coping on all variables in the older adult sample

In order to evaluate the hypothesis that older repressors have higher self reported well-being scores than older non-repressors, the next analysis directly compared the older repressors and non-repressors on all of the inventories used (this analysis could not be performed on the younger sample due to a small number repressors in this group). Results in Table 2 show that older repressors scored significantly lower than older non-repressors on depression, neuroticism, WBSI, TCQ overall, TCQ worry subscale, TCQ punishment subscale, TCQ reappraisal subscale, SPQ overall, SPQ disorganisation

subscale and Fordyce unhappiness. In addition, older repressors scored significantly higher than older non-repressors on Fordyce happiness (66.65 and 52.52 , respectively).

Effects of age on all variables for non-repressors only

Having established that older repressors display better psychological well-being than older non-repressors, we next explored whether the age effects on the entire sample would diminish or disappear after removing repressors from both samples. As “borderline repressors” can sometimes distort findings due to categorising them in the wrong group (see Myers, 2000) they are often removed from various analyses (e.g. Cooke, Myers & Derakshan, 2003). Therefore, we also removed 2 young and 10 old participants who scored 18 on the Marlow Crowne and 37 or 38 on trait anxiety.

Table 3 presents the means and age comparisons with repressors and borderline repressors removed from both young and old samples. The data presented in this table shows that some of the significant group (old vs. young) differences, shown in Table 1 on entire samples, either diminished or disappeared. Thus, with the repressors and borderline repressors removed, older adults no longer scored significantly lower on depression, unhappiness, TCQ overall and TCQ worry and punishment subscales. Importantly, older adults showed significantly higher overall scores on the Illness Attitude Scale as well as on the subscale of concern about pain (the subscale of concern about illness was marginally significant but explained almost 5% of variance). Moreover, the older and younger samples showed equivalent levels of fear of death whereas in the previous analysis, using all participants, older adults reported significantly less fear of death than young adults (see Table 1).

Despite these changes, the data presented in Table 3 also show that even after removal of the repressors and borderline repressors, older adults still had significantly lower scores on neuroticism, psychoticism, rumination, thought suppression, schizotypal personality and trait anxiety. At the same time, they still had significantly

higher scores on the Marlowe Crowne Scale. However, the effect sizes presented in Table 3 are much smaller than those in Table 1 even though the power remained in the acceptable range for most of these comparisons.

Discussion

The results of the present study are important in that they have fully replicated and substantially extended previous findings concerning increased psychological well-being and greater positivity in old age. Compared to young adults, older adults demonstrated significantly less trait anxiety, depression, neuroticism, psychoticism, schizotypal personality, rumination, and thought suppression. Overall, the whole sample of older adults did not rate themselves as happy more often than younger adults. Yet they did rate themselves as unhappy less of the time than younger adults. Thus, the biases in older adults appear to be focused more on avoiding the negative than actively seeking positive thoughts or experiences (*cf.* Cheng, 2004; Schlagman et al., 2006).

A further important finding concerns the prevalence of repressive coping in older adults. In line with our hypothesis, older adults were significantly more likely to be classed as repressors than younger adults (41% vs. 11%, respectively). Having a large number of repressors in the older sample allowed us to compare older repressors and non-repressors on the inventories administered. Older repressors demonstrated significantly better mental health as indexed by reliably lower scores on several measures of psychopathology and mental control. They also rated themselves as significantly happier than older non-repressors.

Taken together, these findings suggest that repressive coping increases in old age and is likely to be related to some of the cognitive biases and the positivity effect shown in several studies reviewed in the introduction. However, there is some disagreement in the literature concerning the possible functions of repressive coping. Several studies have stressed the potentially maladaptive nature of repressive coping

due to its negative long-term effects on physical health in young adults (see Myers, 2000 for a review). In contrast, Weinberger (1990) has argued that repressive coping can potentially protect one's self from extremely adverse negative events. In older adults, such adverse events could include threats to one's self when coping with deaths of relatives/friends and increased realisation of one's own mortality.

In relation to this, a recent study of Gailliot, Schmeichel and Baumeister (in press) has highlighted the unique effects of death and mortality related thoughts on later cognitive processes. When reminded of death, young participants automatically suppressed death related thoughts afterwards and appeared to expend considerable effort in defending against the threat represented by thoughts of death. In light of these findings, it could be suggested that the high levels of repressive coping in older adults serve a vital self-protective function allowing older adults to maintain a high degree of life satisfaction and well-being in the face of decline and eventual death. Furthermore, it is likely that older adults who are repressors are unaware of their bias. This coping style most probably acts pre-consciously to bias attention (Mather, & Carstensen, 2003; Fox, 1993), intentional memory recall (Myers et al., 1992), unintentional memory recall (Schlagman et al., 2006) and self-assessed levels of well-being.

The final set of findings concerns the obtained age effects when all repressors and borderline repressors were removed from both young and old samples. Older adults still demonstrated significantly lower scores on trait anxiety, neuroticism, schizotypal personality, rumination and thought suppression. The fact that older non-repressors also demonstrated better mental health than younger non-repressors suggests that there may be more than one mechanism underlying the positivity effect in old age. Two alternative possibilities exist concerning this second mechanism.

One possibility, often suggested in the literature, is that older adults may become better at managing emotions as a result of life experience (Carstensen et al., 2003;

Labouvie-Vief, DeVoe, & Bulka 1989). For example, Labouvie-Vief et al. (1989) demonstrated that older adults make greater use of cognitive reappraisal as a result of cognitive maturity. In order to examine this idea, the current study included the Thought Control Questionnaire (Wells & Davies, 1994) that directly measures various strategies of mental control a person may use. The results indicated that older adults reported less use of social and re-appraisal methods of mental control than younger adults. This finding is at odds with the theory that older adults improve at mental control, because it is generally accepted that social and re-appraisive methods of mental control are adaptive (Carstensen et al., 2003; Gross & John, 2003).

A second potentially protective mechanism may concern the reduced tendency in older adults to experience task unrelated thought intrusions and involuntary memories in the course of everyday activities (see Giambra, 1989; Schlagman, Kvavilashvili, & Schulz, in press). For example, older non-repressors in the present study scored significantly lower on the rumination scale that included items such as “I often get distracted from what I am doing with thoughts “ or “I seldom think about things that happened in the past”. In addition, several older adults who did not volunteer, returned uncompleted questionnaires with a letter saying that they could not take part in our study because they never experienced negative or intrusive thoughts.

Possible reasons behind the reduction of intrusive thoughts in old age is that, with increased age, people require a greater amount of cognitive resources to carry out seemingly automatic behaviours such as walking (Lindenberger, Marsiske & Baltes, 2000). They also report greater levels of concentration on simple everyday tasks (e.g., Kvavilashvili & Fisher, in press; Schlagman, et al., in press). However, the greater the cognitive resources taken up by everyday activities the less mental capacity will be available for thought intrusions to occur (see, Kvavilashvili & Mandler, 2004). Admittedly, this mechanism will reduce positive intrusions as well, but it is probable

that more of the intrusions experienced in daily life are negative referring to worries or things that must be done. Obviously, the degree to which increased cognitive demands of everyday activities and reductions in task unrelated thoughts protect older adults (both repressors and non repressors) from negative affect and psychopathology awaits further study.

Although the current study produced several interesting findings, they need to be treated with caution. One potential limitation concerns the generalisability of findings to younger and older adult samples other than university undergraduates and healthy community dwelling older adults with relatively high socio-economic status. It is, for example, unclear whether similar findings can be obtained in older adults who are not healthy and/or are of low socio-economic status. Furthermore, our older adult sample were all under the age of 85 (range 64 to 84 years). It is therefore unclear if the prevalence of repressive copers is still present in samples older than 85 years. There is some evidence in the literature showing that levels of depression increase in old-old adults (Teachman, 2006). The use of an undergraduate sample in the present study is perhaps less of a problem (*cf.* Salthouse, 1991). Indeed, several of the studies described in the introduction compared young non-student and older adult populations but still reported less negative emotions and greater psychological well-being in the older samples (e.g. Carstensen et al., 2000; Mroczek & Kolarz, 1998). Moreover, in the study of Kvavilashvili et al. (in preparation) old participants scored significantly lower on anxiety and schizotypal personality than the young non-student participants.

Another issue relates to the cross sectional nature of this research. It could be argued that the greater level of repressive coping found in our older sample may represent a cohort effect rather than a developmental progression. However, there is some evidence in the literature that argues against the idea of our results being entirely due to cohort effects. First, the positivity effect is a well-established finding that has

largely been accepted as a developmental shift occurring with an advanced age. For example, increased positivity in autobiographical memories has been shown to emerge progressively in several longitudinal studies (Field, 1981; Kennedy et al., 2004). On numerous occasions, Carstensen and her colleagues have suggested that it is the realisation that one's time remaining in life is limited that prompts the positivity effect. This means that similar shifts should take place also in young adults who have been diagnosed with a life threatening illness. There is evidence showing that this is the case (see Carstensen et al., 2003). Second, the results of several recent studies on children and young adults indicate that the prevalence of repressive copers in terminally ill samples is higher than in healthy samples. Phipps and Srivastava (1997) compared children with cancer to control participants and found that 36% of the cancer sample were repressors in comparison to 18% of the control group. In another study, Zachariae, Jensen, Pendersen, Jørgensen, Chrisensen, Lassesen and Lehbrink, (2004) found that women diagnosed with breast cancer showed significantly increased levels of repressive coping four weeks after diagnosis compared to a control group who had the same screening procedure but did not have breast cancer.

In conclusion, the results of the present study seem to suggest that far from old age being characterised by negative emotions and thoughts, repression and reduced cognitive capacity may make old age a time of great well-being, where negative intrusions occur much less frequently and the past comes to be seen as a repository of mostly positive experiences. The current findings also open up interesting avenues for future research. For example, future studies should examine the prevalence of repressive coping as a function of both chronological age and perceived time remaining to live, using a longitudinal design and large participant numbers. There is also need to examine repressive coping in older adults using physiological indices instead of relying entirely on self-report measures.

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