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A longitudinal investigation of repressive coping and ageing

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Abstract

Two studies investigated the possibility that repressive coping is more prevalent in older adults and that this represents a developmental progression rather than a cohort effect.

Study 1 compared a sample of younger adults (mean age 27.6 years) with older adults (mean age 74.2 years) on inventories of mental health and well-being and examined the prevalence of repressive coping in both samples. In line with previous research (Erskine, Kvavilashvili, Conway & Myers, 2007) older adults were both psychologically healthier (lower general health questionnaire scores and use of thought suppression) and had a higher prevalence of repressive coping than younger adults (at 30% versus 12% respectively). This replicates and extends the findings of Erskine et al. (2007).

The aim of Study 2 was to examine if there was a developmental progression of repressive coping prevalence rates in a longitudinal sample of older adults. To this end, the sample of older adults previously reported by Erskine et al. (2007) were re-examined after an interval of 7-years. The data indicated that the prevalence of repressive coping rose from 41% at the first time of testing (2002) to 56.4% at the second testing interval (2009). These results suggest that repressive coping may increase across the life span in certain individuals and continue to increase throughout older adulthood. Furthermore, this increase in repressive coping with age appears to be psychologically protective, resulting in better mental health and well-being in those older adults that become repressive copers.

Keywords: Ageing, repressive coping, psychopathology, well-being, thought suppression

“No man enjoys the true taste of life, but he who is ready and willing to quit it”
Lucius Annaeus Seneca

That humans age and die is a self evident truth. That we expend considerable energy avoiding the fact of death is also evident (Becker, 1973; Gailliot, Schmeichel, & Baumeister, 2006; Solomon, Greenberg & Pyszczynski, 1991). Yet one might imagine that, as people get older, it becomes harder to avoid the realisation that one’s time in life is not only limited but will soon end. Older adults are faced with the decline and death of friends and relatives, retirement, the ageing of their own body, the potential loss of certain faculties and the concomitant health issues. But what are the consequences of these realisations? It is plausible that with age people become despondent in the face of unavoidable losses, leading to a greater degree of psychopathology and reduced well-being. However, many studies indicate that later life is characterised by good levels of well-being and mental health that often rivals that of younger adults (Blazer, 2002; Diener & Suh, 1997; Carstensen, Pasupathi, Mayr & Nesselroade, 2000; Carstensen, Turan, Scheibe, Ram, Ersner-Hershfield, Samanez-Larkin, Brooks, & Nesselroade, 2011; Lawton, Kleban & Dean, 1993). There is also some evidence showing that the prevalence of depression and anxiety may be lower in older adults than younger adults. Thus, several studies have shown that there is a negative correlation between depression and age when controlling for confounds such as income, disability, marital status, educational level and gender (Blazer, Burchett, Service, & George, 1991; Blazer, Hughes, & George, 1987; Fiske, Wetherell, & Gatz, 2009; George, Blazer, Winfield-Laird, Leaf & Fischbach, 1988; Jorm, 2000; Weber, Giannakopoulos, Bacchetta, Quast, Herrmann, Delaloye, Ghisletta, Ribaupierre, & Canuto, 2012).

Importantly, a study by Blanchflower and Oswald (2008) examined 500,000 randomly sampled Americans and Western Europeans and suggests that happiness scores

are U-shaped across the life-span, reaching the nadir during middle age. Furthermore, additional data collected by Blanchflower and Oswald (2008) from nearly one million individuals across the UK showed that the relationship between the incidence of self-reported depression and anxiety and age was an inverted U-shaped curve with the prevalence of depression/anxiety rising with age until individuals reach middle age at which point the rate starts to drop.

Thus, the data from convergent sources appears to suggest that old age is a time of good mental health for many older adults. These findings are extended and supported by studies demonstrating that older adults show selective biases towards positive information and away from negative stimuli (Carstensen, 2006). Older adults show episodic memory biases where they voluntarily recall fewer negative images compared to younger adults (Charles, Mather & Carstensen, 2003). Furthermore, these differences also extend to involuntary autobiographical memories with older adults reporting fewer negative involuntary autobiographical memories than younger adults and rating their memories as more positive (Schlagman, Schulz & Kvavilashvili, 2006; Schlagman, Kliegel, Schulz, & Kvavilashvili, 2009). In addition, there is evidence that older adults show different emotional responses in comparison to younger adults in unpleasant situations. Thus, Charles and Carstensen (2008) compared the reactions of older and younger adults to listening to tape recordings where people were heard to make disparaging remarks about the participant. Older adults showed less anger and negativity, but similar levels of sadness to younger adults. Finally, Mather and Carstensen (2003) have demonstrated that older adults respond faster to happy than sad faces indicating attentional bias towards happy faces. The findings with respect to a greater degree of positivity shown by older adults have been termed the positivity effect in old age (Mather & Carstensen, 2005; Samanez-Larkin, Robertson, Mikels, Carstensen, & Gotlib, 2009).

One theory accounting for these phenomena is Carstensen's Socioemotional Selectivity Theory (Carstensen, Isaacowitz, & Charles, 1999; Carstensen, Fung & Charles, 2003). This theory suggests that it is the perception that time is running out (as one gets older) that results in motivational shifts with ageing. Therefore, younger adults are largely motivated to expend energy on tasks which will reward the person later, for example, investing in education, family, and forming new relationships. In direct contrast, as one ages the possibility of gaining rewards in the future diminishes. Thus, it does not make sense for older adults to expend considerable energy chasing future dreams. Consequently, the Socioemotional Selectivity Theory suggests that with increasing age adults change their motivations and goals away from obtaining future rewards towards maximising current satisfaction, especially, with respect to their immediate relationships. In line with this theory, Riediger, Schmiedek, Wagner, and Lindenberger (2009) demonstrated that emotional well-being increased with age in a sample of 378 individuals between 14 and 86 years of age. Furthermore, they investigated participants' attempts to influence their feelings over two 3 day periods. Findings showed that while younger adults were more likely to demonstrate contra-hedonistic motivations (i.e., to maintain or increase negative affect or to reduce positive affect), older adults were more likely to demonstrate pro-hedonistic motivations (specifically, attempting to maintain positive affect and to reduce negative affect).

Despite evidence of enhanced positivity (Carstensen et al., 2003) and declining depression with age (Jorm, 2000), the mechanisms that underpin these effects remain unknown. Furthermore, debate continues within the literature over whether these effects are the result of cohort effects or evidence of developmental progression, although there is appreciation that both processes are probably at work (Jorm, 2000).

The previous study of Erskine, Kvavilashvili, Conway and Myers (2007) attempted to investigate one potential explanatory mechanism that may underlie these effects – a possible increase in repressive coping with age. Repressive coping can be conceptualised as an automatic avoidance of negative and/or threatening information (Myers, 2000, 2010; Myers, Burns, Derakshan, Elfant, Eysenck, & Phipps, 2007). Repressors score low on trait anxiety scales (measured by various trait anxiety inventories) and high on defensiveness (often measured by the Marlowe-Crowne Social Desirability Scale, Crowne & Marlowe, 1964). Weinberger, Schwartz, and Davidson (1979) were the first to propose this method of identifying repressors and numerous later studies have found that repressors dissociate their somatic reactions from their perceptions of distress. Therefore, when confronted with an unpleasant situation, repressive copers report low levels of distress and anxiety but exhibit high levels of physiological arousal indicated by heightened heart rate, blood pressure and electro dermal activity (e.g. Barger, Kircher & Croyle, 1997; Derakshan & Eysenck, 1997; 2001a; 2001b; Lambie & Baker, 2003; Pauls & Stemmler, 2003). Studies indicate that between 10% and 20% of the young adult population are repressive copers (Myers & Reynolds, 2000; Myers & Vetere, 1997; Phipps & Srivastava, 1997). In contrast no data was available on the prevalence of repressive coping in older adults, therefore Erskine et al. (2007) were the first to provide data demonstrating repressive coping to be more prevalent in older adults, with 41% of their older adult sample (mean age 73) exhibiting a repressive coping style compared to 11% in their sample of younger adults (mean age 20). Importantly, Erskine et al. (2007) also demonstrated that older adults showed significant mental health advantages in terms of lower scores on scales of depression, neuroticism, psychoticism, schizotypal personality, rumination and thought suppression.¹ Furthermore, older repressors showed significant health advantages as demonstrated by lower scores on depression, neuroticism, unhappiness, schizotypal personality, illness attitude scale, thought

suppression and greater happiness when compared to older non-repressors. On the basis of these findings, Erskine et al. (2007) proposed that high incidence of repressive coping in old age could be one potential mechanism underlying the positivity effect, accounting also for the reductions in anxiety and depression with age (Carstensen, et al., 2000; Carstensen, et al., 2003; Charles, et al., 2003; Jorm, 2000).

In order to assess this novel idea further, and to replicate Erskine et al.'s (2007) initial findings, we conducted two follow up studies. The aim of Study 1 was to examine the prevalence of repressive coping and its relationship to ageing and mental health in a new sample of older and younger adults. In addition, we wanted to investigate whether older adults would show mental health advantages in comparison to a younger sample using previously investigated measures such as the General Health Questionnaire (Goldberg & Williams, 1988) and whether they would also show higher rates of repressive coping. Critically, in order to investigate the developmental progression of repressive coping, in Study 2, the sample of older adults reported by Erskine et al.'s (2007) was re-tested after an interval of seven years. An increase in rates of repressive coping between Time 1 (2002 – mean age 73) and Time 2 (2009 – mean age 80) would represent good evidence of a developmental progression rather than a cohort effect.

Study 1

Method

Participants:

Sixty-six participants took part. There were 33 community dwelling older adults (13 males and 20 females, mean age 74.15 years, $SD=7.60$)² and 33 younger adults (8 males and 25 females, mean age 27.58 years, $SD=8.49$). The young participants were undergraduate and postgraduate students. The older participants were recruited from local

charities, social organisations and activity clubs (this sample was previously reported by Leggett, Davies, Hiskey, & Erskine, 2011).

Measures:

Measures of repressive coping, mental health and well-being

The Spielberger State-Trait Anxiety Inventory (STAI - Spielberger, Gorsuch, & Lushene, 1983) comprises self-report scales for measuring state and trait anxiety. For this study only the trait anxiety scale was used. The trait anxiety scale is a 20-item measure assessing participants' general tendency towards feeling anxious. Items include "I am inclined to take things hard" and "I am content" are scored on a four point rating scale ranging from 1 (almost never) to 4 (almost always). Overall scores range from 20 to 80, with higher scores indicating greater anxiety.

The Marlowe Crowne Social Desirability Scale (MC - Crowne & Marlowe, 1964) is a 33-item measure of socially desirable responding. However, Crowne and Marlowe (1964) suggest it may more accurately measure the tendency to be defensive. Items include "I have never intensely disliked someone" and "I'm always willing to admit it when I make a mistake" or "I never resent being asked to return a favour". Participants circle "true" or "false" for each statement indicating their agreement. Scores range from 0 to 33, with higher scores indicating a greater need to present oneself in a favourable light.

The General Health Questionnaire (GHQ12 - Goldberg & Williams, 1988) is a 12-item measure asking participants about their general level of happiness, experience of depressive and anxiety symptoms, and sleep disturbance over the last four weeks. Items are rated on a four-point scale, (0 - less than usual; 1 - no more than usual; 2 - rather more than usual; 3 - much more than usual) and include ratings of "Loss of sleep over worry" and "Felt you couldn't overcome your difficulties". Scores range from 0 to 36. Higher scores indicate greater psychological distress.

Measures of mental control

The White Bear Suppression Inventory (WBSI - Wegner & Zanakos, 1994) is a 15-item questionnaire measuring an individual's use of thought suppression in everyday life. Items include "I wish I could stop thinking of certain things" and "I always try and put problems out of mind". Each statement is rated on a five point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Scores range from 15 to 75 with higher scores indicating greater use of thought suppression.

The Thought Control Questionnaire (TCQ - Wells & Davies, 1994) assesses participants' general use of five different thought control strategies: distraction, worry, punishment, re-appraisal and social means of control. The scale contains 30 statements such as "I tell myself not to be so stupid" or "I replace the thought with a more trivial bad thought". Each statement is rated on a four point scale ranging from 1 (almost never) to 4 (almost always). A total TCQ score (ranging from 30 to 120) is computed by summing the subscale scores. Higher scores indicate a greater use of a variety of thought control strategies.

Procedure:

Participants were asked to complete the questionnaires in the order in which they appear in the materials section. This information was generally obtained through participants taking the packs away to complete and return them via post. However, some participants chose to take part at the university in an experimental cubical with the researcher present. On average it took participants between 30-minutes and one-hour to complete the questionnaires.

The classification of repressive copers

Repressors were classified using the same criteria as Erskine et al. (2007). Thus, participants were classified as repressive copers if they scored on or below the young sample's lower quartile (36.50) on anxiety and on or above the young sample's upper

quartile (21) on the Marlowe Crowne scale. We compared this to the quartile values previously employed by Erskine et al. (2007), i.e., 36 or below on trait anxiety and 19 or above on the Marlowe Crowne scale, but the classification of repressive copers did not change significantly.

Results and Discussion

Table 1 shows the mean scores on the inventories, for younger and older groups, and includes the results of one-way ANOVAs between these means. Results showed that older adults had significantly lower scores on trait anxiety, and on the General Health Questionnaire, indicating better mental health than younger adults. Older adults also demonstrated less use of thought suppression and less use of active thought control as shown by significantly lower scores on the Thought Control Questionnaire subscales for reappraisal and worry. Yet, older adults scored significantly higher than younger adults on the Marlowe Crowne scale. This pattern of low scores on anxiety and high scores on the Marlowe Crowne scale is indicative of greater repressiveness.

Insert Table 1 here.

On examining prevalence of repressive coping in the younger and older adult samples, 4 participants (12.1%) in the young sample were classed as repressive copers compared to 10 participants (30.3%) in the older adults. A chi-squared test indicated that this relationship between age and repressive coping was significant $\chi^2 = 3.26$, $df=1$, $p=.035$, one tailed. Using the quartile values previously employed by Erskine et al., (2007), 15.2 % of the younger adults were classed as repressive copers compared to 33.33% of the older adults. Therefore, Study 1 replicated and extended the main findings of Erskine et al. (2007) in a new community dwelling sample of older and younger adults.

Finally, Table 2 shows mean scores for older repressors and older non-repressors on the questionnaires used. In addition to significant differences on trait anxiety and the

Marlowe Crowne scale, older repressors had significantly lower scores on the WBSI suggesting less use of thought suppression which has previously been linked to psychopathology (Erskine, Kvavilashvili & Kornbrot, 2007; Magee, Harden, & Teachman, 2012; Purdon, 1999). Repressors also showed a trend towards lower scores on the TCQ worry subscale possibly demonstrating less use of worry to control intrusive thoughts. Although this effect was marginally significant ($p=.07$) it explained 10% of the variance which according to Cohen (1977), corresponds to a medium to large effect. Thus, concurrent with the previous findings of Erskine et al. (2007), Study 1 suggests that older adults have a higher prevalence of repressive coping and this is linked to better mental health, as assessed by WBSI and TCQ worry subscale

Insert Table 2 here.

Study 2

One remaining question not addressed in Study 1 was the extent to which the change in prevalence rates of repressive coping was evidence of a developmental progression rather than a cohort effect. This is important as much of the previous evidence comes from cross sectional studies that compare adults across the lifespan from different cohorts. Several of these studies have reported decreased negative affect in older adults (Carstensen et al., 2000; Diener & Suh, 1998; Gross, Carstensen, Pasupathi, Tsai, Göttestam, & Hsu, 1997), yet the effects reported may be due to cohort differences. Longitudinal study designs are vital to tease apart cohort versus developmental differences. However, longitudinal studies examining changes in well-being across the life span are relatively rare, and they have produced somewhat inconsistent findings. For example, Costa, Zonderman, McCrae, Cornoni-Huntley, Locke and Barbano (1987) have reported no significant changes in negative or positive affect over a 9 year period in a sample of 4,942

participants aged between 25 and 74 at first testing. In contrast, Stacey and Gatz (1991) reported decreasing negative and positive affect over a 13-year period, however, the effects were small. Similarly, Charles, Reynolds and Gatz, (2001) who conducted a large scale longitudinal study over 21 years showed that negative affect decreased with age for all cohorts, but the rate of decrease was smallest among the oldest participants. Positive affect was stable in young and middle aged but showed slight decreases in the older adults. However, one recent study by Carstensen and colleagues (Carstensen et al., 2011), that examined emotional well-being longitudinally over a 10 year period, demonstrated that ageing was related to better emotional well-being with greater emotional stability. Furthermore, these relationships remained after controlling for personality, verbal fluency, physical health and demographic factors.

Importantly, however, no previous study has examined the prevalence of repressive coping in old age using a longitudinal design, and how this relates to mental health. Therefore, the aim of Study 2 was to conduct a longitudinal follow up study in 2009 on the sample of older adults who were previously tested in 2002 by Erskine et al. (2007). If the findings of Erskine et al. (2007) and Study 1, showing increased rates of repressive coping in older adults, were entirely due to cohort effects, then the participants' trait anxiety and the social desirability scores would remain relatively stable across the 7-year period from 2002 to 2009. In addition, the majority of participants should not change their original repressor/non-repressor status. Previous studies have demonstrated that repressive coping status is remarkably stable over a 12 week period in healthy participants (Zachariae et al. 2004). Therefore, we predicted that only a small percentage of participants (10 to 20%) might be expected to cross the category borders in both directions due to random fluctuations in the scores (as indicated by the stable classification demonstrated by Zachariae et al. 2004). If however, increased repressive coping with age represents a

developmental change, then participants' social desirability scores will increase over the 7-year period, and participants' trait anxiety scores should decrease. In addition, given these changes, the percentage of repressive copers will increase and the probability of becoming a repressive copper after being non-repressor in 2002 should be higher than the probability of becoming non-repressor after being a repressor in 2002.

In addition to examining developmental changes in repressive coping across the 7-year period, Study 2 also set out to examine how any changes over time in repressive coping related to mental well-being and health. Therefore, participants' scores on depression, happiness, unhappiness, neutrality, rumination, thought avoidance and schizotypal personality were also examined.

One final question examined in Study 2 concerned personality changes over time. There is great debate in the literature over the stability of personality over time with mixed findings (Caspi, Roberts, & Shiner, 2005; Costa, & McCrae, 1997; Costa, Herbst, McCrae, & Siegler, 2000; Macrae & Costa, 2003; Mischel, & Shoda, 2008; Roberts, Walton & Viechtbauer, 2006). However, many studies report a decline in neuroticism with age (McCrae, Costa, Pedrosa de Lima, Simoes, Ostendorf, Angleitner, Marusic, Bratko, Caprara, Barbaranelli, Chae & Piedmont, 1999; Roberts, Robins, Caspi, and Trzesniewski, 2003; Soubelet & Salthouse, 2011; Srivastava, John, Gosling, & Potter, 2003). Furthermore, studies note clear associations between personality and susceptibility to mental health issues (Weber et al., 2012). Therefore, Study 2 also examined personality changes, as measured by The Eysenck Personality Questionnaire (Eysenck, Eysenck, & Barrett, 1985), measuring three personality dimensions: introversion/extraversion, neuroticism and psychoticism over the 7-year interval.

Method

Participants:

Time 2 - Summer 2009

Questionnaire packets containing 10 inventories were sent out to the 65 older adult participants who previously took part in the summer of 2002 (see Erskine, et al., 2007).

Thirty-nine participants (22 Males and 17 females) returned completed questionnaires.

From the other 26 participants that did not take part: 5 had died, 2 could not be contacted, 1 reported being too ill to participate and 18 chose not to take part. The mean age of participants taking part was 80.05 years (SD=6.27).

As 39 of the original 65 participants responded at Time 2, between subjects ANOVA's were used to examine any systematic differences in Time 1 scores between participants responding at Time 2 and those that did not but had originally taken part at Time 1. Results indicated no significant differences between the two groups on any of the inventories or subscales at Time 1 ($t < 1$). Most importantly, the groups also did not differ in percentages of participants classed as repressors in 2002, thus there were 41% repressors in the sample of participants who later decided to take part in 2009 compared to 41.7% in the sample who later did not take part.

Materials:

All participants completed the same set of questionnaires they had previously completed in 2002. These were:

Measures assessing repressive coping

The Spielberger Trait Anxiety Inventory (STAI – Spielberger et al., 1983), see method section to Study 1.

Marlowe Crowne Social Desirability Scale (MC - Crowne & Marlowe, 1964), see method section to Study 1.

Measures of psychopathology / well-being

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The Beck Depression Inventory (BDI - Beck, Rush, Shaw, & Emery, 1979, 13-item short form). This scale measures participants' level of depression. Participants are asked to read statements and circle any that they feel apply to them (for example "I am dissatisfied with everything" or, "I am not particularly dissatisfied"). Scores range from 0 to 39 with high scores indicating greater depression.

The Eysenck Personality Questionnaire (EPQ-R - Eysenck, Eysenck, & Barrett, 1985). This inventory measures the three personality dimensions of introversion/extraversion, neuroticism and psychoticism. It also contains a lie scale which was not used in this study. A yes/no response format is used throughout. Each subscale is scored out of a possible 12.

The Schizotypal Personality Questionnaire (SPQ - Raine, 1991). This is a scale assessing schizotypal personality with 74-items. Higher values on the overall score of the SPQ indicate a greater tendency towards schizotypal personality. The scale contains items such as "Do you sometimes feel that things you see on the TV or read in the newspaper have a special meaning for you?" or "I often feel that others have it in for me". Responses are yes or no. Three subscales are derived measuring (1) Cognitive perceptual deficits, (2) Interpersonal deficits, and (3) Disorganisation.

Fordyce Happiness Index (Fordyce, 1988). This scale requires participants to rate the percentage of time they usually feel happy, unhappy and neutral, with the additional constraint that the percentages must add up to 100%.

Measures of mental control

The White Bear Suppression Inventory (WBSI - Wegner & Zanakos, 1994), see method section to Study 1.

Thought Control Questionnaire (TCQ - Wells & Davies, 1994), see method section to Study 1.

Rumination Inventory (McIntosh & Martin, 1992). This 10-item scale assesses participants' level of rumination or experience of repetitive uncontrollable thoughts. Items include "I have no trouble focusing all of my attention on one thing", or "When I don't understand something that happens, I tend to run it over in my mind until I can make sense out of it". Ratings are made on a 7-point scale anchored at 1= "does not describe me well" and 7="describes me well". Scores range from 10 to 70, with higher scores showing greater rumination.

Procedure:

The study was introduced as a seven year follow-up of the previous study assessing personality and thought control ability. Participants were initially contacted by post and sent questionnaire packets containing the inventories described in the materials section. Participants then chose whether they wished to take part, and if they did they then mailed the completed inventories back to the experimenter.

Classification of repressive copers

In view of this project representing a longitudinal 7-year follow-up of a pre-existing sample, the same classification criteria for repressive coping were adopted as in the previous paper (Erskine et al., 2007). Thus, participants were classed as repressive copers if they scored 36 or below on the trait anxiety inventory and 19 or above on the Marlowe Crowne scale.

Results and discussion

Change in the prevalence of repressive coping with age

Given that repressive coping is characterised by low anxiety scores and high social desirability scores, the first analysis examined the change in these scores as a function of time (Time 1 in 2002 vs. Time 2 in 2009). These scores are presented in Table 3. One-way within subjects ANOVAs on these means showed that while mean Marlowe Crowne scores

significantly increased from 19.77 at Time 1 to 21.64 at Time 2 ($p=.01$), trait anxiety scores remained stable over time with the mean of 33.49 at Time 1 and 34.00 at Time 2 ($p=.66$).

This pattern of findings suggests that the prevalence of repressive coping would have increased between Time 1 and Time 2.

In order to examine the change in the prevalence of repressive coping over the 7-year period, the numbers of repressors and non-repressors were calculated at Time 1 and Time 2 for those participants that remained in the sample at Time 2 (See Table 4). These calculations showed that 27 participants (69%) did not change their status from Time 1 to Time 2 (14 non-repressors and 13 repressors). However, 9 participants (23%) who were non repressors at Time 1 became repressors at Time 2. In contrast, only 3 participants (8%) who were repressors at Time 1 became non-repressors at Time 2. These percentages were compared to the percentages predicted by null hypothesis (see Table 4), which assumes that the majority of participants (90%) would remain in the same category and only small minority of participants would cross the category borders due to chance fluctuations in their anxiety and social desirability scores (5% in both directions). A goodness of fit test showed that the actual data were different to our predicted data, $\chi^2 = 26.83$, $df=2$, $p=.0001$.

Examination of the residuals showed that the non-repressor group did not differ from the predicted frequency, but that the group that stayed the same status did, as did the participants that became repressors. This demonstrated that the changes in status found from non-repressors to repressors were not by chance. Finally, out of those 23 participants who were non-repressors at Time 1, probability of becoming a repressor at Time 2 was .39 (9/23). In contrast, out of those 16 participants who were repressors at Time 1, the probability of becoming non-repressor at Time 2 was .19 (3/16). The difference between these probabilities $p_1 - p_2 = .20$ is marginally significant ($p=.07$).³

Table 4 demonstrates that, at Time 1, 16 out of 39 (or 41%) of the sample were repressive copers. When these same 39 participants were examined at Time 2, 22 out of 39 were repressive copers (56.4%), which demonstrates a greater than 15% increase in repressive coping.

Table 5 examines the magnitude of change demonstrated in the 9 participants that became repressive copers at Time 2 that were not at Time 1. What is clear from Table 5 is that it is not generally the case that participants became repressive copers because of very slight changes in the scores; often the shifts were quite large.

Changes in other variables with ageing

Table 3 shows the mean changes from Time 1 to Time 2 on all variables collected. While the general picture is of stability over time, Table 3 shows that the mean rumination scores decreased from 42.03 at Time 1 to 37.64 at Time 2. In terms of personality changes over time, the only marginally significant effect was obtained for trait neuroticism ($p=.058$) with mean neuroticism scores decreasing from 3.76 ($SD=3.24$) at Time 1 to 2.70 ($SD=2.13$) at Time 2.

Does increasing repressive coping convey mental health advantages?

To investigate whether repressive status conveyed an advantage in terms of better mental health and well-being within the older adults, participants' scores on the inventories were examined by repression status. Table 6 shows that older repressors scored significantly lower on neuroticism and unhappiness, and reported using social methods of thought control less. Furthermore, repressors reported being significantly happier than non-repressors. Non repressors also demonstrated a borderline trend ($p=.07$) towards having higher WBSI scores than repressors.

The next analysis sought to examine the change in scores on the inventories administered to 17 participants classified as non-repressors at T2. Table 7 shows the mean

scores on the inventories administered to non-repressors at T1 and T2. On examination of Table 7, what is remarkable is the very high degree of consistency of scores over the seven-year period. Indeed none of the scores significantly change from T1 to T2. Thus, the only variable to show even a trend towards changing was rumination ($p=.09$). In terms of personality change this suggests that in non-repressors personality is stable in older adults.

The final analysis sought to examine the change in scores on the inventories administered to 22 participants classed as repressors at Time 2. Table 8 shows the same data for repressors. Importantly, while many features show consistency several notable shifts are apparent, for example, over time repressors show significant reductions in neuroticism and rumination. In addition, repressors show significant rises in their Marlowe Crowne scores. Thus, in contrast to non-repressors the reductions in neuroticism seen in older repressors suggests that this facet of personality continues to change with age in older repressive copers.

General Discussion

The main objective of this paper was to examine a novel hypothesis proposed by Erskine et al. (2007) that repressive coping may increase with age. This was examined both cross-sectionally in a sample of community dwelling older and younger adults (Study 1) and longitudinally in a sample of older adults over a seven year interval (Study 2).

Study 1 replicated and extended the previous findings of Erskine et al. (2007) by showing a significantly greater prevalence of repressive coping in a sample of older adults compared to younger adults. In addition, the older adults were psychologically healthier than the younger sample. Furthermore, the results indicated that older repressors were psychologically healthier than older non-repressors as demonstrated by their lower WBSI scores. The use of thought suppression has been previously linked to multiple psychopathologies such as anxiety, depression and propensity to obsession (Erskine et al,

2007; Magee, et al. 2012; Najmi, & Wegner, 2008; Purdon, 1999; Wegner & Zanakos, 1994). However, being cross sectional this study could not address whether the difference in the prevalence of repressive coping is best viewed as a cohort effect or a longitudinal progression.

Study 2 was designed to examine the progression of repressive coping over time by re-testing Erskine et al.'s (2007) original sample of older adults after a seven-year gap. Despite only 60% (N=39) of the original sample being re-tested, the analysis demonstrated that there were no systematic biases in the participants that took part at Time 2 and those that did not. At Time 2 the older adults were still remarkably psychologically healthy as indexed by low scores on most of the indices of psychopathology and good scores on measures of well-being. Critically, the rate of repressive coping had risen from 16 participants (41%) at Time 1 to 22 participants (56.4%) at Time 2, further analysis demonstrated that this change was of borderline significance ($p=.07$). Despite this borderline result, the strong directional hypothesis and greater than 15% increase in repressive coping support the developmental progression argument, rather than the cohort effect argument. In addition, what is clear is that participants' Marlow Crowne scores continued to rise significantly across the 7 year period. Further analysis on a case by case basis demonstrated that the shifts from non-repressor to repressor documented in 9 participants over the 7 year period were not on the whole due to small changes in trait anxiety or Marlowe Crowne scores but were due to large shifts in the participants' scores. Further follow-up analysis demonstrated significant mental health advantages for the older repressive copers compared to the older non-repressors at Time 2. Older Time 2 repressors scored lower than older Time 2 non-repressors on trait anxiety, neuroticism, unhappiness, and social methods of thought control. In addition, they demonstrated greater happiness and higher Marlowe Crowne scores. The results of Study 2, therefore, suggest that the increased

prevalence of repressive coping reported in two separate samples of community dwelling older adults (Erskine et al. 2007, and Study 1 here) represent developmental shifts rather than cohort effects. However, a remaining question is the extent to which the findings reported here will generalise to other samples of older adults.

Studies reporting reductions in anxiety, depression and neuroticism with advancing age (Charles, Reynolds & Gatz, 2001; Jorm, 2000; Soubelet & Salthouse, 2011; Srivastava, John, Gosling, & Potter, 2003), alongside those demonstrating positive correlations between age and Marlowe Crowne scores (Carstensen & Cone, 1983; Dijkstra et al., 2001; Ray, 1988; Soubelet & Salthouse, 2011) seem to suggest repressive coping must increase with ageing. If this pattern is generally true of older adults, given that repressive copers are individuals scoring very high on the Marlowe Crowne scale and low on anxiety (Weinberger, 1990; Weinberger, et al., 1979), then the prevalence of repressive coping would have to rise in older adults. Furthermore, Study 2 demonstrates developmental progression evidenced by higher rates of repressive coping between the ages of 73 and 80 years.

It is important to acknowledge that the increased repressive coping seen in older adults is psychologically protective in terms of their increased happiness and lower psychopathology scores. We believe that the current findings can partly explain both the frequently reported drop in the prevalence of anxiety and depression in older adults, but also the positivity effect often reported in older adults whereby they show rapid avoidance of negative and threatening information including memories (Carstensen, 2006; Schlagman et al., 2009). Furthermore, one recent study has shown that older adults may be more successful at thought suppression suffering less intrusions than younger adults (Lambert, Smyth, Beadel & Teachman, 2013). If individuals become more repressive with ageing this

may explain the reduction in intrusive thoughts found by Lambert and colleagues (Lambert et al. 2013).

A recent study by Soubelet and Salthouse (2011) examined the relationship between social desirability, age, psychopathology and personality in a large sample of 1175 adults. Critically, the results demonstrated that older adults did show reductions in levels of negative affect and neuroticism while showing greater satisfaction with life. However, as in the present study, social desirability was positively related to age. The authors, therefore, re-examined the relations between age, psychopathology and personality while controlling for the influence of social desirability. Importantly, when controlling for social desirability the relationships between age and reductions in negative affect and neuroticism and between age and greater positivity were greatly reduced, but not completely eliminated. The authors go on to make the argument that these results have two potential explanations. One explanation is that social desirability measures response bias and therefore controlling for its influence results in a truer picture of the actual relations. An alternative explanation that we favour is that social desirability itself is a dimension that measures an important disposition and is not merely a bias towards desirable responding. This view has a long history and indeed debate over which explanation is more accurate continues to date (Nicholson, & Hogan, 1990; Smith & Ellingson, 2002; Soubelet & Salthouse, 2011; Thomsen, Mehlsen, Viidik, Sommerlund & Zachariae, 2005). However, it is our contention that social desirability is only one component of the dimension underlying these interesting effects, thus in line with Weinberger and colleagues' seminal research (Weinberger, 1990; Weinberger et al., 1979) we argue the other component is reduced trait anxiety and that taken together the two measure a repressive coping orientation that is meaningful and is psychologically protective and appears to increase with advancing age.

Another important issue concerning the present data for Study 2 is that while general changes over time were apparent in the whole sample, it was the group of repressive copers' scores that were reflected in the overall data. Thus when one examines the changes over time for repressors evidence of several changes is found, notably reduction in neuroticism and rumination. However, these same changes – or any others, were not found in the non-repressors. This indicates that personality and psychopathological scores were stable over time in non-repressors. This pattern of no change over time using similar scales has been previously reported by Costa, Zonderman, McCrae, Cornoni-Huntley, Locke and Barbano (1987). This suggests a high degree of consistency in personality, health and well-being among non-repressors between the ages of 73 and 80.

However, several important unanswered questions remain. If repressive coping increases across the life span when does it start to increase and what prompts its rise? In relation to this question, new data from our laboratory adds to our understanding. Thus, in order to examine the effects of age over the whole life span rather than just compare a younger and older sample as most previous studies have done. We recently examined repressive coping in a sample of 230 participants from 18 to 90 years of age (Erskine, Kvavilashvili, Zehra, Eastwood, Jegatheeswaran, Mulimba, Khodatars, Landenberg, Crasto & Georgiou, in preparation). There were 75 younger (18 to 35), 88 middle aged (36 to 65) and 67 older adults (over 65) in the sample. Results indicated that the prevalence of repressive coping increased in a linear progression from 17% in young to 33% in middle aged and up to 52% in older adults.

In relation to the present Study 2, it is clear that not all older adults are repressive copers or become repressive copers. At Time 2 just over 56 % were repressive copers. Therefore, any theory needs to explain and investigate what causes some older adults to

become repressors while others do not. Furthermore, questions regarding the effects of physical health on repressive coping remain unanswered. A wealth of evidence demonstrates that mental health is negatively impacted by the presence of physical disease and pain (Fiske, Gatz, & Pedersen, 2003; Roberts, Kaplan, Schema & Strawbridge, 1997), however the relationship between physical illness and repressive coping is at present under examined. Repressive coping has been shown in some cases to develop as a reaction to threatening medical diagnoses (Phipps & Srivastava, 1997; Phipps, Steele, Hall, & Leigh, 2001; Zachariae, Jensen, Pedersen, Jørgensen, Christensen, Lassesen & Melsene, 2004). Yet, the impact of physical illness on the increased prevalence of repressive coping reported in older adults remains unknown. It is important to note that there is a body of evidence linking repressive coping to poor physical health in the younger population (see Myers et al., 2007; Myers, 2010 for reviews), especially in heart disease (Denollet, Martens, Nyklicek, Conraads, & de Gelder, 2008; Frasure-Smith, Lesperance, Gravel, Masson, Juneau & Bourassa, 2002). Furthermore, one recent meta analysis examining the relationship between repressive coping and somatic disease found that being a repressive copier was significantly associated with greater risk of both cancer and cardiac complications (Mund & Mitte, 2012).

The present studies, while consistent, need to be treated with caution due to their small sample sizes and the fact that the participants were of slightly above average income. It is now important that studies of older adults begin to examine the effects of repressive coping on ageing. If it is generally the case that older adults become increasingly repressive we need to understand how this interacts with both physical and mental health but also with the life circumstances older adults find themselves in. It is now important that future studies examining the positivity effect in old age distinguish between repressors and non-repressors as positivity effects may be much stronger in repressors, or indeed may only occur in

repressors. The current work suggests that this neglected dimension of older adulthood may lead to significant advances in knowledge about this vital life phase.

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Footnotes

¹ For the purpose of this article we define thought suppression as the conscious and wilful suppression of thoughts one does not wish to have (Wegner et al., 1987) whereas repression/repressive coping is defined as the automatic and non-conscious avoidance of negative/threatening information (Myers, 2000).

² One older adult that reported living in sheltered housing was retained.

³ Furthermore, we also examined a more conservative model where we expected 80% of participants to not change status and 10% to become repressors and 10% to become non-repressors. Importantly, even with these more conservative criteria the goodness of fit test was still significant, $\chi^2=7.02$, $df=2$, $p=.03$. In addition, the examination of residuals showed that the percentage of non-repressors was not different from the predicted value but the groups that stayed the same or became repressors were.

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