Worry and depression in the old and young: differences and mediating factors

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May 2010

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ABSTRACT

Worry and depression are the most common mental health issues for adults of all ages. Consistent research has found that older adults are significantly less worried and depressed than younger adults. However there is a lack of understanding about why these differences exist. A comparative investigation of metacognition, self-appraisal and coping is crucial to understanding psychosocial factors that mediate age differences in worry and depression. Benefits of this investigation are twofold; Knowledge of risk factors could improve current intervention programs for worried and depressed adults, and understanding protective factors could help develop prevention programs for all. This study was conducted in Australia and involved 60 students (18-24 years old) and 45 community-dwelling older adults (60-89 years old). Measures of worry, depression, negative self-thinking, metacognition, and coping were given to participants to complete, and several analyses were performed on the data. Findings supported and extended previous literature, revealing that negative self-thinking and problem-solving could fully mediate the age difference in depression, and partially mediate the age difference in levels of worry. This study successfully demonstrated the significance of these factors in the mental health of both younger and older adults. Theoretical and practical implications are discussed in the paper.

KEY WORDS:	WORRY	DEPRESSION	AGE DIFFERENCES	MEDIATING FACTORS	COPING

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Introduction

During their lifetime over 25% of individuals develop a mental disorder, with high levels of worry and depression in particular, leading to worldwide concern (WHO, 2001). Severe symptoms of worry and depression can adversely impact upon personal relationships (Morrison & Bennet, 2009), health (Ader, 2007), and quality of life (Frisch, 2006).

Worry can be characterised as a tendency to evaluate everyday situations as threatening (Butler & Mathews, 1987). It can been viewed on a continuum, with adaptive worry at one end (e.g. helping one to make fast decisions, spurring one on to work harder) and pathological worry at the other which can become disabling (Davey, 1994). Worry has been investigated in the last two decades as both an independent issue and a contributing factor to mental disorders, for example generalised anxiety disorder (Meyer, Miller & Borkovec, 1990).

Similarly depression can be viewed as a continuum with minor symptoms at one end and acute symptoms at the other. According to the DSM-IV depressive symptoms can include feelings of sadness, worthlessness and a lack of interest in usual activities (APA, 1994. Where depression becomes severe and frequent for an individual, drug-therapy or counselling may be required.

In terms of clinical diagnosis, prevalence rates have shown that depression and generalised anxiety disorder (of which worry is a major component) are among the most common mental disorders in the UK, Australia and the US (ONS, 2002; ABS, 2007; Kessler, Chiu, Demler & Walters, 2005, respectively). These figures demonstrate the importance of research in these areas, and the identification of risk factors in the attempt to prevent symptoms becoming debilitating. Prevalence rates have also led to discussion of how different individuals may experience worry and depression. This paper investigates how older adults experience worry and depression compared to their younger counterparts, why this may be, and what the consequences of such issues are for them.

Worry and depression in older adults

Depression is one of the most commonly experienced mental disorders amongst older adults according to a review by Blazer (2003). He concluded that 15% of community-dwelling older adults suffered from clinically significant symptoms of depression. Problems related to excessive worry, for example generalised anxiety disorder (GAD) has also shown to be highly prevalent in older adults (Flint, 1999).

Older adults (60+ years) experience less worry and depression than younger adults (18-25 years) according to consistent literature of the last 20 years (e.g. Powers, Wisocki & Whitbourne, 1992; Christensen et al., 1999). Researchers have speculated as to why this may be and a number of psychosocial explanations for age differences in worry and depression have been identified. Firstly it has been suggested that worry is highly associated with levels of uncertainty and attempts to reduce this to gain control over a situation (Micheli & Castelfranchi, 2005). Young adults often face a wide variety of uncertainty regarding finances, career prospects and relationship decisions (Buchholz, Hofäcker, Mills, Blossfeld, Kurz & Hofmeister,

2009), whereas it could be argued that more established older adults have fewer worries overall.

Age-related decreases in daily stressors have additionally been linked with a lower tendency to feel worried and depressed, as older adults (i.e. who no longer work) have more time for enjoyable activities and can more easily avoid negative conflict (Almeida & Horn, 2004). Poor sleep and increased self-criticism can also result from overwhelming levels of daily stress, leading to symptoms of depression which may explain higher distress in younger adults (Firth-Cozens, 1998).The concept of daily stress as a risk factor is also supported by Powers and others (1992) who found that younger adults were more worried about present issues, whereas older adults' worries were future-oriented. Lastly, younger and older adults may have different ways of interpreting thoughts (i.e. metacognition), evaluating themselves, and coping with stressful situations. This paper investigates these particular factors in relation to age, worry and depression.

Metacognition

The first factor is metacognition which refers to "the psychological structures, knowledge, events and processes that are involved in the control, modification and interpretation of thinking itself" (Wells & Cartright-Hatton, 2004, p. 386). The way that we assess thoughts, including negative ones, influences our cognitive and behavioural responses and can exacerbate feelings of distress. These metacognitive processes are deeply engrained in our everyday responses and occur automatically most of the time (Chambres, Izaute & Marescaux, 2002).

The Self-Regulatory Executive Function Model (S-REF; Wells & Matthews, 1994) indicates that several metacognitive factors are involved in the development of psychological disorders. According to this, metacognitive knowledge can predispose individuals to maladaptive thinking patterns, responses, and coping strategies. For example, a tendency to overestimate their failures may cause some people to avoid activities they normally enjoy and this may lead to depressive symptoms such as worthlessness, or anxiety about the consequences of failing. Metacognition correlates significantly with both perceived stress and negative emotion, and thus may influence worry and depression according to research by Spada, Mohiyeddini & Wells (2008).

In particular, positive and negative beliefs about worry (i.e. meta-worries) have been explored as metacognitive mediators of mood disorders and were found to predispose pathological worry in college students (Wells & Carter, 1999). Their study was based on a model by Wells (1997) which is shown on the following page.

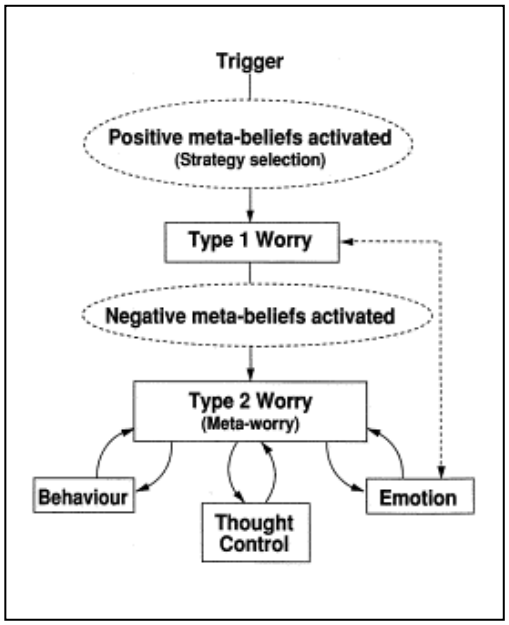

Figure 1: A cognitive model of Generalised Anxiety Disorder (reproduced from Wells, 1997, p.204)

This model suggests that positive meta-beliefs lead to the selection of worry as a coping response, which can subsequently lead to type 2 (i.e. pathological) worry, mainly via the activation of negative meta-beliefs. Positive beliefs about worry thereby "help to install rigidly worrying as a way of coping with perceived threat" (cited in Montorio, Wetherell & Nuevo, 2006, p.470) and these can then develop into negative beliefs as individuals start to feel overwhelmed. Montorio and colleagues replicated Wells and Carter's (1999) study and found that negative beliefs (that worry is dangerous or uncontrollable) and positive beliefs (that worry is helpful) were both related to GAD severity in older adults, and negative beliefs about worry were especially predictive of pathological worry. Taken together these studies demonstrate the link between beliefs about worry and pathological outcome in younger and older adults, however there is no research to date that directly compares these age groups or that incorporates depression as a potential outcome.

Negative self-thinking

The second factor is negative self-thinking. Self-evaluation is a crucial part of our metacognitive processes, and can affect our mood and the way we interpret events. If we are to evaluate ourselves in a positive light we are more likely to be happy and feel competent, while negative evaluations could lead to poor coping strategies and low mood. Beck (1967) was the first to postulate that negative thoughts about oneself, the world and the future, what he called the 'negative triad', were the main features of depressive symptoms. Since then, negative self-thinking (a combination of negative cognitive bias, appraisals and rumination) in particular has been associated with depression (Haaga, Dyck & Ernst, 1991), amongst other mental disorders such as GAD (Wells, 2005).

Verplanken, Friborg, Wang, Trafimow and Woolf (2007) developed the Habit Index of Negative Thinking (HINT) scale, making a distinction in their research between the content and process aspects of negative self-thinking. They argued that studying the automaticity of negative thoughts (a process aspect) tells us about both state and trait low self-esteem, which is associated with depression. From this we can infer how automatic negative thinking is to an individual, and therefore whether they may be vulnerable to developing depressive symptoms. Verplanken and colleagues (2007) used a student sample and found that negative self-thinking was a good predictor of anxious and depressive symptoms. Although older adults have been found to report less negative affect than younger adults (Meeks, Woodruff-Borden & Depp, 2003), habitual negative self-thinking has not yet been investigated amongst older age groups, highlighting the need for further research using this measure.

Coping

The third factor is coping. In addition to thought-appraisal and self-evaluation, metacognitive processes are suggested to influence the way in which we cope with emotional imbalance, and the strategies we select to deal with problems (Wells & Cartright-Hatton, 2004). Helpful and effective coping strategies may in turn have a protective effect on individuals by allowing them to modify thought-appraisal and negative beliefs that may have otherwise led to worry and depression. Therefore it is important to acknowledge individual differences in coping styles and develop prevention strategies for those at risk.

Many different measures of coping exist in the literature and Lazarus (1993) proposes a dividing line between emotion-focused coping (i.e. changing the way in which one attends to/appraises a stressful situation) and problem-focused coping (i.e. changing the stressful situation by acting on the environment/oneself). Coping has also commonly been split into three factor strategies such as “support-seeking”, “avoidance”, and “problem-solving (Amirkhan, 1990). Friedman and Silver (2007) suggest that avoidance coping is generally unhelpful when dealing with threat, as it simply postpones the stressful experience and does nothing to reduce its impact. The authors additionally conclude that both support-seeking and problem-solving represent effective ways of coping but to different degrees based on individual factors (i.e. gender, personality).

Past research on coping and mental health found that age was negatively correlated with the use of escapist/avoidance strategies (Aldwin, 1991). However authors were only able to speculate on the link between age, coping and depression. Overall research has had little to conclude about the coping strategies used by older adults and their efficacy (Kato & Pederson, 2005). Nonetheless there is research suggesting that younger adults tend to use a greater number and variety of coping strategies than older adults (Hunt, Wisocki & Yanko, 2003). This could imply that older adults are unable, or lack motivation, to try different strategies, or conversely that they use fewer coping strategies to better effect than younger adults. It may also be suggested that lower levels of reported depression and worry in older adults is due to their utilisation of positive coping strategies, such as social support and problem-solving. It could be that years of life experience lead to a discarding of maladaptive coping, and increasing appreciation of the strategies that work for them. It can be concluded from the lack of past literature that research needs not only to compare

the different coping strategies used by younger and older adults, but also how these relate to worry and depression.

Rationale

Higher self-reported worry and depression in younger adults may encourage research focused solely on helping these individuals; however older age groups are still an important population to consider. Literature has found that depressive symptoms can have extreme consequences for older adults, for example the rate of suicide is higher (particularly amongst older men) than in any other demographic group (Fiske, Wetherell & Gatz, 2009). Findings like this suggest that whilst the majority of older adults are less depressed and worried than their younger counterparts, those who are affected can suffer severely and have less chance of recovery.

There are many speculations about why older adults are generally found to be less depressed than younger adults, but a lack of empirical research regarding the mediation effects of metacognition, self-appraisal (i.e. negative self-thinking), and coping-all factors associated with these symptoms. It is therefore important to investigate possible explanations for these age differences, as knowledge will inform our understanding of the factors that influence worry and depression. Being able to recognise protective factors utilised by the majority of older adults could also help both older and younger adults who are struggling with severe symptoms. In order to respond to some of the ambiguities surrounding age differences in mental health issues this study aims to do the following:

1) Compare self-reported worry and depression in older and younger adults
2) Compare metacognition, negative self-thinking and coping in older and younger adults
3) Investigate whether these factors mediate the differences between levels of worry and depression in older and younger adults

Method

Participants

The older adult sample consisted of 45 men and women between the ages of 60 and 89 (mean=73.5 years, SD=7.5). Of these 33 were female and 12 male. They were recruited from senior community groups and centres in Sydney, Australia. The seniors' groups included: a creative writing class for women, a men's discussion group, a religious discussion group, a women's support group, and a mixed activity group.

The younger adult sample consisted of 60 Psychology first-year undergraduates at Macquarie University, with ages ranging from 18-24 (mean=19.1 years, SD=1.3). Of these 51 were female and 9 male. The study was advertised on the university participant research pool website, and students chose to sign up to available time slots given and take part in exchange for course credit towards their degree.

Although gender ratio was unequal for both older and younger adult groups, this reflects consistent findings that worry and depression affect more females than males across the lifespan (Hunt et al, 2003; Fiske et al, 2009). Seventy-nine percent of participants had been born in Australia, and all older adults indicated that they had lived in the country for a substantial amount of time.

Materials

PSWQ (Meyer, Miller, Metzger, & Borkovec, 1990)

The Penn State Worry Questionnaire (see Appendix 3) is a 16-item scale measuring trait-like tendency to worry, and uses a five point rating scale from "not at all typical of me" to "very typical of me". Possible scores range from zero (least worried) to 80 (most worried). The PSWQ has shown high internal consistency and good test-retest reliability (Meyer et al., 1990). It measures the frequency, intensity and uncontrollability of worry overall, rather than in specific or state situations. In past research the measure has been used to compare scores of college students with older adults (Hunt et al., 2003). It has also been used to discriminate individuals with GAD from those with other anxiety disorders (Fresco, Mennin, Heimberg, & Turk, 2003). Adequate internal consistency has been reported in both clinical and non-clinical samples (Fresco at al., 2002; Meyer et al., 1990). The scale includes five reversed-scored items.

CES-D (Radloff, 1977)

The Centre of Epidemiologic Studies Depression Scale (see Appendix 4) is a 20-item measure assessing frequency of depressive symptoms with a four-point Likert scale for each item ranging from 0 (rarely experienced the symptom in the last week) to 3 (experienced the symptom for most of the last week). The possible range of scores using this measure is zero (least depressed) to 60 (most depressed), with a score of over 16 indicating a clinically significant degree of depressive symptoms. Its efficacy and reliability have been demonstrated in a number of studies (see Radloff & Locke,

2000 for a review) and it has been used to explore depression in the general population, including older adults (Radloff, 1977). The scale includes four reversed-scored items.

MCQ-30 (Wells & Cartwright-Hatton, 2004)

The Metacognitions Questionnaire-30 (see Appendix 5) is a shortened version of the original MCQ (Cartwright-Hatton & Wells, 1997) which measures the selection of metacognitive appraisal and monitoring techniques. The measure contains 30 items and metacognition is divided into five subscales: positive beliefs about worry, negative beliefs about worry, need to control thoughts, cognitive confidence, and cognitive self-consciousness. Ratings are made on a four-point Likert scale from 1 (do not agree) to 4 (agree very much) and a higher score for each strategy indicates higher frequency of use. The MCQ-30 possesses high internal consistency, split-half reliability and test-retest coefficients (Wells & Cartwright-Hatton, 2004). Meta-cognitive dimensions have been linked to various psychological dysfunctions including: depression (Papageorgiou & Wells, 2003), pathological worry (Wells & Papageorgiou, 1998), and perceived stress (Spada, Nikcevic , Moneta, & Wells, 2008).

HINT (Verplanken, Friborg, Wang, Trafimow, & Woolf, 2007)

The Habit Index of Negative Thinking Scale (see Appendix 6) is a 12-item measure adapted from the Self-Report Habit Index (Verplanken & Orbell, 2003) used to measure the strength of a negative self-thinking habit. Ratings are made on a five-point response scale from 1 (strongly agree) to 5 (strongly disagree), with high ratings indicating a tendency to ruminate. Negative self-thinking is related to feelings of low self-esteem and has been linked to depression (Haaga et al., 1991) and generalised anxiety (Wells, 2004), amongst other distress phenomena. The scale has high internal reliability (Verplanken et al, 2007).

Billings and Moos Coping Measure (Billings & Moos, 1984)

The Billings and Moos Coping Measure (see Appendix 7) is a 32-item scale used to identify various ways of coping with problems/stress and the frequency of using these strategies. Strategies can be categorised into ‘problem solving’, ‘turning to others’ and ‘avoidance’, and ratings are made on a four-point Likert scale from 1 (never) to 4 (often). ‘Problem Solving’ reflects a practical way of coping, ‘turning to others’ involving seeking the social support of others, and ‘avoidance’ reflects a negative, escapist way of coping. The measure has been used to investigate genetic and environmental influences on coping (Kato and Pederson, 2005). Coping styles can impact on anxiety and depression levels in individuals and in severe circumstances increase vulnerability to the development of these disorders (Kato and Pederson, 2005).

Design

The study used a between groups design, comparing self-reported questionnaire ratings of older and younger adults. The IV (independent variable) in the study was age group, and the DVs (dependent variables) were worry and depression (analysed separately).

Procedure

Before data collection, ethics approval for the study was gained (see Appendices 8 and 9). Then group leaders and community club organisers were asked via phone and email for permission to approach community members during/after group meetings.

The nature of the study was explained to both age groups and a brief discussion about the issues was had with older adults (i.e. if a discussion group) before questionnaires were distributed; this was to encourage interest and participation in the study. Participants were asked to fill in questionnaires (including a demographics section-see Appendix 2), put them into the envelopes provided and hand them back or alternatively (for some older adults) post them back in a pre-paid envelope, if time was a limiting factor. All participants were informed of the anonymous and confidential nature of the study, and that the results would be entered into a data spreadsheet where participants would not be identifiable by their responses. Non-response rate was not recorded as all students chose to participate, and many older participants took their questionnaires home to complete. Older participants were given no incentive to complete the questionnaires, and students were automatically awarded course credit through the online sign-up sheet. Students were informed that they would still receive course credit if they failed to complete the questionnaire, e.g. if they found it distressing. A brief oral explanation of the six questionnaires was given (e.g. what types of questions were being asked for each) but no information on the specific items were given. Participants were told that the questionnaires would take 15-30 minutes to complete. They were encouraged to keep the information/consent form which included contact numbers for the researcher and advice if they found any issues distressing and a written debriefing (see Appendices 10 and 11)

Statistics

Several items on the PSWQ (1,3,8,10,11) and CESD (4,8,12) were reversed before data was analysed. Where participants had missed out items (<3), the mean value according to the particular scale/ subscale and age group was inputted. Where participants omitted 3> items, the scale or subscale was omitted from the analysis. All analyses were performed using SPSS software, release 16.0. Analyses included calculation of Cronbach Alpha reliabilities, a one-way ANOVA to investigate differences in older and younger groups, and several multiple regression analyses to test the associations between psychosocial factors and worry and depression. In addition a mediation model (Baron and Kenny, 1986) was used to measure the degree to which these factors could account for differences between the groups.

Results

Psychometric properties of measures

Older and younger adults were assessed separately for reliability on the various scales and subscales using Cronbach's Alpha (see Table 1). Total scores on the PSWQ (worry), CESD (depression) and HINT (negative thinking) were assessed, and were all found to be reliable.

The MCQ (meta-cognitions scale) featured five subscales, and reliabilities ranged from .79 to .89 on four of these subscales for younger adults, and .76-.81 for older adults. One subscale (*Need to control thoughts*) was found to be unreliable for older adults (<.70) and therefore was dropped from further analyses.

Finally the Billings and Moos coping scale featured three subscales, two of which (*avoidance* and *turning to others*) were found to be unreliable for both older and younger adults (<.70). The one reliable subscale (*problem-solving*) was found to have a reliability of .79 for younger adults and .84 for older adults.

Table 1
Range and reliabilities of PSWQ, CESD, HINT, MCQ-30 subscales and coping scores for younger and older adults

Scales	**Younger**		**Older**	
	Range	*Reliability*	*Range*	*Reliability*
PSWQ	20-78	.92*	19-72	.88*
CESD	5-40	.85*	1-39	.85*
HINT	12-59	.94*	12-57	.94*
Problem-solving	9-33	.79*	13-33	.84*
Avoidance	4-21	.54	6-18	.35
Turning to others	1-19	.70*	4-19	.69*
Cog. confidence	0-18	.80*	0-17	.81*
Cog. self-consciousness	4-17	.79*	0-18	.80*
Positive beliefs	0-17	.88*	0-13	.76*
Uncontrollability& Danger	0-18	.89*	0-16	.81*
Need to control thoughts	0-15	.64	0-12	.44

*Significant findings (Cronbach alpha=.70>)

Distribution and data correlation

Data was tested for normal distribution and the following results were found: the PSWQ, CESD and HINT scales all showed a non-normal distribution for the older sample; the MCQ and Billings and Moos coping scale showed normal and non-normal distribution within different subscales for either one or both age groups.

Although an assumption of normal distribution is generally required by Analysis of Variance (ANOVA) procedures, research by Lunney (1970) suggested ANOVAs are robust even when this assumption is violated. He found that ANOVA analyses were accurate when: a) the dependent variable (DV) was dichotomous (i.e. has values of 0 and 1), b) the smaller group holds at least 20% of total responses and there are at least 20 degrees of freedom, and c) DV groups are homogenous in variance. Since all of the above are true for all measures, ANOVA analyses were performed on the data.

It is important to acknowledge that worry was significantly correlated with depression (.49), but the purpose of this research and discussion was to consider them as separate issues influenced by psychosocial factors in different ways.

Age differences in worry and depression

A one-way ANOVA was performed for aim 1: to compare differences in the scores of younger and older adults on depression (CESD total score) and worry (PSWQ total score). There was a statistically significant difference for worry ($F(1, 103) = 22.60$, $p<.001$), and depression ($F(1, 102) = 4.00$, $p<.05$). As Table 2 shows, younger adults reported significantly higher levels of worry and depression than older adults.

Table 2
Descriptive data comparing scores on PSWQ, CESD, HINT, problem-solving, and reliable MCQ-30 scales for younger and older adults (ANOVA)

Scales	Younger		Older				
	Mean	*SD*	*Mean*	*SD*	*F value*	*P value*	*Effect Size*
PSWQ	52.83	12.51	41.26	11.92	22.60	.00*	.18
HINT	37.15	11.73	30.23	10.65	9.47	.00*	.09
Problem-solving	22.35	4.71	25.25	5.53	8.23	.01*	.08
Positive beliefs	5.98	4.12	4.25	3.33	5.29	.02*	.05
CESD	17.92	7.93	14.59	8.96	4.00	.05*	.04
Cog. confidence	4.67	4.43	6.27	4.70	3.14	.08	.03
Cog. self-consciousness	9.73	3.76	8.86	4.01	1.30	.26	.01
Uncontrollability & danger	6.13	4.83	5.36	4.22	.72	.40	.01

*Significant findings (p<.05).

Age differences in metacognition, negative self-thinking and coping

The same one-way ANOVA was also used to investigate aim 2: comparing metacognition (MCQ-30 subscales), negative self-thinking (HINT scale) and coping (Billings and Moos subscales) in older and younger adults. Table 2 reveals that younger and older adults differed significantly on HINT scores (F (1, 102) = 9.47, p<.005), problem-solving subscale (F (1, 102) = 8.23, p<.005), and positive beliefs subscale (F (1, 103)= 5.29, p<.05). This suggests that older adults use less negative habitual thinking, more problem-solving coping strategies, and have less positive beliefs about worry than younger adults.

Relationship between mediators, worry and depression

Finally researchers examined hypothesis three: whether age differences in and worry and depression (separately) were mediated by negative thinking, problem solving and positive beliefs. This was done using Baron and Kenny's (1986) multi-step test of mediation.

All regression models were tested for homoscedascity, linearity, multicollinearity and normally distributed errors. Scatterplots of the standardised residuals and the standardised predicted values revealed no curved trends, so met the assumptions of linearity and homoscedasticity. Models were also tested for multicollinearity, as some of the scales/subscales were significantly correlated. Both models showed VIF values of less than 10 which Everitt (1996) concludes as non-problematic for the assumption of multicollinearity. Menard (1995) also suggested that tolerance values

should be above .2 to be acceptable, which all regression models were. There were normal distributions of errors for all regression models after checking histograms and normal probability plots.

Step 1: The first step in mediation is to perform a several linear regression analyses between the independent variable (IV) and each of the mediating factors. In this study the IV (age) could be significantly predicted by all three mediators (negative thinking, problem solving and positive beliefs), as shown in Table 3.

Table 3
Linear regression analyses between age and mediating factors

Scales	**Constant**		**Age**		
	Unstd. B	*Std. Error*	*Unstd. B*	*Std. Error*	*Beta*
HINT	37.15	1.47	-6.92	2.25	-.29*
Problem-solving	22.35	.65	2.91	1.01	.27*
Positive beliefs	5.98	.49	-1.74	.76	-.22*

*Significant relationship (<.05)

Step 2: The relationship between mediators and dependent variables (DVs) needed to be tested for significance. In this study a regression analysis revealed that negative thinking, problem-solving and positive beliefs about worry could all significantly predict worry (see Table 4). Negative thinking and problem-solving could also predict depression; however the relationship between positive beliefs and depression was not significant (see Table 5).

Table 4
Linear regression between mediators and worry (PSWQ)

Scales	**Constant**		PSWQ		
	Unstd. B	*Std. Error*	*Unstd. B*	*Std. Error*	*Beta*
HINT (negative thinking)	22.31	3.10	.76	.09	.66*
Problem-solving	68.91	5.78	-.88	.24	-.34*
Positive beliefs	43.03	2.15	.97	.33	.28*

*Significant relationship (<.005)

Table 5
Linear regression between mediators and depression (CESD)

Scales	**Constant**		**CESD**		
	Unstd. B	*Std. Error*	*Unstd. B*	*Std. Error*	*Beta*
HINT (negative thinking)	2.09	2.20	.43	.06	.57*
Problem-solving	28.09	3.85	-.49	.16	-.30*
Positive beliefs	16.70	1.42	-.03	.22	-.01

*Significant relationship (<.005)

Step 3: A regression analysis was performed between the IV (age) and DVs (worry and depression, separately). Both relationships were found to be significant (see Tables 6 and 7).

Table 6
Regression analysis between age and worry (PSWQ)

Variable	Unstandardised Coefficients		Standardised Coefficients
	b	*Std. Error*	*beta*
Constant	52.83	1.58	
Age (Young=0, Old=1)	-11.58	2.44	-.43*

*Significant relationship (p=.000)

Table 7
Regression analysis between age and depression (CESD)

Variable	**Unstandardised Coefficients**		**Standardised Coefficients**
	b	*Std. Error*	*beta*
Constant	17.92	1.10	
Age (Young=0, Old=1)	-3.3	1.67	-.20*

*Significant relationship (p=.048)

Step 4: The final step of mediation is to perform a multiple regression analysis entering each of the significant mediators separately and IV (age) as predictors of the DVs (worry and depression). After controlling for each mediator the relationships between the IV and DVs may remain significant or reduce to become non-significant. If they become non-significant, it can be concluded that the mediating factor explains the differences in scores of worry and depression for the different age groups.

A multiple regression analysis was performed (see table 8). After controlling for each mediator, the effects of age as a predictor of worry was still significant, however the coefficient value had changed since the previous regression analysis between worry and age. These mediation analyses revealed that negative self-thinking, problem-solving and positive beliefs about worry partially mediated the relationship between age and worry.

Further mediation effects were tested using the Sobel test (Preacher & Hayes, 2008) and results found that negative self-thinking was the most significant mediator between age and worry (z=-2.86, SE=1.62, p=.00), followed by problem-solving (z= -1.98, SE=.94, p=.05). Positive meta-worry were not a significant mediator between age and worry (z= -1.55, SE=.75, p=.12).

Table 8
Multiple regression analyses between mediators, age and worry (PSWQ)

Variable	**Unstandardised Coefficients**		**Standardised Coefficients**
	b	*Std. Error*	*beta*
Constant	28.08	3.42	
Age (Young=0, Old=1)	-6.82	2.04	-.25*
HINT	.67	.09	.59*
Variable	**Unstandardised Coefficients**		**Standardised Coefficients**
	b	*Std. Error*	*beta*
Constant	67.08	5.45	
Age (Young=0, Old=1)	-9.49	2.48	-.35*
Problem-solving	-.64	.23	-.25*
Variable	**Unstandardised Coefficients**		**Standardised Coefficients**
	b	*Std. Error*	*beta*
Constant	48.85	2.46	
Age (Young=0, Old=1)	-10.13	2.49	-.37*
Positive beliefs	.67	.32	.19*

*Significant finding (p<.05)

A multiple regression analysis was then performed using depression as the DV and age, negative self-thinking and problem-solving as the separate IVs (see table 9). After controlling for each mediator, the effects of age as a predictor of depression were no longer significant. These mediation analyses revealed that negative thinking in particular, and also problem-solving could completely mediate the relationship between age and depression.

Again mediation effects were measured using the Sobel test, and results found that negative self-thinking was the most significant mediator between age and worry (z= -2.78, SE=1.04, p=.01), followed by problem-solving (z=-1.95, SE=.65, p=.05).

Table 9
Multiple regression analyses between mediators, age and depression (CESD)

Variable	**Unstandardised Coefficients**		**Standardised Coefficients**
	b	*Std. Error*	*beta*
Constant	2.74	2.54	
Age(Young=0, Old=1)	-.78	1.49	-.05
HINT	.42	.06	.56*
Variable	**Unstandardised Coefficients**		**Standardised Coefficients**
	b	*Std. Error*	*beta*
Constant	27.71	3.85	
Age (Young=0, Old=1)	-2.05	1.72	-.12
Problem-solving	-.44	.17	-.26*

*Significant finding (p<.05)

Discussion

This study compared levels of self-reported worry, depression, metacognition, negative self-thinking and coping in older and younger adults, and explored the relationship between these factors. The main strength of this study was that it used mediation analyses in order to explain age differences in worry and depression, an approach that is missing from previous research in this area. Results found that on average, older adults were less depressed than younger adults and this difference was completely mediated by lower levels of negative self-thinking and higher use of problem-solving as a coping strategy. Older adults were also found to be less worried than younger adults, and this was partially mediated by lower levels of negative self-thinking, and higher use of coping strategies. Negative self-thinking was the biggest predictor of worry and depression levels, followed by problem-solving strategies, and positive beliefs were not a significant predictor for either. Each part of the analyses will now be looked at in more detail, and in relation to the surrounding literature.

Age differences in worry and depression

Statistical analysis revealed that older adults reported significantly lower levels of worry and depression than younger adults. These initial findings were consistent with a multitude of previous research which found worry and depression was lower amongst community-dwelling older adults than in younger students (e.g. Powers at al., 1992, and Christensen et al., 1999). These authors identified factors such as current stress to explain increased worry and depression in younger adults, while this study suggests problems result from maladaptive appraisal and coping.

Metacognition, Negative Self-Thinking and Coping

Findings also revealed a difference in levels of negative self-thinking, use of coping strategies, and metacognitive processes between younger and older adults. Specifically data analysis found significant differences for overall negative self-thinking (HINT), the problem-solving coping subscale and the positive beliefs about worry subscale of the Metacognition questionnaire (MCQ-30).

Firstly, older adults were found to have fewer automatic negative thoughts about themselves than younger adults, as measured by the HINT scale. Past research has identified a strong relationship between negative self-thinking and depression in a study of college students (Verplanken et al. 2007). This is consistent with the present findings that younger adults reported more depressive symptoms and more negative self-thinking. Higher level of concern about oneself (e.g. negative rumination about oneself) may also reflect the egocentric thinking often attributed to younger adults (Sears, 1986). However negative self-thinking has not been investigated previously amongst older adults, nor has research made comparisons between the two age groups. In this respect, the present study was the first to investigate this issue (one of its major strengths), and in addition linked negative self-thinking with worry, as will be discussed.

Secondly, older adults reported a significantly higher use of problem-solving strategies than younger adults. Problem-solving has been cited previously as an

adaptive approach to coping compared with other types such as avoidance (Friedman & Silver, 2007), therefore we can appreciate the association between effective coping and lower worry and depression. Higher rates of problem-solving also suggest that older adults are in a better position to allow past experiences of problematic situations inform their appraisal and response to current situations. For example, older adults with financial worries are likely to have faced this problem before and so can consider their past actions and evaluate the effectiveness of different paths of action. Conversely, many issues faced by younger adults are novel and uncertain, therefore they may be less inclined to approach these from a problem-solving angle.

Finally, positive beliefs about worry was found to differ between the two age groups, with older adults reporting, on average, a lower level of positive meta-worry. It could be argued that younger adults use positive meta-worry as a motivational mechanism for study or work, whereas older adults may not require this type of stimulation to complete tasks. This finding is consistent with past research which found positive meta-worry was higher in younger than older adults (Wells & Carter, 1999; Montorio et al., 2006); however these comparisons was made between different studies rather than one direct comparison. This research also found that positive meta-worry was positively correlated with pathological worry and GAD (generalised anxiety disorder) in both age groups. This again supports the present findings that older adults had less positive beliefs about worry and lower PSWQ (worry) scores.

Interestingly, despite differences in levels of positive beliefs, the present study did not find a difference in levels of negative beliefs about worry. Wells (1997) developed a cognitive model (see figure 1. of introduction) in which he maintained that positive meta-worry can lead to pathological symptoms mainly via negative meta-worry. Although he suggested that positive meta-worry could directly lead to short-term emotional symptoms (depicted by the model's dotted line), this direct linkage is not apparent for long-term or trait-like pathological worry (i.e. that measured by the PSWQ). It is therefore worth noting that the present study did not support this model or previous research by Wells and Carter (1999), as fewer positive beliefs in older adults did not mean fewer negative beliefs when compared with younger adults. Differences in results may be due to methodological differences, for example Wells and Carter (1999) and the present study used different measures of positive and negative worry, which may have influenced self-report. Nevertheless, the present study indicates that the experience of positive beliefs about worry (e.g. worrying helps me to avoid problems in the future) could be directly associated with overall pathological worry. Further research using regression analyses are necessary to ascertain whether positive beliefs are directly predictive of worry.

Mediation effects

This study not only investigated age differences in levels of worry and depression but also whether these differences could be explained by mediating factors such as beliefs about worry, and thus extended previous findings. Mediation analyses were performed with all factors for which older and younger adults differed significantly in their scores: negative self-thinking, problem-solving coping, and positive beliefs about worry.

Negative self-thinking was found to be the most powerful predictor of worry and depression, partially mediating the differences between levels of worry of older and younger adults, and completely mediating age differences in depression. This direct mediation result successfully extends previous research which demonstrated that negative self-thinking could significantly predict anxious and depressed symptoms (Verplanken et al, 2007). Findings suggest that having frequent and automatic negative thoughts about oneself is associated with an increased risk of becoming worried and depressed, perhaps because it leads to feelings of helplessness or withdrawal behaviour.

The present study may also indicate that older adults can better protect themselves from worry and depression by adopting more positive attitudes towards themselves (implicitly and explicitly). Future research involving a third middle-aged group or a longitudinal design may be useful for determining whether negative self-thinking decreases with age, and could also be helpful for examining the impact of various life stressors.

Problem-solving was identified as another significant psychosocial factor, completely mediating age differences in depression, and partially mediating differences in worry. Coping strategies represent the ways people try to protect themselves from psychological strain, thus problem-solving is a useful strategy used by older adults to respond appropriately to stress and reduce it. Since problem-solving involves appraisal of a situation/worry, brainstorming alternative solutions and using rational evaluation, it is reasonable to assume that greater life experience may explain the result that older adults used it more often.

Taken together the total mediation effects of negative self-thinking and problem-solving on depression support Beck's (1967) initial model of depression. This model suggests that having deeply-embedded negative beliefs about oneself is more likely to result in negative appraisal and selection of maladaptive coping responses, which may then lead to depression. However in terms of partial mediation effects for worry, more research needs to be done to investigate the additional factors that can explain these age differences. One starting point for this (as mentioned previously) may be to identify whether higher uncertainty mediates higher levels of worry, or equally whether security or acceptance mediates lower symptoms of worry.

Limitations and ideas for future research

Findings suggest that lower negative self-thinking and higher use of problem-solving mediate older adults' levels of depression and partially mediate their levels of worry. These findings have profound implications for the field of mental health, but before discussing these it is necessary to note the limitations of this study. First and foremost is the issue of generalisation: since the study was conducted using only older adults from community groups it cannot be generalised to the older adults who do not attend such meetings (e.g. those in care homes, hospitals or at home. Nevertheless, using older community adults is standard practise for comparison studies (e.g. Montorio et al., 2006) and allows us to recognise and understand protective factors, rather than being limited to only negative risk factors if a clinical population was used. In addition, several older adults in this study did mention health complaints after completing the questionnaire, with one lady sharing her experiences

of being on a dialysis machine but who was “still positive about life”. It seems reasonable to suggest that these specific individuals have developed effective coping skills to deal with chronic illnesses. Similarly the younger adult sample consisted entirely of first year undergraduate students at a university, again a population commonly used in many psychological studies.

Another limitation is the cross-sectional nature of the study and being unable to identify whether age differences are due to mediating factors or cohort effects. For example, the older adults in this sample would have been in their 20s in approximately the 1940s-1970s, therefore we cannot expect their experiences of being “younger adults” to be the same as the student sample. For example the number of young adults at university currently is far higher now than it was in past generations, as are university fees, and competition for jobs (Greenaway & Haynes, 2003; Buchholz et al, 2009).

Additionally mental health research has grown exponentially since this time, and with that awareness and understanding of psychological issues such as depression, worry and anxiety (Pardes, 2003). Therefore many of the older adults in this study may have been dealing with less overall stress, and been unaware in their 20s (and even now) that depression and worry can be serious issues that require help. This limitation raises the importance of conducting future longitudinal research concerning worry and depression, as well as raising awareness to older adults that is it acceptable to ask/receive help for mental as well as physical health issues.

The present study was focused on explaining the metacognitive processes that may explain and mediate the age difference in worry and depression in a non-clinical sample. It can be argued that depression and worry are also influenced by biological (health) factors and life events. In addition to anecdotal evidence, which this study recorded, it would be beneficial for future research to incorporate a self-report measure for health-related issues. Research suggests (e.g. Katon, 2003) older adults suffer more from health complications which can affect mood directly (due to pain/fatigue) and indirectly (due to side effects of drug treatment). In addition life-event measures may have informed whether reports of worry and depression were due to immediate circumstances. We were able to partially reduce life event bias by using the PSWQ which measures trait worry, and the HINT scale which measures habitual negative beliefs. However the addition of specific life event and health measures would have resulted in the questionnaire being in excess of 30 minutes, which we felt was too long. Future research (perhaps with larger sample groups) could incorporate a qualitative section about health and daily hassles, and to what extent these contribute to everyday concern and worry.

Implications

Investigation of these two mediating factors (in particular negative self-thinking) could give mental health providers further understanding of the assessment of older adults, and there is potential to increase intervention and prevention programs for this age group. Cognitive Therapy (CT) and Cognitive-Behavioural Therapy (CBT) are both effective in reducing depression and worry/anxiety in older adults, and are supported by empirical evidence (APA Presidential Task Force on Evidence-Based Practice, 2006). Therefore these could be a potential starting point for development, as both

CT and CBT focus on building a realistic and rational understanding of oneself and the world and providing coping skills and strategies. Integrating self-appraisal and problem-solving therapy with a CT and CBT approach may help older adults who already suffer from excessive worry and depression by challenging their beliefs and encouraging adaptive coping. Researchers also suggests that focusing treatment on fewer aspects (i.e. just self-appraisal and problem-solving) and using visual aids (mapping problem-solving strategies) can benefit older adults with sensory or cognitive impairments (Karel & Hinrichsen, 2000).

Recently there has also been increasing interest in 'positive psychology' (Sheldon & King, 2001) which emphasises the importance of creating resilient individuals. Accordingly it could be argued that all older adults could benefit from positive self-thinking and increased use of problem-solving strategies, particularly those with health complaints or facing major life changes. For example, problem-solving therapy has been used effectively with older adults who have major depression and dysthymia (Arean, Hegel, Vannoy, Fan & Unutzer, 2008), however a focus on these skills could also have protective value for those who are not clinically depressed. In addition, although this study is aimed at increasing understanding about older adult mental health, the findings also indicate that help for younger adults (particularly students) could be useful. By offering counselling based around changing negative self-thinking, appraisal of worry and using problem-solving coping, students under pressure could be given emotional support and strategies that they may currently be unfamiliar with. Also by introducing these aspects of thinking early in university (e.g. a workshop as part of induction week) this may help prevent these issues from becoming problematic for students.

In conclusion, negative self-thinking and problem-solving proved to be significant predictors of worry and depression, partially mediating the relationship between age and worry, and completely mediating the relationship between age and depression. These findings have important implications for the development of psychological treatment of depression for both older and younger adults. Findings also highlight that there may be other mediating factors in the development of worry, for example perceived uncertainty; It is important for future research to identify whether factors such as this can fully mediate the relationship between age and worry. Understanding the factors that influence worry, depression and mental disorder in general is crucial not only to treatment but also to prevention. The protective properties of positive self-appraisal and problem-solving would make these effective therapies, appropriate for introduction into resilience programs for adults of all ages.

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