



Worry, emotion control, and anxiety control in older and young adults

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ABSTRACT

Young adults worry more than older adults; however, few studies have examined why age differences may exist in the frequency of worry. The present study aimed to identify age differences in worry frequency, and examine the relation of age and worry to control over one's emotions and control over anxiety. Older adults worried less often than young adults; however, young women worried more often than young men and older adults. Also, young women reported less control over their anxiety and less control over the external signs of their emotions compared to young men and older adults. Worriers had less perceived control over their anxiety, less control over the inner experience of emotions, and less control over the external signs of emotion.

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1. Introduction

Generalized anxiety disorder (GAD) is one of the most prevalent anxiety disorders among older adults, affecting about 7.3% of adults aged 55 and older during a 6-month period (Beekman et al., 1998). Further, GAD is associated with a host of problems among older adults including: increased disability (Porensky et al., 2009), sleep problems (Wetherell, Le Roux, & Gatz, 2003), diminished well-being (Wetherell et al., 2004), and poorer social functioning (Wetherell et al., 2004). As worry is one of the central diagnostic features of GAD, improving our understanding of older adults' experience of worry and control over worry is important.

Worry has been examined in community-dwelling older adults (e.g., Hunt, Wisocki, & Yanko, 2003), in older primary care patients (e.g., Brenes, 2006; Stanley, Novy, Bourland, Beck, & Averill, 2001), and most frequently in older adults with GAD (e.g., Wetherell et al., 2003). In general, older adults have lower levels of uncontrollable or excessive worry, and less frequent worry than young adults (e.g., Hunt et al., 2003). Interestingly, Hunt and colleagues found that while young adults worried more frequently than older adults, young adults utilized more strategies to cope with their worries (Hunt et al., 2003). Additionally, young and older adults worry about different topics (e.g., Diefenbach, Stanley, & Beck, 2001; Hunt et al., 2003), such that young adults worry frequently about work- or school-related and social issues, while older adults' concerns are

mostly health-related concerns (Diefenbach et al., 2001; Person & Borkovec, 1995; Wisocki, 1994).

While there are age differences in worry across adulthood, there is considerable variability in the frequency of worry among older adults. For example, older adults participating in the workforce report more frequent worry than retired older adults (Skaborn & Nicki, 2000). Furthermore, Neikrug (2003) found that the prevalence of worry is higher among the oldest-old (85 years or older) compared to the young-old (65–74). This variability is not surprising when one considers that older adults are a heterogeneous age group, spanning approximately 20 or more years difference in age between the young-old and the oldest-old.

One lifespan motivation theory that may provide a theoretical account for age differences in the frequency of worry is Socioemotional Selectivity Theory (SST; Carstensen, 1991, 1995). According to SST and its supporting research (as reviewed by Carstensen, Isaacowitz, & Charles, 1999), older adults have a shortened time perspective and are motivated to maximize their positive experiences and minimize negative experiences. As one ages and becomes more aware of time limitations, this emotion regulation is achieved through the selection of social situations and individuals with whom one interacts in a fashion that maximizes the frequency, duration, and intensity with which one experiences positive emotions (Carstensen, Fung, & Charles, 2003). In light of Carstensen's well-supported theory, older adults may be motivated to maintain lower levels of worry compared to young adults.

The findings of Gross et al. (1997) on emotion regulation are consistent with Carstensen's theory. That is, there appear to be age-related differences in emotion regulation, with older adults demonstrating better control over their emotions than young adults. In particular, older women report greater control over the inner experience of anger (Gross et al., Study 2, 3). Furthermore

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older adults endorse greater control over the inner experience of happiness, sadness, fear, and disgust (Gross et al., Study 3). In a sample of women, older age was associated with: (1) greater inner control over happiness, sadness, fear, and anger; (2) greater external control over the signs of happiness and sadness; (3) less control over the external signs of disgust (Gross et al., Study 4).

Another possible explanation of age-related differences in emotion regulation may be found in research addressing the use of specific emotion regulation strategies. For example, older adults are more likely to use passive emotion regulation strategies to avoid situations that may be anger-provoking compared to middle-aged and young adults (Blanchard-Fields, Stein, & Watson, 2004). In another study, older women reported more frequent positive reappraisal of thoughts about a conflict situation and less frequent suppressing of emotions compared to young women (John & Gross, 2004). Either being more skilled in reappraisal or using this technique more frequently may help older adults to dismiss or avoid troublesome worries. This notion is partially supported by Mennin, Heimberg, Turk, and Fresco's (2005) Emotion Dysregulation Theory of GAD. Mennin et al. found that greater worry (more excessive and uncontrollable) is associated with lower levels of emotion regulation in a sample of young adults. In summary, older adults worry less frequently and may be better at regulating their emotions compared to young adults. Additionally, worrying is associated with lower levels of emotion regulation among young adult samples. However, to date, no studies have examined the relation between emotion regulation and worry in older adults.

The present study first aimed to reproduce the findings of earlier work demonstrating age differences in the frequency and content of worry (e.g., Hunt et al., 2003; Stanley, Beck, & Zebb, 1996). The second aim was to examine the extent that there are age differences in emotion control¹ as demonstrated in previous studies (Blanchard-Fields et al., 2004; Gross et al., 1997; John & Gross, 2004). The hypothesis that older adults have greater control over their emotions compared to young adults was tested. In addition to examining age differences in emotion control, age differences in control over one particular state, anxiety, was addressed in this study as well. While no studies have investigated age differences in anxiety control, age differences have been found for inner control over fear and inner and external control over other emotions, with older adults reporting more emotion control than young adults (Gross et al., 1997). It was also hypothesized that older adults would report greater perceived anxiety control compared to young adults in the present study.

The third aim of this study was to examine possible explanations for the age differences in worry. In light of previous findings that worrying generates negative affect (e.g., McLaughlin, Borkovec, & Sibrava, 2007) and that worrying is related to greater emotion dysregulation (e.g., Mennin et al., 2005), it was hypothesized that emotion control would be negatively related to worry. Additionally, it was hypothesized that greater perceived anxiety control would be associated with lower levels of worry, as had been found in a previous examination of young adults (Brown, Antony, & Barlow, 1992).

In light of the age differences in worry and in emotion regulation strategies (e.g., Stanley et al., 1996; Gross et al., 1997), and the relation of emotion control to anxiety (e.g., Brown et al., 1992), perceived anxiety control was proposed a mediator of the relation between age and worry. Older adults may structure their

lives to not engage in anxiety-inducing situations, and thus older adults may report having more control over their anxiety. This antecedent-control strategy is focused on the selection of situations to participate in (Gross, 2007). After using overt avoidance strategies, older adults may be less likely to use worry as a cognitive avoidance strategy (c.f., Cognitive Avoidance Theory of Worry, Borkovec, Alcaine, & Behar, 2004). This proposed mediation model could account for the lower prevalence of pathological worry in older adults due to the increased perceived anxiety control.

A second mediation model was examined with emotion control as a mediator of the relation between age and worry. That is, emotion control would account (or partially account) for the difference in worry that is predicted by age. Older adults might be more skilled at managing their emotional experience and emotion expression (Gross et al., 1997; John & Gross, 2004), which could explain the lower frequency of worry in this age group. Variables such as gender, will also be explored worry and emotion control may differ among males and females.

2. Methods

2.1. Participants

One hundred and ten young and older adults were recruited from undergraduate and graduate classes, and from the community (via flyers, a television ad, and researcher visits to senior centers and independent living facilities). Seven older adults were not included in the following analyses for various reasons ($n = 1$ withdrew consent, $n = 6$ questionnaires not returned or returned with large amounts of missing data). All participants were entered into a raffle for four \$75 cash prizes.

Fifty-one young adults, aged 18–30 years of age ($M = 21.43$, $SD = 2.88$ years) and 52 older adult participants, aged 65 years of age and older ($M = 77.59$, $SD = 14.26$), returned completed questionnaires. Demographic data for the sample are presented in Table 1.

Table 1
Demographic and participant characteristics by age group.

	Young adults ($N = 51$)	Older adults ($N = 52$)
Age	21.4 (2.9)	77.7 (7.5)
Gender (Female)	58.8%	64.2%
Years of education	14.7 (2.0)	14.3 (2.5)
Marital status		
Single (%)	96.1	3.8
Married (%)	3.9	51.9
Separated/divorced (%)	0	7.7
Widowed (%)	0	36.5
Ethnicity		
Caucasian (%)	96.1	94.2
African American (%)	3.9	0
Native American (%)	0	1.9
Biracial (%)	0	3.8
Job status		
Employed full/part-time (%)	17.6	5.9
Student (%)	82.4	0
Homemaker/retired (%)	0	90.2
Other or not reported (%)	0	3.9
Income*		
Under \$10,000–\$29,999 (%)	15.7	39.1
\$30,000–\$59,999 (%)	23.5	23.6
\$60,000–\$89,999 (%)	19.6	19.6
\$90,000+ (%)	41.2	17.4
Not reported	0	11.5
Health Status*		
Excellent/good (%)	82.4	57.7
Average/fair/poor (%)	17.6	42.3

* Significantly different at $p < .05$, as determined by Chi-square.

¹ Emotion regulation is the construct of interest in much previous research in the emotion and lifespan developmental literature. In the present study, a measure of emotion control was selected for use. Emotion control may be more narrowly defined than emotion regulation. For a discussion of emotion regulation, the interested reader is referred to Gross (2007, 1998).

Young adults were more likely to have higher family incomes [$\chi^2(3) = 9.54, p = .023$]. Older adults had lower perceived health status ratings on a five point Likert-type scale, $t(99.26) = 3.61, p = .0005$. Possible differences between participant groups were not examined for ethnicity, job status, or marital status due to low cell counts.

2.2. Measures

2.2.1. Demographic Questionnaire

A Demographic Questionnaire was distributed to each participant. Questions on the demographic questionnaire include age, sex, ethnicity, marital status, years of education, family income, and perceived health status.

2.2.2. Anxiety Control Questionnaire (AxCQ)

The Anxiety Control Questionnaire (Rapee, Craske, Brown, & Barlow, 1996) is a 30-item scale that measures an individual's "perceived control over anxiety-related events". This questionnaire uses a Likert-type scale, with values ranging from 0 (strongly disagree) to 5 (strongly agree). Higher scores are indicative of greater perceived control over one's anxiety. Adequate internal consistency of the AxCQ has been found in young adults ($\alpha = .89$; Rapee et al., 1996). Test-retest reliability is good, with correlations between several time points, ranging from $r = .82$ to $r = .84$. To date, no psychometric data have been published for older adults. The internal consistency of responses in the current sample was good for young ($\alpha = .92$) and older adults ($\alpha = .88$).

2.2.3. Carstensen Emotion Questionnaire (CEQ)

The CEQ (Carstensen, 2000) measures the frequency that an individual experience each of the five following emotions: happiness, sadness, fear, anger, and disgust. Frequency is measured using a 4-point Likert-type scale: 1 (never), 2 (rarely), 3 (sometimes) and 4 (often). The next question is used to assess inner control over each of the five emotions. The question is phrased as follows: "How well are you able to control what you feel, by that we mean the inner experience of emotions?" Then, participant's control over the external signs of five emotions is assessed with the following question: "How well can you control the external part, that is, the signs that would let other people know what you are feeling?" After each question, the control of five emotions is rated on a 4-point Likert-type scale: 1 (not at all), 2 (a little), 3 (pretty well), and 4 (very well). In previous studies using the CEQ with young and older adults (Gross et al., 1997; Kennedy, Mather, & Carstensen, 2004), responses to each question were examined for each individual emotion. No composite scores have been reported for this questionnaire and no psychometric properties have been reported. In the present study, the responses to the questions regarding control over emotions were summed to create two subscales: inner control and external control and Cronbach's alpha were calculated for these subscales. These subscales were created to measure emotion regulation of several emotions. In the young adult group, the alphas were as follows: inner control ($\alpha = .73$) and external control ($\alpha = .75$). For the older adult group, the alphas were: inner control ($\alpha = .81$) and external control ($\alpha = .83$).

2.2.4. Penn State Worry Questionnaire (PSWQ)

The PSWQ (Meyer, Miller, Metzger, & Borkovec, 1990) is a 16-item questionnaire that assesses the excessiveness and uncontrollability of worry. Each item is rated on a Likert-type scale, with values ranging from 1 (not at all typical) to 5 (very typical). The item scores are totaled, and scores range from 0 to 80. Higher scores on this instrument indicate greater worry. Psychometric properties of the PSWQ have been examined in samples of young (Meyer et al., 1990) and older adults (Beck, Stanley, & Zebb, 1995; Stanley et al., 1996). Internal consistency was found to be good

($\alpha = .86-.93$) in three samples: clinical, community and college student samples (Brown et al., 1992; Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Molina & Borkovec, 1994). Test-retest reliability is adequate in college samples (ranging from $r = .74$ to $.93$); however, reliability is modest among older adults with a diagnosis of GAD ($r = .54$; Stanley et al., 2001). The mean for a predominantly college sample on the PSWQ is 47.42 ($SD = 13.40$), and for community-dwelling older adults the mean score is 38.94 ($SD = 10.98$) (Startup & Erickson, 2006). The internal consistency estimates were good for the present study: young adults ($\alpha = .94$) and older adults ($\alpha = .86$).

2.2.5. Worry content

Worry content was assessed by ascertaining the "excessiveness" of worry about eight different domains (minor matters, work/school, family, friends, social/interpersonal, health of self, health of significant others, and community/world affairs). To ensure that the questionnaire content was not tailored to young or older adults, the eight domains used in the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV, Brown, DiNardo, & Barlow, 1994) were used. Participants were asked to first provide a rating of the excessiveness of their worry about each domain using a Likert-type scale ranging 0 (no worry) to 8 (constantly worried) as is used in the structured interview. After each numeric frequency rating, an open-ended question asked participants to indicate what it is about each domain that they worry about. Only the ratings of excessiveness were analyzed in the present study.

2.3. Procedure

All participants were consented and completed a HIPAA authorization form. Participants were asked to complete each of the measures and a Demographics Questionnaire. The demographic questionnaire was presented first, and the remaining measures were presented in random order to diminish potential order effects. The questionnaires were stapled together in this order to decrease the chance that participants would complete the questionnaires in a different order.

2.4. Data analysis

2.4.1. Handling of missing data

If more than 25% of the questions were not answered on a questionnaire, the participant's questionnaire total was excluded from analyses. By excluding measures with large amounts of missing data, we aimed to reduce the amount of data that was missing due to overall participant non-response on the questionnaires rather than item non-response (Schafer & Graham, 2002). To address the missing items that remained in the sample (questionnaires with less than 25% missing data) we elected to use single item imputation using group means for the missing item (older adult versus young adult). Although there are limitations to the use of single item imputation (for a review, see Schafer & Graham, 2002), this method allowed us to maintain an adequate level of power in a small sample.

No young adult participants were excluded on account of missing data. Less than 1% (0.03%) of the values for the items was imputed for young adults. Three older adult participants were excluded from all analyses due to missing data. Group means were imputed for less than 1% (0.85%) of values for older adults.

2.4.2. Statistical analysis

The variable of age (old versus young adults) was dummy-coded for the following analyses. The assumption of normality was examined. The Kolmogorov-Smirnov test indicated that normality could not be assumed for the scores on the PSWQ and the AxCQ; however, the skew and kurtosis were within one z-score from zero. After an

Table 2
Means for questionnaires administered.

Measure	Young adults		Older adults		Total	
	M	SD	M	SD	M	SD
Worry (PSWQ)	51.53*	14.46	38.71*	11.06	45.12	14.34
Anxiety control (AxCQ)	104.20	22.00	98.80	19.80	101.55	21.02
Sadness (CEQ)	2.67	.68	2.48	.70	2.58	.69
Fear (CEQ)	2.33	.71	2.21	.70	2.27	.70
Happiness (CEQ)	3.78	.50	3.65	.68	3.72	.60
Anger (CEQ)	2.63	.63	2.42	.64	2.52	.64
Disgust (CEQ)	2.40	.67	2.52	.70	2.46	.68
Inner control (CEQ)	15.31	2.86	15.19	2.99	15.25	2.91
External control (CEQ)	15.33	3.16	14.94	3.06	15.14	3.10
Minor matters	3.86	1.95	3.25	2.01	3.55	2.00
Work/school	5.33*	1.47	.82*	1.44	3.73	2.61
Family	3.71	1.85	4.08	2.00	3.89	1.92
Friends	3.25	1.81	2.64	1.55	2.95	1.71
Social/interpersonal	3.20*	1.79	2.04*	1.72	2.62	1.84
Health (self)	3.47	2.17	3.61	1.94	3.54	2.05
Health (others)	3.82	2.24	3.76	2.00	3.79	2.11
Community/world affairs	3.37	1.80	2.88	1.72	3.13	1.77

* Means were significantly different at the $p < .05$ level.

examination of the histograms and scatter plots, the data were not transformed and no outliers were excluded.

Point-biserial correlations were used to examine the relation between age and the other variables. Pearson correlation analyses were used to examine the relation between continuous variables. To conduct the mediation analyses, linear regression analyses were performed. First, complete mediation analyses were conducted using Baron and Kenny (1986)'s method to determine whether perceived anxiety or emotion control mediated the relation between gender and worry for young adults. For mediation to occur (Baron & Kenny, 1986), the total effect of the independent variable (age) on the dependent variable (worry) must be significant. Next, the effect of age on the mediator (anxiety control, emotion control) must be significant. Then, the effect of anxiety control or emotion control on worry after controlling for age must be significant. Additionally, the Sobel test (Sobel, 1982) was used to test indirect effects of the mediator (emotion control or anxiety control), as in partial mediation.²

In the exploratory analyses, a series of 2 (age) \times 2 (gender) ANOVAs were conducted on worry, emotion control, and anxiety control. To explore interactions, simple main effects analyses were conducted. Since there were only two levels of each variable, no adjustments were made to control for familywise error rate.

3. Results

Descriptive statistics (means and standard deviations) for each age group were calculated and are presented in Table 2.

3.1. Replication of previous research

To examine whether age predicted worry in the present study, a point-biserial correlation analysis was performed with worry and age. Age was inversely related to worry ($r_{pb} = -.45$, $p < .001$), indicating that greater worry was associated with young age. Age differences in the content of worriers were examined. Young adults reported more excessive worry about social/interpersonal matters, $t(100) = 3.33$, $p < .001$, and about work/school, $t(77) = 13.17$, $p < .001$, than older adults. On average young adults reported that they

were more than “occasionally worried (4)” about work and school ($M = 5.33$, $SD = 1.47$) and were in between being “rarely” and “occasionally worried” about social/interpersonal matters ($M = 3.20$, $SD = 1.80$).

To determine whether older adults would have greater control over their emotion than young adults, two point-biserial correlation analyses were conducted. The results showed no significant relation between age and the two measures of emotion control: inner control ($r_{pb} = -.02$, $p = .83$) or external control ($r_{pb} = -.06$, $p = .53$). Additionally, no significant relation was found between age and perceived anxiety control, $r_{pb} = -.13$, $p = .20$.

3.2. Primary analyses

A Pearson correlation analysis was used to test the first hypothesis of whether emotion control would be inversely related to worry. Greater control over the inner experience of one's emotions was found to be related to less worry, $r = -.25$, $p = .01$. Additionally, greater external control over participant's signs of emotions was related to less worry, $r = -.22$, $p = .03$. In particular, PSWQ scores were significantly correlated with inner control over sadness, $r = -.28$, $p = .004$, and external control over signs of sadness, $r = .27$, $p = .005$. Thus, the first hypothesis that emotion control would be inversely related to worry was supported, although the correlations were modest in size.

The second hypothesis that perceived anxiety control would be inversely related to worry, was tested with a Pearson correlation analysis and was supported, as more anxiety control was associated with less worry, $r = -.51$, $p < .001$. Anxiety control and worry shared a considerable amount of variance, 26.0%.

Anxiety control or emotion control were proposed as mediators of the relation between age and worry. Age was significantly related to worry as measured with the PSWQ, but age was not significantly related to emotion control or anxiety control. Thus, there was no significant relation between the independent variable (age) and the proposed mediators (inner emotion control, perceived anxiety control). According to Baron and Kenny (1986)'s criteria, complete mediation did not occur. The analyses are presented in Table 3. Although inner emotion control and anxiety control were not complete mediators, they were examined as partial mediators using the Sobel test (Sobel, 1982) to examine the product of coefficients to determine if emotion control or anxiety control reduced the magnitude of the relation between age and worry. Inner control over emotions was a partial mediator of the relation between age and

² There were six married couples in the older adults sample ($n = 12$). Primary analyses were run without the couples, and no differences were found. Consequently, the couples were included in all analyses.

Table 3
Anxiety control and emotion control mediation models of worry.

Order of entry of set of predictors	β	R^2_{Δ}	Test of Significance
<i>Anxiety control as mediator of age and worry</i>			
Step 1: Age	-.45*	.21	$F_{\Delta} = 26.10, p < .001$
Step 2: Age	-.46*		
Anxiety control	-.58*	.33	$F_{\Delta} = 66.23, p < .001$
<i>Inner control of emotion as mediator of age and worry</i>			
Step 1: Age	-.46	.20	$F_{\Delta} = 25.30, p < .001$
Step 2: Age			
Anxiety control	-.27	.07	$F_{\Delta} = 9.68, p = .002$

* $p < .01$.

worry as determined by the Sobel test, $t = 2.64, p = .008$. Perceived anxiety control was also a partial mediator of the relation between age and worry, as determined by the Sobel test, $t = 4.30, p < .001$. Thus the hypothesis that emotion control and perceived anxiety control would mediate the relation between age and worry was partially supported.

3.3. Exploratory analyses

3.3.1. Gender effects

Following mixed findings of gender differences in the literature, the gender differences in worry, perceived anxiety control, emotion frequency, and emotion control were examined. Women had higher scores on the PSWQ than men, $t(100) = -2.52, p = .01$, indicating that they experienced more uncontrollable worry. Meanwhile, men had higher scores on the AxCoQ, $t(98) = 3.56, p = .001$. Men reported more frequent experience of disgust compared to women, $t(101) = 2.03, p = .05$. Men had higher scores on the external emotional control total, $t(101) = 2.51, p = .01$, as compared with women. In particular, men had greater control over the external signs of sadness, $t(101) = 2.09, p = .04$, and happiness, $t(101) = 2.73, p = .007$.

To further examine this gender effect, a 2 (age) \times 2 (gender) ANOVA was conducted on worry and anxiety control. In the first ANOVA, the effects of age and gender on worry were examined. A significant main effect for both these variables was expected. Significant main effects were found on worry for age, $F(1, 98) = 23.56, p < .001$, partial $\eta^2 = .19$, and gender, $F(1, 98) = 9.48, p = .003$, partial $\eta^2 = .088$. However, these main effects were qualified by a significant interaction, $F(1, 98) = 4.75, p = .03$, partial $\eta^2 = .046$. A differential effect for gender across age groups in the simple main effects analyses. Young women ($M = 56.87, SD = 13.00$) had significantly higher worry, $F(1, 98) = 14.09, p = .0003$, partial $\eta^2 = .13$, than young men ($M = 43.90, SD = 13.22$). No differences were found between older men and women, $F(1, 98) = .40, p = .53$.

The effects of age and gender on anxiety control were examined in the second 2 \times 2 ANOVA. Gender had a significant main effect on anxiety control, $F(1, 96) = 12.31, p = .001$, partial $\eta^2 = .11$, but there was no significant main effect for age, $F(1, 96) = 3.21, p = .08$. A significant interaction was found, which qualified the main effect of gender, $F(1, 96) = 6.90, p = .01$, partial $\eta^2 = .067$. The interaction suggests that there was a differential effect for gender across age groups for perceived anxiety control. Young women ($M = 94.21, SD = 21.68$) reported significantly lower control over their anxiety, $F(1, 96) = 19.62, p < .001$, partial $\eta^2 = .17$, than young men ($M = 118.48, SD = 12.82$). Older men and women did not differ in their perceived control over anxiety, $F(1, 96) = .37, p = .54$.

Complete mediation analyses were conducted to determine whether perceived anxiety mediated the relation between gender and worry for young adults. First, gender was significantly related to worry, $F(1, 49) = 12.13, p = .001$. Second, gender was significantly related to anxiety control, $F(1, 49) = 21.06, p < .001$. Third, anxiety

control was significantly related to worry, $F(1, 49) = 36.27, p < .0001$. Gender was entered in the first step of a hierarchical regression ($\beta = .45, p = .001$). Anxiety control ($\beta = -.58, p < .0001$) was added to the second step. Gender ($\beta = .13, p = .34$) no longer significantly contributed to the final model, $F(2, 48) = 18.58, p < .0001$, which suggests that anxiety control mediated the relationship between gender and worry.

4. Discussion

4.1. Age and sex differences in worry

Young adults reported higher levels of uncontrollable worry than older adults, which support the findings of previous studies (e.g., Beekman et al., 1998; Hunt et al., 2003). Consistent with previous research (e.g., Robichaud, Dugas, & Conway, 2003), young women worried more than young men. This gender difference also has been found in non-anxious and unselected samples, but not in clinical samples (as reviewed in Startup & Erickson, 2006). The gender difference in non-clinical samples for young adults is interesting and concerning. Young women may be experiencing significant levels of worry that could be impairing their everyday lives. Although these levels of worry may not meet criteria for GAD, the worry may improve with psychological interventions. The lack of a gender difference among older adults brings into question whether women worry less as they get older, or whether they are better able to control their worries compare to young women.

When the content of the worries was examined in the exploratory analyses, young adults worried more about social or interpersonal matters, and about work or school, but there were no age differences in the six other domains. The findings for young adults are consistent with the literature (e.g., Powers et al., 1992). Examination and analysis of the qualitative responses in the present dataset revealed that the majority of older adult's worries (45%) pertained to health and safety of themselves or others (Gould, Edelman, Ciliberti, & Bryant, 2009), which is consistent with the previous findings (i.e., Person & Borkovec, 1995; Wisocki, 1988).

4.2. Age and sex differences in emotion control

Older age did not predict greater control over one's emotions in the present study, which is inconsistent with prior research (e.g., Gross et al., 1997; John & Gross, 2004). The first possible factor accounting for the absence of age differences in inner and external control may be due to differences in samples used in the present studies and previous studies. Age differences in emotion control have consistently been found among women (Gross et al., 1997, Study 3 & 4; John & Gross, 2004), but few studies have included men (Gross et al., 1997, Study 1 & 2). In the present study, young men reported significantly greater control over their emotions than young women, while there were no gender differences for older adults. A recent imaging study found gender differences in the activation of certain regions of the brain following the use of different emotion regulation strategies (McRae, Ochsner, Mauss, Gabrieli, & Gross, 2008) in a sample of young adults. In sum, the present study, and those of McRae et al. (2008) and Gross and John (2003) have found gender differences. The presence of gender differences in emotion control or emotion regulation may partially explain the increased prevalence of worry among young women. However, more information is needed about the types of emotion regulation strategies that men use. Although some emotion regulation strategies may be beneficial in the short-term (i.e., suppression), they may be associated with negative health effects in the future (e.g., cardiovascular disease).

The second possible factor accounting for the absence of age differences in emotion control may be due to the measures employed

in the present study and previous work. Age differences in emotion regulation were found in studies with female samples (John & Gross, 2004) using a different self-report measure of emotion regulation, the Emotion Regulation Questionnaire (Gross & John, 2003), to assess the use of two specific emotion regulation strategies: reappraisal and suppression. In contrast to the ERQ, which assesses the use of two specific strategies, the measure used in the present study (CEQ) assesses the amount of perceived control an individual has over the inner experience and external signs of emotions. Therefore, it is difficult to compare the findings of the present study with John and Gross (2004). Additionally, some studies (e.g., Gross et al., 1997) that reported age differences in emotion control used measures (e.g., Berkley Expressivity Questionnaire, Gross & John, 1995), which confound emotion control and emotion experience. Although older adults reported less impulse strength (Gross et al., 1997), it is not clear whether older adults are better at controlling their impulses or whether they experience strong emotions less frequently than younger adults. In another study, Blanchard-Fields et al. (2004) used interviews to determine how older and young adults handled a conflict situation. Blanchard-Fields, Jahnke, and Camp (1995) found that older adults used strategies such as avoidance in more emotionally charged situations, which is a type of emotion regulation strategy that is not captured by measures such as the CEQ or the ERQ. Thus, more comprehensive research on age differences in specific strategies and age differences in overall control over emotions is needed to clarify these findings.

While no age differences in emotion control were found in the present study, inner control over emotions partially mediates the relation between age and worry. As inner control over emotions accounted for some of the variance in the relation between age and worry, the hypothesis that emotion control accounts for age differences in worry was partially supported. Perhaps the relation would be stronger had it been examined in only older and younger women.

4.3. Worry and emotion control

The hypothesis that greater worry would be related to less control over one's emotions was supported for both older and young adults. In the present study, greater control over the inner experience of emotion was related to less worry. Interestingly, greater worry was related to less control over the inner experience of sadness in particular. It is not clear whether the worrying generates the sadness or whether poorer regulation over the inner experience of sadness may lead to greater worry. The relation may be bidirectional, which may allow for psychological interventions aimed to decrease the frequency or controllability of worry or interventions aimed to increase positive affect and decrease contributing behaviors. The present study demonstrates that previous experimental findings of worrying generating negative affect (e.g., McLaughlin et al., 2007) may be extended to older adult samples. Some researchers have reported age differences in the experience of emotion (e.g., Levensen, Carstensen, Friesen, & Ekman, 1991), while other researchers found no age-related differences when the stimuli are relevant for older adults (Kunzmann & Gruhn, 2005).

Furthermore, greater control over the external signs of one's emotions was related to less worry in the present study. However, it is important to note that these correlations were modest in size. These findings support the emotion dysregulation theory of GAD (Mennin, Heimberg, Turk, & Fresco, 2002). Mennin et al. (2002) suggest that individuals with GAD have difficulty regulating their emotions effectively. Worrying could distract individuals from their bodily sensations or monitoring of their behaviors. Perhaps when individuals are worrying, they do not monitor external signs of emotions, that is, their non-verbal responding (e.g., facial expressions). Moreover, this may be a bidirectional relation,

as engaging in worry generates negative affect (e.g., Andrews & Borkovec, 1988; McLaughlin et al., 2007), which may make it more difficult to control one's inner experience of emotions during and after periods of worry. As noted earlier, these findings are modest in size, which indicates that there may be other variables that influence the behavior of worry, and the emotion dysregulation theory of GAD may not fully account for the occurrence of worry among non-clinical samples.

The present study demonstrated that the inverse relation between worry and control over emotions is present among older and younger adults in a community, non-clinical sample. While a relation between worry and emotion dysregulation has been demonstrated with mostly college-aged samples, the present study extends these findings to community-dwelling older adults. This suggests that worry occurs on a continuum, and should be examined as such (Brown & Barlow, 2009). Thus, intervening for individuals with sub-syndromal levels of worry may improve their quality of life and may lead to improved emotion regulation. Additionally, learning emotion regulation skills could positively impact one's life and reduce one's time spent worrying.

4.4. Perceived anxiety control as indirect mediator

When the relation of age to perceived anxiety control was examined, age was not significantly related to perceived anxiety control. Nevertheless, for both young and older adults, anxiety control is related to worry. This begs the question of what is driving the age difference in worry. Perceived anxiety control did not directly mediate the relation between age and worry. Despite this, perceived anxiety control was an indirect mediator of the relation between age and worry. Control over one's emotions, and over anxiety in particular, may account for age differences in worry.

Exploratory analyses examined sex differences in perceived anxiety control. Young women worried more and had less perceived control over their anxiety, but no gender differences were found for older participants. The finding of a differential effect for gender across age groups on anxiety control is unique to this study. Preliminary data presented by Rapee et al. (1996) on the AxCoQ found no significant gender differences. In the present study, the men reported greater control over their anxiety. In fact, in young adults, perceived anxiety control accounted for the variance in the relation between gender and worry. Following this finding, perceived anxiety control may mediate age differences in worry for females only. Unfortunately, this study did not have a sufficiently large sample for exploring that hypothesis.

Greater perceived anxiety control was related to less worry, which supported the hypothesis and was consistent with previous literature using young adult samples (e.g., Zebb & Moore, 2003). The present study extended these findings to older adults. The fact that perceived anxiety control accounted for significant variance in worry for both age groups suggests that anxiety control is an important variable of interest for the treatment of worry. These findings confirm the need to focus worry interventions on anxiety control regardless of the age of clients. Additionally, this finding supports the cognitive avoidance theory of worry (e.g., Borkovec et al., 2004). For both older and young adults in the present study, greater control over one's anxiety was associated with less worry. Thus, if individuals are controlling their anxiety experiences, then they are not employing worry as an avoidance strategy.

4.5. Limitations

The present study is limited in the non-representativeness of the samples. Both older and younger adults were well-educated (2 years of college on average), primarily Caucasian, and had high incomes. Thus, the results may not be generalizable to more hetero-

geneous samples. Additionally, the sample was a community-based sample and the diagnostic status of participants was not characterized despite large standard deviations on the PSWQ. The study was also limited by the measures employed. Additionally, the measures have limited psychometric data for older adult samples, and the PSWQ only has modest test–retest reliability with older adults. The use of the CEQ may be a limitation because it measures emotion control rather than specific emotion regulation strategies. Thus, the present study is limited in that it used a measure of a construct that only focuses on a person's perceived control over the inner experience or the signs of emotions rather than measuring the use of specific strategies to control one's emotions (e.g., avoiding conflict situations, suppression, and reappraisal). The exploratory analyses were limited in that some of the comparisons resulted in small sample sizes for the comparison groups. This limits the power to detect significant results and may have influenced the reported findings.

4.6. Future directions

It is clear that older adults worry less than young adults; however, worry is still associated with disability and a diminished quality of life among older adults. At the present time, little is known about the experience of worry in older adults. To date, worry has not been examined using an experimental paradigm (e.g., Borkovec & Hu, 1990) with older adults. Furthermore, age-related physiological changes may cause worry to be experienced in a different manner in late life (Lau, Edelman, & Larkin, 2001).

The current study attempted to examine correlates of worry as possible explanations for the age differences in prevalence rates of worry. More investigations using a variety of assessment methods (e.g., behavioral measures, self-report measures, and physiological measures) would help to more comprehensively describe the experience of worry. Multiple methods (e.g., direct observation, physiological measurements, and self-report) would aid our understanding of the effects of worry on emotional experience for men and women (Lang, 1979).

Future studies using the CEQ could examine how older and young adults interpret the emotion control items. Using the CEQ in addition to an interview might shed some light on what strategies older and young adults use to regulate and/or control their emotions related to their perception of control over emotions. Utilizing qualitative or mixed method approaches (e.g., Blanchard-Fields et al., 2004; Basevitz, Pushkar, Chaikelson, Conway, & Dalton, 2008) may provide more information about the strategies that older and young adults used to cope with worry and anxiety. For example, interview methods may capture strategies such as avoidance of situations in which older adults would experience negative emotions, which would not be captured by currently used self-report measures. Future research studies could involve the development and validation of a measure that does capture strategies that older adults use to cope with negative emotions.

5. Conclusions

Older adults worry less than young adults. Specifically, young women worry more than young men and older adults. Young women also have less perceived control over their anxiety and over their emotions. Interestingly, older men and women did not differ in their perceived control over emotions, worry, or anxiety control. Regardless of age, worriers have less perceived control over their anxiety, less control over the inner experience of emotions, and less control over the external signs of emotion. These findings provide support for the cognitive avoidance theory and the emotion dysregulation theory of GAD in young and older adults.

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