Secondary Control Belief Combinations (Adjustment and Acceptance) and Well-Being in Older Adults*

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RÉSUMÉ

Peu d'études sur les personnes âgées ont evalué directement les croyances de contrôle secondaires, défini auparavant par Morling et Evered en 2006 comme une combinaison de l'ajustement psychologique et de l'acceptation. Nous avons classé les personnes âgées (n = 223, M – age de 85 ans, 62% femmes) en trois catégories, selon leurs croyances de contrôle secondaires: l'ajustement psychologique seulement, l'ajustement psychologique et l'acceptation, et ni l'ajustement psychologique ni l'acceptation. Par rapport aux personnes qui ont insisté sur croyances au sujet de l'ajustement psychologique seulement, ceux qui ont souligné une combinaison de croyances de contrôle secondaires—incluant à la fois l'ajustement psychologique et l'acceptation—ont rapporté les émotions positives plus fréquentes, une plus grande satisfaction de vie et les maladies chroniques moins sévères. Nos résultats ont des implications dans les deux contextes, théoriques et appliquées. Théoriquement, nos résultats s'étendent la réflexion contemporaine sur le contrôle secondaire. Dans les paramètres appliqués, ils suggèrent des façons de penser qui peuvent améliorer le bien-être parmi les tres vieux.

ABSTRACT

Few studies of older individuals have directly assessed secondary control beliefs, previously defined by Morling and Evered in 2006 as a combination of psychological adjustment and acceptance. We classified older adults (n = 223, M age = 85 years, 62% women) into three categories of secondary control beliefs: psychological adjustment only, psychological adjustment and acceptance, and neither psychological adjustment nor acceptance. Relative to individuals who emphasized beliefs about psychological adjustment only, those who emphasized a combination of secondary control beliefs (including both psychological adjustment and acceptance), reported more frequent positive emotions, greater life satisfaction, and less severe chronic conditions. Our findings have implications in both theoretical and applied contexts. Theoretically, our findings extend contemporary thinking on secondary control. In applied contexts, they suggest ways of thinking that could enhance well-being in the very old.

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Introduction

Evidence suggests that positive reinterpretation is generally beneficial in terms of health and well-being (Seligman & Csikszentmihalyi, 2000), but less is known about how this actually works. In their seminal article of 1982, control theorists Rothbaum, Weisz, and Snyder suggested that there were at least four different ways in which one could positively reinterpret negative situations and events, so as to come to terms with and accept them. The authors coined the term "secondary control" to encompass these four different types of positive reinterpretation. Later in 2006, contemporary control theorists Morling and Evered posited that secondary control included psychological adjustment combined with acceptance. Both Rothbaum et al. and Morling and Evered surmised that secondary control could be used to gain feelings of control over negative situations and events, which could in turn relate to improved health and well-being.

Since 1982, empirical research has found Rothbaum et al.'s four separate types of secondary control and related constructs to relate to health and well-being (e.g., Affleck, Tennen, Croog, & Levine, 1987; Grootenhuis & Last, 1997; Newall, Chipperfield, Daniels, Hladkyj, & Perry, 2009). That said, researchers have only started to consider the possibility suggested by Morling and Evered, that individuals might hold different combinations of secondary control beliefs simultaneously that could in turn relate to health and well-being. In addition, holding combinations of secondary control beliefs could result in more positive health outcomes than holding those beliefs separately.

The present study examined the extent to which older individuals held multiple secondary control beliefs simultaneously, and considered the possible consequences of certain combinations of secondary control for health and well-being. The specific objectives are outlined in greater detail following a brief review of the literature on secondary control and various health and well-being outcomes.

Secondary control has been found to relate to many positive physical and psychological outcomes, such as adjustment to juvenile diabetes (Band & Weisz, 1990); children's adjustment to cancer-related medical procedures (Weisz, McCabe, & Dennig, 1994); lower levels of depression in adolescents with inflammatory bowel disease (Szigethy et al., 2007); health and well-being in college students (Hall, Chipperfield, Perry, Ruthig, & Goetz, 2006); lower recurrence of heart attack, morbidity, depression, and greater life satisfaction in adult cardiac patients (Affleck et al., 1987; Croog & Levine, 1982); less depression, anxiety, and distress in adult cancer patients (Carver, Pozo, Harris, & Noriega, 1993; Thompson, Collins, Newcomb, & Hunt, 1996); and less depression in HIV-positive adult men (Thompson, Nanni, & Levine, 1994). In older individuals, who may be even more likely to experience decreased health and well-being by virtue of age, secondary control and related constructs have more recently been linked to outcomes such as lower levels of depression, decreased feelings of regret, greater life satisfaction, positive emotion, fewer hospitalizations, shorter hospital stays, and survival in later life (Chipperfield et al., 2012; McQuillen, Licht, & Licht, 2003; Newall et al., 2009; Swift, Bailis, Chipperfield, Ruthig, & Newall, 2008).

Research suggests that socio-demographic factors may play a role in the use of secondary control *strategies*, with these strategies being endorsed more by women than by men (Chipperfield, Perry, Bailis, Ruthig, & Chuchmach, 2007) and more by older (> 80 years) relative to younger-old (< 80 years) adults (Chipperfield, Perry, & Menec, 1999). That said, little is known about the relationships between socio-demographic factors and secondary control *beliefs,* which are considerably less action-oriented than secondary control strategies. Furthermore, secondary control beliefs (i.e., one's propensity to psychologically adapt to and accept negative situations and events; Morling & Evered, 2006) could conceivably be influenced by other demographic factors such as income, education, marital status, and region of residence, suggesting those factors as potential co-variates for consideration in the present study.

Our study had three objectives, Objective 1 being to identify whether older adults endorsed secondary control beliefs separately or in combination. This objective was addressed by classifying individuals into "clusters" based on the extent to which they emphasized various secondary control beliefs. Just as secondary control *strategies* have been shown to be used in combination (Chipperfield et al., 1999; Haynes, Heckhausen, Chipperfield, Newall, & Perry, 2009), we expected, in light of Morling and Evered's (2006) work, that some individuals would endorse combinations of secondary control *beliefs.* For example, some individuals could potentially positively reinterpret negative events by downgrading their importance, and simultaneously accept the ways of nature. Furthermore, it seemed plausible for some people to endorse a single secondary control belief, while others might endorse no such belief(s) at all. Rather than outlining specific hypotheses as to the types of beliefs that people might report, we took an exploratory approach and simply documented the number and type of secondary control belief clusters that emerged.

Objective 2 of the present study was to consider possible socio-demographic differences between the secondary control clusters, which resulted in the creation of a descriptive profile of the clusters that emerged as a result

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of meeting Objective 1. In light of past research suggesting age and sex differences in secondary control *strategies* (Chipperfield et al., 1999; Chipperfield et al., 2007), an examination of whether the individuals in each secondary control *belief* cluster differed on certain socio-demographic characteristics was warranted. Again, because there was no prior research to draw upon, an exploratory approach was taken.

In addressing Objective 3 we assessed whether there were significant between-cluster differences on measures of physical and psychological well-being. Based on a few studies that have shown the benefits of combining control *strategies* in older adults (Chipperfield et al., 1999; Haynes et al., 2009), we expected greater benefits to well-being for individuals who emphasized the simultaneous use of multiple secondary control *beliefs*, compared to those who relied on a single belief. In particular, we expected to see those benefits in terms of greater positive emotion, greater life satisfaction, and less-severe chronic conditions. The large proportion of study participants over age 85 in the database provided a rare opportunity to examine the extent to which combinations of secondary control beliefs related to psychological and physical well being.

Method

The present study was a secondary analysis of data performed on a subset of participants from the Aging in Manitoba (AIM) study, a far-reaching longitudinal investigation of older adults. The subset of participants included individuals who took part in the 2001 and 2003 waves of AIM and the Study of Adaptive Strategies (SAS), a three-month AIM follow-up that involved study participants completing in-home questionnaires. Prior to describing the waves of data relevant to this project, brief overviews of AIM and SAS are provided. Additional details of the procedures and sample characteristics are available from Chipperfield, Havens, and Doig (1997), Chipperfield, Campbell, and Perry (2004), and Chipperfield et al. (2012).

Databases: Aging in Manitoba, the Successful Aging Study, and the Present Study

The AIM study began by drawing three independent, cross-sectional, probability samples of community-living seniors aged 60 and older. From its start in 1971 to its completion in 2006, AIM included a total of 8,947 individuals, making it one of the largest and longest population-based studies of older adults ever conducted. In 1996, approximately three months after the AIM interview, a subset of AIM respondents who met relatively more stringent selection criteria, were asked to participate in a second in-home interview. The second in-home interview was the Study of Adaptive Strategies (SAS; n = 353) which covered a variety of topics including control beliefs.

The present analyses included participants who were re-interviewed for SAS 2003 who had previously participated in SAS 1996 (n =167). Individuals who were part of the larger AIM study (n = 65) were also included. Only those participants with valid responses to our key variables were retained for the present analyses (n = 223).

Measurement

Secondary Control Measures

To create our secondary control belief scales, we identified 26 secondary control belief items from the SAS 2003 interview, each reflecting a type of secondary control as defined by Rothbaum et al. (1982). Sample items included: "Compared to when you were younger, how important is good health?"; "Whether my health gets better or worse depends very much on my doctor"; "Much of what happens in our lives is a part of the way Mother Nature works"; and "When someone is unable to influence major events in life, that person should just take it in stride". The 26 secondary control belief items were standardized and subjected to an exploratory factor analysis (EFA) with varimax rotation. Seven separate factors emerged (Table 1). The items that loaded onto the seven factors (eigenvalue > 1.00, critical value = |.50|; Kaiser, 1960; Stevens, 2002) were summed to form seven mutually exclusive secondary control belief scales. We tested the seven scale distributions for normality, and once normality had been ascertained, the alpha reliabilities of the scales were determined. Individual mean scores for each scale were calculated by summing over individual responses to each item and dividing the sum by the total number of items in the scale.

Background Variables

Past work suggested that certain background variables such as age and gender could impact secondary control. Hence, we considered age and gender along with income, education, marital status, region of residence, and perceived control to be potential co-variates in our analyses. The socio-demographic measures were obtained from participant responses to the AIM 2001 interview.

Age

A continuous measure of self-reported age in years was included in the present study. The mean age of our 223 study participants was 84.99 years (SD = 4.32, age range 79 to 98 years). Most (99.1%) of the individuals in the study sample were age 80 and older, allowing us to examine secondary control beliefs in the very old.

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Table 1: Descriptive statistics of the secondary control belief scales formed from the exploratory factor analysis and subsequently entered into the two-step cluster analysis*

Factor	*1*	*2*	*3*	*4*	*5*	*6*	*7*
SC Scale	DIA[a]	ADO[b]	BIN[b]	ACC[b]	ADR[b]	DNP[b]	VCO[b]
Eigenvalue	2.88	2.49	2.21	2.17	2.05	1.80	1.64
% Variance	12.51	10.81	9.60	9.43	8.90	7.82	7.14
Cronbach's α	.78	.79	.81	.76	.74	.66	.64
Mean	.80	3.68	4.37	3.61	4.71	.99	5.32
SD	.49	1.08	.96	1.18	.93	.38	.66

*** Non-standardized values of the descriptive statistics are shown. The original study sample in the 2003 Study of Adaptive Strategies consisted of 232 individuals; however, the analysis *N* decreased to 223 since not all individuals provided valid responses to key indicators of secondary control.**

[a] The non-standardized response scale of the downgrading items was 0 = less important, 1 = about the same, 2 = more important.

[b] The non-standardized response scale of the remainder of the items was 1 = strongly disagree … 6 = strongly agree.

SC = secondary control; DIA = downgrading instrumental/active; ADO = affiliation with distant others; BIN = beliefs in nature; ACC = acceptance; ADR = affiliation with doctor; DNP = downgrading non-instrumental/passive; VCO = living vicariously through powerful others; SD = standard deviation.

Gender

An indicator of gender was included in the present study. Our study sample consisted of 139 women (62.3%) and 84 men. The greater proportion of women in the study sample is typical of older adult populations (Chipperfield et al., 1999).

Income

Monthly income in Canadian dollars was examined for its potential to co-vary with secondary control. Income was assessed by asking the study participants, "What is your best estimate of your total personal income before deductions from all sources during the past 12 months?" Each response was divided by 12 to give the mean monthly income of the individual. The mean monthly income across all SAS 2003 participants was $1,488.35 CAD (*SD* = $1,008.13). Outlier adjustments were made. The income range was $0.00 to $5,002.00 CAD per month. Regression replacement (as described in Tabachnick and Fidell, 2001, p. 63) was used to handle missing values.

Education

Years of education was considered a potential co-variate of secondary control. The AIM 2001 version of the variable was used, since participant responses to the education item were not collected as part of SAS 2003, and it was unlikely that the variable would change between 2001 and 2003. The mean number of years of education across all participants in 2001 was 10.45 (*SD* = 2.63).

Marital Status

Marital status was included in our analysis of potential co-variates. A dichotomous measure of marital status was employed (married vs. unmarried). Our sample (n = 223) was made up of 84 individuals who were married and 139 who were not.

Region

Region of residence was included as a possible co-variate of secondary control. The region variable was dichotomized into urban versus rural region of residence. Residents of Winnipeg and the surrounding areas were considered to be urban dwellers. Residents of the Eastman, Interlake, Central, Norman/Thompson, Parkland, and Westman regions were classified as rural. In our study sample, 181 individuals lived in urban and 42 in rural settings.

Perceived Control

Perceived control was assessed by asking participants about their personal influence over various life domains (Chipperfield et al., 2004). In particular, participants were asked to rate the extent to which they felt they had influence over the various aspects of life (1 = almost no influence, 10 = total influence). Sample questions included, "How much influence [do] you feel you have over … your physical health?" and "…[over] the usual tasks that need to be done?" For our purposes, individual scores for seven life domains were summed to form the measure of perceived control. Our participants had mean perceived control scores of 7.18 (*SD* = 1.85).

Outcome Variables

Our outcome variables consisted of three measures of psychological and physical well-being from 2003. Positive emotion and life satisfaction were the two indicators of psychological well-being. Severity of chronic conditions score indicated physical well-being.

Positive Emotion

Positive emotion was assessed by asking participants to recall how often they had experienced discrete positive

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emotions as per Chipperfield, Perry, and Weiner (2003). These discrete emotions had previously been assessed via the Positive and Negative Affect Scales (Watson, Clark, & Tellegen, 1988). Respondents indicated the frequency with which each discrete emotion was experienced in the past two days (0 = never, 3 = sometimes, 6 = almost always). As reported elsewhere, when these emotions were subjected to a principal components factor analysis, one factor emerged reflecting positive emotion (Chipperfield et al., 2003). For the purposes of the present study, each respondent's frequency ratings of *pride*, *gratitude*, *hope*, *happiness*, *relief*, *contentment*, *inspiration*, *excitement*, and *love* were summed to form a positive emotion score ($\alpha_{\text{SAS 2003 sample}}$ = .80, M = 24.41, SD = 9.79).

Life Satisfaction

The life satisfaction measure used in the present study originated from a well-established scale originally developed by Neugarten, Havighurst, and Tobin (1961). The Life satisfaction Index A asked participants to report whether or not they agreed with 20 statements reflecting satisfaction with life. Sample items include "As I look back on my life, I am fairly well satisfied" and "I would not change my past, even if I could". The "1 = agree" responses were summed to calculate individual life satisfaction scores. In the original SAS 2003 sample (n = 232) the 20-item scale was found to be a sufficiently reliable indicator of psychological well-being (Cronbach's α = .74, M = 13.50, SD = 3.89).

Severity of Chronic Conditions Score

This physical health indicator was constructed from responses to a list of 22 chronic health conditions borrowed from AIM 2001. Study participants were asked whether they had experienced any of the chronic health conditions within the past year, or if they were still experiencing after-effects from having had the health conditions earlier (Yes/No). *Yes* responses were then mapped onto the Seriousness of Illness Rating Scale (SIRS-R), a measure of illness severity that originated in 1968 and was later revised (Rosenberg, Hayes, & Peterson, 1987; Wyler, Masuda, & Holmes, 1968). We determined an illness severity score for each of our study participants by mapping the illnesses each person reported onto the SIRS-R as outlined in Chipperfield, Newall, Chuchmach, Swift, and Haynes (2008). In the isolated cases in which the illnesses did not directly map onto the SIRS-R, we had medical residents assign illness severity scores. We then calculated a mean over the severity scores for each illness reported (M = 386.50, SD = 196.50). Individual severity scores were used as the physical well-being outcome in the present study.

Results

Objective 1: Identifying Clusters of Individuals Differing in Secondary Control Beliefs

To identify groups or clusters of individuals differing in the extent to which they endorsed multiple or singular secondary control beliefs, we conducted a two-step cluster analysis on the seven secondary control belief scales that were found in the EFA (Table 1). Step 1 involved the tree-clustering technique to determine the approximate number of naturally occurring clusters in the data (Ward, 1963). Two to four potential clusters were found. Step 2 involved the interactive partitioning of k-means to separately specify potential two-, three-, and four-cluster solutions (Huberty, Jordan, & Brandt, 2005; Milligan & Cooper, 1987). The three-cluster solution retained reasonable sample sizes in each cluster (Table 2) and was most theoretically meaningful.

Since the secondary control belief scales were standardized, the individual loadings shown in Table 2 can be interpreted with reference to a mean of 0.00 and a standard deviation of 1.00. Because our aim was to classify individuals based on their patterns of emphasis (high endorsement) and de-emphasis (low endorsement) of each of the secondary control beliefs examined, we interpreted loadings of greater than or equal to +.50 (half a standard deviation above the total sample mean) as *emphasis*, and loadings of –.50 or lower (half a standard deviation below the total sample mean) as *de-emphasis* (see Fiori, Antonucci, & Cortina, 2006 for a similar procedure). Loadings between –.50 and +.50 indicated average or moderate emphasis on the secondary control belief in question.

Focusing on the extent to which secondary control beliefs were emphasized, we interpreted the three clusters to represent Psychological Adjustment plus Acceptance (PAA), Psychological Adjustment (PA), and Secondary Control Absent (SCA). As illustrated in Table 2, the individuals in the PAA cluster emphasized beliefs that implied both adjustment (beliefs in nature and affiliation with distant others) and acceptance (or letting go). In contrast, individuals in the PA cluster emphasized downgrading importance, and individuals in the SCA cluster did not emphasize any of the secondary control beliefs considered in the present study.

Objective 2: Co-variates and Descriptive Profile of the Secondary Control Belief Clusters

To develop a descriptive profile, a three-level secondary control cluster variable (1 = PAA, 2 = PA, 3 = SCA) was created to identify individuals in each of the three clusters. The three groups were then compared on the continuous variables age, income, education, and level of perceived direct control using a series of one-way

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Table 2: *K*-means cluster sizes and loadings of the secondary control belief clusters*

Clusters	*N*	Secondary Control Belief Scales						
		ACC	ADO	ADR	VCO	BIN	DNP	DIA
Cluster 1 (PAA)	76	**.51**	**.61**	.18	.43	**.79**	–.37	–.37
Cluster 2 (PA)	77	–.11	–.25	–.34	**–.84**	–.33	**.66**	.48
Cluster 3 (SCA)	70	–.42	–.34	.17	.45	**–.54**	–.34	–.11
Total	223							

*** Positive values indicate above-average emphasis, negative values indicate below-average emphasis, and values between –.50 and +.50 indicate moderate or average emphasis of the given secondary control belief cluster.**
ACC = Acceptance
ADO = Affiliation with Distant Others
ADR = Affiliation with Doctor
BIN = Beliefs In Nature
DIA = Downgrading: Instrumental/Active
DNP = Downgrading: Non-instrumental/Passive
PA = Psychological Adjustment
PAA = Psychological Adjustment plus Acceptance
SCA = Secondary Control Absent
VCO = Living Vicariously through Close Others

analyses of variance (ANOVA). The three groups were also compared on the categorical variables gender, marital status, and region of residence using chi-square analyses (Table 3). The clusters only differed significantly on perceived control: $F(2, 220) = 7.2$, $p \leq .001$. Post hoc Fisher's least significant difference (LSD) tests revealed that the PAA and SCA groups were significantly higher in mean level of perceived control than was the PA group ($p = .05$ for both differences).

Although the significant perceived control finding suggested the value of including perceived control as a co-variate in our subsequent analyses of secondary control and psychological and physical well-being, the inclusion of perceived control in those analyses culminated in the effects of secondary control on the outcomes being nullified. Since our main variable of interest in the present study was secondary control, we opted not to include perceived control as a co-variate in the analyses of psychological and physical well-being.

Objective 3: Secondary Control and Psychological and Physical Well-Being

Our Objective 3 analyses involved a series of univariate ANOVAs to test whether individuals in the three secondary control belief groupings differed on measures of psychological and physical well-being. That is, three separate univariate ANOVAs were performed to assess the effects of the cluster group variable (1 = PAA, 2 = PA,

Table 3: Co-variate analyses and descriptive profile of the three secondary control belief clusters (*n* = 223)

Characteristic	PAA (*n* = 76)	PA (*n* = 77)	SCA (*n* = 70)	χ^2 or *F*	*p*
Age[a]	85.04	85.75	84.10	2.74	.07
Sex[b]	62	58	67	1.19	.55
Income[c]	1,361.42	1,518.01	1,648.74	1.48	.23
Education[d]	10.29	10.16	10.93	1.78	.17
Marital status[e]	63	63	60	.24	.89
Region of residence[f]	80	79	84	.69	.71
Perceived control[g]	7.48	6.55	7.54	7.20	.001

[a]Mean age in years
[b]Percent female vs. male
[c]Mean monthly income in Canadian dollars
[d]Mean years of education
[e]Percent single vs. married
[f]Percent urban vs. rural
[g]Mean level of perceived control measured on a Likert-type scale (1 = almost no influence to 10 = total influence)
PA = Psychological Adjustment
PAA = Psychological Adjustment plus Acceptance
SCA = Secondary Control Absent

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3 = SCA) on the two measures of psychological well-being (positive emotion and life satisfaction) and the single measure of physical well-being (severity of chronic conditions score).

Omnibus *F*-tests revealed significant SC cluster group effects on positive emotion and life satisfaction, and a marginally significant effect on severity of chronic conditions score (Table 4). Post hoc LSD comparisons revealed that the mean positive emotion score of the PAA group ($M = 28.97$) was significantly higher than that of the other two groups ($M = 20.96$ for PA; $M = 23.46$ for SCA). In addition, the mean life satisfaction score of the PAA group was significantly higher than that of the PA group, which in turn was significantly lower than that of the SCA group. A marginally significant SC cluster group effect was found in the univariate ANOVA that examined the severity of chronic conditions outcome. Post hoc LSD comparisons revealed that the mean severity of chronic conditions score of the PAA group was significantly lower than that of both the PA (PAA < PA) and the SCA (PAA < SCA) groups (Table 4).

Discussion

Findings from the present exploratory study of secondary control beliefs suggest that older community-dwelling adults do differ in their styles of thinking. Some individuals emphasize a combination of secondary control beliefs, some emphasize a single secondary control belief, and others do not emphasize secondary control beliefs at all. Approximately equal proportions of individuals were represented by each cluster grouping, suggesting that none of these groups were more likely to occur than the next.

Prior to this study, little empirical research had considered the possibility that individuals simultaneously emphasized combinations of secondary control beliefs. Our findings provide insight into how these different styles of thinking relate to well-being among community-dwelling older adults, a previously uncharted area of research. Early work by Pearlin and Schooler (1978) helped pave the way for the current examination of secondary control beliefs. Pearlin and Schooler's premise was that fending off stressful circumstances likely required more than one cognitive behavioral technique at a time.

The Combined Cluster: Psychological Adjustment plus Acceptance (PAA)

Our findings suggest that there could be distinct advantages associated with emphasizing a combination of beliefs implying adjustment (e.g., affiliating with distant others; beliefs in Mother Nature) and acceptance (or letting go). The PAA individuals reported greater positive emotion, greater life satisfaction, and a slightly lower severity of chronic conditions score than did their peers who emphasized only psychological adjustment. According to Morling and Evered (2006), a combination of psychological adjustment plus acceptance is the theoretical definition of secondary control. Arguably, secondary control protects individuals and reduces their vulnerability to the negative emotions that may accompany stressful low-control circumstances. The potential advantages of *adjustment plus acceptance* are consistent with recent research demonstrating that secondary control in the form of folk beliefs (a type of acceptance and adjustment) predicted health, hospital admissions, and survival (Chipperfield et al., 2012).

Table 4: Univariate analyses of variance results and post hoc comparisons for the effects of secondary control beliefs on psychological and physical well-being[a]

Secondary control belief cluster	***PAA (1) n = 76***		***PA (2) n = 77***		***SCA (3) n = 70***		***Test statistic***	***Effect size***	***Post hoc comparisons***
Dependent variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*(2, 220)	η^2	LSD
Positive emotion	28.97	10.12	20.96	8.52	23.46	9.09	14.90***	.12	**1 > 2***; 1 > 3***
Life satisfaction	13.74	3.34	12.49	4.16	14.24	3.97	4.10*	.04	**1 > 2*; 2 < 3****
SCC	343.04	194.25	411.47	214.61	406.47	170.51	2.90+	.03	**1 < 2*; 1 < 3***

*** The numbers in parentheses in the column headers refer to the numbers used to indicate significant differences in the *LSD* column. η^2 = effect size.**
LSD = Least Significant Difference
***M* = mean**
PA = Psychological Adjustment
PAA = Psychological Adjustment plus Acceptance
SCA = Secondary Control Absent
SCC = Severity of Chronic Conditions Score
SD = standard deviation
$^+p = .06$; $^*p < .05$; $^{**}p < .01$; $^{***}p \leq .001$

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Taken together, the combination of psychological adjustment and acceptance can be seen as having spiritual connotations that could conceivably help fend off certain types of age-related stress. For example, an emphasis on the combination of affiliation with distant powerful others (e.g., God or another higher power), beliefs in Mother Nature (also presumably a higher power), and acceptance (or letting go) may fit well for individuals facing, say, loss of a spouse. Taken in this somewhat spiritual context, the secondary control beliefs that make up the combined cluster could collectively be thought of as "Zen", to capture the tranquility and ultimate feeling of control presumably associated with embracing and being able to completely let go of a stressful negative life event or circumstance.

The Singular Cluster: Psychological Adjustment without Acceptance (PA)

Just as the emergence of the combined cluster was important in the present study, so was that of the singular cluster. In keeping with past research that examined individuals' endorsement of single secondary control beliefs (e.g., Reed, Taylor, & Kemeny, 1993) we found the endorsement of singular secondary control beliefs *not* to be optimally beneficial. In particular, acceptance was conspicuously absent in individuals who psychologically adjusted by downgrading the importance of family, friends, and health. In light of the theoretical stance that secondary control involves both adjustment *and* acceptance (Rothbaum et al., 1982; Morling & Evered, 2006), individuals who only downgraded (without accepting) could have been missing a component necessary for feeling in control. Our findings suggest that psychological adjustment *without* acceptance puts one at a *dis*advantage with regard to positive emotions, life satisfaction, and severity of chronic conditions.

The SC Absent Cluster (SCA): High in Perceived Control?

The somewhat surprising emergence of a cluster of individuals who reported being without secondary control beliefs (SCA) was interesting since in some ways it was the polar opposite of the combined PAA cluster. Individuals in the absent group were relatively lower in beliefs in nature, affiliation with distant powerful others, and acceptance, and they generally de-emphasized the other secondary control beliefs considered in the present study (Table 2). One potential explanation for this lack of emphasis on secondary control beliefs may have had to do with the high levels of perceived control found in these individuals. Their level of perceived control was significantly higher than that of their peers in the PA group (see Table 3: $p = .05$). Rothbaum et al. (1982) originally suggested that secondary control came about when direct attempts to control outcomes failed. However, the high mean levels of perceived control found among the individuals in the SCA cluster suggests that their attempts to exert control had *not* failed, and that they consequently may have had no need to rely on secondary control beliefs. The findings for life satisfaction support this logic. In particular, individuals in the SC Absent group had significantly higher levels of life satisfaction than did those in the singular PA group (Table 4).

We also found perceived control to be significantly higher in the PAA group than in the PA group (Table 3: $p = .05$). This seemed counter to the implied negative relationship between secondary and perceived control in the Rothbaum et al. paper. Specifically, Rothbaum et al. surmised that a lack of direct control gave rise to secondary control. Our findings, however, are consistent with recent research demonstrating that secondary control predicts a psychological sense of control (Chipperfield et al., 2012). Recent research on control strategies (Chipperfield et al., 1999; Haynes et al., 2009) also suggests that people can use secondary control strategies in combination with primary control strategies, which imply perceived control. Thus, our conclusion – that being high in secondary control (as per the PAA group) does not preclude simultaneously being high in perceived control – is consistent with the recent empirical evidence in the field.

Further to this, preliminary analyses that included perceived control as a co-variate (results available upon request) showed that perceived control obscured the effects of secondary control. One explanation for this is that our perceived control measure may have tapped into a broader sense of control that includes secondary control. As suggested elsewhere (Chipperfield et al., 2012), more research is needed to understand the relationship between secondary control and the broader psychological sense of control.

Study Limitations

Measurement limitations in our assessment of secondary control beliefs prevented us from taking into account the variability that might occur in these beliefs over time. For example, it could be that secondary control beliefs change from hour to hour, or that they are situation-specific, or both. Furthermore, individuals may use these beliefs in a flexible manner, combining secondary control beliefs that are different from the ones examined here. If the types of secondary control beliefs individuals emphasize are indeed fluid and situation-specific, individuals could fall into different secondary control clusters at different points in time, further complicating the study of their secondary control beliefs.

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The statistical approaches adopted in our study, factor and cluster analysis, can also be called into question with regard to the various ways that the results can be interpreted. For example, whereas our analyses suggested three clusters, a different analysis could have suggested four clusters. Hence, we do not mean to suggest that only the three clusters that we found are possible. Rather, it is likely that a wide array of secondary control belief clusters could exist, based on individual propensity to emphasize certain beliefs, and/or the characteristics of the stressful negative situation or event at hand. That said, although interpretations arising from cluster analysis may be of a less definitive nature than certain other statistical approaches, cluster analysis is nonetheless still a valuable tool for organizing data into meaningful groups, as evidenced in the present study.

A further limitation to our study is that other viable interpretations of the clusters we found are possible. For example, the important distinguishing feature between the clusters could simply be the variation in the number of beliefs included. That is, our acceptance and adjustment (PAA) group might differ from the adjustment only (PA) group more in terms of the number of beliefs included, rather than in the content or the meaning of those beliefs. Additional research is required to discern whether it is the number of beliefs or their content that is central to individual health and well-being.

The present study is also limited by the potential for a cohort effect, resulting in findings that could vary over time. That is, although approximately one third of the participants in our study emphasized a combination of acceptance and adjustment, this number could vary in future cohorts of older individuals. For example, future cohorts may be more likely to emphasize secondary control beliefs (and in particular, combined secondary control beliefs) at older ages than did the current cohort. A similar cohort effect might operate with regard to gender, which seems especially likely given that the lines between male and female gender roles now seem to be blurring. In future cohorts, this blurring of gender roles could be accompanied by increased emphasis on secondary control beliefs by men.

In addition to the study limitations already mentioned, the issue of 'direction of causality' was a concern. Our findings were based on cross-sectional data, in that the secondary control beliefs and the outcomes were all assessed in 2003. This prevented us from drawing causal conclusions from our analyses. Notably, however, our cross-sectional findings that adjustment and acceptance benefitted psychological and physical well-being (at least in comparison to adjustment only) are consistent with recent empirical results from a five-year follow-up study showing that secondary control predicted survival (Chipperfield et al., 2012).

Conclusions

The findings from the present exploratory study suggest that some older individuals emphasize secondary control beliefs in combination, some emphasize them singularly, and some may not emphasize them at all. In addition, our findings imply that benefits can arise from emphasizing multiple beliefs that are characterized by the components of secondary control as proposed by Rothbaum et al. in 1982 and Morling and Evered in 2006. Those individuals in our study who emphasized a combination of adjustment and acceptance reported scores showing significantly higher positive emotion, greater life satisfaction, and slightly lower severity of chronic conditions than did those participants who emphasized psychological adjustment only.

Our findings could be important in applied contexts, particularly those in which the goal is to enhance well-being in older adults. If our findings can be replicated, they will suggest the viability of the design of a potential cognitive behavioral intervention aimed at promoting certain combinations of psychological adjustment and acceptance in older individuals. Seniors' centers may be good venues for such an intervention. In such settings, health care professionals could teach older individuals how to see age-related decline as a natural part of the life course (beliefs in nature), to see health problems as less important than before (downgrading importance), and to ultimately come to terms with and accept their lot in life (acceptance). If such an intervention could increase positive emotion and life satisfaction and decrease perceived severity of chronic conditions, it would be especially beneficial for older individuals dealing with age-related stressors such as loss of a spouse, or a newly-diagnosed serious illness. Enhanced health and well-being could potentially result by teaching at-risk individuals to emphasize adaptive combinations of secondary control beliefs.

In addition to being important in applied contexts, our findings also have important theoretical implications in that they extend current thinking on secondary control. They open up a new area of inquiry into how combined secondary control beliefs relate to health and well-being. New areas of inquiry are typically accompanied by new research questions, such as whether older individuals hold certain combinations of secondary control beliefs indefinitely, or whether they move back and forth from one control combination to the next. If the latter is the case, then what prompts individuals to move back and forth? Could it be specific characteristics of certain stressors that are important? Or is it critical to understand individual proficiency

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and/or comfort level with emphasizing certain secondary control beliefs? These research questions and many more just begin to address the vastly important yet primarily uncharted area of secondary control beliefs.

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