Original Research Article

Longitudinal Associations of Perceived Mastery and Constraints With Coping and Their Implications for Functional Health for Aging Adults

The International Journal of Aging and Human Development
2023, Vol. 97(2) 135–156

DOI: 10.1177/00914150221112284
journals.sagepub.com/home/ahd

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Abstract

The present study examined longitudinal associations of distinct dimensions of perceived control (i.e., perceived mastery and constraints) with approach and avoidance coping relating to functional health for aging adults, which had not been well studied previously. Using data from two waves of Midlife in the United States ($N = 4{,}963$, whose mean age was 55.4 [$SD = 12.5$]), a longitudinal path model was analyzed for direct and indirect effects among perceived mastery and constraints, approach and avoidance coping, and functional limitations. Bidirectional associations were observed between perceived mastery and approach coping and between perceived constraints and avoidance coping. Moreover, perceived constraints not only were directly associated with functional limitations but also mediated the longitudinal associations of the other factors of interest with functional limitations. These findings can inform future research on perceived control and coping in the context of promoting functional health.

Keywords

perceived control, approach coping, avoidance coping, MIDUS

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Introduction

Perceived control, or beliefs about one's ability to influence their life circumstances (Lachman et al., 2011), has been studied as a predictor and outcome of health and other factors during adulthood (e.g., Ferguson & Goodwin, 2010; Gerstorf et al., 2011; Hostetler, 2012; Infurna & Okun, 2015; Jopp & Schmitt, 2010; Kempen et al., 2005). However, while recent studies (Drewelies et al., 2018; Infurna et al., 2018; Infurna & Mayer, 2015) addressed specific dimensions of perceived control, including perceived mastery and constraints, it has not been fully understood how perceived mastery and constraints are related to health and related factors. In order to fill in this gap in the literature, the present study specifically addressed the associations of perceived mastery and constraints with different types of coping relating to functional health during adulthood. We focused on functional health as a health outcome due to its relevance to independent living and quality of life (Baernholdt et al., 2012; Martinez-Martin et al., 2012) as well as successful aging (Rowe & Kahn, 1997).

Multidimensionality of Perceived Control

While there is a large body of research on perceived control conducted over decades (Reich & Infurna, 2016), recent research (Drewelies et al., 2018; Infurna et al., 2018; Infurna & Mayer, 2015) suggests that perceived control is multidimensional. Specifically, two of the dimensions of perceived control are perceived mastery (i.e., one's beliefs that they can achieve desired goals or outcomes) and perceived constraints (i.e., one's beliefs that they have obstacles that can prevent their goal achievement) (Drewelies et al., 2018; Skinner, 1996), which are suggested to be related but distinct constructs. However, research remains limited in differentiating associations of perceived mastery and constraints for other related factors (e.g., health). Overall, perceived control, consisting of these two dimensions, is suggested to affect or be affected by various factors, and its relationships with such factors may be reciprocal (see Lachman's conceptual model; Lachman, 2006; Lachman et al., 2011). Among the relevant factors, the present study focused on addressing coping relating to functional health.[1]

Different Types of Coping

While researchers have distinguished types of coping in multiple ways, the present study adopted the classification of approach coping and avoidance coping (Carver, 2007) considering the contrasting health-related implications of these types of coping (Glanz & Schwartz, 2008) as discussed later. Whereas approach coping is directed at engaging or actively dealing with the stressor or related emotions, avoidance coping is directed at disengaging from the stressor or associated negative emotions (Carver & Connor-Smith, 2010; Litman, 2006). Approach coping may involve different strategies, such as attempting to solve problems or eliminate stressors directly and to regulate emotions or accept experiences when struggling. In contrast, avoidance

coping can be characterized by some avoidance behaviors such as denial and disengagement from such problems causing stress. Approach and avoidance coping are usually considered adaptive and maladaptive ways, respectively, to deal with a stressor (Glanz & Schwartz, 2008).

Potential Reciprocity of Links Between Perceived Control and Coping

Previous research suggests that associations between perceived control and coping may be reciprocal (Aldwin, 2011; Skinner, 2016). As a possible explanation (Lachman et al., 2011; Skinner, 2016), if individuals initially have high perceived control, or confidence about their ability to achieve their goals (i.e., high perceived mastery) while viewing their possible obstacles as manageable (i.e., low perceived constraints), they may seek and tackle challenging opportunities by using constructive or action-oriented strategies (i.e., approach coping). As it is likely that their goal attainment would be successful in many cases due to their constructive approaches as well as persistence, their experience using adaptive coping may further enhance their perceived control. In contrast, if individuals initially have low perceived control doubting their goal-achievement ability (i.e., low perceived mastery) and seeing their possible obstacles interfering with their activities (i.e., high perceived constraints), they may avoid challenging tasks by using maladaptive strategies involving avoidance and goal disengagement (i.e., avoidance coping). Since their circumstances would be unlikely to change or even likely to become worse due to their disengagement from the problem, their perceived control may further decline. There have been multiple cross-sectional studies indicating links of assumed directions from perceived control, or some of its dimensions (e.g., perceived mastery; Ben-Zur, 2002), to higher levels of approach coping (e.g., active coping, planning, positive reinterpretation) and lower levels of avoidance coping and from different strategies of approach and avoidance coping to perceived control (e.g., Dijkstra & Homan, 2016) for adult populations. However, there has been a dearth of longitudinal research that address possibly bidirectional associations of specific dimensions of perceived control (e.g., perceived mastery and constraints) with different types of coping (e.g., approach and avoidance coping) for aging populations.

Direct Associations of Perceived Control and Coping With Functional Health

Perceived control and its dimensions have been found to have positive longitudinal implications for functional health for aging adults. For example, Kempen et al. (2005) found that lower perceived control predicted greater increases in functional disability over 8 years for middle-aged and older adults. In addition, Infurna and Mayer (2015) addressed the two dimensions of perceived control and found that controlling for covariates, higher perceived constraints, but not perceived mastery, predicted

greater increases in functional limitations over 4 years among participants of the Health and Retirement Study. As a possible explanation for the links of perceived control or its dimensions to functional health, health-promoting behaviors may be involved (Lachman et al., 2011). Specifically, those with higher perceived mastery and lower perceived constraints may be more likely to engage in behaviors such as exercise and healthy eating, which may help them maintain their functional health.

Research on longitudinal associations of coping with functional health is limited. For physical or physiological health as well as related health behaviors, some research suggests positive implications of approach coping or related coping strategies (e.g., focusing on solving problems) (e.g., O'Donnell et al., 2008; Park et al., 2008; Tsenkova et al., 2008) and negative implications of avoidance coping (e.g., Billings et al., 2000; Park et al., 2008) among various adult populations. In addition, related to functional health, Eisenberg et al. (2012) showed that avoidance coping, but not approach coping, was associated with physical functioning cross-sectionally for heart failure patients aged 53.5 on average. However, the meta-analysis of Penley et al. (2002), focusing mainly on cross-sectional studies, and other studies (e.g., Sempértegui et al., 2017) did not show such associations of multiple types of approach and avoidance coping with physical health or physical functioning for adult populations. Thus, the findings of previous research were mixed and limited, warranting more longitudinal investigations. As a speculation, if aging adults use approach coping when facing stressful experiences possibly related to aging such as declines in their physical abilities (i.e., age-related losses; Baltes et al., 1980; Ebner et al., 2006), they may be likely to adopt constructive ways to maintain their functional health (e.g., increasing physical activity, managing their health conditions, focusing on what they can do or change if their problem or situation is less controllable; Barlow et al., 2016). In contrast, if they use avoidance coping, they may avoid facing the reality (e.g., declined physical abilities) without taking any actions or compensatory strategies, which may contribute to further decreasing functional abilities and health.

Potential Mediation of Perceived Mastery and Constraints and/or Coping

Considering these direct associations among perceived mastery and constraints, approach and avoidance coping, and functional health, it can be speculated that: (1) perceived mastery and constraints may mediate the associations of approach and avoidance coping with functional limitations; and (2) the two types of coping may mediate the associations of perceived mastery and constraints with functional health. In other words, with regard to the first speculation, the reason why approach and avoidance coping could predict functional health may be because of their associations through perceived mastery and constraints: approach and avoidance coping are associated with perceived mastery and constraints (i.e., those who rely more and less on approach coping and avoidance coping, respectively, would likely experience increased

perceived mastery and decreased perceived constraints), which is in turn associated with functional health. If these types of coping are related to perceived mastery and constraints reciprocally as discussed earlier, a similar logic can be used regarding the second speculation: those with high mastery and low constraints would be more and less likely to use approach coping and avoidance coping, respectively, which is in turn associated with better functional health.

While research is lacking in addressing these potential mediational relationships, it would be theoretically and practically beneficial to have better understanding of such relationships. For example, while Lachman's conceptual model (Lachman, 2006; Lachman et al., 2011) described relations of perceived control to behavioral and other factors affecting age-related outcomes (e.g., health), additional investigations on the mediational relationships may help strengthen the model by adding coping as a specific factor that is a part of the mechanisms of the links to health. The improved knowledge of such relationships can also inform future research exploring potential ways to improve coping strategies (by enhancing perceived control) and/or increase perceived mastery and decrease perceived constraints (by improving coping), aiming to promote functional health.

Purpose of the Study

The present study aimed to contribute to the literature by addressing the nuance of associations among perceived control, coping, and functional health in later life. Specifically, our focuses were on (1) potential longitudinal reciprocity between two dimensions of perceived control (i.e., perceived mastery and constraints) and two different types of coping (i.e., approach and avoidance coping) and (2) potential mediational roles of perceived mastery and constraints and/or approach and avoidance coping for the associations with functional health during adulthood.

Referring to the previous research discussed earlier, we made two sets of hypotheses. The first set of our hypotheses were: higher perceived mastery and lower perceived constraints would predict increases in approach coping and decreases in avoidance coping over time; higher and lower levels of approach and avoidance coping, respectively, would predict increases in perceived mastery and decreases in perceived constraints over time. The second set of our hypotheses were: increased perceived mastery and decreased perceived constraints would mediate the associations of higher approach coping and lower avoidance coping with fewer functional limitations; increased approach coping and decreased avoidance coping would mediate the associations of higher perceived mastery and lower perceived constraints with fewer functional limitations. While we suspected that the patterns of the associations might differ between perceived mastery and constraints and/or between approach and avoidance coping (e.g., the associations might be significant for only one of each pair of the predictors) for these hypotheses, we did not make specific hypotheses for such differences and examined them in an exploratory manner due to the limited previous research.

Methods

Sample and Data

The present study used data from the Midlife in the United States (MIDUS; University of Wisconsin - Madison Institute on Aging, 2020). Aiming to investigate psychosocial and behavioral factors, health, and well-being throughout adulthood, MIDUS has conducted a series of national surveys for American adults aged 20 to 75 at baseline (Brim et al., 2019) including three waves of main surveys: MIDUS1 ($N = 7,108$) in 1995–1996, MIDUS2 ($N = 4,963$) in 2004–2006, and MIDUS3 ($N = 3,294$) in 2013–2014.

As MIDUS adopted measures for coping from its second wave, data from MIDUS2 ("Time 1 [T1]" in the present study) and MIDUS3 ("Time 2 [T2]") were used for the present study. The average age at T1 of the 4,963 respondents (aged 28 to 84) was 55.4 ($SD = 12.5$), and 53% of them were women. A great majority (90%) of the selected respondents reported their race as White.

Measures

For the measures described below, which were selected from those of MIDUS (Ryff et al., 2019; Ryff et al., 2021), a correlational matrix as well as descriptive statistics are shown in Table 1.

Demographic Characteristics (at T1)

Age (in years), sex (recoded to male = 0, female = 1), and highest level of education (recoded to at least completing 4-year college degree or equivalent education = 1 or not = 0) were included as demographic covariates.

Chronic Health Conditions (at T1)

MIDUS respondents reported whether they had experienced chronic conditions (e.g., high blood pressure, diabetes, stroke) for the past 12 months. This measure indicated the total number of chronic conditions reported.

Emotional Disorder (at T1)

MIDUS respondents reported whether they have experienced mental health problems (i.e., anxiety, depression, or some other emotional disorder) in the past 12 months (= 1) or not (= 0).

Perceived Mastery and Perceived Constraints (at T1 and T2)

The measure of perceived mastery consisted of four items (e.g., "I can do just about anything I really set my mind to," "what happens to me in the future mostly depends on me"), while that of perceived constraints consisted of eight items (e.g., "there is little I can do to change the important things in my life," "I sometimes feel I am being pushed around in my life") (Lachman & Weaver, 1998). MIDUS respondents reported how much they agreed with each of these items by using a 7-point Likert-type scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*). For each of the measures, the items were reverse-coded

Table 1. Descriptive Statistics and Correlation Matrix for Respondents at MIDUS2 ($N = 4{,}963$).

Variable	*M* (SD)	Correlations														
	or %	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. T1 age	55.4 (12.5)	-														
2. Sex (men = 0, women = 1)	53%	0.004 (n.s.)	-													
3. T1 education (college graduate = 1 or not = 0)	37%	−0.113	−0.113	-												
4. T1 chronic health conditions	2.5 (2.6)	0.210	0.116	−0.136	-											
5. T1 emotional disorder (yes = 1, no = 0)	19%	−0.042	0.147	−0.065	0.465	-										
6. T1 perceived mastery	5.7 (1.0)	−0.043	−0.057	0.045	−0.149	−0.155	-									
7. T2 perceived mastery	5.6 (1.0)	−0.131	−0.049	0.064	−0.193	−0.128	0.527	-								
8. T1 perceived constraints	2.6 (1.2)	0.054	0.081	−0.167	0.287	0.257	−0.498	−0.396	-							
9. T2 perceived constraints	2.6 (1.2)	0.152	0.041	−0.183	0.278	0.198	−0.378	−0.478	0.628	-						
10. T1 approach coping	37.9 (6.1)	0.042	0.038	0.110	−0.090	−0.100	0.400	0.319	−0.387	−0.319	-					
11. T2 approach coping	37.7 (6.1)	−0.015 (n.s.)	0.043	0.127	−0.079	−0.050	0.301	0.395	−0.274	−0.368	0.620	-				

(Continued)

Table 1. Continued

Variable	*M* (SD)	Correlations														
12. T1 avoidance coping	22.4 (5.6)	0.043	0.207	−0.183	0.211	0.265	−0.233	−0.228	0.457	0.398	−0.240	−0.216	-			
13. T2 avoidance coping	21.7 (5.7)	0.130	0.170	−0.191	0.228	0.208	−0.225	−0.236	0.386	0.490	−0.226	−0.192	0.593	-		
14. T1 functional limitations	1.8 (0.9)	0.355	0.134	−0.208	0.495	0.185	−0.185	−0.213	0.318	0.315	−0.113	−0.119	0.207	0.231	-	
15. T2 functional limitations	2.0 (0.9)	0.431	0.122	−0.226	0.417	0.159	−0.152	−0.244	0.286	0.357	−0.104	−0.124	0.215	0.254	0.697	-

Note. All correlation coefficients except ones remarked with "(n.s.)" are significant at $p < .05$.

(so that higher scores would indicate higher levels of perceived mastery or constraints) and then averaged as a score of perceived mastery or constraints. The Cronbach's alpha of these scales at T1 and T2 were: 0.73 and 0.74 for perceived mastery and 0.86 and 0.88 for perceived constraints.

Coping Variables (at T1 and T2)

While MIDUS included two overall scales of coping named "problem focused coping" and "emotion focused coping" which were based on another classification of coping (Lazarus & Folkman, 1984), these measures actually better reflected the constructs of approach and avoidance coping, respectively.[2] Thus, the present study used them as measures of approach and avoidance coping.

Approach Coping. The measure corresponding to the construct of approach coping consisted of 12 items including four items related to positive reinterpretation and growth (e.g., "I try to grow as a person as a result of the experience"), four items related to active coping (e.g., "I concentrate my efforts on doing something about it"), and four items related to planning (e.g., "I make a plan of action") (Carver et al., 1989; Kling et al., 1997). MIDUS respondents rated how well each of these items described how they usually experienced a stressful event by using a 4-point Likert-type scale: *a lot* (1), *a medium amount* (2), *only a little* (3), and *not at all* (4). The 12 items were reverse-coded and then summed so that higher scores would indicate higher levels of approach coping. The Cronbach's alpha of this scale was 0.90 at both waves.

Avoidance Coping. The other measure corresponding to avoidance coping consisted of 12 items including four items related to focus on and venting of emotion (e.g., "I get upset and let my emotions out"), four items related to denial (e.g., "I say to myself 'this isn't real'") and four items related to behavioral disengagement (e.g., "I admit to myself that I can't deal with it, and quit trying") (Carver et al., 1989; Kling et al., 1997). MIDUS respondents reported how well each of these items described how they usually experienced a stressful event by using a 4-point Likert-type scale: *a lot* (1), *a medium amount* (2), *only a little* (3), and *not at all* (4). The 12 items were reverse-coded and then summed so that higher scores would indicate higher levels of avoidance coping. The Cronbach's alpha of this scale was 0.83 at both waves, respectively.

Functional Limitations (at T1 and T2)

MIDUS adopted the Medical Outcomes Study 36-item short-form health survey (SF-36) (Ware & Sherbourne, 1992). The respondents reported how much their health limited them in doing seven activities such as carrying groceries, walking, and moderate and vigorous activities (e.g., bowling, running) by using a 4-point Likert-type scale ranging from 1 (*a lot*) to 4 (*not at all*). The seven items were reverse-coded and averaged so that higher scores would indicate greater functional limitations.

Analytic Strategy

In order to address the research questions, a path analysis model was constructed as shown in Figure 1. Reciprocity was examined by assessing cross-lagged paths:

associations of (1) T1 perceived mastery and constraints predicting T2 approach and avoidance coping and (2) T1 approach and avoidance coping predicting T2 perceived mastery and constraints were assessed while controlling for T1 baseline levels of the outcomes as well as covariates (i.e., assessing (1) residualized changes over time in approach and avoidance coping, predicted by baseline perceived mastery and constraints; (2) changes in perceived mastery and constraints, predicted by baseline approach and avoidance coping). In addition, the mediational paths from T1 perceived mastery and constraints to T2 approach and avoidance coping to T2 functional limitations and from T1 approach and avoidance coping to T2 perceived mastery and constraints to T2 functional limitations were assessed while T1 (baseline) functional limitations as well as the other covariates was controlled for in predicting T2 functional limitations.[3] The model was run with maximum likelihood with Mplus (Muthén & Muthén, 1998–2017) using all available data (i.e., full information maximum likelihood),[4] and the model fit was evaluated using the conventional criteria (RMSEA < 0.08, CFI > 0.90, and SRMR < 0.08 as acceptable; Kline, 2015; Little, 2013). The indirect effects from T1 perceived mastery and constraints and from T1 approach and avoidance coping to T2 functional limitations were assessed using a bootstrapping method (i.e., resampling with replacement; Bollen & Stine, 1990; Muthén & Muthén, 1998–2017). Indirect effects were considered significant

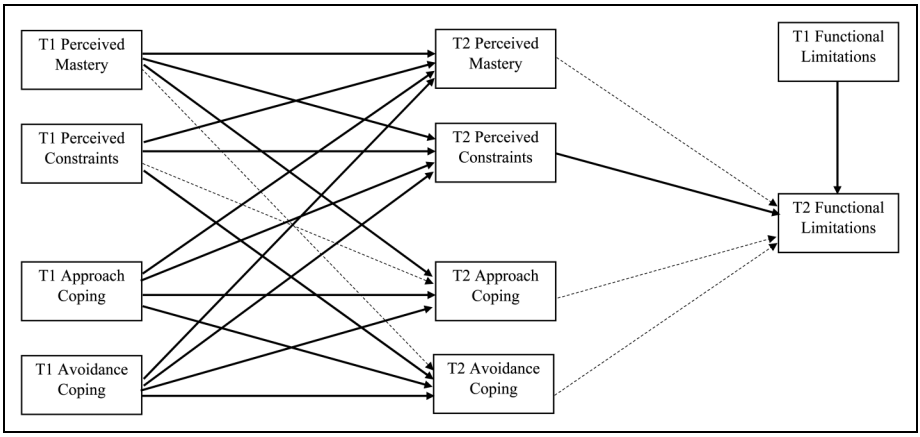

Figure 1. Path model analyzed for effects of perceived mastery/constraints and approach/avoidance coping on functional limitations.

Note. All regression paths are controlled for T1 age, female, college graduate, chronic health conditions, and emotional disorder, while the paths from these covariates are not shown in the above figure. All exogenous variables are allowed to correlate with each other; the error terms of T2 perceived mastery, T2 perceived constraints, T2 approach coping, and T2 avoidance coping are allowed to correlate with each other; these covariance arrows and error terms are not shown in the above figure. Solid and dashed regression paths indicate that their effects have been found significant ($p < .05$) and non-significant, respectively, in the present study.

if their standardized 95% confidence interval estimated using 5,000 bootstrap samples did not include zero.

Results

The model fit statistics of the path analysis model indicate a good fit (RMSEA = 0.017, CFI = 0.998, and SRMR = 0.006) while its model chi-square was significant, $\chi^2 = 19.836$, df = 8, $p < .05$. Figure 1 indicates which regression paths were found significant and which were not, and estimated standardized effects are summarized in Tables 2 and 3.

Direct Effects

Effects on Perceived Mastery and Constraints

As seen in Table 2, both T1 approach coping and avoidance coping significantly predicted residualized changes in perceived mastery and constraints: T1 approach coping predicted increases in perceived mastery ($\beta = 0.102$, $p < .001$) and decreases in perceived constraints ($\beta = -0.065$, $p < .01$), and T1 avoidance coping predicted decreases in perceived mastery ($\beta = -0.042$, $p < .05$) and increases in perceived constraints ($\beta = 0.127$, $p < .001$). Controlling for these effects and covariates, T1 perceived mastery and constraints predicted decreases in each other. Among the covariates at T1, older age and more chronic health conditions predicted both decreases in perceived mastery and increases in perceived constraints. Additionally, being male and *not* graduating from college predicted increases in perceived constraints, but not change in perceived mastery.

Effects on Approach and Avoidance Coping

As seen in Table 2, T1 perceived mastery predicted only increases in approach coping ($\beta = 0.063$, $p < .01$), but not change in avoidance coping, while T1 perceived constraints predicted only increases in avoidance coping ($\beta = 0.090$, $p < .001$), but not change in approach coping. Controlling for these effects and covariates, T1 approach coping and avoidance coping predicted decreases in each other. Among the covariates at T1, being female and graduating from college predicted increases in approach coping, while older age, being female, and *not* graduating from college predicted increases in avoidance coping.

Effects on Functional Limitations

As seen in Table 3, among the predictors of functional limitations, only T2 perceived constraints ($\beta = 0.111$, $p < .001$) predicted the outcome independently of all other, nonsignificant predictors including T2 perceived mastery, approach coping, and avoidance coping, controlling for the baseline level of functional limitations and other covariates. Among the covariates, older age, *not* graduating from college, and more chronic conditions predicted increases in functional limitations.

Table 2. Longitudinal Direct Effects Between Perceived Mastery or Constraints and Approach or Avoidance Coping.

Predictor/covariate	Standardized coefficient (S.E.)	Predictor/covariate	Standardized coefficient (S.E.)
T2 perceived mastery predicted by:		T2 perceived constraints predicted by:	
T1 approach coping	0.102 (0.021)***	T1 approach coping	−0.065 (0.019)**
T1 avoidance coping	−0.042 (0.021)*	T1 avoidance coping	0.127 (0.020)***
T1 perceived constraints	−0.114 (0.025)***	T1 perceived mastery	−0.071 (0.018)***
T1 perceived mastery (baseline)	0.408 (0.022)***	T1 perceived constraints (baseline)	0.477 (0.022)***
T1 age	−0.094 (0.019)***	T1 age	0.095 (0.017)***
Female	−0.007 (0.016)	Female	−0.039 (0.015)**
T1 education	−0.013 (0.015)	T1 education	−0.054 (0.014)***
T1 chronic conditions	−0.070 (0.028)*	T1 chronic conditions	0.077 (0.022)**
T1 emotional disorder	0.014 (0.021)	T1 emotional disorder	−0.004 (0.019)
T2 approach coping predicted by:		T2 avoidance coping predicted by:	
T1 perceived mastery	0.063 (0.019)**	T1 perceived mastery	−0.024 (0.020)
T1 perceived constraints	0.019 (0.023)	T1 perceived constraints	0.090 (0.023)***
T1 avoidance coping	−0.075 (0.022)**	T1 approach coping	−0.056 (0.023)*
T1 approach coping (baseline)	0.580 (0.019)***	T1 avoidance coping (baseline)	0.494 (0.024)***
T1 age	−0.022 (0.017)	T1 age	0.087 (0.019)***
Female	0.041 (0.016)**	Female	0.047 (0.016)**
T1 education	0.051 (0.015)***	T1 education	−0.055 (0.015)***
T1 chronic conditions	−0.018 (0.031)	T1 chronic conditions	0.051 (0.031)
T1 emotional disorder	0.037 (0.020)	T1 emotional disorder	0.014 (0.020)

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. Predictors/covariates with the note "(baseline)" are baseline levels of T2 outcome measures; thus, the other predictors predicted residualized changes in the outcomes.

Table 3. Direct Effects of Perceived Mastery and Constraints and Approach and Avoidance Coping on Functional Limitations.

Predictor/covariate for T2 functional limitations	Standardized coefficient (S.E.)
T2 perceived mastery	−0.035 (0.018)
T2 perceived constraints	0.111 (0.020)***
T2 approach coping	0.010 (0.015)
T2 avoidance coping	0.014 (0.017)
T1 functional limitations (baseline)	0.540 (0.020)***
T1 age	0.200 (0.015)***
Female	0.026 (0.013)
T1 education	−0.057 (0.013)***
T1 chronic conditions	0.055 (0.027)*
T1 emotional disorder	0.007 (0.017)

Note. ***$p < .001$, **$p < .01$, *$p < .05$.

Indirect Effects

As seen in Table 4, some of the indirect effects from T1 perceived mastery and constraints and from T1 approach and avoidance coping to T2 functional limitations (controlling for its T1 baseline level as well as the other covariates) were found significant as their 95% confidence interval did not include zero. All these significant indirect effects from the four T1 predictors were through T2 perceived constraints, which were the only significant (direct) predictor of functional limitations as reported above.

Discussion

As a unique contribution to the aging literature, the present study addressed distinct dimensions of perceived control, including perceived mastery and constraints, and examined their possible longitudinal reciprocity with approach and avoidance coping. In addition, this study investigated how their associations were related to functional health, specifically addressing the potential mediational role of perceived mastery and constraints and/or that of approach and avoidance coping. The findings can inform future research as well as practice as discussed below.

Associations of Perceived Mastery and Constraints With Coping

With regard to the first set of hypotheses, bidirectional associations between perceived mastery and approach coping and between perceived constraints and

Table 4. Significant Indirect Effects From T1 Predictors to T2 Functional Limitations.

Path of indirect effect	Standardized estimate	95% confidence interval	
		Lower limit	Upper limit
T1 perceived mastery → T2 perceived constraints → T2 functional limitations	−0.008	−0.013	−0.003
T1 perceived constraints → T2 perceived constraints → T2 functional limitations	0.053	0.033	0.073
T1 approach coping → T2 perceived constraints → T2 functional limitations	−0.007	−0.012	−0.003
T1 avoidance coping → T2 perceived constraints → T2 functional limitations	0.014	0.008	0.022

Note. The indirect effects are considered significant if their 95% confidence interval does not include zero. Only significant indirect effects are listed above (Other indirect effects from each T1 predictor to T2 functional limitations are not significant.).

avoidance coping were found, implying the reciprocity of each of these pairs of associations. These findings seem to be reasonable: those with high perceived mastery (believing that they can achieve their goals) may be inclined to cope with stressful experiences in a constructive way (i.e., approach coping), and their likely success in dealing with those experiences would further increase their perceived mastery; in contrast, those with high perceived constraints (perceiving obstacles preventing their goal achievement) may be inclined to avoid tackling their challenges or disengage from their goal strivings (i.e., avoidance coping), and their likely failure to achieve goals would lead them to see more obstacles that interfere with their desired outcomes. Considering the potential reciprocity, lower levels of perceived mastery and/or approach coping as well as higher levels of perceived constraints and/or avoidance coping may create vicious circles (i.e., lower mastery leading to decreases in approach coping, which would in turn lead to decreases in mastery; higher constraints leading to increases in avoidance coping, which in turn would lead to increases in constraints). Those vicious circles may be alarming particularly for older adults, who are likely to experience decreases in perceived mastery and increases in perceived constraints (Lachman et al., 2009), possibly leading to changes in their coping strategies. As these changes may be related to age-related experiences (e.g., decreased opportunities for goal achievement, increased actual constraints due to uncontrollable factors; Lachman et al., 2011), the vicious circles may continue unless they make some intentional efforts or receive interventions to break the circles. While such interventions are addressed later when discussing practical implications of

the present findings, they may need to be developed considering the associations of these factors with functional health as discussed next.

Mediational Relationships and Their Practical Implications

While we generally hypothesized the mediational role of perceived mastery and constraints as well as that of approach coping and avoidance coping in our second set of hypotheses, we exploratorily investigated possible differences of the associations of these factors. Considering the present findings, perceived constraints may be a key mediator for the associations with functional limitations as all the indirect effects found significant in the present study were through perceived constraints.

While approach coping and avoidance coping were not directly associated with functional limitations (independent of perceived mastery and constraints) as seen in Table 3, they were associated with changes in perceived constraints, which were in turn associated with functional limitations. While future research should be conducted to determine the causality of the associations, these findings provide practical implications. Specifically, it can be speculated that enhancing approach coping and reducing avoidance coping may lead to decreasing perceived constraints, which is expected to predict fewer functional limitations. Previous research on coping skills training particularly for those with chronic health conditions (e.g., Bose et al., 2016; Livneh & Martz, 2014) suggests that multiple strategies of approach coping, such as problem solving, planning, and active acceptance are teachable. While more research on effective approaches to teaching such coping strategies may be needed for various adult populations including non-clinical ones, identifying how to teach aging adults to effectively use approach coping may be a potential way to (indirectly) help them maintain their functional health by decreasing their perceived constraints. In addition, it may be even more effective if such teaching approaches or interventions can help individuals replace their existing strategies of avoidance coping with more adaptive coping strategies (i.e., approach coping) in dealing with their stressful experiences.

Perceived constraints were the factor directly associated with greater functional limitations in the present study. As discussed earlier, perceived constraints predicted increases in avoidance coping, which might in turn result in increasing perceived constraints. This reciprocity may lead to greater and greater functional limitations through continuously increased perceived constraints. Considering this, reducing perceived constraints may be an important component of effective interventions to enhance functional health. In addition to coping, perceived mastery is another factor to be addressed as it was also indirectly associated with fewer functional limitations through decreased perceived constraints. Thus, possibly, one of the focuses of the interventions should be on enhancing perceived control in general (consisting of perceived mastery and constraints). One such intervention for aging adults may be cognitive restructuring, aimed at increasing one's beliefs about their ability to change, which is suggested to be effective especially when being combined with skill training for actual abilities (e.g., memory, physical abilities) (Robinson & Lachman, 2017).

Thus, one direction of future research is to develop effective approaches or interventions (e.g., improving coping strategies, cognitive structuring, skill training) to decrease perceived constraints, aiming to promote functional health for aging adults.

Limitations

There are some limitations of the present study to be noted. First, due to having only two waves of data, this study could not conduct complete longitudinal mediational analysis in which the predictors predict the mediators over time (from T1 to T2), which in turn predict the outcome over time (from T2 to an additional timepoint T3). Although MIDUS conducted three waves of surveys, coping variables were adopted from their second wave so such complete longitudinal analyses could not be conducted. Particularly, for the significant indirect associations reported in Table 4, the associations between perceived constraints and functional limitations were concurrent.[5] Thus, these results should be interpreted with caution in terms of the directionality of these associations and warrant further research using a complete longitudinal mediational model by having at least three waves of data. In addition, considering the potential impacts of health status on perceived control and related factors (Lachman et al., 2011), it may be likely that some of the predictors included in the present study are reciprocally related to functional limitations. In this study, the directionality from functional limitations to perceived mastery, perceived constraints, approach coping, and avoidance coping was not addressed.[6] Such additional paths should also be examined when having the three-wave mediational model as mentioned above. Moreover, while the present findings suggest overall positive and negative implications of approach and avoidance coping, respectively, for perceived mastery and constraints relating to functional health in later life, the present study did not address the potential impacts of specific circumstances on the associations among these factors nor the adaptability of specific coping strategies in different circumstances. While avoidance coping seems to be maladaptive or detrimental for well-being in most cases, it may depend on the specific circumstance which strategies of approach coping can be adaptive. For example, while coping strategies such as problem solving and planning may be beneficial when the problem is solvable or controllable, other strategies such as positive reinterpretation and active acceptance may be more adaptive when the issue is not controllable, which adults may be more likely to experience due to their increased losses with age (Barlow et al., 2016). Future research should investigate the nuance of the associations, or how specific coping strategies, particularly various strategies of approach coping, are related to the different dimensions of perceived control in varying circumstances. Lastly, the MIDUS sample was not necessarily representative of the general population, which was another limitation. Specifically, more than 90% of MIDUS participants reported their race as White. Future research should investigate whether the findings of the present study can be replicated for diverse populations in terms of race/ethnicity as well as other demographic characteristics (e.g., socioeconomic status).

Conclusions

The present study indicated bidirectional associations between perceived mastery and approach coping and between perceived constraints and avoidance coping, implying their potential reciprocity. In addition, perceived constraints mediated the associations of the other factors of interest with later functional limitations. These findings can inform future research as well as practice, suggesting that focusing on reducing perceived constraints (by improving coping strategies and/or enhancing perceived mastery as well as other interventions to decrease perceived constraints) may be an important component of effective approaches to enhance functional health for aging adults.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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Supplemental material

Supplemental material for this article is available online.

Notes

1. Perceived control may be related to health conditions, such as functional limitations, reciprocally (Lachman et al., 2011). However, the present study focused on addressing potential reciprocity between multiple dimensions of perceived control and coping, while treating functional limitations as an outcome predicted by these factors, as this area of research was more limited. Later in this article, not addressing the potential reciprocity for functional limitations is noted as a limitation of the present study.
2. While the measure named "problem focused coping" included items related to the subscale of "positive reinterpretation and growth" as mentioned in the main text, positive reinterpretation involves changing cognition to enhance positive emotions or reduce negative emotions, rather than solving problems, which can be considered a strategy of emotion-focused as well as approach coping (Carver & Connor-Smith, 2010). In addition, the measure named "emotion focused coping" included only items related to avoidance or disengaging behaviors (i.e., venting of emotion, denial, behavioral disengagement). Thus, we considered that it

should be appropriate to use the former and latter measures as ones that represented approach and avoidance coping, respectively, rather than problem- and emotion-focused coping.

3. As both waves of each predictor were likely to have similar relationships with T2 functional limitations, only paths from T2 perceived mastery, perceived constraints, approach coping, and avoidance coping to T2 functional limitations were included (without having paths from these predictors at T1 to T2 functional limitations) in the model as shown in Figure 1, in order to avoid potential collinearity. For these included direct paths from the predictors, possible age differences were examined in a preliminary analysis by additionally including interaction terms of age with the predictors. As none of the interactions were significant, no age differences were found for these paths. Thus, we conducted the subsequent, main analyses without including the interaction terms, assuming that the associations were similar among those of different ages.
4. The full information maximum likelihood method was selected aiming to reduce potential biases in producing estimates (Little, 2013) due to attrition from T1 to T2 as well as non-respondence to certain items. Among 4,963 respondents at T1, only 3,949 (80%) responded to all T1 measures of interest with valid answers. Among all T1 respondents, 3,293 (66%) participated in the T2 survey, out of whom 2,857 (87%) responded to all T2 measures of interest with valid answers. While more detailed information will be available upon request, the results of logistic analyses for non-respondence at T1 and non-participation at T2 indicate: among T1 respondents (who provided at least demographic information), younger people (OR = 0.978; 95% CI: 0.972, 0.984), men (OR = 0.657; 95% CI: 0.571, 0.756), and those with lower education (OR = 0.660; 95% CI: 0.568, 0.768) (controlling for the demographic variables other than each variable) were more likely to have missing data for some of the other measures of interest (i.e., not complete cases); with regard to the attrition, older people (OR = 1.018; 95% CI: 1.011, 1.024), men (OR = 0.735; 95% CI: 0.632, 0.855), and those with lower education (OR = 0.579; 95% CI: 0.493, 0.681), with greater functional limitations (OR = 1.312; 95% CI: 1.191, 1.445), or with higher perceived constraints (OR = 1.127; 95% CI: 1.042, 1.220) at T1 (controlling for all the measures other than each variable) were less likely to participate in the T2 survey. As preliminary analyses including only the complete cases (who responded to all T1 and T2 measures with valid answers; $N = 2{,}597$), the same analyses as our main analyses reported in this article were conducted, and their results were similar to those of the main analyses in terms of significant direct effects and indirect effects, as reported in the online supplemental material.
5. In addition to the main results reported, a revised model was analyzed by having paths from T1 predictors to T2 functional limitations (i.e., longitudinal paths), instead of paths from T2 predictors to T2 functional limitations (i.e., concurrent paths included in the original path analysis model reported in this article), while keeping T1 (baseline) functional limitations and other covariates (without examining indirect effects). In the revised model, T1 perceived constraints and avoidance coping (but not T1 perceived mastery nor approach coping) predicted residualized change or increases in functional limitations over time. (The detailed results will be available upon request.) Thus, in this additional analysis, T1 perceived constraints had a direct longitudinal effect on increases in functional limitations.
6. In another additional analysis (whose detailed results will be available upon request), T1 functional limitations significantly predicted only T2 perceived constraints (not T2 perceived

mastery, approach coping, nor avoidance coping) controlling for the baseline levels (at T1) of these four measures (which were outcome variables in this additional analysis, while they were predictors in the main analysis reported in this article) as well as other covariates. Thus, at least associations between perceived constraints and functional limitations may be reciprocal, which should be examined with complete, three-wave mediational analyses.

References

Aldwin, C. (2011). Stress and coping across the lifespan. In S. Folkman (Ed.), *The Oxford handbook of stress, health, and coping* (pp. 5–34). Oxford University Press.

Baernholdt, M., Hinton, I., Yan, G., Rose, K., & Mattos, M. (2012). Factors associated with quality of life in older adults in the United States. *Quality of Life Research*, *21*(3), 527–534. https://doi.org/10.1007/s11136-011-9954-z

Baltes, P. B., Reese, H. W., & Lipsitt, L. P. (1980). Life-span developmental psychology. *Annual Review of Psychology*, *31*(1), 65–110. https://doi.org/10.1146/annurev.ps.31.020180.000433

Barlow, M. A., Wrosch, C., Heckhausen, J., & Schulz, R. (2016). Control strategies for managing physical health problems in old age: Evidence for the motivational theory of life-span development. In J. W. Reich, & F. J. Infurna (Eds.), *Perceived control: Theory, research, and practice in the first 50 years* (pp. 281–307). Oxford University Press.

Ben-Zur, H. (2002). Coping, affect and aging: The roles of mastery and self-esteem. *Personality and Individual Differences*, *32*(2), 357–372. https://doi.org/10.1016/S0191-8869(01)00031-9

Billings, D. W., Folkman, S., Acree, M., & Moskowitz, J. T. (2000). Coping and physical health during caregiving: The roles of positive and negative affect. *Journal of Personality and Social Psychology*, *79*(1), 131–142. https://doi.org/10.1037/0022-3514.79.1.131

Bollen, K. A., & Stine, R. (1990). Direct and indirect effects: Classical and bootstrap estimates of variability. *Sociological Methodology*, *20*, 115–140. https://doi.org/10.2307/271084

Bose, N. C., Persson, H., Björling, G., Ljunggren, G., Elfström, M. L., & Saboonchi, F. (2016). Evaluation of a coping effectiveness training intervention in patients with chronic heart failure – A randomized controlled trial. *European Journal of Cardiovascular Nursing*, *15*(7), 537–548. https://doi.org/10.1177/1474515115625033

Brim, O. G., Baltes, P. B., Bumpass, L. L., Cleary, P. D., Featherman, D. L., Hazzard, W. R., … R. A. Shweder (2019). *Midlife in the United States (MIDUS 1), 1995–1996*. Inter-university Consortium for Political and Social Research [distributor]. https://doi.org/10.3886/ICPSR02760.v18.

Carver, C. S. (2007). Stress, coping, and health. In H. S. Friedman & R. C. Silver (Eds.), *Foundations of health psychology* (pp. 117–144). Oxford University Press.

Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology*, *61*(1), 679–704. https://doi.org/10.1146/annurev.psych.093008.100352

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategy: A theoretical based approach. *Journal of Personality and Social Psychology*, *56*(2), 267–283. https://doi.org/10.1037/0022-3514.56.2.267

Dijkstra, M., & Homan, A. C. (2016). Engaging in rather than disengaging from stress: Effective coping and perceived control. *Frontiers in Psychology*, *7*, 1415. https://doi.org/10.3389/fpsyg.2016.01415

Drewelies, J., Agrigoroaei, S., Lachman, M. E., & Gerstorf, D. (2018). Age variations in cohort differences in the United States: Older adults report fewer constraints nowadays than those 18 years ago, but mastery beliefs are diminished among younger adults. *Developmental Psychology*, *54*(8), 1408–1425. https://doi.org/10.1037/dev0000527

Ebner, N. C., Freund, A. M., & Baltes, P. B. (2006). Developmental changes in personal goal orientation from young to late adulthood: From striving for gains to maintenance and prevention of losses. *Psychology and Aging*, *21*(4), 664–678. https://doi.org/10.1037/0882-7974.21.4.664

Eisenberg, S. A., Shen, B. J., Schwarz, E. R., & Mallon, S. (2012). Avoidant coping moderates the association between anxiety and patient-rated physical functioning in heart failure patients. *Journal of Behavioral Medicine*, *35*(3), 253–261. https://doi.org/10.1007/s10865-011-9358-0

Ferguson, S. J., & Goodwin, A. D. (2010). Optimism and well-being in older adults: The mediating role of social support and perceived control. *The International Journal of Aging and Human Development*, *71*(1), 43–68. https://doi.org/10.2190/AG.71.1.c

Gerstorf, D., Röcke, C., & Lachman, M. E. (2011). Antecedent–consequent relations of perceived control to health and social support: Longitudinal evidence for between-domain associations across adulthood. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *66*(1), 61–71. https://doi.org/10.1093/geronb/gbq077

Glanz, K., & Schwartz, M. D. (2008). Stress, coping, and health behavior. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 211–236). Jossey-Bass.

Hostetler, A. J. (2012). Community involvement, perceived control, and attitudes toward aging among lesbians and gay men. *The International Journal of Aging and Human Development*, *75*(2), 141–167. https://doi.org/10.2190/AG.75.2.c

Infurna, F. J., Kappes, C., & Fraire, N. (2018). Long-term antecedents of constraints and mastery: Findings from the health and retirement study. *Psychology and Aging*, *33*(6), 965–974. https://doi.org/10.1037/pag0000281

Infurna, F. J., & Mayer, A. (2015). The effects of constraints and mastery on mental and physical health: Conceptual and methodological considerations. *Psychology and Aging*, *30*(2), 432–448. https://doi.org/10.1037/a0039050

Infurna, F. J., & Okun, M. A. (2015). Antecedents and outcomes of level and rates of change in perceived control: The moderating role of age. *Developmental Psychology*, *51*(10), 1420–1437. https://doi.org/10.1037/a0039530

Jopp, D. S., & Schmitt, M. (2010). Dealing with negative life events: Differential effects of personal resources, coping strategies, and control beliefs. *European Journal of Ageing*, *7*(3), 167–180. https://doi.org/10.1007/s10433-010-0160-6

Kempen, G. I. J. M., Ranchor, A. V., Ormel, J., Van Sonderen, E., Van Jaarsveld, C. H. M., & Sanderman, R. (2005). Perceived control and long-term changes in disability in late middle-

aged and older persons: An eight-year follow-up study. *Psychology & Health*, *20*(2), 193–206. https://doi.org/10.1080/08870440512331317652

Kline, R. (2015). *Principles and practice of structural equation modeling* (4th ed.). Guilford.

Kling, K. C., Seltzer, M. M., & Ryff, C. D. (1997). Distinctive later-life challenges: Implications for coping and well-being. *Psychology and Aging*, *12*(2), 288–295. https://doi.org/10.1037/0882-7974.12.2.288

Lachman, M. E. (2006). Perceived control over aging-related declines: Adaptive beliefs and behaviors. *Current Directions in Psychological Science*, *15*(6), 282–286. https://doi.org/10.1111/j.1467-8721.2006.00453.x

Lachman, M. E., Neupert, S. D., & Agrigoroaei, S. (2011). The relevance of control beliefs for health and aging. In K. W. Schaie, & S. L. Willis (Eds.), *Handbook of the psychology of aging* (pp. 175–190). Academic Press.

Lachman, M. E., Rosnick, C., & Röcke, C. (2009). The rise and fall of control beliefs in adulthood: Cognitive and biopsychosocial antecedents and consequences of stability and change over nine years. In H. Bosworth & C. Hertzog (Eds.), *Aging and cognition: Research methodologies and empirical advances* (pp. 143–160). American Psychological Association.

Lachman, M. E., & Weaver, S. L. (1998). The sense of control as a moderator of social class differences in health and well-being. *Journal of Personality and Social Psychology*, *74*(3), 763–773. https://doi.org/10.1037/0022-3514.74.3.763

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal and coping*. Springer Publishing.

Litman, J. A. (2006). The COPE inventory: Dimensionality and relationships with approach-and avoidance-motives and positive and negative traits. *Personality and Individual Differences*, *41*(2), 273–284. https://doi.org/10.1016/j.paid.2005.11.032

Little, T. D. (2013). *Longitudinal structural equation modeling*. Guilford.

Livneh, H., & Martz, E. (2014). Coping strategies and resources as predictors of psychosocial adaptation among people with spinal cord injury. *Rehabilitation Psychology*, *59*(3), 329–339. https://doi.org/10.1037/a0036733

Martinez-Martin, P., Prieto-Flores, M. E., Forjaz, M. J., Fernandez-Mayoralas, G., Rojo-Perez, F., Rojo, J. M., & Ayala, A. (2012). Components and determinants of quality of life in community-dwelling older adults. *European Journal of Ageing*, *9*(3), 255–263. https://doi.org/10.1007/s10433-012-0232-x

Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (8th ed.). Muthén & Muthén. https://www.statmodel.com/download/usersguide/MplusUserGuideVer_8.pdf

O'Donnell, K., Badrick, E., Kumari, M., & Steptoe, A. (2008). Psychological coping styles and cortisol over the day in healthy older adults. *Psychoneuroendocrinology*, *33*(5), 601–611. https://doi.org/10.1016/j.psyneuen.2008.01.015

Park, C. L., Edmondson, D., Fenster, J. R., & Blank, T. O. (2008). Positive and negative health behavior changes in cancer survivors: A stress and coping perspective. *Journal of Health Psychology*, *13*(8), 1198–1206. https://doi.org/10.1177/1359105308095978

Penley, J. A., Tomaka, J., & Wiebe, J. S. (2002). The association of coping to physical and psychological health outcomes: A meta-analytic review. *Journal of Behavioral Medicine*, *25*(6), 551–603. https://doi.org/10.1023/A:1020641400589

Reich, J. W., & Infurna, F. J. (2016). *Perceived control: Theory, research, and practice in the first 50 years*. Oxford University Press.

Robinson, S. A., & Lachman, M. E. (2017). Perceived control and aging: A mini-review and directions for future research. *Gerontology*, *63*(5), 435–442. https://doi.org/10.1159/000468540

Rowe, J. W., & Kahn, R. L. (1997). Successful aging. *The Gerontologist*, *37*(4), 433–440. https://doi.org/10.1093/geront/37.4.433

Ryff, C. D., Almeida, D., Ayanian, J., Binkley, N., Carr, D. S., Coe, C., … D Williams. (2019). *Midlife in the United States (MIDUS 3), 2013–2014*. Inter-university Consortium for Political and Social Research [distributor]. https://doi.org/10.3886/ICPSR36346.v7.

Ryff, C. D., Almeida, D. M., Ayanian, J., Carr, D. S., Cleary, P. D., Coe, C., … D. Williams (2021). *Midlife in the United States (MIDUS 2), 2004–2006*. Inter-university Consortium for Political and Social Research [distributor]. https://doi.org/10.3886/ICPSR04652.v8.

Sempértegui, G. A., Karreman, A., van Hout, G. C., & Bekker, M. H. (2017). Functional status in patients with medically unexplained physical symptoms: Coping styles and their relationship with depression and anxiety. *Journal of Health Psychology*, *22*(13), 1743–1754. https://doi.org/10.1177/1359105316638548

Skinner, E. A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology*, *71*(3), 549–570. https://doi.org/10.1037/0022-3514.71.3.549

Skinner, E. A. (2016). Seven guideposts to the study of perceived control across the lifespan. In R. John, & J. I. Frank (Eds.), *Perceived control: Theory, research, and practice in the first 50 years* (pp. 309–339). Oxford University Press.

Tsenkova, V. K., Dienberg Love, G., Singer, B. H., & Ryff, C. D. (2008). Coping and positive affect predict longitudinal change in glycosylated hemoglobin. *Health Psychology*, *27*(2S), S163–S171. https://doi.org/10.1037/0278-6133.27.2(Suppl.).S163

University of Wisconsin - Madison Institute on Aging. (2020). *Midlife in the United States: A national longitudinal study of health & well-being*. http://midus.wisc.edu/

Ware Jr., J. E., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical Care*, *30*(6), 473–483. https://doi.org/10.1097/00005650-199206000-00002

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