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Has human progress stagnated in recent decades? Evaluating Seligman's (2021) model of agency and its correlates using the MIDUS three-wave longitudinal study

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ABSTRACT

Grounded in Seligman's tripartite model of agency, the authors developed the 10-item Agency Scale. Using data from three waves (1994–1996, 2004–2006, 2013–2014) of the MIDUS national longitudinal study, results from midlife adults ($N = 2,717$) supported a three-factor structure, corresponding to self-efficacy, future-minded planning (as a measure of optimism), and imagination. Evidence for measurement invariance, construct validity, and reliability was provided. The three subscales of the Agency Scale uniquely and positively predicted effort, persistence, generativity (as an indicator of innovation), and perceived progress. Supporting Seligman's hypothesis, sequential mediation analyses revealed that effort, persistence, and generativity significantly mediated the self-efficacy-perceived progress, future-minded planning-perceived progress, and imagination-perceived progress relations, respectively. Significant mean differences across three timepoints indicated an overall declining trend in scores of agency (including self-efficacy, future-minded planning, and imagination) and perceived progress. Collectively, these findings provide support for Seligman's tripartite model of agency.

How much progress has the American society made from past decades? This is a challenging question that depends heavily on how we operationalize the notion of societal progress. When considering technological advancements, for example, a survey from the Research Center (2021) showed that smartphone ownership has drastically increased over time, from 35% in 2011 to 85% in 2021. However, such a technological advancement does not necessarily strengthen interpersonal connections. Indeed, researchers have observed that one in three people in countries like the U.S. experience loneliness–a contagious public health concern associated with irritability and depressive symptoms (Cacioppo & Cacioppo, 2018). Multiculturally, despite several successful efforts and effective outcomes of diversity training programs (Bezrukova et al., 2016), racism still penetrates in blatant and subtle ways in our everyday life (Cheng et al., 2022). Additionally, although the U.S. is often referred to as 'the Land of the Free', there has been a decline in political and economic freedom in recent decades (Hacker, 2019, Hu, 2020). Considering the above, it might be difficult to arrive at a conclusive answer regarding the extent of societal progress in America. However, Seligman (2021) has recently proposed that human progress should be studied in tandem with human agency. This study seeks to examine agency and progress through Seligman's proposed lens.

The determinant of perceived progress: Seligman's tripartite model of agency

In this article, we focus on people's subjective perception of human progress (hereafter referred to as 'perceived progress'). According to Seligman (2021), perceived progress is determined by agency, whereby the presence of agency leads to perceived progress, while a lack thereof results in perceived stagnation. Defined as the belief that one can influence the world, agency comprises three components (Seligman, 2021): (1) self-efficacy, referring to one's expectations that they *can* accomplish their goals; (2) optimism (also known as future-mindedness), describing one's *future time perspective* of their goal pursuit; and (3) imagination, denoting one's achievement of *a broad range* of future goals.

Seligman's tripartite model of agency has been supported by recent studies. Regarding the relationship between agency and perceived progress, Seligman (2021) reviewed several periods in the Greco-Roman epoch, including the Iliad (which depicted humans with little agency and perceived progress), the Odyssey (which featured humans with considerable agency and perceived progress), the 6th–5th century BCE and early Christianity (which showed humans with full-blown agency and considerable perceived progress), and the fourth century CE (which relegated human agency to God's grace; perceived progress stagnated). Seligman (2021) concluded that strong agency beliefs were linked to perceived progress while weak human agency beliefs were related to perceived stagnation. Taking a non-Western cultural perspective, Zhao et al. (2022) conducted a qualitative review of several periods of ancient China, focusing on the interplay between agency and perceived progress. They covered periods of the Shang (1600–1046 BCE; featuring humans with limited agency and perceived progress), the Zhou (1045–256 BCE; showing humans with increased agency and perceived progress), the Axial Age (530 BCE–221 BCE; highlighting humans with remarkable agency and perceived progress), and the Imperial Age (221 BCE–220 CE; showing humans balancing individual and collective agency as well as making considerable perceived progress). In addition to these qualitative findings, using a word quantification method to count the frequency of certain words in text at a given time, Seligman (2022) found that more perceived progress occurred when agentic words appeared more frequently.

Limitations of existing studies

Despite the aforementioned studies, research on Seligman's (2021) theory of agency is still in its infancy. One limitation is the lack of appropriate measures that assess agency as proposed by Seligman (2021). Most extant scales measuring agency are domain-specific. For instance, the Moral Agency Scale (Black, 2016) measures one's experience of control in moral domains; the Sense of Agency Rating Scale (SOARS) assesses one's involuntariness and effortless in hypnotic domains (Polito et al., 2013); the Women's Agency Scale (Cheong et al., 2017) addresses women's ability to self-define and pursue goals in family domains; the Agency of University Students Scale (Jääskelä et al., 2017) assesses students' course-specific agency in academic domains; and the Exercise of Self-Care Agency Scale (Yamashita, 1998) primarily appraises one's perceived practices of self-care.

Another limitation of existing measures of agency is that they do not reflect Seligman's (2021) conceptualization of agency. For instance, the Sense of Agency Scale (SAS; Tapal et al., 2017) primarily assesses one's experience of self-initiated actions, whereas Rutenberg et al.'s (2022) measure assesses students' academic agency that comprises self-efficacy, meta-cognition, and action.

Taken together, existing measures of agency have been limited to specific domains and do not capture self-efficacy, optimism, and imagination––the nuances of agency proposed by Seligman. Guided by Seligman's (2021) conceptualization, we sought to address these limitations by developing a new scale, the Agency Scale, to assess one's self-efficacious expectation that they can accomplish their goals, future time perspective of their goal pursuit, and broad-minded imagination.

Correlates of agency

To assess the construct validity of the Agency Scale, we examined its relations with several conceptually relevant correlates. First, we expected that one's experience of self-efficacy, optimism (which is assessed by future-minded planning––which, according to Seligman, [2021, p. 4], is 'a measure of optimism', and imagination would be correlated with agency personality traits (e.g. self-confident, assertive; S. Y. Kim et al., 2021) and perceived progress. Also, we speculated that the components of agency would be related to purpose in life (hereafter referred to as 'purpose') due to their conceptual similarities: both emphasize prospection (i.e. representation of various possible futures) that requires individuals to engage in goal pursuit in the present for their desired future (Bronk & Mitchell, 2022).

Seligman's (2022) hypothesized that '[self-]efficacy causes trying hard; optimism causes persistence, and imagination causes innovation' (p. 2)–the mechanisms by which agency promotes perceived progress. Therefore, we surmised that self-efficacy motivates one's effort in goal pursuit (hereafter referred to as 'effort') and optimism (measured by future-minded planning) promotes one's persistence in goal striving (hereafter referred to as 'persistence'). We also posited that imagination results in generativity, which is defined as one's creation of meaningful legacies for future generations, in contrast to perceived stagnation (McAdams, 2019; Thomas & Tee, 2022). Because innovation involves 'new, creative departures' (Seligman, 2021, p. 1) and generativity taps into one's creation of positive advances, we speculated a positive association between them based on their conceptual link. In turn, we expected these three pathways predicting perceived progress, respectively.

The present study

Against this backdrop, the study aimed to achieve four main goals. First, we sought to develop the Agency Scale to assess one's experience of self-efficacy, future-minded planning, and imagination, based on Seligman's (2021) theorization. Using the MIDUS three-wave national longitudinal data, we hypothesized (**Hypothesis 1**) a correlated three-factor structure that corresponds to self-efficacy, future-minded planning, and imagination across three timepoints (Time 1 [T1], Time 2 [T2] and Time 3 [T3]). To investigate Seligman's (2021) notion that 'different individuals, different cultures . . . may have a lot or only a little efficacy . . . optimism, and . . . imagination' (Seligman, p. 1), we examined measurement invariance of the three-factor structure of the Agency Scale at T1-T3 across gender and religious denomination groups.

Second, to assess the construct validity of the Agency Scale, we hypothesized (**Hypothesis 2**) that, across T1-T3, positive correlations between the three subscales of the Agency Scale and the following conceptually relevant correlates––agency traits, purpose, effort,[1] persistence, generativity, and perceived progress. Additionally, we examined the unique effects of the Agency Scale and hypothesized (**Hypothesis 3**) that self-efficacy at T1, future-minded planning at T1, and imagination at T1 would uniquely predict effort at T2 and T3, persistence at T2 and T3, generativity at T2 and T3, and perceived progress at T2 and T3, after controlling each other's effects. Furthermore, we examined the internal consistency and the test-retest reliability of the Agency Scale at T1-T3.

Third, we explored sequential mediating pathways (Cain et al., 2018) linking self-efficacy, future-minded planning, and imagination to perceived progress. Specifically, we hypothesized (**Hypothesis 4**) that effort at T2 would mediate the relation between self-efficacy at T1 and perceived progress at T3; persistence at T2 would mediate the link between future-minded planning at T1 and perceived progress at T3; as well as future-minded planning would mediate the association between imagination at T1 and perceived progress at T3.

Fourth, the study explored potential changes of agency and perceived progress in recent 30 years, given our interest in the trend of agency and perceived progress in recent decades instead of ancient times (e.g. Greco-Roman epoch, ancient China). As the literature on the trajectory of agency and perceived progress in recent years has been controversial (e.g. perceived growth vs. stagnation), we did not formulate any directional hypotheses.

Method

Scale development

We developed the Agency Scale using a nationally representative sample across three timepoints. Although our scale development was limited by the archival nature of the available data, we were intentional in referencing (a) Seligman's (2021) conceptualization of agency; (b) the face validity of the selected items for the Agency Scale; (c) the scale items conventionally used by scholars to assess self-efficacy, future-minded planning, and imagination.

To measure self-efficacy, we identified the Personal Mastery Scale (PMS; Lachman & Weaver, 1998) based on existing studies assessing self-efficacy (e.g. Litzelman et al., 2017; Zainal et al., 2019). Additionally, we selected the Environmental Mastery Subscale of the Psychological Well-Being Scale (Ryff, 1989) due to its conceptual similarity to the PMS. To assess future-minded planning, we identified the Self-Directedness and Planning Scale (Chen et al., 2013; Dunkel, 2013) and the Continuous Planning Scale (Prenda & Lachman, 2001). As Seligman (2021) used foresight (p. 2) and optimism interchangeably, we also included one item assessing one's foresight. To measure imagination, we considered relevant personality adjective items, namely, 'imaginative', 'creative', and 'broad-mindedness'. This consideration is congruent with Seligman's (2021) notion on imagination, which is closely related to 'creative departures' and a broad range of goal pursuit (p. 1). These item selection efforts resulted in the initial 17 items, which were then examined using factor analyses and a series of criteria (see the Results section).

Participants

Data were from Wave 1 (T1; 1994–1996), Wave 2 (T2; 2004–2006), and Wave 3 (T3; 2013–2014) of the Midlife in the United States (MIDUS) study (Radler, 2014). The integrated data file for the three waves includes 7108 participants. At T1, 6325 participants provided consent and completed the self-administered questionnaires (SAQ), 4041 at T2, and 2717 at T3. For the purposes of the present study, we only included individuals who completed the SAQ across the three waves, resulting in a final sample of 1214 (45%) males and 1,503 (55%) females (Total $N = 2717$). The average age of participants was 46 years old ($SD = 11.23$). While most participants (95%) were identified as White, few identified as Black (3%) or other racial identities (e.g. Asian or others; 2%).

Based on Seligman's (2021) work on the role of religion (e.g. Christianity) on agency and perceived progress, we

examined participants' self-identified religious denominations (i.e. self-identified religious preferences). Following previous studies (e.g. K. H. C. Kim, 2007, Taniguchi & Thomas, 2011) and the classifications from the Research Center (2015), we classified participants' religious denominations into five categories out of 46 options. Our sample comprised 522 (19%) Evangelical Protestants, 353 (13%) Catholics, 201 (7%) Mainline Protestants, 131 (4.8%) Agnostics, Atheists, or those with no preferences, and 107 (3.9%) other religious denominational preferences (e.g. Muslim) (percentages do not round up to 100% due to missingness).

Measures

Self-efficacy

Self-efficacy was assessed by two scales. First, the 4-item Personal Mastery Scale (PMS; Lachman & Weaver, 1998) has items such as 'When I really want to do something, I usually find a way to succeed at it'. Participants rated their agreement on statements with a 7-point rating scale, ranging from 1 (*strongly agree*) to 7 (*strongly disagree*). Items were reversely coded so that higher scores reflect more self-efficacy. The negative association of the PMS with perceived constraint (e.g. feeling helpless) provided empirical support for its validity evidence. In this study, the alpha coefficients were .70 (T1), .74 (T2), and .74 (T3); test-retest reliability coefficients were .53 (T1-T2), .54 (T2-T3), and .46 (T1-T3). In additional to the PMS, we used the 3-item Environmental Mastery Subscale (EMS) of the Psychological Well-Being Scale (Ryff, 1989). The EMS has items such as 'The demands of everyday life often get me down'. Participants rated their agreement on items with a 7-point Likert scale. Validity evidence was found in its positive association with internal locus of control. In this study, we found coefficients of internal consistency of .53 (T1), .55 (T2), and .56 (T3) as well as test-retest reliability of .46 (T1-T2), .49 (T2-T3), and .39 (T1-T3). Notably, both the PMS and EMS use a 7-point Likert scale, which differed from the 4-point Likert scales used to assess future-minded planning and imagination. Consistent with previous studies (e.g. Leunissen et al., 2021), we transformed both the PMS and EMS scores to a 4-point scale using Aiken's (1987) equation.

Future-minded planning

Future-minded planned was measured by one item and two scales. The first measure was the item 'I can head off a bad situation before it happens' to assess foresight. Test-retest reliability coefficients were .31 (T1-T2), .46 (T2-T3), and .28 (T1-T3). The second measure was the 3-item Self-Directedness and Planning

Scale (SDPS; Chen et al., 2013, Dunkel, 2013). Its sample items are 'I like to make plans for the future' and 'I know what I want out of life'. Validity evidence of the SDPS was supported through its positive association with optimism. Its internal consistency coefficients were .74 (T1), .74 (T2) and .76 (T3), and test-retest reliabilities were .59 (T1-T2), .59 (T2-T3) and .52 (T1-T3). The third measure was the 5-item Continuous Planning Scale (CPS; Prenda & Lachman, 2001). The first two items of the CPS were identical with the SDPS.[2] A sample item (reversely coded) is 'I live one day at a time'. The positive correlations of the CPS with life satisfaction and perceived control demonstrated its validity evidence. In this study, we found its internal consistency coefficients of .64 (T1) and .62 (T2, T3) as well as test-retest reliability coefficients of .61 (T1-T2), .62 (T2-T3), and .55 (T1-T3). For the above item and two scales, participants rated the items with a 4-point Likert scale, ranging from 1 (*a lot*) to 4 (*not at all*). Items were reversely coded so that higher scores reflect higher standings.

Imagination

We assessed imagination by three items that ask participants to rate how well each of the self-descriptive adjectives describes them. The adjectives in question were imaginative, creative, and broad-minded (hereafter referred to as the Imagination Scale). Responses were provided based on a 4-point scale ranging from 1 (*a lot*) to 4 (*not at all*). Items were reversely coded so that higher scores indicated higher standings in imagination. For validity evidence, factor analytic findings showed that these items loaded onto the openness personality trait (Zimprich et al., 2012). For the current study, the alpha coefficients of the 3-item imagination scale were .66 (T1), .67 (T2), and .66 (T3); its test-retest reliability coefficients were .69 (T1-T2), .68 (T2-T3), and .62 (T1-T3).

Agency personality traits

Similar to the way we assessed imagination, agency personality traits were measured using five self-descriptive adjective items, including self-confident, forceful, assertive, outspoken, and dominant. Participants rated each item on a 4-point scale ranging from 1 (*a lot*) to 4 (*not at all*). Items were reversely coded so that higher scores on the 5 items indicated higher standings in the agency personality trait. Evidence of validity was supported by its positive, significant association with other personality traits, such as extraversion and openness to experience (S. Y. Kim et al., 2021). The alpha coefficients of the 5-item agency trait were .82 (T1) .82 (T2) and .81 (T3); its test-retest reliability coefficients were .73 (T1-T2), .75 (T2-T3), and .67 (T2-T3).

Purpose

Purpose was indexed by the 3-item Purpose in Life Subscale (PILS) of the Psychological Well-Being Scale (Ryff, 1989). A sample item (reversely scored) is 'Some people wander aimlessly through life, but I am not one of them'. Participants rated items on a 7-point Likert scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*). Higher scores indicated greater levels of purpose. Validity evidence was supported by its positive associations with personal growth and self-esteem and its negative association with depression. In line with previous studies (e.g. Hill et al., 2016), we observed low internal consistency coefficients of the PILS in this study: .34 (T1), .25 (T2), and .32 (T3). Its test-retest reliability coefficients were .46 (T1-T2), .53 (T2-T3), and .42 (T2-T3).

Effort

Effort was assessed by the 4-item Behavioral Disengagement Subscale (BDS) of the Multidimensional Coping Inventory (Carver et al., 1989), which was available in the MIDUS archival data at T2 and T3 only. The BDS measures one's effort in goal pursuit and to what extent people give up attaining goals. A sample item goes 'I give up trying to reach my goal'. Participates rated items on a 4-point Likert scale ranging from 1 (*a lot*) to 4 (*not at all*), with higher scores reflecting more effort (i.e. less behavioral disengagement). Evidence for the BDS's construct validity was demonstrated through its negative associations with empathic and social self-efficacy (DiGiunta et al., 2010. The Cronbach's alphas of BDS were .73 (T2) and .74 (T3) and its test-retest reliability coefficients were .50 (T2) and .50 (T3).

Persistence

Persistence was measured by the 5-item Persistence in Goal Striving Subscale (PGSS) of the Control Strategies Scale (Wrosch et al., 2000). A sample item is 'I rarely give up on something I am doing, even when things get tough'. Participants rated items on a 4-point Likert scale ranging from 1 (*a lot*) to 4 (*not at all*) and items were reversely coded so that higher scores on the PGSS reflect higher levels of persistence. Evidence for the PGSS's construct validity was shown in its positive correlation with positive reappraisals in goal strivings (i.e. positive reframing of negative situations). For the present study, we found the PGSS's coefficient alphas of .77 (T1, T2) and .78 (T3), as well as test-retest reliability coefficients of .60 (T1-T2), .63 (T2-T3) and .55 (T1-T3).

Generativity

Generativity was assessed by the 6-item Loyola Generativity Scale (LGS; McAdams & de St Aubin, 1992).

A sample item is 'Others would say that you have made unique contributions to society'. Participants rated items on a 4-point Likert scale ranging from 1 (*a lot*) to 4 (*not at all*) and items were reversely coded so that higher scores on the LGS reflect more generativity. Evidence for convergent validity of the LGS was supported through its positive associations with other generativity scales. In this study, we found LGS's internal consistency coefficients of .84 (T1) and .85 (T2, T3) as well as test-retest reliability coefficients of .64 (T1-T2; T2-T3) and .57 (T1-T3).

Perceived progress

We used the 3-item Social Actualization Subscale (SAS) of the Social Well-Being Scale (Keyes, 1998) to assess participants' subjective perception of societal progress. A sample item is 'Society has stopped making progress'. Participants rated items on a 7-point rating scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*). Higher scores on the SAS indicate more perceived progress. Validity evidence of the SAS was supported by a positive association with perceived quality of society. For this study, the internal consistency of the SAS was .68 (T1, T2) and .70 (T3); test-retest reliability coefficients were .53 (T1-T2), .49 (T2-T3), and .46 (T1-T3).

Religious identification

For our post hoc analyses, we included the 6-item Religious Identification Scale (RIS) to assess the importance of religion among participants' life (Choi & Chou, 2010). A sample item is 'How important is religion in your life?' Participants rated items on a 4-point Likert scale ranging from 1 (*very*) to 4 (*not at all*). Items were reversely coded so that higher scores on the items reflected stronger religious identification. Validity evidence of the RIS was shown in its positive correlation with religious giving (Choi & DiNitto, 2012). For the RIS in this study, we found internal consistency coefficients of .90 at all time-points, and test-retest reliability coefficients of .83 (T1-T2), .85 (T2-T3), and .77 (T1-T3).

Results

Factor structure of the agency scale

Exploratory factor analyses

To test our first hypothesis, we examined the factor structure of Agency Scale using exploratory (EFAs) and confirmatory factor analyses (CFAs) with the initial 17 items. We randomly split the sample at T1 into two halves, with the first half (*n* = 1,362) being used for EFAs and second half (*n* = 1,355) for CFAs. As missingness for scale items was low (ranging from .1% to 3.3%),

we employed the Expectation Maximization algorithm to impute missing values. We conducted principal axis factoring with promax rotation for our EFAs. The Kaiser – Meyer – Olkin Measure of Sampling Adequacy was .80 and chi-square for Bartlett's Test of Sphericity was 5,583.25 (p <.001), indicating the appropriateness for factor analysis of the data. We used parallel analysis (Patil et al., 2017) to identify the number of factors to retain. Eigenvalues for the first four factors obtained from our data (4.18, 1.81, 1.63, and 1.18) were higher than the 95% percentile eigenvalues created from 5,000 random data sets (1.23, 1.19, 1.15, and 1.12). The eigenvalue for the fifth factor from our data was lower than that generated from the random datasets (1.07 vs. 1.10), suggesting a four-factor structure. In contrast, the scree plot suggested a five-factor structure (eigenvalue >1). The first to fifth factors explained 24.60%, 10.66%, 9.60%, 6.93%, and 6.31% of the total variance, respectively. When selecting items based on the factor pattern matrix, we referenced: (1) Seligman's (2021) tripartite model of agency; (2) items scholars conventionally used to measure agency (e.g. Litzelman et al., 2017 and Zainal et al. [2019] for items of the Personal Mastery Scale; Chen et al., 2013 and Dunkel, 2013 for Self-Directedness and Planning Scale); and (3) our goal in creating a brief scale (less than six items per scale) and having at least three items per subscale (to reliably yield convergent solutions in confirmatory factor analyses) (Marsh et al., 1998). Hence, we dropped the one item assessing foresight (due to its limited item number and its low factor loading, .30), the fourth factor (i.e. three items of the CPS due to the CPS's inconsistent factor loadings such as the first

two and the last three items loading onto two different factors and due to the CPS's three items' lower factor loadings than the SDPS's, ranging from .53 to .62) and the fifth factor (i.e. three items of the EMS due to its first item's low factor loading of .32, resulting in only two available items; Ryff, 1989). As a result, 10 items were chosen for subsequent analyses out of the initial 17 items (see Table S1 of the supplementary material).

Then, another EFA model was specified using the selected 10 items. Consistent with findings from the scree plot and parallel analysis, the pattern matrix showed a three-factor solution: no cross loadings >.20 and all items loaded on the hypothesized factors >.40 (except the item of broad-mindedness with a .22 factor loading, which we retained to trade for a 3-item subscale) (Tabachnick & Fidell, 2001) (see Table 1). The three factors explained 32.70%, 14.78%, and 12.18% of the total variance for the Agency Scale, correspondingly. According to the meaning of the items, we labelled these three factors as self-efficacy, future-minded planning, and imagination, respectively.

Confirmatory factor analyses

Next, we conducted CFAs on the 10 items of the Agency Scale[3] in Mplus 8.3 using the robust maximum likelihood estimation (MLR). Full information maximum likelihood was used to address the missing values (≤3% for all items). Two competing models[4] were tested: a unidimensional model versus a correlated three-factor model (based on the same factor structure as found by the EFA). Model fit was evaluated based on Weston and Gore's (2006) recommendations: the root mean square error of approximation

Table 1. Factor loading for the exploratory and confirmatory factor analyses at three timepoints.

Item	Exploratory factor analysis (T1; $n = 1,362$)			Confirmatory factor analysis (T1; $n = 1,355$)			Confirmatory factor analysis (T2; $n = 2,717$)			Confirmatory factor analysis (T3; $n = 2,717$)		
	SE	FP	I	SE	FP	I	SE	FP	I	SE	FP	I
1	.69	−.02	.05	.75*			.69*			.71*		
2	.63	−.01	.07	.70*			.75*			.71*		
3	.64	.01	−.07	.52*			.60*			.61*		
4	.48	.05	−.07	.47*			.57*			.57*		
5	−.11	.90	−.03		.74*			.82*			.79*	
6	.11	.55	.05		.71*			.69*			.67*	
7	.10	.58	.02		.68*			.60*			.68*	
8	−.01	−.01	.86			.87*			.85*			.86*
9	−.04	.01	.84			.79*			.80*			.78*
10	.13	.10	.22			.27*			.33*			.31*

Note. *p < .001. SE = self-efficacy; FP = future-minded planning; I = imagination.
Item 1: I can do just about anything I really set my mind to.
Item 2: When I really want to do something, I usually find a way to success at it.
Item 3: Whether or not I am able to get what I want is in my own hands.
Item 4: What happens to me in the future mostly depends on me.
Item 5: I like to make plans for the future.
Item 6: I know what I want out of life.
Item 7: I find it helpful to set goals for the near future.
Item 8: How well does 'imaginative' describe you?
Item 9: How well does 'creative' describe you?
Item 10: How well does 'broad-minded' describe you?

(RMSEA) ≤ .10, comparative fit index (CFI) ≥ .90, and standardized root mean square residual (SRMR) ≤ .10. As shown in Table 2, at T1, the unidimensional model demonstrated a poor fit to the data, whereas the correlated three-factor model displayed a significantly better fit to the data. For T2 and T3, we conducted CFAs using the full sample ($N =$ 2,717), which yielded similar findings. Thus, the correlated three-factor model was selected as the final model, providing support for our first hypothesis.

The three factors were significantly correlated with each other: (a) self-efficacy with future-minded planning: $\beta_{T1} = .48$; $\beta_{T2} = .48$; $\beta_{T3} = .50$; (b) self-efficacy with imagination: $\beta_{T1} = .33$; $\beta_{T2} = .33$; $\beta_{T3} = .29$; and (c) future-minded planning with imagination: $\beta_{T1} = .29$; $\beta_{T2} = .33$; $\beta_{T3} = .34$; all $ps < .001$. Factor loadings for this model are reported in Table 1. Based on this three-factor solution, we created subscale scores by averaging the items in each factor. The subscales were named the self-efficacy subscale, the future-minded planning subscale, and the imagination subscale.

Measurement invariance

As our sample was predominantly (95%) White, we assessed the measurement invariance of our correlated three-factor structure based on gender (e.g. female vs. male) and religious denomination groups (e.g. Catholic vs. Mainline Protestant vs. Evangelical Protestant vs. Other Religious Preferences vs. Agnostic/Atheist/No Preferences) at each timepoint. Specifically, we examined configural invariance (equivalent factor across groups), metric invariance (equivalent factor loadings across groups), and scalar invariance (equivalent item intercepts across groups) of the model (Putnick & Bornstein, 2016).

The results showed that at all three timepoints, the configural, metric, and scalar invariance models all demonstrated acceptable fit (see Table 2). We found no significant differences in the model fit for the configural and metric invariance model across gender (T1, T2) and religious denominations (T1, T3). The scalar invariance model was a significantly poorer fit to the data than the metric invariance model across gender (T1, T2, T3) and religious denominations (T1, T2, T3).

However, instead of relying on the chi-square difference test for measurement invariance, which tends to be over-sensitive to detecting non-invariance in large samples, Chen (2007) suggested that (a) a difference of ≥ −.010 in CFI, coupled with a difference of ≥ .015 in RMSEA and a difference of ≥ .030 in SRMR, indicates metric non-invariance; and (b) a difference of .010 in CFI, coupled with a difference of .015 in RMSEA and a difference of

Table 2. Fit indices of models of agency across three timepoints.

Model	χ^2	df	CFI	RMSEA	SRMR	Model comparison
Time 1 (T1), $n = 1,355$						
Unidimensional model	1,279.184**	35	.489	.164	.101	———
Correlated three-factor model	169.289**	32	.944	.057	.044	Δscaledχ^2(3) = 1,232.03**
Multigroup CFA across gender						
Configural invariance	202.405**	64	.944	.057	.046	———
Metric invariance	214.926**	71	.942	.055	.051	Δscaledχ^2(7) = 13.47
Scalar invariance	244.589**	78	.932	.057	.056	Δscaledχ^2(7) = 30.95**
Multigroup CFA for religious denominations						
Configural invariance	323.018**	160	.936	.062	.058	———
Metric invariance	354.733**	188	.935	.058	.073	Δscaledχ^2(28) = 35.67
Scalar invariance	408.154**	216	.925	.058	.079	Δscaledχ^2(28) = 53.45*
Time 2 (T2), $N = 2,717$						
Unidimensional model	2,401.568**	35	.523	.163	.101	———
Correlated three-factor model	338.686**	32	.938	.061	.042	Δscaledχ^2(3) = 1,862.53**
Multigroup CFA across gender						
Configural invariance	362.109**	64	.940	.060	.044	———
Metric invariance	363.280**	71	.942	.057	.046	Δscaledχ^2(7) = 6.42
Scalar invariance	444.603**	78	.927	.061	.050	Δscaledχ^2(7) = 91.49**
Multigroup CFA for religious denominations						
Configural invariance	383.519**	160	.914	.075	.059	———
Metric invariance	420.660**	188	.910	.071	.079	Δscaledχ^2(28) = 44.98*
Scalar invariance	473.336**	216	.901	.069	.077	Δscaledχ^2(28) = 51.60*
Time 3 (T3), $N = 2,717$						
Unidimensional model	2401.681**	35	.547	.158	.100	———
Correlated three-factor model	209.016**	32	.966	.045	.036	Δscaledχ^2(3) = 2,284.81**
Multigroup CFA across gender						
Configural invariance	228.701**	64	.969	.044	.037	———
Metric invariance	249.452**	71	.966	.043	.044	Δscaledχ^2(7) = 21.24*
Scalar invariance	284.125**	78	.961	.044	.047	Δscaledχ^2(7) = 36.49**
Multigroup CFA for religious denominations						
Configural invariance	306.829**	160	.948	.059	.051	———
Metric invariance	322.494**	188	.953	.052	.059	Δscaledχ^2(28) = 21.51
Scalar invariance	364.646**	216	.948	.051	.062	Δscaledχ^2(28) = 41.53*

Note. **$p < .001$; *$p < .05$.

.010 in SRMR signify scalar non-invariance. Overall, changes in CFI, RMSEA, and SRMR were within Chen's (2007) recommended cutoff range (see Table 2). Taken together, these findings supported configural, metric, and scalar invariance of the Agency Scale across gender and religious denominations across T1-T3.

Construct validity of the agency scale

Our second and third hypotheses were addressed using our full sample ($N = 2,717$). Missing data on our study variables ranged from .1% to 6.8%. Participants' number of missing data were only weakly, significantly correlated with a few of our study variables ($r_{\text{purpose T1}} = -.06$; $r_{\text{perceived progress T1}} = -.04$; $r_{\text{purpose T2}} = -.10$; $r_{\text{future-minded planning T2}} = -.08$; $r_{\text{purpose T3}} = -.11$; $r_{\text{generativity T3}} = -.04$; $r_{\text{effort T3}} = -.11$; $r_{\text{perceived progress T3}} = -.05$; $ps < .05$), possibly due to our large sample size. Thus, we used the Expectation Maximization algorithm to impute missing values. Descriptive statistics and intercorrelations of the key variables are displayed in Table 3. Across T1-T3, self-efficacy, future-minded planning, and imagination were significantly and positively associated with agency traits, purpose, effort (only T2 and T3) persistence, generativity, and perceived progress, supporting our second hypothesis.

Religious identification was negatively, weakly related to self-efficacy (T1-T3) and imagination (T2-T3), as well as positively, weakly linked to future-minded planning (T1-T3).

Moreover, we tested the unique effects of self-efficacy, future-minded planning, and imagination using multiple regression. Table 4 shows that self-efficacy (T1), future-minded planning (T1), and imagination (T1) uniquely, positively, and significantly predicted effort (T2, T3) with a small effect size; persistence (T2, T3) and generativity (T2, T3) with a medium effect size, as well as perceived progress (T2, T3) with a small effect size. Thus, we found support for our third hypothesis.

Pathways from agency to perceived progress

For our fourth hypothesis on sequential mediation analyses, we used a bias-corrected bootstrap estimation analysis using 5000 random bootstrap samples with random replacement (Hayes, 2013). The PROCESS macro, which combines the use of multiple regression and biased-corrected bootstrapping, was used to identify significant mediation effects and differences in the magnitude of the mediation effects

Table 3. Means, standard deviations, and intercorrelations of variables.

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
Time 1 (T1)												
1. Self-efficacy	3.55	.56	—									
2. Future-minded planning	3.19	.64	.37**	—								
3. Imagination	3.06	.62	.26**	.29**	—							
4. Agency traits	2.70	.67	.35**	.36**	.36**	—						
5. Purpose	5.65	1.11	.15**	.35**	.11**	.14**	—					
6. Persistence	3.24	.53	.50**	.49**	.33**	.41**	.19**	—				
7. Generativity	2.86	.61	.25**	.38**	.36**	.36**	.17**	.38**	—			
8. Perceived Progress	4.09	1.38	.21**	.21**	.14**	.12**	.19**	.15**	.15**	—		
9. Religious identification	2.78	.78	−.08**	.15**	−.03	.00	.04*	.08**	.16**	−.04	—	
Time 2 (T2)												
1. Self-efficacy	3.50	.57	—									
2. Future-minded planning	3.14	.65	.36**	—								
3. Imagination	2.98	.65	.28**	.29**	—							
4. Agency traits	2.62	.66	.36**	.37**	.36**	—						
5. Purpose	5.53	1.06	.19**	.37**	.15**	.14**	—					
6. Persistence	3.21	.53	.47**	.48**	.36**	.39**	.18**	—				
7. Generativity	2.87	.62	.27**	.38**	.38**	.37**	.20**	.40**	—			
8. Perceived Progress	4.29	1.30	.24**	.25**	.16**	.13**	.20**	.17**	.20**	—		
9. Religious identification	2.77	.80	−.05*	.16**	−.06**	−.02	.04*	.07**	.16**	−.04	—	
10. Effort†	3.29	.55	.28**	.27**	.20**	.22**	.31**	.30**	.21**	.22**	−.03	—
Time 3 (T3)												
1. Self-efficacy	3.41	.60	—									
2. Future-minded planning	3.08	.68	.38**	—								
3. Imagination	2.95	.66	.24**	.30**	—							
4. Agency traits	2.59	.67	.33**	.35**	.35**	—						
5. Purpose	5.35	1.14	.21**	.36**	.17**	.17**	—					
6. Persistence	3.19	.55	.44**	.49**	.35**	.40**	.19**	—				
7. Generativity	2.80	.64	.25**	.37**	.36**	.37**	.27**	.37**	—			
8. Perceived Progress	3.89	1.34	.17**	.17**	.16**	.10**	.17**	.07**	.14**	—		
9. Religious identification	2.75	.84	−.06**	.14**	−.05*	.01	.02	.06**	.15**	−.14**	—	
10. Effort†	3.26	.58	.25**	.22**	.14**	.18**	.36**	.25**	.19**	.18**	−.10**	—

Note. $N = 2,717$. **$p < .01$; *$p < .05$. †Data on effort were only available at T2 and T3 due to the archival nature of the MIDUS data.

Table 4. Regression analyses.

	Time 2 (T2)					Time 3 (T3)				
	B	SE	β	R²	f²	B	SE	β	R²	f²
Outcome: Effort				.09***	.10				.06***	.06
Self-efficacy (T1)	.16	.02	.16***			.14	.02	.14***		
Future-minded planning (T1)	.15	.01	.17***			.11	.02	.12***		
Imagination (T1)	.06	.02	.07***			.06	.02	.07***		
Outcome: Persistence				.20***	.25				.18***	.22
Self-efficacy (T1)	.20	.02	.21***			.23	.02	.23***		
Future-minded planning (T1)	.18	.02	.22***			.17	.02	.19***		
Imagination (T1)	.15	.02	.18***			.12	.02	.14***		
Outcome: Generativity				.17***	.20				.14***	.16
Self-efficacy (T1)	.07	.02	.07***			.09	.02	.08***		
Future-minded planning (T1)	.21	.02	.21***			.20	.02	.20***		
Imagination (T1)	.25	.02	.26***			.22	.02	.22***		
Outcome: Perceived Progress				.06***	.06				.03***	.03
Self-efficacy (T1)	.35	.05	.15***			.22	.05	.09***		
Future-minded planning (T1)	.22	.04	.11***			.12	.04	.06**		
Imagination (T1)	.15	.04	.07***			.19	.04	.09***		

Note. ***$p < .001$; **$p < .01$. $N = 2,717$. f^2 = effect size of the regression model.

(Hayes, 2013). Figure 1 shows that effort (T2) significantly mediated the relation between self-efficacy (T1) and perceived progress (T3), $B = .07$, $SE = .01$, $β = .03$, 95% CI = .042, .092 (see Panel A); persistence (T2) significantly mediated the relation between future-minded planning (T1) and perceived progress (T3), $B = .03$, $SE = .01$, $β = .02$, 95% CI = .005, .062 (see Panel B); and generativity (T2) significantly mediated the relation between imagination (T1) and perceived progress (T3), $B = .07$, $SE = .02$, $β = .03$, 95% CI = .037, .096 (see Panel C). To summarize, self-efficacy was associated with effort; future-minded planning was linked to persistence; and imagination was related to generativity, which all in turn was linked to perceived progress, respectively. Thus, we found support for our fourth hypothesis.

Panel A

Effort (T2)

Self-efficacy (T1) — $B = .24, SE = .02, β = .24***$ — Effort (T2) — $B = .28, SE = .05, β = .11***$ — Perceived Progress (T3)

$B = .26, SE = .05, β = .11***$

Panel B

Persistence (T2)

Future-minded planning (T1) — $B = .29, SE = .01, β = .35***$ — Persistence (T2) — $B = .12, SE = .05, β = .05*$ — Perceived Progress (T3)

$B = .22, SE = .04, β = .10***$

Panel C

Generativity (T2)

Imagination (T1) — $B = .33, SE = .02, β = .33***$ — Generativity (T2) — $B = .20, SE = .04, β = .09***$ — Perceived Progress (T3)

$B = .21, SE = .04, β = .10***$
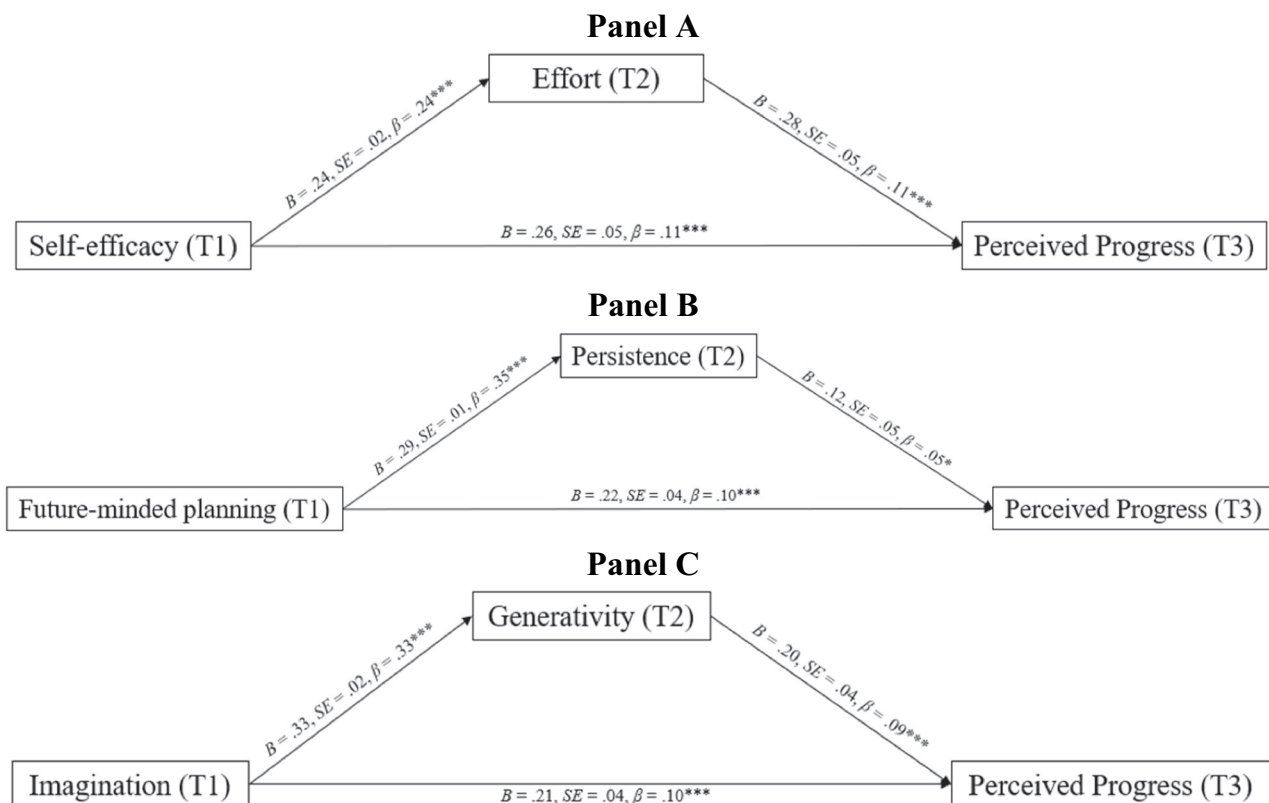
Figure 1. Mediation analyses.

Table 5. Mean differences, standard deviations of the differences, and paired-sample t-test statistics of variable scores across the three timepoints.

Variable	M	SD	t	df	[95% CI]	p	Cohen's d
Agency							
T1–T2	.06	.37	8.10	2716	[.043, .071]	<.001	.16
T2–T3	.06	.37	8.54	2716	[.047, .075]	<.001	.16
T1–T3	.12	.41	15.18	2716	[.103, .134]	<.001	.29
Self-efficacy							
T1–T2	.04	.55	4.02	2716	[.021, .064]	<.001	.08
T2–T3	.09	.56	8.63	2716	[.072, .115]	<.001	.17
T1–T3	.14	.61	11.68	2716	[.113, .159]	<.001	.22
Future-minded planning							
T1–T2	.05	.58	4.18	2716	[.025, .069]	<.001	.08
T2–T3	.06	.60	5.34	2716	[.039, .084]	<.001	.10
T1–T3	.11	.64	8.77	2716	[.084, .133]	<.001	.17
Imagination							
T1–T2	.08	.50	8.40	2716	[.062, .100]	<.001	.16
T2–T3	.03	.53	2.87	2716	[.009, .049]	.004	.06
T1–T3	.11	.57	10.12	2716	[.089, .131]	<.001	.19
Perceived Progress							
T1–T2	−.20	1.30	−8.00	2716	[−.249, −.151]	<.001	−.15
T2–T3	.40	1.33	15.57	2716	[.347, .447]	<.001	.30
T1–T3	.20	1.42	7.21	2716	[.143, .250]	<.001	.14

Changes of agency and perceived progress in recent 30 years

To address our fourth research question, we conducted a series of paired-sample *t*-tests to examine mean differences in scores of agency, self-efficacy, future-minded planning, imagination, and perceived progress from T1 to T2, from T2 to T3, and from T1 to T3. As shown in Table 5, statistically significant decreases in mean scores were observed in agency, self-efficacy, future-minded planning, and imagination, from T1 to T2, from T2 to T3, and from T1 to T3. Although there was a statistically significant increment in perceived progress from T1 to T2, significant decrements were observed from T2 to T3 and from T1 to T3. Overall, we observed a decreasing trend in agency, self-efficacy, future-minded planning, imagination, and perceived progress across the three timepoints.

Results for post hoc analyses

Because Seligman (2021) suggested that individuals' subscription to certain religions that emphasize varying degrees of agency could impact perceived progress, we speculated the relation between agency and perceived progress to be related to the strength of one's religious identification. Using Hayes (2013) PROCESS, we tested the moderating role of religious identification on the agency-perceived progress relation. The predictors (self-efficacy, future-minded planning, and imagination at T1), the outcome (perceived progress at T2, T3), and the moderator (religious identification at T1) were

entered simultaneously. We used the simple slopes method to test the moderating relationships.

Across religious denominations ($n = 2,717$), we found that the interaction between self-efficacy and religious identification at T1 significantly predicted perceived progress at T2, $B = −.12$, $SE = .05$, $p = .019$. As indicated in Panel A of Figure 2, when religious identification was low, self-efficacy and perceived progress were significantly and positively correlated, $B = .57$, $SE = .11$, $p < .001$; when religious identification was high, the positive correlation between self-efficacy and perceived progress was still significant but weaker, $B = .20$, $SE = .08$, $p = .008$. Panels B and C of Figure 2 display significant moderation effects of future-minded planning × religious identification at T1 on perceived progress at T2, $B = −.12$, $SE = .05$, $p = .008$ and T3, $B = −.12$, $SE = .05$, $p = .019$. That is, future-minded planning was positively and significantly related to perceived progress at lower levels of religious identification (T2: $B = .44$, $SE = .09$, $p = .000$; T3: $B = .24$, $SE = .06$, $p = .000$) but not at higher levels (T2: $B = .12$, $SE = .06$, $p = .050$; T3: $B = .06$, $SE = .06$, $p = .333$).

Among Catholics ($n = 353$), we found significant moderation effects of future-minded planning × religious identification at T1 on perceived progress at T2, $B = −.42$, $SE = .15$, $p = .005$ and T3, $B = −.32$, $SE = .16$, $p = .045$ (see Panels D and E of Figure 2). In both sets of moderation analyses, future-minded planning was positively and significantly related to perceived progress at lower levels of religious identification (T2: $B = .55$, $SE = .14$, $p = .000$; T3: $B = .43$, $SE = .15$, $p = .004$) but not at higher levels (T2: $B = .03$, $SE = .16$, $p = .835$; T3: $B = .04$, $SE = .17$, $p = .802$). We also found a significant imagination ×
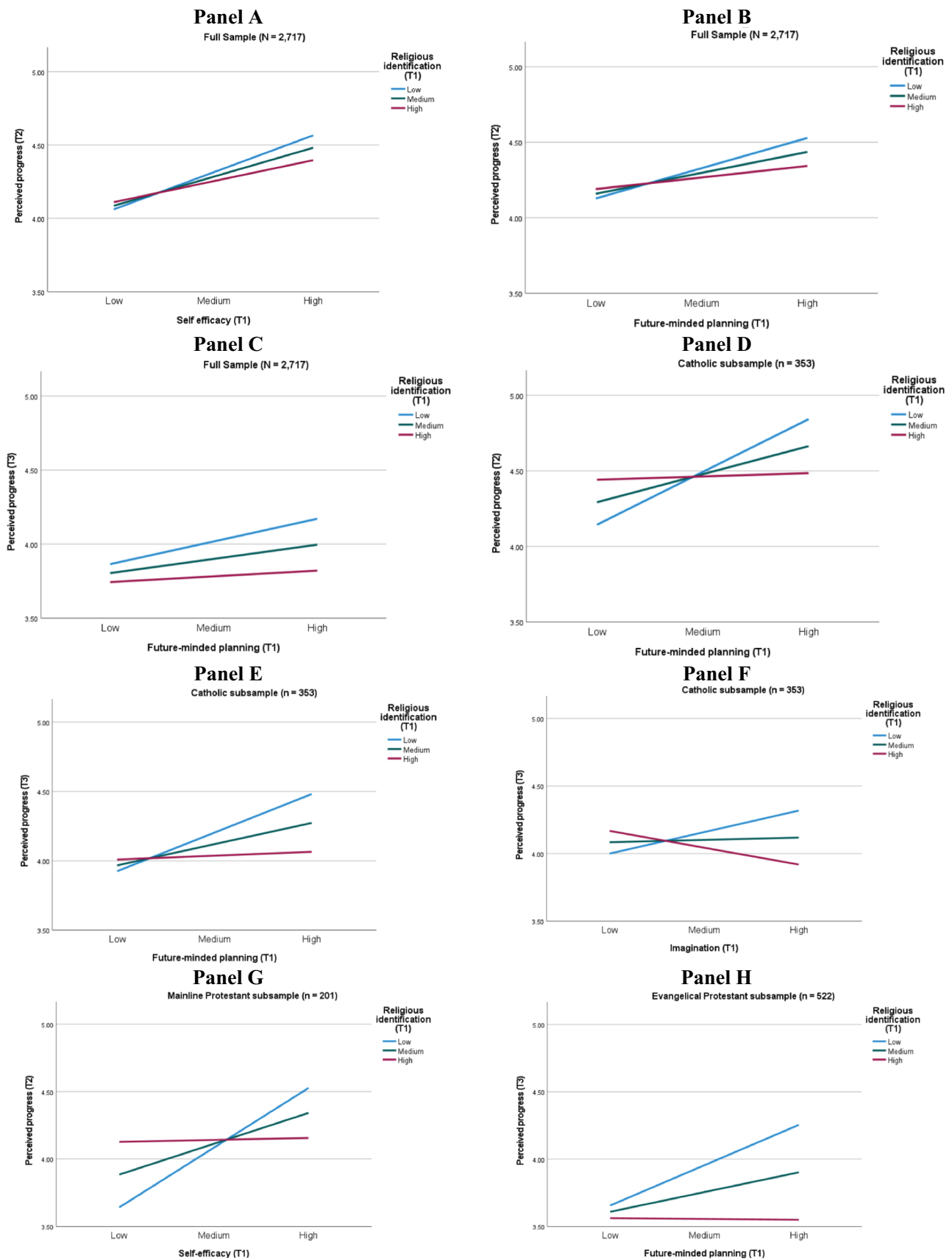
Figure 2. Moderation analyses.

religious identification moderation effects on perceived progress at T3, $B = -.37$, $SE = .17$, $p = .031$ (see Panel F of Figure 2). The positive association between imagination and perceived progress was significant at lower ($B = .46$, $SE = .23$, $p = .049$), but not higher levels of religious identification ($B = .40$, $SE = .21$, $p = .050$).

Among Mainline Protestants ($n = 201$), we found that religious identification significantly moderated the link between self-efficacy and perceived progress (T2), $B = -.49$, $SE = .21$, $p = .022$. Panel G of Figure 2 shows that self-efficacy and perceived progress was positively and significantly related at lower ($B = .80$, $SE = .28$, $p = .005$), but not higher levels of religious identification ($B = .03$, $SE = .20$, $p = .892$). Among Evangelical Protestants ($n = 522$), religious identification significantly moderated the relation between future-minded planning and perceived progress (T3), $B = -.33$, $SE = .13$, $p = .012$. As shown in Panel H of Figure 2, future-minded planning was positively, significantly related to perceived progress (T3) at lower levels of religious identification ($B = .46$, $SE = .13$, $p = .001$), but not at higher levels ($B = -.01$, $SE = .14$, $p = .944$). Besides these results, no other significant moderation effects were found, $ps > .05$.

Discussion

Grounded in Seligman's (2021) tripartite model of agency, the present study developed the Agency Scale and examined its factor structure, measurement invariance, construct validity and reliability using a nationally representative sample across three timepoints. Factor analyses provided support for the 10-item Agency Scale. Moreover, the study provided evidence for the construct validity and reliability of the Agency Scale. Additionally, we investigated changes of agency and perceived progress across the three timepoints.

Our first goal was to develop the Agency Scale, reflecting Seligman's (2021) tripartite view of agency. Both our EFA and CFA findings at three timepoints favored a correlated three-factor structure of agency, namely, self-efficacy, future-minded planning, and imagination. Supporting our first hypothesis, across T1-T3 results from CFAs demonstrated the superiority of the three-factor model to a one-factor model. We also found evidence for measurement invariance across gender and religious denominations for the three-factor structure of the Agency Scale.

Our second goal was to assess the construct validity of the Agency Scale. Supporting our second hypothesis, correlational and regression findings showed that self-efficacy, future-minded planning, and imagination were associated with several conceptually relevant correlates. Specifically, across three timepoints self-efficacy, future-

minded planning, and imagination were positively, significantly associated with agency traits, purpose, effort (at T2 and T3 only), persistence, generativity, and perceived progress. Moreover, self-efficacy, future-minded planning, and imagination uniquely predicted effort, persistence, generativity, and perceived progress, after controlling each other's effects. Such unique effects demonstrated that the three components of agency are unique, albeit related, constructs, providing empirical support for Seligman's (2021, 2022) notions that agency predicts perceived progress. Thus, we found support for our third hypothesis. Internal consistency and test-retest reliability for the Agency Scale were also empirically supported.

Our third goal was to examine the pathways through which agency was linked to perceived progress. In support of our fourth hypothesis, our sequential mediating pathways were significant. That is, effort (T2) significantly mediated the relation between self-efficacy (T1) and perceived progress (T3); persistence (T2) mediated the association between future-minded planning (T1) and perceived progress (T3); and generativity (T2) mediated the link between imagination (T1) and perceived progress (T3). These findings provided support for Seligman's (2022) notion that '(self-)efficacy causes trying hard; optimism causes persistence, and imagination causes innovation. These are exactly the mechanisms by which agency causes progress' (p. 2).

Our fourth goal was to examine potential changes of scores in agency and perceived progress in recent decades. Significant mean differences across three timepoints indicated an overall declining trend in scores of agency, self-efficacy, future-minded planning, imagination, and perceived progress. Although we observed a significant increase in scores of perceived progress from T1 to T2, the overall trend of perceived progress was decreasing. The declining trend of agency and perceived progress was congruent with Seligman's (2022) statement, 'the presence of … agency causes progress and conversely, its absence causes stagnation' (p. 2). On the declining trend of agency, scholars have pointed out that while digital technological advancement enhances perceived agency, the process of which empowers digital devices to 'manage' perceived agency (e.g. while human agency created internet search engines, the reliance on which might limit one's imagination to come up with innovative solutions, resulting in human agency 'being managed') (Coker, 2018). On the other hand, perceived progress is complex––that is, the continuous process of perceived progress may at the same time generate negative effects for human beings, environment, and society, such as pollutions, negatively impacting their well-being and health (Coccia & Bellitto, 2018).

Post hoc analyses showed that with our full sample self-efficacy and perceived progress (T2) were more strongly, positively correlated when religious identification was lower, and weakly, positively related when religious identification was higher. Also, future-minded planning was positively related to perceived progress at lower levels of religious identification but not at higher levels. This trend on perceived progress prevailed among Catholics (T2 and T3) and Evangelical Protestants (T3). Among Catholics, the positive association between imagination and perceived progress was significant at lower, but not higher levels of religious identification whereas among Mainline Protestants, self-efficacy and perceived progress was positively related at lower, but not higher levels of religious identification. It is noteworthy that our findings should be interpreted with caution because the results demonstrated inconsistent patterns across predictors (self-efficacy vs. future-minded planning vs. imagination), and subgroups of religious denominations, and timepoints (e.g. T2 vs. T3). Overall, these findings provided some support for Seligman's (2021) writings that certain religions relegating human agency to being grace, a gift from God might weaken agency linking to perceived stagnation.

Strengths of the current study

Several strengths of this study are worth mentioning. The Agency Scale is designed to capture Seligman's (2021) tripartite model of agency, which is not included in existing measures of agency. The Agency Scale also overcomes the limitations of domain-specific assessment in the current literature. These contributions are significant for advancing the psychology of agency by providing a measure that more comprehensively captures the concept of agency.

Another strength of the Agency Scale is its strong construct validity, as demonstrated by our use of a nationally representative with three timepoints. Our findings of factor and correlational analyses, multiple regression, mediation analyses, mean difference tests, as well as post hoc analyses led to three key conclusions. First, self-efficacy, future-minded planning, and imagination are three distinct but related components of agency. Second, the Agency Scale contains unique explanatory power in predicting conceptually relevant correlates. Third, the Agency Scale predicted perceived progress through unique pathways: while self-efficacy predicted perceived progress through effort, future-minded planning and imagination predicted perceived progress through persistence and generativity, respectively. These findings were consistent with Seligman's (2021) conceptualization of agency. Additionally,

developing the three subscales of the Agency Scale permits the independent investigation of the correlates for each subscale, which is not possible with other existing scales. Thus, the Agency Scale may facilitate the exploration of new research avenues and allow studies to examine the subscales independently according to specific research purposes.

To the best of our knowledge, this study is the first empirical study to utilize a nationally representative sample to examine the relationships between agency and conceptually relevant outcomes. While previous qualitative studies (Seligman, 2021; Zhao et al., 2021) provided insightful theoretical concepts, our quantitative findings provided empirical support for Seligman's (2021) conceptual claims. As the Agency Scale demonstrated measurement invariance across gender and religious denominations in a nationally representative sample, our findings provided some basis for generalization to the larger U.S. population.

The use of a three-wave longitudinal data is also a strength of this study. Cross-sectional approaches are prone to bias and unable to draw casual inferences. However, our use of multiple timepoints to conduct, for example, sequential mediation analyses account for the passage of time between agency and perceived progress, enabling our research to study conceptual claims with a nationally representative sample despite limited resources (Cain et al., 2018).

Limitations and future directions

While this study contributes to the literature on the measurement of agency, several limitations in our study should be noted. First, although the MIDUS data contains a nationally representative sample, the majority (95%) of our participants were White. While we found some evidence for the Agency Scale's measurement invariance based on gender and religious denominations, we did not have a sufficient number of racial (e.g. African Americans), other gender (e.g. transgender and nonbinary people) or other non-Western religious minorities (e.g. Buddhism) regarding their experience of agency. Future research could test the Agency Scale with diverse samples to evaluate model comparisons, psychometric properties, and cross-cultural validity. Such findings would help examine the Agency Scale's measurement equivalence, providing a better understanding of how people from diverse backgrounds experience agency. Second, due to the archival nature of the MIDUS data, our scale development process was limited to existing data and available scale items. For example, we conceptualized generativity as an indicator of innovation. Future research could test to what extent other

existing scales might better capture the facets of agency, such as the Social Innovation Scale (Bulut et al., 2013). Third, although we used three timepoints in our data analyses, such as regression, moderation, and sequential mediation analyses, our use of PROCESS macro was based on observed variables, which possesses problems associated with unaccounted measurement errors in predictors and outcomes (Hayes et al., 2017). Future research could consider applying latent variable measurement models in longitudinal analyses. Finally, as previous studies suggested (e.g. Black, 2016, Cheong et al., 2017, Jääskelä et al., 2017, Polito et al., 2013, Yamashita, 1998), agency can be conceptualized as a domain-specific construct. Future research could adapt the Agency Scale to develop new measures of agency in diverse contexts, such as scientific and technological settings.

Implications and conclusions

This study presents several practical implications. Based on the predictive relations between agency and perceived progress, we encourage positive institutions, such as corporate companies, national organizations, religious systems, sports teams, counseling centers, and schools that aim to grow and prosper, to consider regularly assessing individuals' and groups' agency in order to promote perceived progress. Individuals and groups that seem to struggle with making perceived progress could work with positive psychological practitioners (e.g. mentors, teachers, trainers, educators, coaches, therapists) who can adopt strategies such as applying a growth mindset (perceiving agency as a mindset; Seligman, 2022; Schroder, 2021) or providing encouragement to promote agency (see Wong et al., 2019 on academic self-efficacy). Notably, our findings on the mediation effects shed light on distinct interventions to promote perceived progress. Affirming one's self-efficacy of goal accomplishment could be helpful if the practitioner aims to enhance perceived progress by increasing one's effort, whereas tapping into one's future-time perspective of their goal pursuit could help them persist in goal striving, furthering their perceived progress. If the goal is to promote perceived generative progress, facilitating one's imagination could be beneficial.

In conclusion, we evaluated Seligman's (2021) theory of agency by developing the Agency Scale and testing its psychometric properties. We found evidence for a conceptually meaningful three-factor structure, measurement invariance, internal consistency and test-retest reliability, as well as positive associations with theoretically relevant correlates. We also observed a declining trend in agency and perceived progress in recent three decades. We hope that the Agency Scale will inspire more nuanced and applied research in the psychology of agency. We join Seligman (2021, 2022) to encourage positive psychological scholars and practitioners to focus on promoting perceived progress by enhancing individuals' agency, ultimately advancing our society.

Notes

1. Due to the archival nature of the data, effort was assessed at T2 and T3 only (see Measures section).
2. To clarify, we did not duplicate analyzing the two shared items to avoid biased correlations between the CPS and the SDPS.
3. Only waves 2 (T2) and 3 (T3) of the MIDUS data contain the 6-item Life Orientation Test-Revised (LOT-R; Scheier et al., 1994) that assesses optimism. We transformed its 5-point scale to a 4-point scale using Aiken's (1987) formula and conducted CFAs with the LOT-R to test the three-factor structure of agency at T2 and T3. We found poor model fit to the data at both T2 ($\chi^2(62) = 987.25$, $p < .001$, CFI = .873, RMSEA = .076, SRMR = .063) and T3 ($\chi^2(62) = 975.46$, $p < .001$, CFI = .879, RMSEA = .074, SRMR = .065). Thus, we excluded the LOT-R in the Agency Scale.
4. We also considered a bifactor model of agency. Due to a lack of compelling conceptual justifications (Selbom & Tellegen, 2019), we did not assess a bifactor model.

Disclosure statement

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