Goal pursuit and eudaimonic well-being among university students: Metacognition as the mediator

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ABSTRACT

This study investigated the relationship between goal-striving, goal-aspiration, metacognition, and eudaimonic well-being (EWB). Inspired by Aristotle's teaching, the rationale for this study is that eudaimonic well-being is achievable through self-actualizing processes such as goal-striving and goal-aspiration and by exercise of reason. Goal-striving, metacognition (as a way of exercise of reason), and goal-aspiration (as an indicator of eudaimonic pursuits) were explored in relation to EWB. A mediation analysis of a sample of 513 university students (M_{age} = 25.07, SD = 7.21) indicated that metacognition partially mediated the relationship between goal-striving and EWB for the full sample ($p < .001$) and goal-aspiration moderated this relationship. High goal-aspiration indicated a full mediation while low goal-aspiration indicated only a partial mediation. The finding suggests that metacognition which is a teachable competence and goal-aspiration which is a trainable desire can play a determining role in individuals' self-actualization and EWB.

KEYWORDS: eudaimonic well-being, self-actualization, goal-striving, goal-aspiration, well-being, metacognition, emerging adults, eudaimonia, happiness, goal pursuit, goal orientation

WELL-BEING AND HAPPINESS have been of great import for human beings since ancient times. Scholarly efforts to shed light on these concepts can be traced to Hellenic philosophy when the closely linked concept of *human goods* was of concern. Yet, the route towards a fulfilling life remains complicated and ambiguous; so much so that it may never be clarified entirely. Nevertheless, research conducted with untested new variables could augment our understandings of the path to well-being and happiness. Therefore, the present study investigated some relatively untested possible elements that may help to pave the route to, what may be considered an individual's well-being.

As such, the purpose of this study was to investigate the relationship between goal-pursuit (as a self-actualizing process), metacognition (as an attainable intellectual capacity), and (eudaimonic) well-being. In this attempt, the present study was inspired by Aristotle's teaching in *Nicomachean Ethics* about the human ultimate good and the requirements of living a good life. The concepts of self-actualization and metacognition, as they will be discussed in the conceptual framework, address elements of character and intellect in Aristotle's conception of the human good to some levels. The concept of eudaimonic well-being addresses the concept of a good life at a secondary level and in a personal and subjective sense.

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» THE CONCEPT AND CONCEPTIONS OF HUMAN WELL-BEING

Some of the contemporary conceptual works on human well-being (Ryan et al., 2008; Waterman, 1990A, 1990B) made references to *eudaimonia*. Eudaimonia is a Greek term, which is mainly known by the special attention it received in *Nicomachean Ethics*. Nicomachean Ethics is a collection of lectures of Aristotle, the philosopher of the fourth century BCE The concern with eudaimonism and human goods, however, predates Aristotle (Norton, 1976). The concept of eudaimonia or well-being, in Greek philosophy, is commonly understood as the ultimate good and the purpose of life for human beings. Yet as Aristotle (2004) also acknowledged, people used (and are using) the same term eudaimonia (well-being or happiness) with different conceptions in mind. Thus, ancient and contemporary philosophers are also not exempt from representing varying conceptions of the ultimate good.

For instance, there is a conception of the ultimate good, pioneered by Aristippus in the third century BCE, that favors pleasure and feeling good (i.e., hedonic enjoyment) over any other goods (Tatarkiewicz, 1976). In the modern literature, there is another conception of well-being, namely, hedonic or subjective well-being. It is different from hedonic enjoyment or pleasure in that its concept commonly includes the cognitive judgment of satisfaction with life in addition to positive affect and negative affect (Andrews & Withey, 1976; Deci & Ryan, 2008; Diener, 1984; Diener, Suh, Lucas, & Smith, 1999).

On the other hand, Aristotle (2004) gave a very objective account of human well-being arguing that eudaimonia is the highest, the noblest, and the most complete of all goods, which is a contemplative activity of the soul. Because he was concerned with the good of the society, he noted that contemplative work, the greatest good for an individual human, needed to be manifested in practice if it was to influence the society. Therefore, his work was more focused on being a *good human,* who also has a happy well-lived life as a secondary eudaimonic life compared to a wise human. This secondary eudaimonic life, he argued, was at its best the life of a practical wise person who lived and acted in accordance with both virtues of character (e.g., courage, honesty) and intellect (i.e., judgment, wisdom). He also argued that virtues of intellect are achievable mainly through education and exercise of reason, and virtues of character were attainable mainly by habituation and training. This quality, of living well and acting well, needed to be deliberately pursued and desired and chosen for its own sake and for nothing else.

Moreover, there is another conception of eudaimonia that focuses on *daimon* as the true self and interprets eu-daimon-ia (*eu* means well) as living in accordance with the true self. This translates *o* knowing and living in truth to one's true self through actualizing one's own innate strength or potential excellence (Norton, 1976). This is the conception that has driven contemporary eudaimonic approaches in the conceptualization of human well-being (e.g., Ryan, Huta, & Deci, 2008; Seligman, 2002; Waterman, 1990A). Waterman (1990A, 1990B) was primarily guided by Norton's (1976) contemporary representation of eudaimonism and influenced by the work of other contemporary philosophers (e.g., Kraut, 1979; Telfer, 1980). He presented the concept of *eudaimonic well-being* as an individualistic and subjective account of eudaimonia. He argued that this subjective account of eudaimonia was more practical in the realm of psychological science than that of Aristotle. He, in line with Norton (1976), argued that the concept of ultimate good involved actualizing those potentialities which represent the true self (i.e., the best that one is capable of being) unique to each individual person.

Conceptual framework

Being concerned with individuals' well-being in terms of being-the-best-one-can-be, the authors of the present study are interested in the human good that involves one striving for his/her own best that s/he is capable of being. This conception of well-being, which is more in line with Waterman's (1990A, 1993), involves actualizing one's capabilities, capacities, and competences in talent-related, skill-related, character-related, and intellectual pursuits and any other growth-related goal-oriented efforts. This conception of well-being suggests that well-being represents a life which involves self-actualization as

> *ongoing actualization of potentials, capacities, and talents, as fulfillment of mission (or call, fate, destiny, or vocation), as a fuller knowledge of , and acceptance of, the person's own intrinsic nature, as an increasing trend toward unity, integration, or synergy within the person. (Maslow, 1968, p. 25)*

A review of related conceptual literature (e.g., Maslow, 1968; Rogers, 1951, 1961; Ryan et al., 2008; Seligman, 2002; Waterman, 1990A, 1990B) also suggested that a conceptual link between well-being and self-actualizing efforts was implied by the literature. However, the nature of this relationship and, in fact, whether or not they are two distinct phenomena, is rather ambiguous in the existing literature. Some assistance from Aristotle's teaching may shed light on this issue.

Although this study is concerned with eudaimonic well-being, which is significantly different from Aristotle's eudaimonia in several ways (see Waterman 1990A for detailed discussion), the authors tried to have considerations of the Aristotelean eudaimonic view in their conceptualization and operational definitions of the concepts that are hypothesized as antecedents to eudaimonic well-being. The gist of Aristotle's (2004) teaching, as evidently presented in the last three chapters of *Nicomachean Ethics*, is that achieving excellence in intellect is superior to other kinds of achievement in terms of what is conceptually the best in and for humans. But, again, he argued that practically what is best for us is excellence in both character and intellect; he stated that this practically good life is happy/well-lived, but it represents eudaimonia in a secondary way.

We may logically argue that these concluding remarks from Aristotle implies that any kind of *human* characteristic activity contributes to one's well-being at some level (not the highest level though) depending on the level of character and intellect at which the respective characteristic activity is being performed. Following the same line of argument as Aristotle's (2004), only at a subjective and secondary level however, the less ideal yet fulfilling life (i.e., eudaimonic well-being) may be attained if we live and act in accordance with the bests of our personal goals through exercise of reason and rational choice. These personal goals may be talent-related, skill-related, health-related, relationship-related, and so on. We argue that eudaimonia might be achieved by living and acting in accordance with virtue of character and intellect through exercise of "goal-directed reason" (representing intellect; p. 104) and rational choice (representing character and intellect; p.104). We also argue that any of these can be accomplished at differing levels. With different levels of (right) rational choice, we will have different levels of goal-aspiration. Similarly, with different levels of exercise of reason, we will have different levels of performance in our goal-striving, and thus we will have different levels of eudaimonic well-being.

Relying on the above argument, the conceptual framework set forth in the present study conceptualizes self-actualization as a goal-oriented process. This goal-oriented process involves both goal-aspiration and goal-striving and eudaimonic well-being as a quality of life which is a concurrent outcome of this process. Further, we argue that metacognition, as an attainable intellectual capability and a way of exercise of goal-oriented reason, is essential for setting self-actualizing needs and goals and for facilitating the regulation of personal efforts towards those goals. That is, metacognition, which is primarily known as cognition about cognitive processes (Flavell, 1979; Lin & Zabrucky, 1998; McCromick, 2003), can serve the purpose of self-actualization by helping self-actualizing goal-setting and goal-striving. Thus, we also argue that, as

an overarching construct, metacognition can be hypothesized to mediate the relationship between self-actualizing variables (i.e., goal-aspiration and goal-striving) and eudaimonic well-being.

Eudaimonic well-being and self-actualization

Eudaimonic well-being has been operationally defined by Waterman et al. (2010) based on a contemporary account of eudaimonia. This account was significantly different from that of Aristotle's (see Waterman, 1990a). They introduced the concept of personal expressiveness as a quality that represents eudaimonic aspects of well-being and as a signifier of self-realization and optimal human functioning. Expressiveness occurs when individuals engage in actions which are in the direction of discovering and developing their potentials and oriented towards achieving their personal goals while adding meaning to their lives (Waterman et al. 2010). Thus, eudaimonic well-being is centered on personal expressiveness in the form of engagement and meaning in life. Engagement and meaning were also highlighted by Peterson, Park, and Seligman (2005) as two of the three routes to happiness (the third being pursuing pleasure [i.e., hedonic well-being]) and as eudaimonic aspects of a *full* life.

Eudaimonic well-being requires living an engaged and meaningful life. To acquire and maintain this lifestyle, human individuals need to be attuned to their inner self. They also need to continuously actualize their characteristic activities, the potentials actualizing which make them who they willingly wish to be. The term self-actualization seems to be the most plausible terminology to describe this fulfilling mindset and lifestyle. A review of literature on self-actualization indicated that the term self-actualization has been considered to imply similar connotations as do concepts such as maturation, full humanness, and ultimate being (Maslow, 1968) or full functionality (Rogers, 1951). However, research literature has loosely defined and used the term self-actualization. For instance, Kerr (1991) viewed self-actualization as *challenging the limits of intellectual potentials* to use the intellectual gifts to the fullest. He, however, reduced its operational definition to *receiving advanced academic degrees or prestigious jobs* (Kerr, 1985). Reis and his colleagues (Reis & Callahan, 1989; Walker, Reis & Leonard, 1992) considered it *the achievement in recognized fields of endeavor* such as in the areas of National Merit semi-finalists, patents, the United States Senate, and the Supreme Court.

Self-actualization: a goal-oriented process

Although the contemporary literature has not yet come to a consensus to operationalize the concept of (self-)actualization, Rule (1991) suggested a new approach to both conceptually and operationally defining the concept. Challenging the traditional view of self-actualization (e.g., Jones & Crandall, 1986; Shostrom, 1964) which was merely personality-oriented, Rule (1991) proposed self-actualization as a goal-oriented process. He argued that actualization denotes the process of growth, change, unfolding, developing, and transcending which manifests itself in personal goals people pursue (Rule, 1991, p.252). Human beings are growth oriented as much as they are goal-oriented. In fact, growth or self-actualization is the goal for the self (Rule, 1991). Rule's conceptualization of self-actualization implies that the quality of striving for personal goals

is a reflection of one's effort in the process of self-actualization. Accordingly, the present study considered striving for personal goals a self-actualizing process and hypothesized that personal goal-striving predicts eudaimonic well-being.

From Aristotle's (2004) teaching, the aim and the means of a good life need to be driven by the right reason. That is the aim and actions should be in accordance with the virtues of character and intellect. Similarly, the aim needs not be chosen for the sake of anything else but its own sake and because it is worth pursuing in itself and it is good by itself. It is also desired, pleasant, valued, and worthy of choice to a good person and to human beings in general. Thus, the self-actualizing goals also need to fulfill certain qualities to be eudaimonic. These qualities are also emphasized by contemporary eudaimonist scholars. Accordingly in this study, self-actualization was defined as pursuing and striving to achieve self-actualizing goals which are

a) inspired by eudaimonic and intrinsic aspirations (e.g., self-acceptance, relatedness, & helpfulness; Kasser & Ryan, 1996);

b) personally valuable and bring joy and pleasure to one rather than being imposed by other people or pursued to avoid negative feelings such as guilt or shame (i.e., self-concordant goals; Ryan & Connell, 1989; Sheldon, 2004);

c) pursued because they are good by themselves not because they are the means to achieve other goals (i.e., constitutive vs. instrumental goal orientations; Fowers, Mollica, & Procacci, 2010);

d) intrinsically worthwhile to human beings (i.e., virtuous; Ryan et al. 2008; Seligman, 2002); and

e) personally expressive (Waterman et al., 2010).

The variable goal-aspiration was conceptualized and measured to capture the range of these qualities. It was also investigated as a moderator in relation to goal-striving in predicting eudaimonic well-being.

Metacognition

There are some external and internal requirements for an effective goal pursuit to be taken place. The internal requirements may include emotional, cognitive or any other intrapersonal skills and the external requirements may take in any environmental factor from the physical environment to social interactions and skills. In this study, the authors focused on internal requirements for goal-striving and among them especially on cognition and metacognition. Metacognition, by definition, is *cognition about cognitive processes* (Flavell, 1979; Lin & Zabrucky, 1998; McCromick, 2003) and involves metacognitive knowledge and metacognitive regulation (Brown 1977, 1987). Metacognition is a trainable capacity and can be taught by teaching about how the brain works and as a set of regulatory skills and strategies (Borkowski & Muthukrishna, 1992; Gaskins & Pressley, 2007). The capacity of metacognition as a teachable and attainable skill for goal-setting and goal pursuit made it a proper candidate for a way of exercise of goal-oriented reason and, thus, to serve the purpose of this study.

In the metacognition framework, supplying the mind with personalized goals, tasks, and action plans could be referred to as *goal-setting* and *planning*. Goal-setting has been identified as one of the key functions of metacognition (Tarricone, 2011). Goal-setting, planning, and strategy-adjustment during a deliberate problem-solving situation, which equips people for their personal striving, are considered metacognitive regulatory skills (Brown, 1987; Tarricone, 2011) and involve both monitoring and control functions of the brain. Goal-Striving requires a combination of regulatory processes: *monitoring* the situation, identifying the problem or defining a personal project, setting goals and sub-goals to overcome the problem or accomplish the project, and *controlling* the actions or strategies being used. All these metacognitive regulatory skills in order to function require metacognitive knowledge including knowledge of strategies and knowledge of metacognitive processes involved. Metacognitive knowledge is a form of self-awareness (Brown, 1977; Brown & Smiley, 1977) which informs the regulatory processes (Tarricone, 2011).

Altogether, metacognition is characterized as an interacting combination of knowledge and skills, that involves monitoring and control processes during a deliberate problem-solving situation. In this study, metacognition was theoretically identified as a supporting factor for high quality personal striving and thus hypothesized to have a mediational effect in the relationship between goal-striving and well-being. The speculation is that metacognition could be a potential intrapersonal mediator for goal-striving in enhancing eudaimonic well-being.

For instance, assume that we have developing and maintaining a good relationship with our friends as a self-actualizing goal. Metacognition, as a way of exercise of reason, has been argued to help with identifying the problems or obstacles at the time or what can be improved. We can set the identified problems as sub-goals and tasks of metacognition and look for strategies that offer a solution to our problems (e.g., being more appreciative). Then, we try and switch from one strategy to another (e.g., being more kind when she needed you) if the first strategy is not working. One also has to be conscious and decisive about the goals and think about the next strategy to get closer to the goals (in this case, our friends). Thus, the goal of metacognition is to be mindful about our self-actualizing goals. Our eudaimonic well-being was hypothesized to be enhanced as much as we find our personal pursuits meaningful and engaging.

» RESEARCH QUESTION

This study explored the relationships among eudaimonic well-being, goal-striving and goal-aspirations (as two self-actualization variables), and metacognition. The main research question was: Does metacognition fully mediate the relationship between goal-striving and eudaimonic well-being? The secondary research question was: Does goal-aspiration moderate this mediational effect? To answer these questions the

following hypotheses were tested: *(1)* Goal-striving will significantly and positively predict eudaimonic well-being; *(2)* Goal-Striving will significantly and positively predict general metacognitive competence; *(3)* Metacognition will significantly and positively predict eudaimonic well-being; *(4)* Goal-striving will not significantly predict eudaimonic well-being over and above metacognition; *(5)* The indirect effect of goal-striving (through metacognition) on eudaimonic well-being will be significantly different from zero *(6)* Goal-aspiration will moderate the relationship between goal-striving and eudaimonic well-being, *(7)* Goal-aspiration will moderate the mediated relationship between goal-striving and eudaimonic well-being where metacognition is the mediator.

» METHOD

The present study was part of a larger research study exploring the nature and antecedents of eudaimonic well-being. For data collection, a battery of paper-and-pencil questionnaires were administered in a university setting using measures of well-being, general metacognitive competence, goal-striving, goal-aspiration, and demographic variables.

Participants

The participants were 513 undergraduate ($n = 370$) and graduate students ($n = 143$) ranging in age from 17 to 60 years-of-age ($M = 25.07$, $SD = 7.21$) from a public research university in South Florida, USA. Approximately 83% were emerging adults ($n = 428$, between 17 and 29 years of age; 30 years of age being the turning point towards more demographic stability; Arnett, 2000; Rindfuss, 1991) and 16.6% were adults ($n = 85$, at or above 30 years of age). Hispanics comprised 64.3% of the sample ($n = 330$); 64.3% was female ($n = 330$), and 17.3% of the participants were married ($n = 89$). Almost 60% of the sample consisted of education students; 39.2% were students representing a wide range of other majors (i.e., science, engineering, and international relations). Table 1 displays the demographic data.

Table 1. frequency table of demographic variables ($N = 513$)

variables	freq.	%
age		
emerging-adult (17–29)	428	83.4
adults (30–60)	85	16.6
gender		
male	183	35.7
female	330	64.3
marital status		
married	89	17.3
single	424	82.7
level of education		
graduate	143	27.9
undergraduate	370	72.1
major		
education	312	60.8
non-education	201	39.2
ethnicity		
hispanic	330	64.3
non-hispanic	183	35.7

Research measures

The measure of eudaimonic well-being (MEWB) Eudaimonic Well-Being (EWB) was measured using a 20-item modified version of the Questionnaire for Eudaimonic Well-Being (QEWB; Waterman et al., 2010) scale and 7 items from the 28-item Life-Regard Index-Revised (LRI-R; Debats, 1998) on a 5-point Likert scale (0 being *Strongly Disagree* and 4 being *Strongly Agree*). Due to changes made to QEWB and addition of items from LRI-R to the measure, the preliminary validity of the new measure of eudaimonic well-being was tested using exploratory factor analysis (EFA). Items which did not load on any of the factors (i.e., Meaning and Pleasure of Engagement factors) by factor coefficients at or above .30 were not included in the measurement (Tabachnick & Fidell, 2007). From the total of 28 items only 21 were retained, which made up the

new Measure of Eudaimonic Well-Being (MEWB). Cronbach's alpha for the new, overall 21-item MEWB was .89 (for the two subscales: 14-item Meaning in Life α = .90, 7-item Pleasure of Engagement α = .70). The final EWB score was computed by summing the 21 item scores (M = 61.52, SD = 12.24).

The measure of general metacognitive competence (MGMC)
Metacognition (MC) was operationalized as general metacognitive competence using a modified version of the 52-item Metacognitive Awareness Inventory (MAI; Schraw & Dennison, 1994). For the purpose of this study, four items were removed. Wording of some items were revised to reflect *general* problem-solving situations rather than learning situations merely focused on studying for a class or test. Due to the modifications to the measure and based on the recommendation of the authors of the MAI, a preliminary validity analysis (EFA) was conducted, which yielded a new scale which we will call the Measure of General Metacognitive Competence (MGMC). As a result of exploratory factor analysis, 46 items were retained on this new measure using the cut-off point of ≥.30 for factor coefficients (26 items for Regulation of Cognition and 20 items for Knowledge of Cognition). Final MC scores were computed summing the item-ratings on the 46 items (M = 339.14, SD = 5.49). Cronbach's alpha for the overall measure (46 items) was .96 (for the subscales: Regulation of Cognition α = .94, and for Knowledge of Cognition α = .92). The items were rated on an 11-point Likert-Scale from 0 to 10 based on the extent to which they were true for each participant (0 being *not at all*, 5 being *half of the time*, and 10 being *all of the time*).

Measures for self-actualization variables
Self-actualization was measured in two ways; that is, goal striving and goal aspirations. First, participants were instructed to list five personal goals:

> *Please think of your personal projects you want to accomplish, your goals you are concerned about when planning for your future, and goals that inspire you in your everyday life. Personal goals might involve various life areas, as for example study, family, friends, your own personal growth, leisure time, health, jobs, housing conditions, etc. Focus on long-term goals (e.g., to improve the relationship with a friend) rather than on single behavioral acts or short-term pursuits (e.g., to buy a present for a friend next week).*

Then participants were asked to rate and answer questions for each goal about their goal-striving and aspirations on a 7-point Likert scale.

The measure of goal-striving (MGS). Goal-striving (GS) as an actualizing process was measured through self-rating of six items about

a) Importance (one item from Emmons's (1999) Striving Assessment Scale);

b) Effort (one item from Emmons's (1999) Striving Assessment Scale);

c) Clarity (two items from Robitschek's (1998) Personal Growth Initiative Scale); and

d) Inspiration (two items; Milyavskaya et al., 2012) in regard to each goal.

Participants rated the extent to which each of six statements described them from 1 to 7 (1 being *not at all*, 4 being *moderately*, and 7 being *very much*). Cronbach's alpha for the MGS was .91. Scores were summed on these six items for each goal and total scores for goal-striving were obtained averaging goal-striving scores across the five goals (M = 33.65, SD = 4.20).

The measure of goal-aspiration (MGA). To preliminarily reflect both Aristotle's eudaimonic view and contemporary views of eudaimonic living in personal goal pursuits, the authors used 15 items (partly adopted, partly developed) representing the eudaimonic values presented in the conceptual framework to measure goal aspiration (GA) Participants were asked, for instance, to what extent they pursued each goal: "*because it is good by itself*" (a constitutive orientation), "*because it makes you a better person*" (a subjective eudaimonic orientation),"*because it makes you look better among your friends, family, or other people in general*" (an extrinsic aspiration), "*because it makes you use and build upon your potentials*" (a personal expressiveness orientation), "*because it makes you learn new things about yourself and/or the world*" (an intellect orientation), " *because it makes other people's lives better*" (a character orientation), "*Because you endorse it freely and value it wholeheartedly*" (an intrinsic aspiration; as in Ryan and Connell's (1989) locus of causality). They rated the statements from 1 to 7 (1 being *not at all for this reason* and 7 being *very much for this reason*).

A preliminary validity study of this measure, as expected, indicated two factors: Extrinsic aspirations (6 items) and Actualizing Aspirations (9 items). Cronbach's alpha for the 15-item MGA was .70 (for Extrinsic Aspiration α = .88, and for Actualizing Aspirations α = .87). Items representing Extrinsic Aspiration (i.e., image, fame, popularity, and money) were reverse coded, so high scores indicated low extrinsic motivation and vice versa. Scores on all items were summed for each goal and were averaged across the five goals to obtain the overall GA score (M = 78.36, SD = 9.06).

» PROCEDURE
Two steps were taken to answer the research questions related to the mediation model: *(1)* Baron and Kenny's (1986) method; and *(2)* Shrout and Bolger's (2002) Bootstrap Procedure. The first four hypotheses in essence followed the four Baron and Kinney (1986) steps for testing mediation models, with the exception that the authors included control variables in testing each hypothesis. Thus, a General Linear Regression approach (GLM) was used. Shrout and Bolger's (2002) Bootstrap Procedure using structural equation modeling (SEM) was taken to test the mediation model and to specify the indirect effect of goal-striving on eudaimonic well-being. Shrout and Bolger's (2002) Bootstrap Procedure has no assumption of normality (Efron & Tibshirani, 1993; Mooney & Duval, 1993) and has been shown to yield higher statistical power for small or moderate sample size than Baron and Kenney's (1986) method (MacKinnon et al., 2002). GLM was also used to test Hypothesis 6. The moderated mediation in Hypothesis 7 was tested using a multigroup approach in SEM (see Ng et al.)

Table 2. zero-order correlation coefficients for well-being variables, goal-striving, and general metacognitive competence ($N = 513$)

variables	EWB	GS	GA	GMC
EWB	1.00	—	—	—
GS	0.35*	1.00	—	—
GA	0.36*	0.44*	1.00	—
MC	0.56*	0.36*	0.27*	1.00

Note. SWB = subjective well-being; EWB = eudaimonic well-being; GS = goal-striving; GA = goal-aspiration; GMC = general metacognitive competence. * $p < 0.001$, one-tailed.

Pre-analyses

Before proceeding with hypothesis testing, the preliminary correlational analysis showed that all variables were positively and significantly correlated as predicted (see Table 2), with correlation coefficients ranging from .27 to .56. The homogeneity of regression slopes test (McNeil, Newman, & Fraas, 2012) for the full sample also indicated that in predicting EWB, there was no interaction between Metacognition and Goal-Striving, $F(1, 509) = 1.036$, $B = -.002$, $\beta = -.413$, $p = .31$, Metacognition and Goal-Aspiration, $F(1, 509) = .771$, $B = .001$, $\beta = .364$, $p = .38$, and Goal-Aspiration and Goal-Striving, $F(1, 509) = 3.229$, $B = -.021$, $\beta = -.908$, $p = .07$.

Furthermore, to be able to account for demographic variable effects in the subsequent analyses, the possible differentiating demographic effects on the research variables were examined using the GLM approach taking all the demographic variables and their two-way interactions into account. Students' age group, major, and gender were detected to have differentiating effect on variables of interest. However, no interaction effect was detected. Emerging adults scored significantly lower on eudaimonic well-being and metacognition compared to adults, respectively $B = -5.28$, $\beta = -.16$, $p < .001$ and $B = -20.76$, $\beta = -.14$, $p < .05$. The mean EWB score was 66.92 ($SD = 10.98$) for adults and 60.45 ($SD = 12.21$) for emerging adults; the mean GMC score was 356.46 ($SD = 51.51$) for adults and 335.70 ($SD = 55.67$) for emerging adults. In general, education students scored significantly higher on eudaimonic well-being, goal-striving, and goal-aspiration as compared to non-education students, respectively $B = 4.37$, $\beta = .17$, $p < .001$, $B = 1.55$, $\beta = .18$, $p < .001$, and $B = 2.29$, $\beta = .12$, $p < .01$. The mean EWB score was 63.56 ($SD = 12.06$) for education students and 58.36 ($SD = 11.88$) for non-education students. The mean GS score was 34.41 ($SD = 3.89$) for education students and 32.48 ($SD = 4.39$) for non-education students. The mean GA score was 79.57 ($SD = 9.16$) for education students and 76.47 ($SD = 8.57$) for non-education students. Further, males scored significantly lower on goal-striving and goal-aspiration compared to females, respectively $B = -1.05$, $\beta = -.12$, $p < .05$ ($M = 32.61$, $SD = 4.59$ for males and $M = 34.23$, $SD = 3.85$ for females) and $B = -2.29$, $\beta = -.12$, $p < .01$ ($M = 76.34$, $SD = 9.46$ for males and $M = 79.48$, $SD = 8.64$ for females). The final models that included the important demographic variables are presented in Table 3.

Based on these findings, in addition to testing the hypothesis on the full sample, the sample was split into two independent sub-samples by each respective demographic variable (i.e., gender, major, and age group); that is, three sets of two independent sub-samples, and the hypotheses were tested on each sub-sample to examine if we could find support for each hypothesis despite demographic differences. While dividing the sample by one demographic variable, the remaining demographic variables were used as control variables in testing the hypotheses as appropriate. Table 4 displays means and standard deviations for the variables of interest in the full sample and within each sub-sample. However, being mindful of space considerations, the results of the sub-sample analyses were reported only if they deviated from that of the full sample analyses.

Hypotheses testing and results

Hypothesis 1

Hypothesis 1 states that Goal-Striving positively and significantly predicts EWB. In the full sample, the GLM approach indicated that Goal-Striving explained 10.1% of variance in EWB, $F(1, 509) = 61.887$, $B = .95$, $\beta = .33$, $p < .001$, over and above age group and major of study which together accounted for 6.8% of variance in EWB. The regression coefficient also indicated that for every 1 SD change in Goal-Striving, EWB changes by .33 SD. Further, the analyses for the sub-samples also yielded similar results in support of Hypothesis 1. The unique contribution of goal-striving to eudaimonic well-being was the smallest for adults (5.6% of the variance) and was the greatest for males (14.1% of the variance). Overall, Hypothesis 1 was supported for all sub-samples as well as the full sample indicating a significant positive relationship between goal-striving and eudaimonic well-being.

Table 3. summary of GLM predicting eudaimonic well-being, metacognition, goal-striving, and goal-aspiration from demographic variables ($N = 513$)

variables	B	β	R^2	$\bar{R}^2$	ΔF	df_1	df_2
eudaimonic well-being							
age group	−5.280†	−0.161	—	—	—	—	—
major	4.368†	0.174	—	—	—	—	—
overall model	—	—	0.068	0.064	18.538†	2	510
metacognition							
age group	−20.759*	−0.139	—	—	—	—	—
overall model	—	—	0.019	0.017	10.100*	1	511
goal-striving							
gender	−1.049*	−0.120	—	—	—	—	—
major	1.549†	0.180	—	—	—	—	—
overall model	—	—	0.063	0.059	17.006†	2	510
goal-aspiration							
gender	−2.293*	−0.121	—	—	—	—	—
major	2.286*	0.123	—	—	—	—	—
overall model	—	—	0.041	0.037	10.838†	2	510

Note. $\bar{R}^2$ = adjusted R-squared; ΔF = change in F. * $p < 0.01$; † $p < 0.001$.

Hypothesis 2

Hypothesis 2 states that Goal-Striving positively and significantly predicts metacognition. In the full sample, the GLM approach indicated that Goal-Striving explained 13.1% of variance in Metacognition, $F(1, 510) = 78.43$, $B = 4.78$, $\beta = .36$, $p < .001$, over and above age group which accounted for 1.9% of variance in MC. The regression coefficient also indicated that for every 1 SD change in Goal-Striving, MC changes by .36 SD. Further, the analyses for the sub-samples also yielded similar results in support of Hypothesis 2. The contribution of goal-striving to metacognition was the greatest for males (19.8% of the variance) and was the smallest for females as well as education students (10% of the variance). Overall, Hypothesis 2 was supported for all sub-samples as well as the full sample indicating a significant positive relationship between goal-striving and Metacognition.

Hypothesis 3

Hypothesis 3 states that metacognition positively and significantly predicts eudaimonic well-being. In the full sample, the GLM approach indicated that metacognition explained 28.1% of variance in eudaimonic well-being, $F(1, 509) = 219.63$, $B = .118$, $\beta = .54$, $p < .001$, over and above age group and education which together accounted for 6.8% of variance in EWB. The regression coefficient also indicated that for every 1 SD change in MC, EWB changes by .54 SD. In addition, the analyses for the sub-samples also yielded similar results in support of Hypothesis 3. The unique contribution of metacognition to EWB was the greatest for non-education students (31% of the variance) and closely followed by males (30.8%) and was the smallest for females (27.3% of variance) as well as education students (27.6% of the variance). Overall, Hypothesis 3 was supported for all sub-samples as well as the full sample indicating a significant positive relationship between metacognition and eudaimonic well-being.

Hypothesis 4

Hypothesis 4 states that goal-striving does not significantly predict eudaimonic well-being over and above metacognition. In the full sample, the GLM approach indicated that goal-striving still significantly explained 1.8% of variance in eudaimonic well-being, $F(1, 508) = 14.59$, $B = .43$, $\beta = .15$, $p < .001$, when controlling for the effect of metacognition, $F(1, 509) = 219.63$, $\Delta R^2 = .281$, $R^2 = .349$, adjusted $R^2 = .345$, $B = .107$, $\beta = .48$, $p < .001$. The regression coefficient also indicated that for every 1 SD change in GS, EWB changes by .15 SD. The results for the sub-samples are presented in Table 5.

Although the unique contribution of goal-striving to EWB substantially dropped after controlling for metacognition (the mediator) indicating partial mediation, a full mediation was not supported for the full sample and for any of sub-samples except for adults, $F(1, 81) = .555$, $\Delta R^2 = .004$, $B = .17$, $\beta = .07$, $p = .46$. The

Table 4. means and standard deviations for eudaimonic well-being (EWB), metacognition (MC), goal-striving (GS), and goal-aspiration (GA) for the full sample and for sub-samples

	variables of interest							
	EWB		MC		GS		GA	
(sub-)samples	M	SD	M	SD	M	SD	M	SD
male (*n* = 183)	59.84	12.46	337.31	53.48	32.61	4.59	76.34	9.46
female (*n* = 330)	62.46	12.04	340.15	56.63	34.23	3.85	79.48	8.64
significant mean differences	no		no		yes		yes	
education (*n* = 312)	63.56	12.06	342.78	55.59	34.41	3.89	79.57	9.17
non-education (*n* = 201)	58.36	11.88	333.48	55.00	32.48	4.39	76.47	8.57
significant mean differences	yes		no		yes		yes	
adult (*n* = 85)	66.92	10.98	356.46	51.51	33.76	4.35	80.10	9.48
emerging adults (*n* = 428)	60.45	12.21	335.70	55.67	33.63	4.17	78.01	8.94
significant mean differences	yes		yes		no		no	
full sample (*N* = 513)	61.52	12.24	339.14	55.49	33.65	4.20	78.36	9.06

reduction in ΔR^2 was the greatest for males (.118) and followed closely by non-education students (.113) and, was the smallest for adults (.058), though there was a full mediation. That is that in adults the whole variance explained by GS in EWB was accounted for by their metacognition. Overall, Hypothesis 4 was only supported for the subsample of adults.

Hypothesis 5

Hypothesis 5 states that the indirect effect of goal-striving on eudaimonic well-being (i.e., the contribution of goal-striving to eudaimonic well-being through metacognition) is significant. The indirect effect of the independent variable on the dependent variable through the mediator, in this case the indirect effect of Goal-Striving on EWB through Metacognition, is known as the index of mediation. AMOS 18.0 was used to test the mediation model and to indicate the significance of the indirect effect. For the full sample and for each subsample, important demographic variables (i.e., age group, major, and gender) were entered into the models as appropriate. All models were investigated for model fit using global and focused fit indices (i.e., chi-square, the Root Mean Square Error of Approximation, the *p* value for the close fit, the Comparative Fit Index, the Standardized Root Mean Residual, the standardized residual covariance, and modification indices), and fit indices indicated good fit for all models. Using AMOS 18.0 for Shrout and Bolger's (2002) Bootstrap procedure, the researchers requested 5000 bootstrap samples with 95% confidence interval (bias-corrected percentile method). The result for the mediation index is presented in Table 6.

The results indicated that the indirect effect of Goal-Striving on EWB (i.e., the mediational effect) was statistically significant for the full sample and for all sub-samples. For instance, the results for the full sample was $B = .5094$ (95% CI [.3799, .6672]), $\beta = .1748$ (95% CI [.1317, .2236]), $p < 0.001$. That is, on average for every 1 SD positive change in Goal-Striving, EWB changes by .17 SD. This model explained a total variance of 36% in EWB. For Adults, $B = .4965$ (95% CI [.1761, .9228]), $\beta = .2007$ (95% CI [0.0754, 0.3572]), $p < 0.001$, and for emerging adults, $B = .5078$ (95% CI [.3721, .6721]), $\beta = .1730$ (95% CI [.1291, .2261]), $p < 0.001$,

Table 5. summary of general linear model predicting eudaimonic well-being from goal-striving while controlling for metacognition

variable	eudaimonic well-being				
full sample (N = 513)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
age group and major (block 1)	—	0.068	18.538	2	510
metacognition	0.483¶	—	—	—	—
block 2	—	0.281	219.63¶	1	509
goal-striving	0.149¶	—	—	—	—
block 3	—	0.018	14.593¶	1	508
total R² = 0.367, R̄² = 0.362					
female (n = 330)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
age group and major (block 1)	—	0.071	12.586¶	2	327
metacognition	0.490¶	—	—	—	—
block 2	—	0.273	135.78¶	1	326
goal-striving	0.122†	—	—	—	—
block 3	—	0.013	6.560†	1	325
total R² = 0.357, R̄² = 0.350					
male (n = 183)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
age group and major (block 1)	—	0.044	4.157†	2	180
metacognition	0.491¶	—	—	—	—
block 2	—	0.308	85.22¶	1	179
goal-striving	0.171†	—	—	—	—
block 3	—	0.023	6.567†	1	178
total R² = 0.375, R̄² = 0.361					
non-education students (n = 201)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
age group (block 1)	—	0.000	0.015	1	199
metacognition	0.491¶	—	—	—	—
block 2	—	0.310	89.14¶	1	198
goal-striving	0.157†	—	—	—	—
block 3	—	0.020	5.965†	1	197
total R² = 0.331, R̄² = 0.321					
education students (n = 312)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
age group (block 1)	—	0.050	16.40¶	1	310
metacognition	0.488¶	—	—	—	—
block 2	—	0.276	126.38¶	1	309
goal-striving	0.144‡	—	—	—	—
block 3	—	0.019	8.694‡	1	308
total R² = 0.344, R̄² = 0.338					
adults (n = 85)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
major (block 1)	—	0.111	10.343‡	1	83
metacognition	0.541¶	—	—	—	—
block 2	—	0.294	40.510¶	1	82
goal-striving	0.068	—	—	—	—
block 3	—	0.004	0.555	1	81
total R² = 0.409, R̄² = 0.387					
emerging adults (n = 428)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
major (block 1)	—	0.023	10.236‡	1	426
metacognition	0.474¶	—	—	—	—
block 2	—	0.287	176.55¶	1	425
goal-striving	0.170¶	—	—	—	—
block 3	—	0.023	14.884¶	1	424
total R² = 0.333, R̄² = 0.329					

* The standardized regression coefficients are reported from the overall model and only for the main variables. † $p < 0.05$; ‡ $p < 0.01$; ¶ $p < 0.001$.

indicating a significant mediational effects. That is, on average for every 1 SD positive change in Goal-Striving, EWB changes by .20 SD for adults and by .17 SD for emerging adults. The mediational model explained a total variance of 38% in EWB of adults and 34% in EWB of emerging adults. Overall, the result of bootstrap procedure supported the mediational effect of metacognition in the relationship between goal-striving and eudaimonic well-being. This mediational effect was partial for all sub-samples except for sub-samples of adults. For adults, the mediational model showed a greater effect size and indicated a full mediation.

Mediated variance
To illustrate an approximation of the unique mediational contribution of goal-striving (GS) to eudaimonic well-being (EWB) through metacognition (MC), the estimates of R-Squared Change for the unique contribution of GS to EWB before and after controlling for MC was subtracted from each other ($\Delta R^2_{without\ mediator} - \Delta R^2_{with\ mediator}$). The result, presented in Table 7, indicates the proportion of variance in EWB accounted for by mediation or, in other words, the mediated variance shared by the three variables. The results indicated that the mediated variance was 8.3% for the full sample. The greatest mediated variance was detected for males (11.8%) closely followed by non-education students (11.3%), and it was the smallest for adults (5.8%).

Hypothesis 6
Hypothesis 6 states that goal-aspiration (GA) moderates the relationship between goal-striving (GS) and eudaimonic well-being (EWB). To produce the interaction term, scores on goal-striving and goal-aspiration were standardized to avoid possible multicollinearity problems (Stevens, 2002). In the full sample, the GLM approach indicated that the interaction between GS and GA, which reflects the moderation effect, accounted for a small yet statistically significant percentage of variance in EWB, $F(1, 507) = 4.120$, $\Delta R^2 = .006$, $R^2 = .219$, $adjusted\ R^2 = .212$, $B = -.87$, $\beta = -.08$, $p < .05$. Similar results, with a slightly larger effect size, were observed for adults, $F(1, 80) = 4.53$, $\Delta R^2 = .044$, $R^2 = .218$, $adjusted\ R^2 = .179$, $B = -1.93$, $\beta = -.21$, $p < .05$, but not for emerging adults or any of the other subsamples. The results are presented in Table 8. Therefore, Hypothesis 6 was supported for the full sample and for the sub-sample of adults only.

Moderating effect of goal-aspiration
To plot the interaction, the regression analysis was rerun using the dichotomous GA and standardized scores for GS to obtain the regression coefficients. A median split was used to dichotomize the goal-aspiration variable. Scores at or above the median, 78.00 were categorized as the high goal-aspiration group and scores below 78.00 labeled as the low goal-aspiration group.

Table 6. summary of mediation analyses predicting eudaimonic well-being from goal-striving (GS) with metacognition (MC) as the mediator

| (sub-)samples | indirect effect of GS on EWB | | |
	point of estimate	lower−upper bound (95% CI)	overall R^2 (lower−upper bound)
full sample ($N = 513$)	0.5094 (0.1748)	0.3799−0.6672 (0.1317−0.2236)†	0.3657* (0.2874−0.4281)
female ($n = 330$)	0.4854 (0.1550)	0.3134−0.6989 (0.1013−0.2169)†	0.3598* (0.2644−0.4426)
male ($n = 183$)	0.5948 (0.2199)	0.4061−0.8300 (0.1517−0.3026)†	0.3707* (0.2553−0.4656)
non-education ($n = 201$)	0.5611 (0.2074)	0.3791−0.7963 (0.1414−0.2868)†	0.3310* (0.2123−0.4313)
education ($n = 312$)	0.4785 (0.1541)	0.3032−0.6967 (0.0993−0.2182)†	0.3479† (0.2517−0.4308)
adult ($n = 85$)	0.4965 (0.2007)	0.1761−0.9228 (0.0754−0.3572)†	0.3842* (0.1650−0.5344)
emerging adults ($n = 428$)	0.5078 (0.1730)	0.3721−0.6721 (0.1291−0.2261)†	0.3374* (0.2571−0.4089)

Note. Significance levels are based on p-values estimated by bias-corrected confidence intervals. Standardized regression coefficients are in parentheses. * $p < 0.01$; † $p < 0.001$.

Plotting the interaction effect indicated that for the full sample (see Figure 1), while the relationship between goal-striving and eudaimonic well-being is positive and statistically significant for both high and low goal-aspiration groups , higher goal-aspiration has a positively moderating effect on this relationship. That is, students with higher level of eudaimonic self-actualizing aspiration reported higher goal-striving and higher eudaimonic well-being compared to students with lower level of eudaimonic self-actualizing aspirations.

On the other hand, for the adult sub-sample, the relationship between GS and EWB was not significant for the high level of goal-aspiration, but it was positive and significant for students with the lower level of goal-aspiration. As illustrated in Figure 2, while the maximum level of eudaimonic well-being for adult students with high eudaimonic self-actualizing aspirations was steady around the observed group mean (68.67) and did not exceed 70, eudaimonic well-being of adult students with low goal-aspiration exceeded that average point as the scores on the quality of their goal striving increased. That is, while low goal-aspiration group were lower in their eudaimonic well-being at the lower levels of goal-striving compared to high goal-aspiration, as their goal-striving exceeded the sample mean (33.65) their eudaimonic well-being also exceeded eudaimonic well-being of high goal-aspiration group.

Goal-aspiration, goal-striving and eudaimonic well-being in remaining sub-samples

Conducting GLM, where GA was entered in the first step and GS in the second step, indicated that goal-aspiration positively and significantly predicted EWB. Similarly, goal-striving also positively and significantly predicts eudaimonic well-being for all remaining sub-samples over and above goal-aspiration. For non-education students, goal-aspiration significantly accounted for 13.0% of variance in eudaimonic well-being, and goal-striving accounted for additional 5.9% of unique variance; for education students the amount of variance accounted for by GA and GS respectively

was 9.6% and 3.1%. For female students 6.8% and 3.4%, for male students 17.7% and 5.1%, and for emerging adults 12.6% and 4.6%. Table 9 present the results of these analyses.

Overall, Hypothesis 6 was supported for the full sample and for the sub-sample of adult students, meaning, goal-aspiration moderated the relationship between goal-striving and eudaimonic well-being. In the full sample, students with high eudaimonic self-actualizing aspiration reported higher level of well-being at all reported levels of goal-striving compared to students with low eudaimonic self-actualizing aspiration. For adults, EWB was steady for the high goal-aspiration group while it was positively increasing for the low goal-aspiration group by increases in goal-striving. In other sub-samples, there was no interaction effect, but goal-striving accounted for unique variances in EWB over and above goal-aspiration. The greatest variance (in EWB) accounted for by GA was for males (17.7%) and the smallest variance was observed for females (6.8%). The amount of unique variance (in EWB) shared by GS over and above that of GA did not exceed 6.0% for any of the sub-samples. This amount of variance is notably lower than what was observed in testing Hypothesis 1 where there was no consideration of goal-aspiration (also see Table 7 for ΔR^2 without mediator). This indicated that a percentage of the variance in EWB is shared by both goal-aspiration and goal-striving. Given the large amount of shared variance by GA and GS, it could be expected that metacognition fully mediates the relationship between GS and EWB when GA is being used as the moderator. This prediction was partially supported by the results of the moderated mediation analyses for testing Hypothesis 7.

Hypothesis 7

Hypothesis 7 states that goal-aspiration (GA) moderates the mediated relationship between goal-striving (GS) on eudaimonic well-being (EWB) where metacognition is the mediator. To test Hypothesis 7 for the full sample and the sample of adults, which already (in Hypothesis 6) has shown a significant interaction effect between GA and GS, a multigroup approach was used with the same SEM model as in Hypothesis 5. For the remaining sub-samples, goal-aspiration was added to their respective SEM models. Testing the models for fit indices indicated a good fit (Chi-square = 6.8, $df = 7$, $p > .05$; CFI $\geq .95$, $P_{close} \geq .05$; RMSEA $\leq .08$) for all models. Then, mediation was tested for the full sample and for the sub-samples (Table 9).

Table 7. the mediated variance shared by goal-striving, metacognition, and eudaimonic well-being

| (sub-)samples | unique direct contribution of GS to EWB | | |
	ΔR^2 without mediator	ΔR^2 with mediator	% of mediated variance
full sample ($N = 513$)	0.101	0.018	8.3
female ($n = 330$)	0.078	0.013	6.5
male ($n = 183$)	0.141	0.023	11.8
non-education ($n = 201$)	0.133	0.020	11.3
education ($n = 312$)	0.089	0.019	7.0
adult ($n = 85$)	0.058	0.000	5.8
emerging adults ($n = 428$)	0.116	0.023	9.3

Table 8. summary of GLM predicting EWB from goal-striving and goal-aspiration

variable	eudaimonic well-being				
full sample (N = 513)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
age group and major (block 1)	—	0.068	18.54¶	2	510
goal-aspiration	0.238¶	—	—	—	—
goal-striving	0.213¶	—	—	—	—
block 2	—	0.145	46.82¶	2	508
GA × GS	−0.081†				
block 3	—	0.006	4.120†	1	507
total *R²* = 0.219, *R̄²* = 0.212					
adults (n = 85)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
major (block 1)	—	0.111	10.34‡	1	83
goal-aspiration	0.074	—	—	—	—
goal-striving	0.211	—	—	—	—
block 2	—	0.063	3.103†	2	81
GA × GS	−0.212†	—	—	—	—
block 3	—	0.044	4.527†	1	80
total *R²* = 0.218, *R̄²* = 0.179					
emerging adults (n = 428)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
major (block 1)	—	0.023	10.24‡	1	426
goal-aspiration	0.026	—	—	—	—
block 2	—	0.126	63.14¶	1	425
goal-striving	0.241	—	—	—	—
block 3	—	0.046	24.16¶	1	424
total *R²* = 0.196, *R̄²* = 0.190					
non-education students (n = 201)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
age group (block 1)	—	0.000	0.015	1	199
goal-aspiration	0.258¶	—	—	—	—
block 2	—	0.130	29.52¶	1	198
goal-striving	0.264¶	—	—	—	—
block 3	—	0.059	14.43¶	1	197
total *R²* = 0.189, *R̄²* = 0.177					
education students (n = 312)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
age group (block 1)	—	0.050	16.40¶	1	310
goal-aspiration	0.221¶	—	—	—	—
block 2	—	0.096	34.75¶	1	309
goal-striving	0.199‡	—	—	—	—
block 3	—	0.031	11.77‡	1	308
total *R²* = 0.178, *R̄²* = 0.170					
female (n = 330)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
age group and major (block 1)	—	0.071	12.59¶	1	327
metacognition	0.176¶	—	—	—	—
block 2	—	0.068	25.80¶	1	326
goal-striving	0.207¶	—	—	—	—
block 3	—	0.034	13.42¶	1	325
total *R²* = 0.174, *R̄²* = 0.164					
male (n = 183)	**β***	**ΔR²**	**ΔF**	**df₁**	**df₂**
age group and major (block 1)	—	0.044	4.157†	1	180
metacognition	0.323¶	—	—	—	—
block 2	—	0.177	40.59¶	1	179
goal-striving	0.251‡	—	—	—	—
block 3	—	0.051	12.42‡	1	178
total *R²* = 0.272, *R̄²* = 0.255					

* The standardized regression coefficients are reported from the overall model and only for the main variables. † *p* < 0.05; ‡ *p* < 0.01; ¶ *p* < 0.001.

The result of the mediation analyses indicated the full mediation for high goal-aspiration group in the full sample (Direct effect = .2227, *p* = .18; Indirect effect = .3129, *p* < .01) while for low-goal-aspiration group in the full sample only partial mediation was detected (Direct effect = .4670, *p* < .01; Indirect effect = .5171, *p* < .001). In addition, full mediation was supported for the low goal-aspiration group in the adult sub-sample (Direct effect = .4938, *p* = .38; Indirect effect = .7790, p < .05). However, no mediational effect was detected in adults with high goal-aspiration nor was there a direct relationship between goal-striving and EWB, indicating no relationships between goal-striving and EWB.

As expected, partial mediational effects for most of sub-samples changed to full mediational effect when goal-aspiration was added to the model. Altogether the results for all subsamples, and in general for the students with high goal-aspirations, were in line in supporting the hypothesis 7 that stated goal-aspiration moderates the mediational effect of metacognition in the relationship between GS and EWB. Most of the partial mediations in the subs-samples became full mediations except for emerging adults and for adults with high goal-aspiration which no direct or indirect effect was observed.

Summary of the results

In sum, Hypotheses 1 to 3 were supported for the full sample and for all the subsamples. The individuals who scored higher on goal-striving were more likely to score higher on eudaimonic well-being. This suggested that individuals with higher quality of goal-striving experience higher level of eudaimonic well-being. In addition, the individuals who scored higher on goal-striving were more likely to score higher on general metacognitive competence. This implied that individuals with higher quality of goal-striving also demonstrate higher general metacognitive competence. Further, the individuals who scored higher on metacognition were more likely to score higher on eudaimonic well-being, suggesting that individuals with higher general metacognitive competence experience higher level of eudaimonic well-being.

On the other hand, Hypothesis 4 was only supported for the sub-sample of adults. Comparing adults and emerging adults, the finding suggests that for adults the relationship of goal-striving with eudaimonic well-being is fully dependent on their metacognition. However, for emerging adults the quality of goal-striving contributes to their eudaimonic well-being above and beyond their general metacognitive competence. The analyses on the other sub-samples also yielded similar results as that of emerging adults. The follow-up mediation analyses in Hypothesis 5 also supported the full mediation for adults but not for any other sub-samples. While this mediational relationship was more dominant for adults than it was for emerging adults (i.e., the full mediation vs. partial mediation), metacognition and goal-striving shared a greater amount of variance in emerging adults (9.3%) compared to adults (5.8%). This
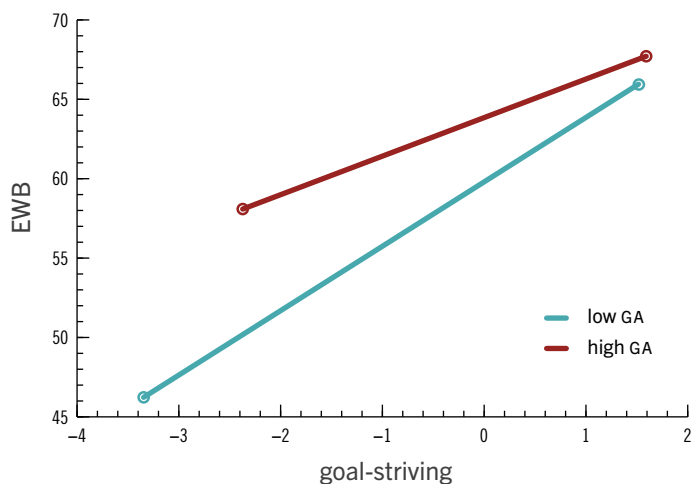
Figure 1. the goal-aspiration by goal-striving interaction in predicting eudaimonic well-being for the full sample

finding confirms that for both cases, higher quality of goal-striving is linked to higher metacognition which fosters higher eudaimonic well-being. It also indicates that goal-striving of emerging adults, while sharing metacognition as the common element, is different from adults' in defining eudaimonic well-being.

Hypotheses 6 and 7 took goal-aspiration into account as a moderator. While an interaction was detected for the full sample and for the sub-sample of adults, there was no interaction for the remaining sub-samples. For the full sample, goal-aspiration moderated the relationship between goal-striving and eudaimonic well-being in a way that individuals with the higher level of goal-aspiration experienced higher level of eudaimonic well-being at all reported levels of goal-striving compared to individuals with lower level of goal-aspiration. Adults with high aspiration remained steady in their eudaimonic well-being regardless of their goal-striving. However, goal-striving positively predicted eudaimonic well-being for adults with low goal-aspiration indicating that the higher the level of goal-striving is for these individuals, the higher their eudaimonic well-being would become regardless of their low goal-aspiration.

In addition, the observed full mediations after goal-aspiration was taken into consideration indicated that goal-aspiration and metacognition together explained all the shared variance between ᴇᴡʙ and goal-striving (except for low-aspiration students and emerging adults). This finding partly suggests that goal-aspiration completes the mediational effect of metacognition. Altogether, metacognition and goal-aspiration were found to be two overarching constructs in contributing to individuals' eudaimonic well-being.

» DISCUSSION

Virtues of character and intellect, as discussed by Aristotle (2004), are two main elements responsible for individuals' well-being. Achieving excellences in these two kinds of virtue allows individuals to perform at the optimal level of rational choice and exercise of reason when making decisions in their everyday lives, in setting their goals and in their efforts in pursuing their goals. This optimal functioning creates a life of *acting well and living well*. We pre-

sented a rationale that contemporary concepts of goal-aspiration and metacognition can represent these two kinds of virtue, and different levels of goal-aspiration and metacognition can indicate different levels of character and intellect. Further, we argued that different levels of this optimal functioning can be represented within a contemporary conceptualization of self-actualization in which self-actualization is a goal-oriented process (Rule, 1991) and can in part be represented by two concepts of goal-aspiration and goal-striving. Different levels of self-actualization, then, argued to be associated with different levels of eudaimonic well-being, a well-being conception which represents the ultimate good in a subjective way.

Although none of the previous studies of well-being, self-actualization, or metacognition has employed the conceptual framework presented in this study, there were some research studies that investigated the links between different representations of these constructs. For instance, the positive link between self-actualization and subjective well-being and psychological well-being has been detected in the literature where self-actualization was argued to be represented by the highest level of Loevinger's (1976) ego development (Bauer, Schwab, & McAdams, 2011). Previous research on goal-related variables and individuals' well-being also indicated the positive effect of intrinsic and autonomous (versus extrinsic and controlled) goal aspirations and goal attainment, and goal progress on self-actualization (measured as a personality characteristic) and subjective and psychological well-being (e.g., Kasser & Ryan, 1996, 2001; Sheldon & Kasser, 1998; Sheldon, Kasser, Smith, & Share, 2002; Sheldon, Ryan, Deci, & Kasser, 2004). Further, research indicated a link between self-awareness (an aspect of metacognition) and self-actualization and self-actualizing personalities (e.g., Bar-on, 2001, 2006; Culbert, Clark, & Bobele, 1968). Studies, also, indicated a link between cognitive and metacognitive efficiency and psychological well-being (e.g., Fastame, Penna, Rossetti, & Agus, 2013).

Following our argument, we developed an empirical study that examined these hypothesized relationships with a focus on exploring the mediational role that metacognition (as a way of exercise of goal-oriented reason and as a teachable skill) may play
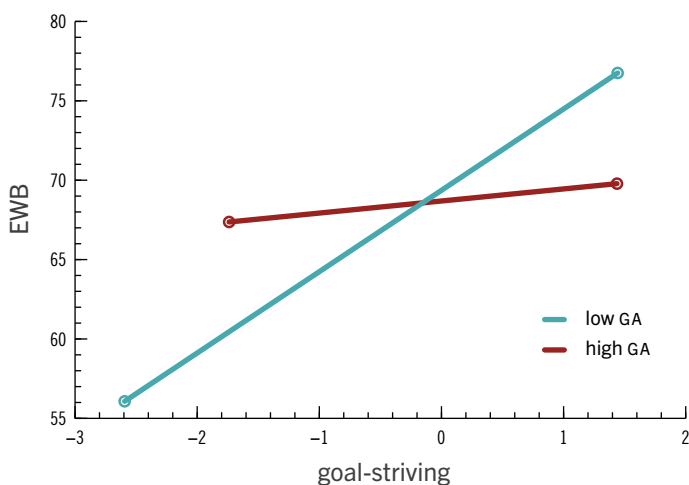

Figure 2. the goal-aspiration by goal-striving interaction in predicting eudaimonic well-being for the subsample of adults

Table 9. summary of moderated mediation analyses predicting eudaimonic well-being from goal-striving (GS) with metacognition (MC) as the mediator and goal-aspiration (GA) as the moderator

(sub-)samples	unique direct contribution of GS to EWB		
	without mediator	with mediator	
	direct effect	direct effect	indirect effect
full sample (N = 513)			
high GA (n = 201)	sig	0.2227 (0.0723)	0.3129 (0.1015)†
low GA (n = 312)	sig	0.4670 (0.1621)†	0.5171 (0.1795)‡
adult (n = 85)			
high GA (n = 50)	ns	−0.0278 (−0.0108)	0.2419 (0.0937)
low GA (n = 35)	sig	0.4938 (0.1900)	0.7790 (0.2998)*
emerging adults (n = 428)	sig	1.0731 (0.0878)*	2.0247 (0.1656)‡
female (n = 330)	sig	0.9176 (0.0707)	1.9955 (0.1525)‡
male (n = 183)	sig	1.0575 (0.0927)	2.3202 (0.2034)‡
education (n = 312)	sig	0.9096 (0.0704)	1.8371 (0.1421)‡
non-education (n = 201)	sig	1.0997 (0.0968)	2.1967 (0.1934)‡

Note. Only unstandardized regression coefficients were reported for direct and indirect effects. * $p < 0.05$; † $p < 0.01$; ‡ $p < 0.001$.

in the relationship between self-actualizing efforts and eudaimonic well-being. Findings from the present study suggest that the quality goal-striving, which was indicated by higher goal-importance and commitment, and higher effort, initiation and inspiration for pursuing personal goals, make a positive contribution to individuals' well-being. The findings also suggest that individuals' general metacognitive competence, as operationally defined and measured in this study, was largely responsible for this contribution. While this effect was more dominant for adults than it was for emerging adults, the finding implies that, for both cases, the development of general metacognitive competence provides the internal competency for a quality goal pursuit that, in turn, helps with higher experience of eudaimonic well-being.

In other words, metacognition enhances eudaimonic well-being at least partly through its practical effect manifested in the quality of goal pursuit. The metacognitive competence (including monitoring, evaluation, goal-setting, planning, strategy use, and strategy adjustment) provides the intrapersonal skills required for a quality goal-striving that enhances eudaimonic well-being. That is, metacognitive thinking provides a medium to exercise high-quality goal-pursuits and self-actualization that nurture eudaimonic well-being. Nevertheless, the contribution of metacognition to eudaimonic well-being was beyond its association with goal-striving.

In addition, goal-aspiration as an indicator of the eudaimonic aspects of self-actualization showed to be influential in students' well-being as they strive for pursuing their personally worthwhile goals. The way individuals strive for their goals and the reason they pursue those goals has some shared effects on their eudaimonic well-being. But the findings from this study imply that the exercise of reason and character seems to play an overarching role when it comes to individuals' goal pursuit and well-being. That is, the role of eudaimonic self-actualizing aspiration was complementary to general metacognitive competence in contributing to those aspects of eudaimonic well-being associated with goal-striving.

Yet, in general the relationship between goal-striving and eudaimonic well-being is more complex for students with lower eudaimonic self-actualizing aspirations – thus, with less-than-optimal rational choices – compared to those with higher goal-aspiration. We can argue that in addition to the intellectual aspects of their goal-pursuit, either there may be other aspects to the goal-striving of these groups that contribute to their well-being, or their eudaimonic well-being enhances by a sense of meaning and engagement they may directly develop through committing to personally inspiring effortful planned goal pursuits. Similar complexity exists for emerging adults, who regardless of their goal-aspiration and the intellectual aspects of their goal-striving find other eudaimonic fulfillments in their pursuits.

Implications

Metacognition is an information-processing competency that is manifested more clearly in problem-solving tasks and situations, and is known as an attainable competence; that is, it can be taught as sets of skills for goal-setting and problem-solving (Borkowski & Muthukrishna, 1992; Gaskins & Pressley, 2007). The finding of this study implies that developing general metacognitive skills prepares individuals for a quality goal-striving and helps them experience higher levels of eudaimonic well-being in part by an effective and enhanced goal-oriented effort. Thus, teaching metacognition as early as possible may equip our students and individuals with an essential competence for paving their ways towards their optimal functioning and eudaimonic well-being.

Further, goal-aspiration is more or less a matter of character and a trained desire to appreciate eudaimonic ends, namely, the ends which are intrinsic, constitutive, self-concordant, and personally expressive and particularly value-oriented. As Aristotle (2004) argued, virtue of character is mainly developed through habituation and training from early ages. He argued that by being surrounded by right rules and laws, children may be able to train their desires in a right direction as they practice the rational choice under these rules and laws. Character education as well as right parenting may play influential roles here. However, as Aristotle argued, to build a culture for good character, developing a *good* legislation system may be necessary.

Because "rational choice is either desire-related intellect or thought-related desire" (p.105), it still requires the development of both intellect and character to function at its optimal level. Thus, this two virtues need to be addressed in parallel as one lacking the other may not function as good. An intellectual person who lacks character and morality could turn into a cruel clever person. The virtuous person lacking intellect may not be able to adequately differentiate between right and wrong in varying situations and, thus, be unable to make or perform a practically wise choice.

Directions for future research

The finding implies that goal-strivings of adults and emerging adults are different in nature and quality as their pattern of contribution to eudaimonic well-being is different. While metacognition is responsible for adults' actualizing efforts, the quality of goal-striving that contributes to emerging adults' eudaimonic well-being is only partly related to their general metacognitive competence. This suggests that there may be some other intrapersonal, interpersonal, and environmental factors in the life of emerging adults that explain this discrepancy. The researchers recommend further exploration of the nature of goal pursuits for emerging adults in comparison with adults to add insight into this discord.

Furthermore, the finding suggests that developing metacognition and pursuing eudaimonic self-actualizing aspirations both have advantages in creating a eudaimonic living that go beyond a quality goal-striving. The metacognitive competence may help with the goal selection (i.e., the identification of the problem or purpose and the kind of goals one selects to pursue that purpose or to solve the problem), which is a step prior to goal-striving. Being metacognitive also means acting with more self-awareness (Brown, 1977; Brown & Smiley, 1977), which may be the link to the personal expressiveness and eudaimonic well-being. Further, high goal-aspiration indeed represents some character strengths that may be in part responsible for the enhancement of eudaimonic well-being. Scrutinizing the complex nature of the relationship between eudaimonic well-being and these two constructs and discovering ways in which developing metacognition and character can contribute to eudaimonic well-being is a subject for future research.

In sum, metacognition and goal-aspirations are only two elements that were found to contribute to eudaimonic well-being as they are related to individuals' goal-oriented pursuits. There is a great amount of variance in eudaimonic well-being, which this study was unable to explain. Given the great concern people have over living a fulfilling life, research into other possible contributors to individuals' well-being will be enlightening. Self-actualization and metacognition are also complex constructs, research into which can be of merit for their theoretical and practical implications in the field of education, psychology, and in life. ■

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