Summary
The Investigation of the Relationships between Developmental Regulation Processes and Well-being in Emerging Adulthood

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Developmental regulation models suggest that individuals have a crucial role in planning and regulating their own development across their life-span (e.g., Heckhausen, Wrosch, & Schulz, 2010). Three major models have been proposed: the model of selection, optimization, and compensation (Baltes & Baltes, 1990); the motivational theory of life-span development (Heckhausen et al., 2010); and the dual-process model of assimilative and accommodative coping (Brandtstädter & Renner, 1990). All three theories focus on the successful and positive development of individuals.

The model of selection, optimization, and compensation (SOC) posits that individuals manage their development successfully through three processes: selection (S), optimization (O), and compensation (C). According to the SOC model, selection focuses on setting goals. Furthermore, it is separated into two different processes, which are elective selection (ES) and loss-based selection (LBS). Elective selection involves specification and contextualization of goals; it also requires making a commitment to desired goals. Loss-based selection, however, involves the reconstruction of an individual's goal hierarchy as a consequence of loss in resources, in addition to also focusing on the more important goals and looking for new goals to maintain a functioning level. According to the model, optimization focuses on striving goals. It includes acquiring new skills and resources, allocating resources (effort and time) correctly, and modeling successful others. The final process, compensation, involves using external aid and helping others, activating unused skills and resources (Baltes & Baltes, 1990; Freund & Baltes, 2002).

The motivational theory of life-span development proposes that individuals use different motivational processes effectively to meet challenges that they encounter across their life course. One of the most important processes of the model is optimization, which involves taking into consideration developmental opportunities and time constraints to maintain primary control capacities. Besides optimization, four major control strategies have been proposed: selective primary and secondary control and compensatory primary and secondary control. The first one, selective primary control, refers to making an investment of resources (time, effort etc.) in order to pursue desired goals. The second one, selective secondary control, refers to increasing motivational commitment to the required goals (e.g., thinking positive parts of goal attainment). The third one, compensatory primary control, refers to seeking the help of others or trying unusual ways to obtain a goal. The final strategy, compensatory secondary control, includes devaluing the chosen goal and downgrading the importance of the goal (Heckhausen et al., 2010).

Finally, the dual-process model of assimilative and accommodative coping postulates that individuals optimize the balance of gains and losses across their life-span with the aid of two coping strategies: assimilative and accommodative coping. According to the model, assimilative coping entails persistent commitment to the goal and goal-focused resource mobilization. On the other hand, accommodative coping requires adjusting goals to existing constraints and canalizing resources to achievable goals (Brandtstädter & Renner, 1990; Brandtstädter & Rothermund, 2002).

Haase, Heckhausen, & Wrosch (2013) recently suggested that the different developmental regulation processes that are mentioned above form together around three key regulation processes: meta-regulation, goal engagement and goal disengagement. For instance, the motivational theory of life-span development posits that selective primary control, selective secondary control and compensatory primary control serve goal engagement, whereas compensatory secondary control serves goal disengagement. In addition, optimization, which is

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defined as a high regulatory process of goal selection, serves meta-regulation. Haase et al., (2013) also investigated the role of these key processes on individuals' well-being. In short, results revealed that meta-regulation predicted goal engagement and disengagement positively. Additionally, goal engagement and disengagement predicted individuals' well-being positively. Furthermore, meta-regulation had a positive indirect effect on individuals' well-being.

In the present study, a model that was proposed by Haase et al., (2013) was tested during emerging adulthood. Before that, psychometric properties of a SOC questionnaire, which assesses four developmental regulation processes, were also examined (Study 1). Specifically, the following research hypotheses were formulated: Meta-regulation will be positively associated with goal engagement and goal disengagement. Furthermore, goal engagement and goal disengagement will be positively associated with individuals' well-being. Finally, meta-regulation has to associate with individuals' well-being via goal engagement and goal disengagement (Study 2).

Study 1

Method

Sample

The sample consisted of 300 participants (54% female and 46% male). The mean age of the participants was 24.23 years (SD = 3.47), and ages ranged from 18 to 30 years. Fifty percent of the participants were undergraduates, two-year college students or graduates; 45% were bachelors, postgraduates, PhD students or PhDs; and 5% were high-school graduates. The majority of the participants were unmarried (87%).

Measures

Selection, Optimization, and Compensation (SOC) Questionnaire (Freund & Baltes, 2002). The SOC questionnaire is a 48 item self-report scale [12 items each for elective selection (ES), loss-based selection (LBS), optimization (O) and compensation (C)]. Each of the items consists of two statements [e.g., "I concentrate all my energy on a few things" (target) – "I divide my energy among many things" (distracter)]. Participants were required to decide which of the statements (target or distracter) described them better.

Tenacious Goal Pursuit and Flexible Goal Adjustment (Tenflex) Scales (Brandtstädter & Renner, 1990). Tenflex is a 30 item self-report scale (15 items each for tenacious goal pursuit and flexible goal adjustment). Each

item (e.g., "The harder a goal is to achieve, the more appeal it has to me") is rated on a five-point scale from 0 (strongly disagree) to 4 (strongly agree). Cronbach's alpha of the subscales ranged from .80 to .83 (Brandtstädter and Renner, 1990). In this sample internal consistencies of subscales were found to be .87 for tenacious goal pursuit and .83 for flexible goal adjustment.

UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980). UCLA is a 20 item self-report scale. Each item (e.g., "I feel left out") is rated on a four-point scale from 1 (never) to 4 (often). Russell et al., (1980) found Cronbach's alpha coefficient to be .94. In this sample, Cronbach's alpha was .92.

Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). Satisfaction with life is a 5 item self-report scale. Each item (e.g., "I am satisfied with my life") is rated on a seven-point scale from 1 (strongly disagree) to 7 (strongly agree). Diener et al. (1985) found Cronbach's alpha coefficient to be .87. In this sample, Cronbach's alpha was .85.

Procedure

To begin with, the SOC questionnaire was translated into Turkish by a researcher. After the translation was complete, final versions of the items were formed with two professors and one PhD student. Before the administration procedure, required permissions were obtained from the Ethics Commission of Hacettepe University. The participants completed the study voluntarily.

Results

In order to examine the factor structure of the SOC questionnaire, confirmatory factor analysis was performed. Analysis revealed that the proposed four-factor model provided good fit to the data, [χ^2 (48, N = 300) = 99.11, p < .01, GFI = .95, AGFI = .92, NNFI = .98, CFI = .98, RMSEA = .06]. The structural correlations of the scale ranged from .50 to .83 and the standardized coefficients of the scale ranged from .67 to .81. Additionally, the four-factor and the single-factor solutions were compared with each other. The single-factor model yielded poor fit to the data, [χ^2 (54, N = 300) = 495.36, p < .001, GFI = .78, AGFI = .69, NNFI = .88, CFI = .90, RMSEA = .16]. The chi-square change statistics showed that the four-factor model was the best fit to the data, [$\Delta\chi^2$ (6) = 396.25, p < .05]. Within the predictive and convergent validity, as expected, ES, LBS, OPT and COM were negatively correlated with loneliness, whereas they (except LBS) were positively correlated with satisfaction with life. Furthermore, ES, OPT and COM were positively

correlated with tenacious goal pursuit. Additionally, only OPT and COM were positively correlated with flexible goal adjustment. Finally, the internal consistency of the subscales ranged from .69 to .83.

Study 2

Method

Sample

The study sample consisted of 396 participants (54% female and 46% male). The mean age of the participants was 23.92 years ($SD = 3.80$), and ages ranged from 18 to 30 years. Forty six percent of the participants were undergraduates, two-year college students or graduates; 48% were bachelors, postgraduates, PhD students or PhDs; and 6% were high-school graduates. The majority of the participants were unmarried (82%).

Measures

In study 2, Optimization in Primary and Secondary Control Scale, Rosenberg Self-Esteem Scale and Brief Symptom Inventory were administered to the participants along with the scales which are used in Study 1.

Optimization in Primary and Secondary Control (OPS) Scale (Heckhausen & Schulz, 1993; 1995; Heckhausen, Schulz, & Wrosch, 1998).
An OPS is a 44 item self-report scale (8 items each for selective primary control, selective secondary control, compensatory primary control, compensatory secondary control; and 12 items for optimization). Each item (e.g., "I try to pursue new life time goals when the time is right") is rated on a five-point scale from 1 (almost never true) to 5 (almost always true). Cronbach's alpha of the subscales ranged from .79 to .81 (Heckhausen et al., 1998). In this sample Cronbach's alpha of the subscales ranged from .59-.87.

Rosenberg Self-Esteem Scale (Rosenberg, 1965).
Rosenberg self-esteem is a 10 item self-report scale. Each item (e.g., "On the whole, I am satisfied with myself") is rated on a four-point scale from 1 (strongly disagree) to 4 (strongly agree). In this sample, Cronbach's alpha was .87.

Brief Symptom Inventory-BSI (Derogatis, 1992).
The BSI is a 53 item self-report scale. Each item of the BSI (e.g., "Feeling that most people cannot be trusted") is rated on a five-point scale, ranging from 0 (not at all) to 4 (extremely). Internal consistency of the subscales ranged from .71 to .85 (Derogatis, 1992). In this sample, Cronbach's alpha was .96 for total score.

Procedure

Before the administration procedure, required permissions were obtained from the Ethics Commission of Hacettepe University. Informed consent, demographic information form, and scales were delivered to the participants in an envelope and the participants were brought the completed forms within a week. The participants completed the study voluntarily.

Results

To determine the relationships between meta-regulation, goal engagement, goal disengagement and well-being (except BSI- The BSI did not correlate with optimization and secondary control strategies.), structural equation modeling was performed. For the **self-esteem**, **satisfaction with life**, and **loneliness** models, the measurement and the structural models with added correlated error terms provided poor fit to the data. After testing the model proposed by Haase et al., (2013), the indicators of the model were reduced. In the newly proposed model, only the strategies of the motivational theory of life-span development were used. For the **self-esteem** model, the final model provided acceptable fit to the data, [$\chi^2(48, N = 389) = 149.33, p < .001$, GFI = .94, AGFI = .90, NNFI = .96, CFI = .97, RMSEA = .07]. All of the indicators loaded significantly on their latent variables. An examination of the structural correlations between latent variables indicated that meta-regulation was positively correlated with goal engagement, goal disengagement and self-esteem ($r = .85, p < .001$; $r = .76, p < .001$; $r = .36, p < .001$, respectively). Goal engagement was positively correlated with goal disengagement and self-esteem ($r = .69, p < .001$; $r = .56, p < .001$, respectively). Finally, the goal disengagement was positively correlated with self-esteem ($r = .38, p < .001$). The test of the proposed model provided acceptable fit to the data, [$\chi^2(50, N = 389) = 158.97, p < .001$, GFI = .94, AGFI = .90, NNFI = .96, CFI = .97, RMSEA = .08]. The results indicated that meta-regulation predicted goal engagement and disengagement positively. Additionally, goal engagement predicted self-esteem positively. However, goal disengagement did not predict self-esteem. Results revealed that meta-regulation had an indirect effect on self-esteem via goal engagement.

For the **satisfaction with life** model, the final model provided acceptable fit to the data, [$\chi^2(39, N = 389) = 113.77, p < .001$, GFI = .95, AGFI = .91, NNFI = .96, CFI = .97, RMSEA = .07]. All of the indicators loaded significantly on their latent variables. An examination of the structural correlations between latent variables indicated that meta-regulation was positively correlated with goal engagement, goal disengagement and satisfaction

with life ($r = .85$, $p < .001$; $r = .76$, $p < .001$; $r = .34$, $p < .001$, respectively). Goal engagement was positively correlated with goal disengagement and satisfaction with life ($r = .70$, $p < .001$; $r = .43$, $p < .001$, respectively). Finally, the goal disengagement was positively correlated with satisfaction with life ($r = .40$, $p < .001$). The test of the proposed model provided acceptable fit to the data, [χ^2 (41, $N = 389$) = 115.58, $p < .001$, GFI = .95, AGFI = .92, NNFI = .96, CFI = .97, RMSEA = .07]. The results indicated that meta-regulation predicted goal engagement and disengagement positively. Additionally, goal engagement predicted satisfaction with life positively. However, goal disengagement did not predict satisfaction with life. Results revealed that meta-regulation had an indirect effect on satisfaction with life via goal engagement.

For the **loneliness** model, the final model provided acceptable fit to the data, [χ^2(48, $N = 389$) = 145.56, $p < .001$, GFI = .94, AGFI = .90, NNFI = .96, CFI = .97, RMSEA = .07]. All of the indicators loaded significantly on their latent variables. An examination of the structural correlations between latent variables indicated that meta-regulation was positively correlated with goal engagement and goal disengagement ($r = .85$, $p < .001$; $r = .76$, $p < .001$, respectively), and goal engagement was positively correlated with goal disengagement ($r = .70$, $p < .001$). On the other hand, meta-regulation, goal engagement and goal disengagement were negatively correlated with loneliness ($r = -.30$, $p < .001$; $r = -.35$, $p < .001$; $r = -.21$, $p < .01$, respectively). The test of the proposed model provided acceptable fit to the data, [χ^2(50, $N = 389$) = 144.92, $p < .001$, GFI = .94, AGFI = .91, NNFI = .96, CFI = .97, RMSEA = .07]. The results indicated that meta-regulation predicted goal engagement and disengagement positively, whereas goal engagement predicted loneliness negatively. However, goal disengagement did not predict loneliness. Results revealed that meta-regulation had an indirect effect on loneliness via goal engagement.

Discussion

In this study, firstly, psychometric properties of the SOC questionnaire were examined. Confirmatory factor analysis indicated a four-factor structure that is in line with the original scale. It was also demonstrated that components of the questionnaire (ES, LBS, OPT and COM) were positively and highly correlated with each other. As for the results related to the predictive validity of the scale, ES, LBS, OPT and COM were negatively associated with loneliness, whereas they (except LBS) were positively associated with satisfaction with life. As for the results related to the convergent validity of

the scale, ES, OPT and COM were positively associated with tenacious goal pursuit. Additionally, only OPT and COM were positively associated with flexible goal adjustment. Moreover, internal consistency scores for different components of the questionnaire were congruent with the original scale (Freund & Baltes, 2002).

Secondly, we tested a model that was proposed by Haase et al., (2013) during emerging adulthood. Analyses were conducted separately for each well-being indicator. After testing the model proposed by Haase et al., (2013), the indicators of the model were reduced. Within the frame of the **self-esteem and satisfaction with life** models, findings indicated that meta-regulation predicted goal engagement and goal disengagement positively. In addition, goal engagement predicted self-esteem and satisfaction with life positively. However, goal disengagement did not predict individuals' self-esteem and satisfaction with life. Similarly, within the frame of the **loneliness** model, meta-regulation predicted goal engagement and disengagement positively, whereas goal engagement predicted loneliness negatively. However, goal disengagement did not predict individuals' loneliness. Results revealed that meta-regulation had an indirect effect on individuals' self-esteem, satisfaction with life and loneliness via goal engagement. Findings revealed that Haase et al.'s (2013) assumptions were markedly confirmed in the present study.

Previous studies revealed that strategies evaluated within the context of goal disengagement, such as compensatory secondary control or accommodative coping, were used more effectively with older ages (Brandstädter & Renner, 1990; Heckhausen, Schulz & Wrosch, 1998). Compensatory secondary control includes devaluing a chosen goal and downgrading the importance of the goal. In addition, accommodative coping requires adjusting goals to existing constraints and canalizing resources to achievable goals. Haase et al., (2013) also indicated that goal disengagement was positively associated with well-being (e.g., purpose in life) in the older group, but not in the young or middle-aged groups. Therefore, it was believed that goal disengagement is a more powerful predictor of individuals' well-being in older age groups.

One of the limitations of this study was its cross-sectional design for seeking answers to research questions. Future longitudinal studies could clearly reveal the direction of the relationships between key regulatory processes and well-being. Additionally, in the present study, only the relationships between key developmental processes and individuals' well-being were investigated. Future studies should focus on different variables (perfectionism, coping strategies, problem solving and etc.) that are associated with these regulatory processes.

In conclusion, the findings provided evidence of the validity and reliability of the Turkish version of the SOC questionnaire. Furthermore, the findings also revealed that different key regulatory processes, meta-regulation, goal engagement and goal disengagement contribute considerably to individuals' functioning during emerging adulthood.