THE ROLE OF ACHIEVEMENT GOALS IN MOTIVATIONAL REGULATION AND FLOW IN LEARNING

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Abstract

Appropriate self-regulation in motivation and experiencing flow in learning and other academic activities are important factors for success in study and psychological wellbeing. Previous studies suggested that achievement goals have role in student's motivation for learning, but there is only partial knowledge regarding the role of achievement goals in motivational regulation and academic flow. The aim of this study was to explore: a) the role of achievement goals in motivational self-regulation and study-related flow; b) the incremental role of mastery self-talk motivational strategy in academic flow over the mastery-approach goal; c) the mediating role of mastery self-talk motivational strategy in the relationship between mastery-approach goal and academic flow. It was expected that both mastery-approach goal and mastery self-talk motivational strategy will have positive and incremental role in academic flow, and that the relationship between mastery-approach goal and academic flow would be mediated through using motivational strategy of mastery self-talk. The participants were 113 university undergraduate students studying mathematics (M= 20 years, 61% females). Self-report questionnaires assessing achievement goals, strategies used for self-regulation of motivation, and study-related flow were applied. Data analysis included regression analyses and mediational analyses. Regression analyses revealed that personal goal achievements explained 43% of variance in mastery self-talk strategy, 32% of variance in performance-approach self-talk strategy, 18% of variance in performance-avoidance self-talk strategy, 11% of variance in environmental control strategy, 7% of variance in self-consequating strategy, and 10% of variance in proximal goal strategy. Personal achievement goals explained 45% of variance in academic flow. Mastery-approach goal was predictive for explaining individual variance in most of positive motivational strategies and academic flow. In line with hypothesis, it was found that mastery self-talk mediated the relationship between mastery-approach goal and flow. The results underscore the importance of adopting mastery-approach goal and using mastery self-talk strategy in order to experience study-related flow.

Keywords: Achievement goals, motivation, motivational regulation, flow.

1. Introduction

Flow is an optimal state of experiencing deep concentration and absorption in activity, intrinsic motivation and enjoyment (Csikszentmihalyi, 1975). Flow can be experienced in various activities, including during learning and other study activities, i.e. in academic domain (study-related or academic flow). Experiencing academic flow was found to correlate positively with higher student engagement (Shernoff & Csikszentmihalyi, 2009) and academic achievement (e.g., Ljubin-Golub, Rijavec, & Olčar, 2016), but also with measures of well-being (e.g., Engeser & Rheinberg, 2008; Rijavec, Ljubin Golub, & Olčar, 2016; Steele & Fullagar, 2009), and may even prevent burnout (Ljubin-Golub, Rijavec, & Olčar, 2020; Rijavec & Ljubin Golub, 2019). Therefore, it is of interest to study factors which may increase experiencing academic flow. Based on Csikszentmihalyi theory (1975), and previous research in non-educational domain (Kowal and Fortier, 1999), it may be posited that having mastery orientation will lead to experiencing flow in academic domain more frequently. In educational domain previous studies found that students who perceived their teachers as providing more autonomy support experienced more autonomous learning motivation which, in turn led to more frequent flow in learning (Ljubin-Golub, Rijavec, & Olčar, 2020). However, there is only a limited number of researches investigating the role of achievement goals in academic flow. Study done in high school students in Malaysia found that experiencing flow in learning was correlated both to mastery and performance goals, while regression analyses showed that mastery goals was the only significant factor in explaining variance in flow (Mustafa, Elias, Roslan, & Mohd Noah, 2011). However, there is no study done on university students,

and no study used 2x2 achievement goal theory framework. This framework posits that both mastery and performance goals may be differentiated with regard to approach-avoidance distinction, i.e., whether one is focused on positive possibility to approach and achieve success or is focused on negative possibility to avoid failure (Elliot & McGregor, 2001). Combining the mastery-performance and approach-avoidance categories leads to four types of achievement goals: mastery-approach (attaining task-based or intrapersonal competence), performance-approach (attaining normative competence), mastery-avoidance (avoiding task-based or intrapersonal incompetence) and performance-avoidance (avoiding normative incompetence (Elliot & Muruyama, 2008, p. 614). Thus, it seems worth studying this topic more thoroughly.

Besides mastery-approach, it seems that self-regulation of motivation may also be important factor for experiencing flow. There are several self-regulating motivational strategies that students use to enhance motivation (Walters, 1998; Ljubin-Golub, Petričević, & Rovan, 2019). Previous research found that mastery self-talk strategy was the most important predictor of academic flow (Ljubin-Golub, 2019). However, the role of mastery self-talk strategy it is not clear in the broader framework of motivation, e.g. in terms of achievement goal theory. Thus, the second aim of the study was to investigate simultaneously the role of both achievement goals and motivational regulation strategies in academic flow.

2. Objectives and hypotheses

Based on the above, the aims of this study were to explore: a) the role of achievement goals in motivational self-regulation and academic flow; b) the incremental role of mastery self-talk motivational strategy in academic flow over the mastery-approach goal; c) the mediating role of mastery self-talk motivational strategy in the relationship between mastery-approach goal and academic flow.

It was expected that mastery-approach and performance-approach goals would be positively related to mastery self-talk and performance-approach self-talk strategies, respectively, and also to academic flow (Hypothesis 1). It was also expected that both mastery-approach goal and mastery self-talk motivational strategy will have positive and incremental role in academic flow (Hypothesis 2), and that the relationship between mastery-approach goal and academic flow would be mediated through using motivational strategy of mastery self-talk (Hypothesis 3).

3. Methods

3.1. Participants and procedure
The convenience sample comprised 113 university undergraduate students majoring in mathematics education (M= 20 years, 61% females), on average 20 years old (M = 20.29 +/- SD= 1.91). Questionnaires were applied during regular psychology course. Participation in study was voluntarily and anonymously.

3.2. Instruments
Achievement goals were assessed by the modified 15-items The Achievement Goals Scale (AGS, Rovan, 2011). The items in original scale assess achievement goals in relation to specific study course, while the modification for all items of the scale in this study was done in order to assess achievement goals in relation to the study as whole. The scale assesses student's mastery-approach goal, mastery-avoidance goal, performance-approach goal, performance-avoidance goal and work avoidance goal. All items were rated od 7-point scale ranging from 1 (*totally disagree*) to 7 *(totally agree)*.

Motivational self-regulation strategies (MRSs) were assessed with the 30-item Motivational Regulation Questionnaire (MRQ, Schwinger et al., 2007), which is an extended version of Wolters's questionnaire (1999). The MRQ assesses eight motivational self-regulation strategies: (1) Enhancement of situational interest, (2) Enhancement of personal significance, (3) Mastery self-talk, (4) Performance-approach self-talk, (5) Performance-avoidance self-talk, (6) Environmental control, (7) Self-consequating, and (8) Proximal goal setting. All items were rated on 5-point scale ranging from 1 (*very rarely/never*) to 5 (*very often/always*).

Academic flow was assessed by the Study-Related Flow Inventory (WOLF-S) which includes items measuring absorption, study enjoyment and intrinsic study motivation (Bakker, Ljubin-Golub, & Rijavec, 2017). All 13 items of the scale are rated on a 7-point scale ranging from 1 (*never*) to 7 (*always*).

Measures used were previously shown to have good psychometric characteristics in Croatian samples (Bakker, Ljubin-Golub, & Rijavec, 2017; Ljubin-Golub, Petričević, & Rovan, 2019; Rovan,

2011). In this study all instruments also demonstrated adequate reliability of Cronbach alpha type as presented in Table 1.

4. Results

4.1. Descriptive statistics and correlations

Descriptive statistics are presented in Table 1. Mastery-approach mean was above theoretical mean of the scale, while Mastery-avoidance, Performance-approach, Performance-avoidance, and Work avoidance were all slightly below the theoretical mean point of the scale. Use of all motivational strategies except Performance-avoidance self-talk was slightly above the theoretical mean and experiencing academic flow was slightly below the theoretical mean point.

Achievement goals (Mastery-approach, Mastery-avoidance, Performance-approach, Performance-avoidance) were all positively correlated to each other with bivariate correlations ranging from $r = .31$ to 55 (all $ps \leq .001$), and were either not correlated or had negative association with Work avoidance goal with r ranging from -.19 ($p < .05$, Performance-approach) to -.65 ($p < .001$, Mastery-approach). Motivational strategies were mostly low-to moderate intercorrelated. Experiencing academic flow was positively associated with mastery-approach ($r = .57$, $p < .001$), mastery-avoidance ($r = .25$, $p < .01$), and performance-approach ($r = .28$, $p < .01$) goals, having no association with performance-avoidance goal ($r = .11$, $p > .05$), and was negatively associated with work avoidance ($r = -.62$, $p < .001$).

Table 1. Means, standard deviations, range and Cronbach alpha of the measures used.

	M (SD)	Actual Range	Cronbach α
AGS Mastery-approach	5.50 (1.21)	1.33-7.00	.87
AGS Mastery-avoidance	4.58 (1.40)	1.00-7.00	.77
AGS Performance-approach	3.72 (1.39)	1.00-7.00	.77
AGS Performance-avoidance	3.45 (1.76)	1.00-7.00	.95
AGS Work avoidance	3.18 (1.54)	1.00-7.00	.86
MRQ Enhancement of situational interest	2.82 (0.98)	1.00-5.00	.89
MRQ Enhancement of personal significance	3.38 (0.96)	1.00-5.00	.81
MRQ Mastery self-talk	3.27 (0.83)	1.00-5.00	.77
MRQ Performance-approach self-talk	3.49 (0.89)	1.00-5.00	.84
MRQ Performance-avoidance self-talk	2.39 (1.00)	1.00-5.00	.78
MRQ Environmental control	3.52 (0.90)	1.00-5.00	.71
MRQ Self-consequating	3.80 (0.90)	1.00-5.00	.86
MRQ Proximal goal setting	3.52 (0.94)	1.00-5.00	.80
WOLF-S Academic flow	3.49 (1.00)	1.08-6.15	.91

Note. AGS= Achievement Goal Scale; MRQ=Motivational Regulation Questionnaire,
WOLF-S= Study-Related Flow Inventory

Regression analyses (Table 2) revealed that personal achievement goals explained from 7% to 43% of variance in specific motivational self-talk strategy. Their role is especially prominent for explaining variance in mastery self-talk strategy (43%) and performance-approach self-talk strategy (35%). Mastery-approach goal was predictive for explaining individual variance in most of positive motivational strategies and academic flow. Performance-approach goal was predictive for explaining individual variance in mastery self-talk and performance-approach self-talk, but also to negative strategy of performance-avoidance self-talk which strategy was also explained by performance-avoidance goal. Personal achievement goals explained 45% of variance in academic flow, with both mastery-approach and performance approach along were positive predictors and work avoidance negative predictor of academic flow. As predicted, mastery-approach goal was positively related to mastery self-talk strategy ($\beta = .35$) and to academic flow ($\beta = .27$), performance-approach goal was positively related to performance-approach self-talk ($\beta = .40$) and to academic flow ($\beta = .17$), thus supporting Hypothesis 1. It is also worth noting that mastery-avoidance goal was positively related to mastery self-talk strategy ($\beta = .27$), while performance-approach goal was related to both performance-approach and performance-avoidance self-talk strategies, as well as was performance-avoidance goal.

In order to examine the role of mastery-approach goal and mastery self-talk strategy within the context of other achievement goals and other motivational strategies, we performed regression analysis with all four achievement goals (i.e. without work avoidance goal) entered in step 1 and all motivational strategies in step 2. Predictors together explained 50% of variance (adjusted 44%). Achievement goals explained 36% of variance in academic flow ($F\Delta_{(4,108)}=15.58$, $p<.001$), and all eight motivational strategies explained additional 14% of flow variance ($F\Delta_{(8,100)}=3.44$, $p<.01$). In the final step only

mastery-approach goal and mastery self-talk strategy were significant predictors ($\beta = .35$, $p<.001$, and $\beta = .43$, $p<.001$, respectively). Additional regression analyses were done with mastery-approach goal entered in the first step and mastery self-talk strategy entered in the second step, and vice versa, with flow as criteria. Predictors together explained 44% of the variance in academic flow ($F(2,110)=42.41$, $p<.001$). The mastery-approach goal entered in step 1 explained 33% of the variance in academic flow ($F\Delta(1,111)=53.64$, $p<.001$), and mastery self-talk accounted for additional 11% of unique variance beyond the mastery-approach goal ($F\Delta(1,110)=21.35$, $p<.001$). Adding mastery-approach goal after the mastery self-talk strategy, mastery-approach explained additional 7% of the variance in academic flow ($F\Delta(1,110)=14.110$, $p<.001$). The results showed that both mastery-approach goal and mastery self-talk motivational strategy had positive and incremental role in academic flow, thus confirming Hypothesis 2.

Table 2. Results of the regression analyses of motivational self-regulation strategies and academic flow.

Goals	Motivational self-regulation strategies (MRSs)								Acad. flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Mastery-approach	.33*	.10	.35**	.20	-.01	.27*	.38**	.38**	.27**
Mastery-avoidance	.01	.09	.27**	-.11	-.19	.02	-.04	-.03	.10
Performance-approach	.00	.19	.19*	.40***	.26**	.07	.09	.11	.17*
Performance-avoidance	-.12	-.15	-.09	.23*	.37**	.10	-.07	-.04	-.17
Work avoidance	.02	.01	-.18	.01	.08	-.05	.11	.04	-.42***
R^2	.09	.05	.46***	.35***	.22***	.15**	.11*	.14**	.47***
Adj R^2	.05	.01	.43***	.32***	.18***	.11**	.07*	.10**	.45***

Note. Standaridized beta coefficients are shown. *p < .05; . **p < .01; ***p < .001. (1) Enhancement of situational interest, (2) Enhancement of personal significance, (3) Mastery self-talk, (4) Performance-approach self-talk, (5) Performance-avoidance self-talk, (6) Environmental control, (7) Self-consequating, and (8) Proximal goal setting.

Mediation analysis was done using PROCESS bootstrapping method with 5000 bootstrapped samples and 95% confidence intervals (Preacher & Hayes, 2004). Direct effect of mastery-approach goal on academic flow was significant (b=1,20; SE= 0.319, CI= 0.5659, 1.8299), as well as indirect effect via mastery self-talk (b=0.862; Boot SE= 0.220, BootCI= 0.4830, 1.3518). Thus, results showed partial mediation and Hypothesis 3 was partially confirmed.

5. Discussion

It was shown that achievement goals together explained 47% of the variance in the academic flow, suggesting that adopting adequate personal achievement goal is one of the most important mechanisms underlying the individual differences in experiencing flow in academic domain. Experiencing academic flow was found to be strongly related to mastery-approach goal, but also has low positive bivariate association with mastery-avoidance and performance-approach achievement goals. However, as suggested by regression analyses, the key role of experiencing academic flow is to adopt the mastery-approach goal. One of the mechanisms through which mastery-approach leads to academic flow is mastery self-talk motivational strategy. However, mediation was partial suggesting that there are also some other factors associated with mastery-approach which are important in facilitating flow, such as deeper processing and deeper concentration. Future research should further study the role of other motivational factors in developing and adopting the mastery-approach, such as interest, usefulness of learning, or student's self-efficacy.

Besides the central role of mastery approach goal, mastery self-talk was itself found to have unique role for academic flow, incrementing the mastery-approach goal in explaining academic flow and explaining additional 11% of unique variance beyond mastery-approach. This finding is in line with previous research (Ljubin-Golub, 2019) and suggests the central role of mastery self-talk motivational strategy as a mechanism leading to academic flow. Therefore, it is of crucial value to foster the use of this motivational self-regulation strategy in order to facilitate academic flow. Since this strategy accents to keep on learning for the sake of learning, personal challenge, or personal value of the learning, teachers should try to point out the personal and practical value of learning and to organize process of learning as a personal challenge.

As per limitations of the study, the sample comprised university students majoring in mathematics education and further research should determine whether the results may be generalized to other student population. Second, the study is of cross-sectional design and therefore no causal effects are implied. Third, the study did not address students' academic achievement, socio-economic status or some other factors such as overall student's wellbeing which may be relevant for student motivation.

6. Conclusion

The study showed the key roles of adopting mastery-approach goal and mastery self-talk motivational strategy in order to experience flow in academic domain.

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