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### Procrastination, Motivation, & Flow

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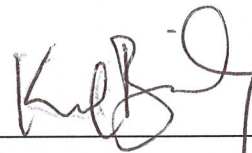
Procrastination, Motivation, & Flow

Reginald Desrosiers

March 28<sup>th</sup>, 2016

Advisor: Dr. Karl Bailey

Primary Advisor Signature: \_\_\_\_\_

A handwritten signature in black ink, appearing to read 'Karl Bailey', written over a horizontal line.

Department: \_\_\_\_\_

BEHAVIORAL SCIENCES

## Procrastination, Motivation, &amp; Flow

Flow, “an optimal psychological state that represents those moments where the individual is totally absorbed into the task, and where the experience is very rewarding in itself” (Wang, Liu, & Khoo, 2009), is a highly desirable experience and is thus the subject of numerous scientific studies. Mihaly Csikszentmihalyi (1990) describes this “optimal experience” as a precarious balance between an individual’s perceived capabilities and the perceived challenges of the task at hand, states that “[the Flow experience] usually occurs when we confront tasks we have a chance of completing” (Chapter 3). Procrastination, in contrast, is “the act of needlessly delaying tasks to the point of experiencing subjective discomfort” (Solomon & Rothblum, 1984). This behavior reaches epidemic proportions in academia (“as many as 50% of college students procrastinate on academic tasks at least half of the time and an additional 38% report procrastinating occasionally.” [Lee, 5]), and is correlated with impaired academic performance. Given these two options, why would any student choose to procrastinate?

Eunju Lee (2005) conducted a study with this question in mind. As procrastination is essentially a lack of self-regulation, she used Self-Determination Theory to discover potential motivational causes; “This motivational perspective is particularly salient for examining the relationship between motivation and flow because it distinguishes among different forms of motivation on the basis of the degree to which they can be considered self-determined” (Kowal & Fortier, 1999). Using 262 university students from South Korea, she distributed a questionnaire measuring degree of procrastination, frequency of flow experience, and most likely source of motivation to determine “whether the presumed relationships between procrastination and flow experiences were caused by the covariance between flow and motivation or whether they were independent of motivational effects” (8). As expected, she found that procrastination

was positively correlated with amotivation and negatively correlated with intrinsic motivation, self-determined extrinsic motivation, and flow (including all five of the flow subscales).

However, she found that procrastination was not strongly influenced by non-self-determined extrinsic motivation. Furthermore, in performing a hierarchical multiple regression analysis she found that motivation may not be a strong contributor to procrastination at all: “Results indicated that procrastination was best predicted by students' flow experiences rather than by motivation. That is, the students who concentrated on the task at hand and had clear goals with little self-consciousness tended not to procrastinate in their academic work.” (12)

In her discussion, Eunju mentioned that the most significant limitation to her study was the sample selection: only Koreans were accepted into the study. She suggested that a more diverse population would help “determine the robustness of the findings” (13). However, since the publication of this article, very little research has been done in regards to these correlations and no researcher has attempted to replicate this study. Therefore, a study will be conducted on the campus of Andrews University (the second-highest ethnic diversity on a national university-level campus in the United States of America, according to the US & World News Report in 2015) to examine the relationships between students' academic procrastination and their motivation and flow experience, as well as significant predictors for procrastination and flow. I hypothesize that procrastination will be positively correlated with amotivation and negatively correlated with extrinsic motivation and intrinsic motivation. I also hypothesize that motivation will not significantly contribute to the variance in procrastination when flow is considered simultaneously.

## **Method**

### **Subjects**

Subjects were recruited from the Behavioral Sciences Research Participation Pool. Subjects were only be included in the study if they are 18 years of age or older, fluent in English, and are full-time students at Andrews University.

Data from the Behavioral Sciences Research Participation Pool provided 113 useful responses (27 males, 86 females). Of these responses, 35% of subjects identified as White, 28% of subjects identified as Asian/Pacific Islander, 20% of subjects identified as Latino/Latina, 15% of subjects identified as African American, 9% of subjects identified as West Indian, 4% of subjects did not identify with the provided demographic labels, & 1% of subjects identified as American Indian/Alaskan Native.

This project was reviewed and approved by the Andrews University IRB.

**Materials**

All subjects completed the following questionnaires online via a lab-specific installation of LimeSurvey Version 2.05+ Build 140520 or newer.

Measure	Source	Number of Items
Procrastination: Procrastination Scale	Tuckman (1991)	16
Procrastination: Irrational Procrastination Scale	Steel (2010)	9
Motivation: Academic Motivation Scale	Vallerand et al. (1992)	28
Motivation: Academic Self-Regulation Scale	Vansteenkiste (2009)	16
Motivation: Intrinsic Religious Motivation Scale	Hoge (1972)	10
Motivation: Purpose in Life Scale	Schulenberg et al (2010)	4
Flow: Flow Short Scale	Engeser & Rheinberg (2008)	10
Demographics		6

**Procrastination.** The Procrastination Scale by Tuckman (1991) is designed to assess the procrastination tendencies of college students. It contains 16 items using 7-point Likert-type

response format from *strongly agree* (7) to *strongly disagree* (1). Items on this scale include: “I needlessly delay finishing jobs, even when they are important,” “I postpone starting in on things I don’t like to do,” and “When I have a deadline, I wait till the last minute.” The reliability of the scale (Cronbach’s  $\alpha$ ) is .86.

The Irrational Procrastination Scale by Steel (2010) is designed to assess general procrastination tendencies, and has been included in this study to increase internal validity for the procrastination variable. It contains 9 items using 7-point Likert-type response format from *strongly agree* (7) to *strongly disagree* (1). Items on this scale include: “I put things off so long that my well-being or efficacy unnecessarily suffers,” “If there is something I should do, I get to it before attending to lesser tasks,” and “My life would be better if I did some activities or tasks earlier.”

**Motivation.** The Academic Motivation Scale by Vallerand et al. (1992) is designed to assess dimensions of motivation according to Self-Determination Theory. It contains 28 items using 7-point Likert-type response format from *corresponds exactly* (7) to *does not correspond at all* (1). Items on this scale include: “because I experience pleasure and satisfaction while learning new things” (Intrinsic Motivation – To Know); “for the pleasure I experience while surpassing myself in my studies” (Intrinsic Motivation – Towards Accomplishment); “for the intense feelings I experience when I am communicating my own ideas to others” (Intrinsic Motivation – To Experience Stimulation); “because I think that a college education will help me better prepare for the career I have chosen” (Extrinsic Motivation – Identified); “to prove to myself that I am capable of completing my college degree” (Extrinsic Motivation – Introjected); “because with only a high-school degree I would not find a high-paying job later on” (Extrinsic Motivation – External Regulation); and “honestly, I don’t know; I really feel that I am wasting

my time in school” (Amotivation). The reliability of the scale (Cronbach’s  $\alpha$ ) ranged from .76 and .86, except for the identification subscale which had a value of .60.

The Academic Self-Regulation Scale by Vansteenkiste (2009) is designed to assess dimensions of motivation among college students according to Self-Determination Theory, and has been included in this study to increase internal validity for the introjected regulation, external regulation, identified regulation, and intrinsic motivation subscales. It contains 16 items using 5-point Likert-type responses from *very important* (5) to *completely not important* (1). Items on this scale include “because I’m supposed to do so” (External Regulation); “because I want others to think I’m smart” (Introjected Regulation); “because I want to learn new things” (Identified Regulation); and “because I am highly interested in doing this” (Intrinsic Motivation).

The Intrinsic Religious Motivation Scale by Hoge (1972) is designed to assess intrinsic and extrinsic religious motivation, and has been included in this study to increase internal validity for the motivation variable. It contains 10 items using 7-point Likert-type responses from strongly agree (7) to strongly disagree (1). Items on this scale include “My faith involves all of my life” (Intrinsic Religious Motivation) and “It doesn't matter so much what I believe as long as I lead a moral life” (Extrinsic Religious Motivation). The scale's reliability as measured by the Kuder-Richardson formula 20 is .901.

The Purpose in Life Scale by Schulenberg et al (2010) is designed to assess perceived meaning and life purpose, and has been included in this study to increase internal validity for the motivation variable. It contains 4 items using 5-point Likert-type responses from high (5) to low (1). The reliability of the scale (Cronbach’s  $\alpha$ ) ranged from .79 to .93.

**Flow.** The Flow Short Scale by Engeser & Rheinberg (2008) is designed to assess flow. It contains 10 items using 7-point Likert-type responses from very much (7) to not at all (1).



Items on this scale include “I feel just the right amount of challenge” (Flow – Absorption) and “My thoughts/activities run fluidly and smoothly” (Flow – Fluency). The reliability of the scale (Cronbach’s  $\alpha$ ) was 0.92.

### **Results**

The first research question of this study concerned the relationships of students' academic procrastination with their motivation and flow experience. Results are presented in Table 1. Procrastination as measured by the Procrastination Scale was significantly and negatively correlated with the intrinsic motivation – knowledge measure of the Academic Motivation Scale and the Purpose in Life measure, while procrastination as measured by the Irrational Procrastination Scale was significantly and negatively correlated with flow fluency. I also obtained significant, positive correlations between flow fluency and introjected regulation as measured by the Irrational Procrastination Scale and the Purpose in Life measure. Contrary to my hypothesis, procrastination was not significantly correlated with amotivation, extrinsic motivation, or flow.

I conducted a hierarchical multiple linear regression analysis to investigate the independent contributions of motivation and flow measures to predict the students' academic procrastination. Performed on both the Tuckman Procrastination Scale and the Steel Irrational Procrastination Scale, this regression's purpose was to determine whether variables significantly correlated with procrastination continue to be significant with the other variables are taken into account. The results of these analyses are shown in Tables 2 and 3.

In the first step of the hierarchical multiple regression analysis for the Procrastination Scale and Irrational Procrastination Scale, I entered all fourteen motivational measures that accounted for 26% of the variance in student's procrastination when measured by the

Procrastination Scale,  $F(14, 99) = 2.44$ ,  $p = .005$ , and 20% of the variance in student's procrastination when measured by the Irrational Procrastination Scale,  $F(14, 98) = 1.73$ ,  $p = .062$ . Intrinsic motivation – knowledge (Academic Motivation Scale) and introjected regulation (Academic Self-Regulation Scale) were significant predictors for the Procrastination Scale and extrinsic religious motivation, intrinsic religious motivation, and introjected motivation (Academic Self-Regulation Scale) were significant predictors for the Irrational Procrastination Scale (See Table 3).

In the second step of the analysis, I entered the two flow measures. When I added this set of variables to the prediction equation, it accounted for an additional 1% of the variance in procrastination for both scales, which constituted a negligible increase in the explained variance for the Procrastination Scale,  $F(2, 96) = 0.49$ ,  $p > .616$ , and the Irrational Procrastination Scale,  $F(2, 96) = 1.60$ ,  $p = .082$ . There were no significant effects for flow measures for either scale, although the effect of extrinsic religious motivation and introjected motivation (Academic Self-Regulation Scale) became less significant when flow measures were entered into the analysis.

In the third step of the analysis, I chose to enter demographic measures to account for significant effects on procrastination as the study gathers data from a more diverse sample than Lee's. When I added this set to the prediction equation, it accounted for an additional 6% of variance in procrastination for the Procrastination Scale and an additional 7% of variance in procrastination for the Irrational Procrastination Scale. This constituted a moderate increase in the explained variance for the Procrastination Scale,  $F(4, 92) = 2.04$ ,  $p = .096$ , and the Irrational Procrastination Scale,  $F(4, 92) = 1.77$ ,  $p = .036$ . I found marginal positive effects for age and US residence for the Procrastination Scale and a significant positive effect for male subjects for the Irrational Procrastination Scale. Furthermore, after entering these demographic measures into the

analysis for the Irrational Procrastination Scale, extrinsic religious motivation demonstrated a more significant negative effect on procrastination. These results indicated that procrastination was best predicted by motivation and demographic measures rather than by flow: students that are intrinsically motivated to learn and do not associate their religious affiliations with other aspects of their life tended to not procrastinate in their academic work, whereas students that involve their religious beliefs in all aspects of their life are more prone to procrastinate in their academic work.

I also conducted a hierarchical multiple regression analysis to investigate the variables that most significantly predict flow fluency, as it had stronger overall correlations with procrastination and motivations than flow absorption. The results of this analysis can be seen in Table 4.

In the first step of the hierarchical multiple regression analysis for flow fluency, I entered all four demographic measures that accounted for 8% of the variance in student's flow fluency,  $F(4, 108) = 2.37, p = .057$ . There were no significant predictors for this step.

In the second step of this analysis, I entered the two procrastination measures that accounted for an additional 4% of variance in flow fluency, which constituted a negligible increase in the explained variance for flow fluency,  $F(2, 106) = 0.49, p = .082$ . There were no significant effects for procrastination measure, although the effect of gender became marginally significant when procrastination measures were entered.

In the third step of this analysis, I entered all fourteen motivational measures that accounted for an additional 33% of the variance in student's flow fluency,  $F(14, 92) = 3.94, p < .001$ . I found a significant positive effect for purpose of life. Furthermore, after I entered these motivational measures into the analysis, gender lost its marginal positive effect on flow fluency

and procrastination as measured by the Irrational Procrastination Scale demonstrated a marginal negative effect on flow fluency. These results indicated that flow fluency was best predicted by purpose in life rather than by procrastination or other measures of motivation. That is, students that perceive their life as clearly purposeful and meaningful tend to experience an increased fluency of performance in their academic studies.

### **Discussion**

I aimed to study the correlations between procrastination, motivation and flow, as well as significant predictors of procrastination as a college student. I found significant and negative correlations between procrastination and flow fluency, purpose in life, intrinsic motivation – knowledge. I also found a highly significant and positive correlation between flow fluency and purpose in life. These findings are consistent with the hypothesis. However, procrastination was not significantly correlated with the other flow measure or any other motivation measure, which is contrary to my predictions.

As my predictions are replicating Eunju Lee's results, this study contradicts the current literature on this subject. Furthermore, I chose to include measures of religious motivation and purpose in life in order to expand the validity of the motivation measure. I attribute this inconsistency to the more diverse sample of students that this study has gathered data.

The most relevant limitation to this study was the dissimilar results between the motivation and procrastination scales. The correlation of extrinsic religious motivation between these two scales was particularly inconsistent, with the Procrastination Scale displaying a positive correlation with extrinsic religious motivation and the Irrational Procrastination Scale displaying a negative correlation with extrinsic religious motivation. However, this demonstrates that the theoretical construct of procrastination needs to be clarified within the scientific

community to create more internally valid scales for procrastination. In future studies, researchers need improve the construct validity of procrastination and motivation, and test their validity in more diverse studies.



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Appendix A

Measure	1	2	3	4	5	6	7	8	9	10	11
1. PRO	-	-	-	-	-	-	-	-	-	-	-
2. IPS	.67***	-	-	-	-	-	-	-	-	-	-
3. AMS.INT	-	-.17	-	-	-	-	-	-	-	-	-
4. AMS.EXT	.39***	.06	.04	.20***	-	-	-	-	-	-	-
5. AMS.IJ	-.14	-.12	.48***	.34***	-	-	-	-	-	-	-
6. VAN.IJ	.18	.04	.52	.27**	.42***	-	-	-	-	-	-
7. REL.INT	-.13	.07	.36***	-.13	.24***	-.18	-	-	-	-	-
8. REL.EXT	.15	-.15	-.27**	.00	-.10	.21*	-.42***	-	-	-	-
9. PIL	-.25**	-.13	.33***	-.04	.12***	-.15	.32*	-.19***	-	-	-
10. FLOW.FL	-.17	-	.30**	-.05	.23***	.00	.16	.07	.53***	-	-
11. FLOW.ABS	.00	-.06	.19*	-.11	.12**	.02	.06	.11	.21*	.56*	-
M	3.98	4.19	4.88	5.30	4.60	3.07	5.26	3.21	3.95	4.13	4.21
SD	.76	1.01	1.24	1.17	1.48	1.14	1.15	1.48	.88	1.05	.90

*Note.* Intercorrelations for students (N = 113) are presented below the diagonal. Means and standard deviations for students are presented in the horizontal rows. For all scales, higher scores are indicative of more extreme responding in the direction of the construct assessed. PRO = Procrastination Scale, IPS = Irrational Procrastination Scale, AMS.INT = intrinsic motivation – knowledge (Academic Motivation Scale), AMS.EXT = External Regulation (Academic Motivation Scale), AMS.IJ = Introjected Regulation (Academic Motivation Scale), VAN.IJ = Introjected Regulation (Academic Self-Regulation Scale), REL.INT = Intrinsic Religious Motivation, REL.EXT = Extrinsic Religious Motivation, PIL = Purpose in Life, FLOW.FL = Flow Fluency, FLOW.ABS = Flow Absorption. \*p < .05; \*\*p < .01; \*\*\*p < .001

Appendix B

**TABLE 2. Results of the Hierarchical Regression Analysis Predicting Procrastination Scale (Tuckman, 1991)**

Variable	$\beta$		
	Step 1	Step 2	Step 3
<b>Motivation</b>			
amotivation (AMS)	-0.025	-0.031	-0.034
external regulation (AMS)	0.068	0.083	0.083
external regulation (VAN)	-0.001	-0.005	0.036
extrinsic religious motivation	0.024	0.017	0.021
intrinsic motivation - knowledge (AMS)	-0.273**	-0.276**	-0.251*
intrinsic motivation – stimulation (AMS)	-0.085	-0.071	0.070
intrinsic motivation – accomplishment (AMS)	0.099	0.092	0.081
intrinsic motivation (VAN)	0.105	0.092	0.056
intrinsic religious motivation	0.084	0.089	0.094
identified regulation (AMS)	0.002	-0.014	0.008
identified regulation (VAN)	0.026	0.011	0.020
introjected regulation (AMS)	-0.088	-0.086	-0.086
introjected regulation (VAN)	0.156*	0.156*	0.166*
purpose in life	-0.157	-0.149	-0.174
<b>Flow</b>			
fluency		-0.033	-0.023
absorption		0.094	0.113
<b>Demographics</b>			
male			0.141
age			0.088†
class standing			-0.083
only US			0.301†
F	2.44	0.49	2.04
(triangle)R <sup>2</sup>	.26	.27	.33
p	.005**	.616	.096†

†p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001

Appendix C

**TABLE 3. Results of the Hierarchical Regression Analysis Predicting Irrational Procrastination Scale (Steel, 2010)**

Variable	$\beta$		
	Step 1	Step 2	Step 3
<b>Motivation</b>			
amotivation (AMS)	0.157†	0.158	0.131
external regulation (AMS)	0.128	0.139	0.134
external regulation (VAN)	0.091	0.095	0.134
extrinsic religious motivation	-0.281**	-0.270*	-0.282**
intrinsic motivation - knowledge (AMS)	-0.227	-0.220	-0.204
intrinsic motivation – stimulation (AMS)	-0.082	-0.061	-0.056
intrinsic motivation – accomplishment (AMS)	0.179	0.180	0.123
intrinsic motivation (VAN)	0.089	0.087	0.063
intrinsic religious motivation	0.201*	0.196*	0.217*
identified regulation (AMS)	-0.060	-0.101	-0.056
identified regulation (VAN)	0.127	0.111	0.171
introjected regulation (AMS)	-0.088	-0.086	-0.086
introjected regulation (VAN)	-0.196*	-0.178†	-0.160†
purpose in life	-0.126	-0.035	-0.070
<b>Flow</b>			
fluency		-0.169	-0.172
absorption		0.096	0.104
<b>Demographics</b>			
male			0.511*
age			0.097
class standing			-0.120
only US			0.233
F	1.73	1.60	1.77
(triangle)R <sup>2</sup>	.20	.21	.28
p	.062†	.082†	.036*

†p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001

Appendix D

**TABLE 4. Results of the Hierarchical Regression Analysis Predicting Flow Fluency**

Variable	$\beta$		
	Step 1	Step 2	Step 3
<b>Demographics</b>			
male	0.331	0.413†	0.256
age	0.050	0.069	-0.009
class standing	0.149	0.012	0.078
only US	-0.200	-0.149	-0.311
<b>Procrastination</b>			
procrastination scale (Tuckman)		-0.029	0.276
irrational procrastination scale (Steel)		-0.206	-0.229†
<b>Motivation</b>			
amotivation (AMS)			0.057
external regulation (AMS)			-0.032
external regulation (VAN)			0.030
extrinsic religious motivation			-0.037
intrinsic motivation - knowledge (AMS)			0.048
intrinsic motivation – stimulation (AMS)			0.041
intrinsic motivation – accomplishment (AMS)			0.043
intrinsic motivation (VAN)			0.099
intrinsic religious motivation			-0.040
identified regulation (AMS)			-0.174
identified regulation (VAN)			0.070
introjected regulation (AMS)			0.108
introjected regulation (VAN)			-0.078
purpose in life			0.598***
F	2.37	2.56	3.94
(triangle)R <sup>2</sup>	.08†	.12†	.45
p	.057†	.082†	2.96 e-5***

†p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001