College Students' Need for Cognition, Academic Motivation, Performance, and Well-Being

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Abstract

Students (N=48) enrolled in a higher Psychology course participated in this study by answering the Need for Cognition Scale (NCS), Academic Motivation Scale (AMS), and Psychological Well-Being Scales (PWBS). The average of the percentage scores in the midterm and final examinations was used as an indicator of academic performance. Data were analyzed using Pearson product moment correlations. Academic motivation was found to correlate significantly with three dimensions of well-being (environmental mastery, personal growth, purpose in life) and need for cognition, but not with academic performance. One important implication of this study is that nurturing certain dimensions of well-being can improve motivation in our students. Thus, one of possible interventions for students-at-risk due to lack of motivation in their studies would be a program addressing such well-being dimensions.

Keywords: need for cognition, academic motivation, academic performance, well-being

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It remains a challenge to educational psychologists and other educators on how to improve academic performance of students, which is the usual indicator that transfer of learning has occurred. While motivation is usually implicated as a reason for underperformance, not much attention has been given to other factors that may have a bearing on both motivation and performance, such as how the process of thinking is valued by students. A student who highly values thinking will consequently invest more effort in dealing with cognitive tasks, especially those that are deemed as challenging.

Even less attention has been given to psychological-spiritual-existential states (e.g., well-being) of the student, both in research and in practice, as it relates to his or her functioning inside the classroom. Often, such topics are treated as separate from education. This goes against the principle of looking at the person as a *gestalt*, or in his or her entirety, as we seek to understand thinking, affect, and behavior.

In this research, the interrelationships of academic motivation, need for cognition, dimensions of psychological well-being, and academic performance were examined.

Academic Performance

Academic performance (AP), as reflected in the grades, has typically been used to gauge whether students have learned their lessons and indirectly, whether teachers were able to carry out their work well. Indeed, school success has been popularly attributed to cognitive ability.

Still, there are alternative lines of evidence suggesting stronger predictive utility of other constructs in relation to academic performance. For instance, the ability to regulate one's actions has been found to have positive associations with achievement outcomes. In a longitudinal study of 140 eighth-grade students, those who were highly disciplined were found to outperform their peers in report-card grades, standardized achievement test scores, admission to a competitive high school, and attendance (Duckworth & Seligman, 2005). More so, self-discipline was able to predict AP over the school year more than that of intelligence.

Personality has also been found to be related as well to academic performance. O'Connor and Paunonen (2007) noted that there is a high frequency of findings in the voluminous literature that conscientiousness and its constituent narrow personality traits were moderately related to AP. Aside from conscientiousness, two of the remaining Big Five personality factors were found to be related -- openness to experience (positive correlation) and extraversion (negative correlation). However, the contradictory findings on these two factors imply that such directional relationships may hold true only in some situations. Similarly, Chamorro-Premuzic and Furnham (2003) found conscientiousness to lead to higher academic achievement while neuroticism was found to impair academic performance. A hierarchical regression of the Big Five personality traits yielded that they were better predictors of AP, absenteeism, essay marks, and classroom behaviour than cognitive ability, beliefs about intelligence, and gender (Furnham, Chamorro-Premuzic & McDougall, 2002).

In sum, as demonstrated by the studies mentioned, academic performance does not depend on ability alone but can also be influenced by quite a number of variables, both internal and external to the learner.

Academic motivation

Motivation is deemed to be crucial to student success, influencing what, when, and how learning happens. Students who are highly motivated demonstrate eagerness to learn and subsequently engage in behaviors geared towards the acquisition of knowledge. Hence, motivation refers to the process of initiating and maintaining behavior in a particular direction, often in pursuit of an identified goal or set of goals. Goals provide impetus for and direction to action. Together with energy, effort, and persistence, this often leads to enhanced performance. Gains showed by motivated students may be the outcome of a systematic approach to their learning efforts. Also, motivation is reciprocally related to learning and performance (Schunk, Pintrich, & Meece, 2008). This means that when motivated students perform well, this further strengthens their academic motivation to continue to do so.

In general, motivation level has been found to be strong predictors of academic achievement in the sense that students who report higher

levels of motivation also report higher levels of learning or get better grades relative to their peers (Tavani & Losh, 2003; Bernaus & Gardner, 2008; Hardré & Sullivan, 2008; Pribyl, Sakamoto, & Keaten, 2004). Brophy (2010) qualified that performance will also depend on the quality of motivation, such that performance is best when motivation is at an optimal level rather than when it is below or above it.

Furthermore, the form of motivation, whether intrinsic or extrinsic, will have different effects on learning and performance (Ormrod, 2006). Students are more likely to benefit when they are intrinsically motivated to engage in classroom activities and in the learning process. One intrinsic motivator is when the doer is happy with what he or she is doing. Mistler-Jackson and Songer (2000) as well as Yunus, Ishak and Razak (2010) found in their respective studies that motivated and highly performing students experience a higher level of satisfaction. It may be that the satisfaction derived from engagement in the tasks and what ensues from good performance (e.g., high grades, social praise) serve as potent positive reinforcers. These feed on the initial motivation such that the student is inclined to continue actions that would bring about desired rewards.

The need for cognition

The need for cognition (NC) is one type of nonbiological higher need, similar to Henry Murray's *need for understanding*, which is defined as a tendency to "analyse experience, to abstract, to discriminate among concepts, to define relations, to synthesize ideas, and to arrive at generalizations that are comprehensive and verifiable" (Murray, 1938, p. 224). In his theory of human motivation, Abraham Maslow (1943) considered the desire for facts, desire to know, curiosity, and exploration as important in the achievement of the basic needs as well as expressions of self-actualization. He also postulated, based on clinical evidence, that the *need to know* may be a function of intelligence. NC has also been used interchangeably by some researchers with the construct *curiosity*. For instance, Reiss (2009) conceptualized NC as *intellectual curiosity*, which he considered to motivate thinking and valuation of ideas.

Although the word "need" appears in the phrase "need for cognition", Cacioppo and Petty (1982) —whose seminal work is ubiquitous in subsequent investigations on NC —clarified that this was used in a

statistical rather than a biological sense. It may be more accurate then to refer to NC as a motivational tendency to engage in extensive thinking relative to others, rather than arising from a physiological deficit.

Several characteristics were found to distinguish between the person high in NC and low in NC. Individuals rated to be high in NC were more likely to engage in effortful thinking (Petty, Briñol, Loersch & McCaslin, 2009); enjoy tackling complex tasks, experience less frustration and mental discomfort when given a demanding mental task (Cacioppo & Petty, 1982); utilize more information in the face of counter-attitudinal persuasive messages (Cacioppo, Petty & Morris, 1983); evaluate more favorably informational materials with high verbal and low visual complexity (Martin, Sherrard & Wentzel, 2005) and, are more aware of their thinking, prefer structure and clarity in their surroundings, have stronger attitudes, are more likely to evaluate their thoughts for validity, and enjoy high thought confidence (Petty et al., 2009). Moreover, curiosity as a trait has been implicated in more frequent growth-oriented behaviors, greater meaning in life, and greater life satisfaction (Kashdan & Steger, 2007).

A number of studies have linked NC with task performance. Following a regression analysis, the need for cognition rather than metacognition was found to be a significant predictor of intellectual task performance (β= .25, t= 4.81,p=.01) (Coutinho, 2006). This is contradictory, however, to the finding of an earlier study that NC was unrelated to abstract reasoning as well as verbal reasoning (Cacioppo, Petty & Morris, 1983). The need for cognition has also been found to correlate significantly with a measure of cognitive ability (the Scholastic Aptitude Test; r=.24, p<.001) and a measure of a thinking disposition (the Actively Open minded Thinking Scale; r=.40, p<.001) (West, Toplak, & Stanovich, 2008). Reiss (2009) found that many students with low curiosity scores in the Reiss School Motivation Profile (RSMP) became easily bored with traditional school curricula as well as intellectual activities. Furthermore, the RSMP curiosity scale was found to significantly correlate with intrinsic motivation (r=.54, p<0.01) and with positive affect (r=.26, p<0.01) (Olson & Chapin as cited in Reiss, 2009).

Psychological well-being

Psychological well-being (PWB) is a construct popularly associated with the Positive Psychology movement and it is often used interchangeably with subjective well-being. PWB is not limited to the absence of a disorder or distress. Rather, it encompasses a wealth of human experiences such as growth, meaning, and happiness. In general, one enjoys PWB when there are more positive emotions experienced than negative ones. Simply put, it is the subjective feeling of contentment, happiness, and satisfaction with life.

Factors that have been found to affect well-being include, among others, self-efficacy, optimistic attitude, and locus of control (Singh & Mansi, 2009). Parental factors have also been found to impact student well-being, particularly that of parental subjective mental health status (Giannakopoulos, et. al, 2009) and perceived parental involvement (Kripps & Zyromsky, 2009). In the latter study, a parenting style that is authoritative/democratic was found to positively influence psychological well-being of adolescents. This in turn was found to positively influence levels of intrinsic motivation for learning. School context was also found to be a major influence on schoolchildren's general subjective well-being (Konu, Lintonen & Rimpelä, 2002).

Given this breadth, researches abound on myriad positive experiences that fall under well-being and its correlates. Huppert (2009) found psychological well-being to be associated with flexible and creative thinking, pro-social behaviour, and good physical health. Similarly, taking on goals that are related to self-improvement and growth were associated positively with various indices of well-being while avoidance tendencies and concerns with validating/demonstrating one's competence were associated with adjustment problems (Tuominen-Soini, Salmela-Aro, & Niemivirta, 2008). Such studies suggest that fostering a classroom atmosphere that nurtures well-being can be an aid in realizing objectives of schools and teachers for their students.

METHODOLOGY

Sample

Forty-eight college students enrolled in a higher Psychology subject participated in the study. All of the participants were Psychology majors from a rurally-based extension program of a state-sponsored university. Fifty-eight percent of the participants were in their junior year while 42% were seniors. There were more females (n=37; mean age=19.28) than males (n=11; mean age=20.09). This reflected the preponderance of females in the student population of Psychology majors in the school. Due to the big difference in the female-to-male ratio, gender was not treated as a variable on which to compare the study variables.

In the curriculum, the Psychology subject the respondents were enrolled in carried a 4-unit credit load, in contrast to the usual 3-unit credit load. As such, this particular subject had heavier and more demanding requirements compared to their other subjects.

Prior to the administration of the instruments, the researcher briefed the students about the study. They were informed that participation was voluntary; refusal to participate would not affect their final grade; and, that participation would be awarded extra credit. Their responsibilities and rights as participants were discussed and these were presented in written form as well as in the informed consent sheet.

Instrumentation

Need for Cognition Scale

The Need for Cognition Scale (NCS) was intended to distinguish between individuals who were inclined to engage in and enjoy "effortful analytic activity" (Cacioppo et al., 1983). The NCS has strong validity evidence (Cacioppo & Petty, 1982). For this study, the shortened version of the NCS was used. Statements in the original 34-item NCS was reduced to 18 and the two have been found to have a high significant correlation (r=0.95, p<.001) (Cacioppo, Petty & Kao, 1984). The shortened

form has nine questions that are positively stated such as: "I would prefer complex to simple problems"; "The notion of thinking abstractly is appealing to me"; "I find satisfaction in deliberating hard and for long hours" while the other half were reverse-scored statements such as "Thinking is not my idea of fun"; "I only think as hard as I have to"; and, "Learning new ways to think does not excite me very much." Respondents were asked to rate each statement according to the extent that it characterized them on a 5-point scale, ranging from *extremely characteristic* to *extremely uncharacteristic*.

Academic Motivation Scale

The Academic Motivation Scale (AMS; Pascarella et al., 2007) is composed of eight items, where respondents are asked to indicate the extent of their agreement or disagreement with statements about their academic motivation, using a five-point response format (from *strongly agree* to *strongly disagree*). Sample items include: "I am willing to work hard in a course to learn the material even if it won't lead to a higher grade"; "When I do well on a test, it is usually because I am well-prepared, not because the test is easy"; and, "I frequently do more reading in a class than is required simply because it interests me." The internal consistency reliability of the AMS ranges from .69 to .74.

Academic Performance

The percentage scores of the participants in the midterm examination and final examination were averaged and used as an indicator for academic performance (AP). The examination questions covered topics specified in the syllabus. These topics were also discussed in class and the instructor-made Powerpoint presentations used in the lectures were provided to the students. A reference book, from which the lectures and examination questions were based, was specified at the start of the semester.

Psychological Well-Being Scales

The Psychological Well-Being Scales (PWBS; C. Ryff, personal communication) is composed of six 14-item scales measuring dimensions

of psychological well-being, such as *autonomy, environmental mastery, personal growth, positive relations with others, purpose in life*, and *self-acceptance* (Ryff, 1989). Autonomy is defined as the extent to which students view themselves as being independent and able to resist social pressures ("I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people"); environmental mastery as the extent to which students feel in control of and able to act in the environment ("In general, I feel I am in charge of the situation in which I live"); personal growth as the extent to which students have a sense of continued development and self-improvement ("I am not interested in activities that will expand my horizons"- reverse scored); positive relations with others as the extent to which students have satisfying, trusting relationships with other people ("Most people see me as loving and affectionate"); purpose in life as the extent to which students hold beliefs that give life meaning ("I live one day at a time and don't really think about the future" – reverse scored); and, self-acceptance as the extent to which students have a positive attitude about themselves ("When I look at the story of my life, I am pleased with how things have turned out"). The respondents were asked to indicate their agreement or disagreement with each of the statements, choosing from *strongly disagree* to *strongly agree*. There are statements that are negatively stated and these are reverse-scored. The scales have good internal consistency with coefficient alphas ranging from .83 to .98.

ANALYSIS

Since outcome factors are continuous variables, the Pearson product-moment correlation analyses were performed for the respondents' scores on the NCS, AMS, AP, and PWBS.

RESULTS AND DISCUSSION

The means and standard deviation scores for the NCS, AMS, AP and PWBS can be seen in Table 1. Thirty-three percent of the sample (n=16) reported low academic motivation (using a median score of 26 as cut-off). Of these students, majority did not perform well in the class

(using a cut-off grade of 75) but there were three students who were able to get high grades in the class. Among the variables, there was greatest variation in the scores for academic performance, possibly indicating heterogeneity in students' abilities in remembering and understanding the subject matter. In contrast, there was the least variation among scores in the Academic Motivation Scale, which suggests that the participants' motivational levels did not depart greatly from each other.

Table 1. Descriptive data on the NCS, AMS, AP and PWBS

Measures	Mean	Standard Deviation
NCS	62.29	10.28
AMS	26.67	4.88
AP	63.58	16.02
PWBS-Aut	36.92	9.62
PWBS-Env Mas	36.23	5.93
PWBS-Per Gro	43.33	5.94
PWBS-Pos Rel	41.65	9.52
PWBS-Pur	40.81	5.40
PWBS-Self Acc	38.46	6.92

Note. Aut=Autonomy; Env Mas=Environmental Mastery; Per Gro=Personal Growth;Pos Rel=Positive Relations with Others; Pur=Purpose in Life; Self Acc=Self-acceptance

The researcher expected the need for cognition to be related to both academic motivation and academic performance. Intuitively, students who have a high need to know would presumably be intrinsically interested to read more and understand the lessons. Consequently, because they understand the lessons, it is expected that they would perform better than their peers who are low in the need for cognition. However, of these speculated relationships, only that of the need for cognition and academic motivation was found to be significant at the $p<0.01$ level ($r=.40$, $p=.004$) as presented in Table 2. Need for cognition and academic performance showed a very weak relationship, to the point

of it being negligible (r= -.04, NS). A similar finding was found between academic motivation and performance (r=.13, NS).

Table 2. Correlation coefficients (r) among need for cognition, academic motivation, academic performance, and well-being

Variables	1	2	3	4	5	6	7	8	9
1. NC	-	.40**	-.04	.30	.28	.48**	.22	.48**	.32*
2. AM	-	-	.13	-.04	.32*	.36*	.23	.44**	.28
3. AP	-	-	-	-.05	.25	-.01	-.09	.12	.08
4. Aut	-	-	-	-	.43**	.34*	.25	.20	.38**
5. Env Mas	-	-	-	-	-	.73**	.52**	.64**	.54**
6. Per Gro	-	-	-	-	-	-	.40**	.64**	.54**
7. Pos Rel	-	-	-	-	-	-	-	.50**	.60**
8. Pur	-	-	-	-	-	-	-	-	.60 **
9. Self Acc	-	-	-	-	-	-	-	-	-

Note: Aut=Autonomy; Env Mas=Environmental Mastery; Per Gro=Personal Growth;Pos Rel=Positive Relations with Others; Pur=Purpose in Life; Self Acc=Self-acceptance
*p<.05 (two-tailed) **p<.01 (two-tailed)

It may be that the lack of a significant relationship between the need for cognition and academic performance, as well as academic motivation and academic performance, were due to several factors which were not included in the study. For instance, gender was not considered because of the disparity in the number of males and females in the class. However, gender has been found in several studies to affect motivation (e.g., Tella, 2007; Chaturvedi, 2009; Rusillo & Arias, 2004) and school performance (e.g., Yousefi, Mansor, Juhari, Redzuan & Talib, 2010). In addition, though NC taps into the tendency to engage in extensive thinking, the outcome of such thinking may not always be logical and rational (Petty et al., 2009). Hence, even if a person is high in NC, it does not necessarily follow that his or her thinking processes is at all times accurate and without flaw. Thus, even someone high in the need for cognition can make many errors and get a low score in an examination.

The resulting lack of a relationship between academic motivation and academic performance contradicts that of Tella's study (2007), who found motivation to affect the academic achievement of secondary school

students. Aside from obvious differences in the sample (i.e., North American versus Filipino; secondary school versus tertiary school), a possible explanation for this finding is the level of complexity of the Psychology subject and hence, the examinations. It may be that even if a student is highly motivated to study, he or she can still perform poorly in the examinations because of the higher cognitive load (i.e., there are many materials to read and technical terms to remember).

Furthermore, given that the instrument used to gauge motivation does so in general terms, it is also possible that the academic motivation of the student is generally high but he or she is not as motivated for this particular Psychology subject. Aside from these, other factors to consider are the students' cognitive processing styles (deep versus surface); persistence and effort expended in tackling difficult material; test-taking strategies; tendency to experience test anxiety; and, achievement goals (mastery versus performance).

With regard to the well-being scales, the researcher speculated that the need for cognition would be related to environmental mastery and purpose in life. Logically, people who yearn to know and to understand would be more equipped with ideas that could translate into applications to transcend limitations and meet challenges in their environments. Also, people who are more likely to mull things over may be more receptive to ponder questions about existence (including one's purpose in life) as well. The researcher's speculation about the need for cognition as being related to purpose in life was supported (r=.48, p=.001), but not for environmental mastery. Instead, significant associations were found between the need for cognition and personal growth (r=.48, p=.001) and self-acceptance (r=.32, p=.024). The similarity in the values of the correlation coefficients for purpose in life and personal growth are interesting to note. Further explorations in how the two are related may be warranted. Although these three dimensions of well-being are seemingly distal to educational issues, the researcher argues that the consideration of well-being dimensions are still relevant, coming from the perspective that education should target the development of the whole person and not merely his or her grasp of the lessons.

Academic motivation was found to correlate significantly with environmental mastery (r=.32, p=.028), personal growth (r=.36, p=.011), and purpose in life (r=.436, p=.002). As can be seen, the strongest (though modest) relationship with AM was remarkably with purpose in life. What

accounts for this relationship may lie in the educational philosophy of the school. The school, being state-sponsored, espouses the ideal of using one's education in contributing to the development and progress of the country. This end-goal has been indoctrinated in the students since their entry into the university. As such, if the students have internalized and incorporated this in their goals in life, a first step would be that they get a good education and learn all that they can. The relationship between AM and purpose in life also implies that if education (particularly at the college level) can facilitate purpose generation in students, then the motivational levels of students could become higher.

Other significant relations were found among the well-being dimensions, such as that between autonomy and environmental mastery, personal growth, and self-acceptance; environmental mastery and personal growth, positive relations with others, purpose in life, and self-acceptance; personal growth and positive relations with others, purpose in life, and self-acceptance; positive relations with others and purpose and self-acceptance; and, purpose and self-acceptance. Since the six dimensions are loading onto a single construct which is well-being, the inter-relationships are not surprising.

What is more baffling at first glance is the lack of a relationship between autonomy and positive relations with others as well as with autonomy and purpose in life. However, if culture will be used to contextualize such findings, the puzzle diminishes to be so. In a culture that is described as relational and collectivistic, it is the practice that people cluster in groups (family, cliques, school organizations). In turn, these groups become a big part of one's social identity and is influential in one's thinking and behavior that contributes to how one conceptualizes his/her purpose in life. Also, Filipinos' way of relating to each other could best be described as a merging of the self with the other (*kapwa*), and there is a recognition of our interdependence in one another.

CONCLUSION AND RECOMMENDATIONS

Unmotivated students are at risk in failing their courses, of frequently absenting themselves from their classes, dropping out, or of not graduating on time. As such, motivation is an important aspect to consider by educators since this is usually seen as crucial to performing

well academically. However, the present study did not find such a relationship between motivation and performance, contrary to the general trend of findings. One reason to account for this may be that the index of performance used may not have accurately captured how well the students did in the class. Also, learning should be differentiated from performance in the sense that the examination scores are not absolute measures of how much the student has learned. Further studies on the mechanism of how motivation impacts on performance should be done to elucidate other factors that may mediate between the two. The relationship of motivation to performance appears to be more complex than once thought, and may warrant further examination.

This study demonstrated that academic motivation is associated with need for cognition, personal growth, purpose in life, and environmental mastery. Thus, there are gains in developing and nurturing a high need of cognition in students. Since this is not something that every student has and possess in equal amounts, educators ought to give careful thought and planning to how they will teach the lessons. Questions that will pique students' curiosities could be given before every lesson segment to encourage effortful thinking and active acquisition of knowledge through, for example, research. Also in this way, students are encouraged to adopt mastery goals rather than performance goals. In general, mastery goals have been found to influence performance in a more positive manner.

However, although getting the students interested is the usual strategy to make students decide to read, study, and know more about the lessons, given the diversity of students in terms of background, personality, and interests, it may be quite a heavy burden on the teacher to constantly come up with ways to stimulate students' curiosities. In light of this, the significant correlations between academic motivation and the three dimensions of well-being may be noteworthy to consider. Intervention programs for students could include personal growth workshops or the psychological-spiritual-existential aspect of development could be incorporated in the teaching strategies and activities.

Several recommendations to improve the present study are to utilize a bigger and more varied sample size as well as to counterbalance demographic factors such as gender and socio-economic status. Since the scales used are all self-report scales, they are vulnerable to bias. Perhaps a measure of the extent to which the respondents' tend to present

themselves in a socially desirable manner might be used to check against a biased response style. The scale to measure academic motivation might also be modified to refer to the specific subject that was selected for the study.

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