

## Original Paper

# Motivation and Academic Performance: An Inter-country Comparison

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### **Abstract**

*The objective of this paper is to explore the impact of amotivation on academic performance and to test whether the impact of motivation on academic performance differs across students from China and the U.S. Using data from Chinese and U.S. students located in their home countries, we find amotivation negatively impacts academic performance of both groups of students. We also show that external motivation is positively associated with academic achievement. While these findings are consistent with results from previous studies, we extend the understanding on the relationship between motivation and academic performance by demonstrating that the magnitude of the detrimental impact of amotivation differs between students in the two countries and that the positive impact of higher levels of external motivation provides similar benefits for both groups of students.*

### **Keywords**

*motivation, academic performance, self-determination theory*

### **1. Introduction**

The relationship between motivation and academic performance is well documented. Students with higher levels of internal and well-regulated external motivation tend to perform better than students with lower levels of internal and well-regulated motivation. Amotivation is almost universally shown to be correlated with poor academic performance. These results have been shown to true for students from all areas of the world (Baker, 2004; Amrai, Motlagh, Zalani, & Parhon, 2011; Sikhwari, 2014; Hsieh, 2014; Kusurkar, Cate, Vos, Westers, & Croiset, 2012; Rienties, Beausaert, Grohnert, Niemantsverdriet, & Kommers, 2012).

Although the direct relationship between autonomous motivation and academic performance appears to be robust, we are not aware of any other research that simultaneously uses a single, highly reliable questionnaire, to compare how changes in different types of motivation impacts academic the performance of students studying in different countries. In this paper, we seek to answer two questions: First, we ask if the motivational orientation is similar for students from different countries. Second, we ask if the impact of motivation on academic performance is consistent for students from different countries. If different motivational orientations do exist for students from different parts of the world, or if the impact of amotivation on academic performance does differ between students from different parts of the world, awareness of these differences may help instructors who struggle with how to motivate students in a global classroom. To answer these questions, we gathered data from two groups of university students studying business-related disciplines; one group in China and one in the U.S. Identical surveys were administered using the same protocols in November of 2016 at a university in Shanghai, China, and at a university in Ogden, Utah. English language surveys were administered by a native English speaker in the U.S., and Mandarin language surveys were conducted by a native Mandarin speaker in China. More than 650 students from the two universities were surveyed resulting in 560 usable observations. We find that Chinese students have significantly greater levels of amotivation and internal motivation than their U.S. counterparts. We also find that higher levels of external motivation are associated with higher academic performance in both groups of students, and that higher levels of amotivation are detrimental to student performance in both groups. We further find significant differences in the magnitude of the impact of amotivation on academic achievement. The decline in performance from increased levels of amotivation is greater for the Chinese students than for the U.S. students. Our results suggest that the impact of motivational orientation on academic performance is more complicated than has previously been thought. Although our results are not as robust with regard to why motivational orientation affects academic performance differently for the two groups, our results are consistent with some of the general findings in the literature. Furthermore, we conclude that this topic deserves a deeper investigation to determine whether differences in cultural norms, teaching methodologies, student experiences, or other as-yet-identified factors are responsible for these differences.

Our paper is presented in five sections. In Section Two of this paper we summarize the theories of motivational behaviour most relevant to our study and describe what we know about how motivation differs among students around the world. We focus on data and estimation methods in Section Three along with descriptions of the data gathered and highlight some of the differences between the U.S. and Chinese students. In Section Four we present our results and conclusions are contained in Section Five.

## 2. Methods

### 2.1 Motivational Behaviour

A significant body of research has investigated the relationship between the motivations of university students and their level of educational success (Coutts, Gilleard, & Baglin, 2011). Much of this discussion began with an analysis of how internal and external motivation are related to student success (Kasser & Ryan, 1996), but as our understanding of motivation has matured, the literature examining student motivation and educational outcomes has migrated from describing motivation as internal vs. external to describing motivation as autonomous vs. controlled (Deci & Ryan, 1985, 2000, 2008).

Deci and Ryan (2008) explain that “autonomous motivation involves behaving with a full sense of volition and choice, whereas controlled motivation involves behaving with the experience of pressure and demand toward specific outcomes that comes from forces external to the self” (p. 14). This description represents the essence of Self-Determination Theory (SDT) which suggests that (a) both internal motivation and well-internalized external motivation define autonomous motivation, and (b) external motivation which has not been internalized defines controlled motivation. SDT recognizes that external motivation, to a degree, can be internalized.

Ryan and Deci (2007) divide external motivation into four categories: external regulation, introjection, identification, and integration. These four levels of seemingly external motivation differ in the degree to which they may become integrated into an individual’s perception of themselves. External regulation is the least autonomous of the categories of external motivation, and integrated orientation is the most autonomous. In the middle are introjection and identification. Introjection occurs when an individual adopts a goal without accepting it completely as their own; they accept the goal, but do not truly internalize it. The objective is no longer completely controlled and may have an autonomous component. Identification occurs when an individual recognizes the importance of an outside goal and works to achieve that goal because they believe the goal is important. Finally, the least controlled category of external motivation is integration. Integration occurs when the objective is truly internalized by the individual. In this way, what was external is now fully internalized.

Examples of external motivation may be the case of studying for a test because of a fear of punishment if the test result is not viewed as satisfactory by a parent or other external source. Introjected motivation may occur when a student observes that successful students join clubs and she or he asks questions about joining a club. The student may recognize that acting in a specific way leads to success. Put simply, the student may partially adopt some external beliefs as his or her own beliefs.

Integrated regulation refers to activities that are completely internalized, even though these activities may have once been less autonomous in nature. Evidence does appear to support the notion that well-regulated motivation is beneficial. In a study conducted in Taiwan, Chen and Kraklow (2015) found that students who are characterized as having high levels of autonomous motivation or high

levels of well-regulated external motivation exhibit a greater level of engagement in the learning process than students with other motivational orientations. Consistent with SDT, this relationship was stronger for the group with high levels of autonomous motivation.

Amotivation is defined as the absence of motivation. Students who are amotivated are more likely to act without intention (Deci & Ryan, 1991) and to have less concern with outcomes in general. Amotivation may result from a belief that the activity does not matter (Ryan, 1995), a sense of hopelessness (Bandura, 1986), or from low self-esteem (Peterson & Seligman, 1984). It is amotivation that is most often associated with low academic outcomes (Baker, 2004).

One important aspect of SDT is that autonomous motivation is described as a stock, where the total accumulated value is comprised of intrinsic and well-internalized extrinsic motivation. Because the accumulated value of autonomous motivation is fluid, students may be internally motivated in some aspects of their lives and externally motivated in other aspects (Vansteenkiste, Lens, & Deci, 2006). In other words, a student's motivation can change. Because motivational is not fixed, it is clear that both university administrators and educators have the ability to influence levels of motivation and amotivation by creating a meaningful curriculum and providing instruction in a manner that engages students.

Creating clear connections between traditional measures of academic performance and learning outcomes that are important to students may generate higher levels of autonomous motivation and reduce amotivation (Deci & Ryan, 2006). For some students, this may mean linking academic coursework to economic success, but to others it may mean connecting academic outcomes to social justice interests. This connection highlights the importance of choosing the right field of study for students. If a student chooses a major they are not personally committed to, academic success may be less likely than if the student is given more time to explore before choosing a major field of study. By understanding what is important to students, and connecting these items to educational outcomes, we have the possibility to increase levels of motivation and reduce amotivation.

Studies of motivation of international students have primarily focused on study-abroad students and international students in a different host country. Areepattamannil et al. (2011) explored motivation and academic achievement of Indian immigrant adolescents in Canada and compared to learners in India. Compared to their peers in India, the authors find that Indian immigrant adolescents in Canada had higher intrinsic motivation and academic achievement; however, Indian adolescents in India had higher extrinsic motivation than the Indian immigrants. In an analysis of motivations of domestic and international students studying abroad in a private educational institution in Singapore, Chue and Nie (2016) found that international students had a higher level of intrinsic motivation, identified regulation, external regulation, deep learning and surface learning, but a lower level of amotivation compared to domestic students. Furthermore, the authors found that the same level of perceived psychological needs

support would result in a higher level of intrinsic motivation and a lower level of amotivation for international students. Bulgan and Çiftçi (2017) studied the academic performance and adaptation of married international students. They found that international students who have (i) higher satisfaction in their marriages and (ii) higher academic self-efficacy are more prone to have better adaptation processes.

While comparative studies on the differences in motivation between students from different regions of the world is scarce, a growing literature on the sources of motivation and academic achievement of Chinese students has made important contributions. Chen, Lee and Stevenson (1996) examined test scores of students from kindergarten-age through the eleventh grade from Beijing, China, Taipei, Taiwan, Sendai, Japan, and Minneapolis and Chicago in the U.S. To account for the differences in the high-level performance of Chinese students, the authors conclude that traditional Chinese cultural factors about human beings, the role of family involvement in promotion of child progress, and dedication to hard work are associated with performance.

Chow and Chu (2007) explored the orientation of achievement motivation based on parental involvement and expectations as well as the traditional Chinese virtue of *filial piety* defined as a respect for one's parents and ancestors. From a survey of secondary students from Hong Kong, they found that engaged parental involvement and feedback along with *filial piety* have a positive impact on motivation for academic achievement among students. Conversely, they found that a lack of parental feedback and lack of caring significantly contribute to academic amotivation among students. He and Hutson (2018) used an appreciative education framework to evaluate the strengths of Chinese international students and the potential for support during their academic transition. From surveys, interviews, and focus groups, the authors found that an obligation to family support from home as well as motivation and commitment to success are positively related to acculturation success. When evaluating information from just the focus groups, however, Chinese students did not identify cultural aspects and family support as strengths for acculturation.

While it is argued that there are other factors influencing the motivation of international study abroad students, some research exists on the comparison of motivation and academic performance of student groups in their respective native countries. A tool developed by Vallerand et al. (1992) to assess the various dimensions of motivation among a sample of Canadian college students was the Academic Motivation Scale (AMS). Subsequent research employing the AMS, such as Vallerand et al. (1993), Cokley (2000), Cokley, K. O., Bernard, N., Cunningham, D., and Motoike, J. (2001), and Ratelle, Guay, Vallerand, Larose, and Senécal (2007), examined the validity of the AMS in different settings and countries. Yet, we do not find any examples in the literature that use the AMS motivation survey to compare the performance of both U.S. students with international students in the same analysis. Our paper is notable for contributing to the existing literature by attempting fill this void.

## 2.2 Data

In order to collect data on student well-being we surveyed students at two large, public universities, one located in Ogden, Utah, and the other located in Shanghai, China. Although the survey method used in this study comparing Chinese and US students appears to be the method predominately used in comparable research, (Zhang-Wu, 2018) other methodologies could have been employed. Using surveys to gather data is an efficient way of gathering data for quantitative studies such as ours, although other research methods are used. Mixed methods which include case studies and detailed personal interviews can provide a narrative to help interpret quantitative results.

One important consideration that lead us to use a survey method to gather data for our study was the need for consistency with prior research examining the impact of academic motivation on student success. Because the most critical piece of information needed for our analysis is a measure of capable of differentiating between the subscales of internal and external motivation as defined in SDT, we used the twenty-eight question Academic Motivation Scale (AMS-28) to gather data on student's motivation in each location. As explored by Vallerand et al. (1992, 1993), the AMS-28 includes seven subscales which are designed to measure three types of intrinsic motivation (to know, to accomplish, and to experience stimulation), three types of extrinsic motivation (extrinsic motivation-identified regulation, extrinsic motivation-introjected regulation, and external motivation-external regulation), and amotivation. While the AMS-28 does not have a subcategory to measure external motivation-integrated regulation, it is otherwise very closely linked to SDT theory. Almost universally, the AMS-28 is given as part of a survey instrument which also asks for demographic information and other data related to a specific research. As a survey instrument, the AMS-28 has been shown to have high internal and test-retest validity (Vallerand et al., 1992). Our choice of using a survey to gather data for this study was based on how the AMS has been historically used, and the reliability of the data obtained through using the survey.

Table 1 presents the mean level of academic motivation for U.S. and Chinese students using two different motivational constructs. First, we report the mean values for the six subscales of academic motivation measured by the AMS-28 for the Chinese and U.S. students. Second, we collapse the scales into three larger categories: internal academic motivation, external academic motivation, and amotivation. No significant differences between the U.S. and Chinese students were found for the external regulation subscales of the AMS-28 or for external regulation in general. Significant differences were observed for the internal motivation subscales of the AMS-28 and for the general measure of internal motivation. Students from the U.S. showed significantly lower levels of internal motivation than their Chinese counterparts. Although we cannot be certain of why this is the case, it may be explained by cultural norms, academic experiences, or the specific characteristics of the universities included in this study. The university in the U.S. is an open enrolment university with a

student body more consistent with a community college population. The Chinese university is a mid-level, ranked university, with a student body that has performed relatively well on the college entry examinations.

Table 1 also shows that Chinese students in our data set have significantly higher amounts of academic amotivation than the U.S. students. Again, although we cannot be certain why, this may reflect cultural differences or differences in the educational experiences. The earnings of college graduates are more closely linked to university reputation than academic performance (Kong, 2017) in China as compared with the U.S. Because of this, at the university level, the economic benefit of higher levels of academic performance is greater in the U.S. than in China. This is very likely to increase the level of amotivation in Chinese university students relative to U.S. university students. Because amotivation is also linked to the classroom experience, differences in classroom pedagogy may also contribute to levels of amotivation.

**Table 1. Motivation Levels**

Motivation Type		Mean All Students	Mean US Students	Mean Chinese Students
Desire to Know*	Internal	5.24	5.03 (1.53)	5.34 (1.06)
Desire to Explore*	Internal	4.51	3.84 (2.31)	4.81 (1.13)
Desire to Achieve*	Internal	4.75	4.47 (1.68)	4.89 (1.12)
Average Internal* Motivation	Internal	4.84	4.45 (1.56)	5.01 (0.95)
Identified Regulation	External	5.50	5.48 (1.48)	5.52 (1.11)
Introjected Regulation	External	4.83	4.88 (1.57)	4.81 (1.35)
External Regulation	External	5.62	5.58 (1.49)	5.64 (0.99)
Average External Motivation	External	5.32	5.31 (1.34)	5.32 (0.99)
Amotivation*		2.91	2.38 (1.82)	3.16 (1.61)
Sample Size		547	171	376

\*Indicates significant differences in means between U.S. and Chinese students at  $p < .05$ .

Standard deviations are in parentheses.

### 2.3 Analysis

We examine two sets of empirical models; first using GPA as the dependent variable and second using ZSCORE as the dependent variable. For each dependent variable we use two different specifications for measuring motivation which were outlined in our discussion of Table 2. Because the universities in

this study have vastly different grading policies, we use two different methods to measure academic performance. In China, the university included in the study enforces a grade distribution that mandates a maximum of 20% “A” grades and a 40% maximum for “B” grades, whereas the U.S. university has no such restriction. The first way we measure academic performance is by using each student’s GPA. In the second method, we use the z-score for each student’s GPA. The z-score measures the number of standard deviations between an individual student’s GPA and the average GPA for the student’s home university. By using the z-score we focus on the standardized differences in grades at the university rather than the absolute grade point average. Table 2 presents the means and standard deviations of all data used for our analysis. Again, we provide three columns of information: all subjects, Chinese subjects and U.S. subjects. As can be seen from the Table 2, GPAs are significantly higher in the U.S., which reflects the forced grade distribution.

**Table 2. Means and Standard Deviations**

Variable Name	Mean	Mean	Mean
	All Students	US Students	Chinese Students
GPA*	2.87 (0.67)	3.23 (0.47)	2.70 (0.69)
ZSCORE	0.00 (1.01)	0.00 (0.98)	0.00 (1.03)
STUDY*	21.46 (19.27)	10.41 (8.18)	26.70 (20.57)
WORK*	11.11 (13.70)	23.37 (13.82)	5.30 (9.03)
TMALE*	0.44(0.49)	0.54 (0.50)	0.39 (0.49)
BUSINESS*	0.49 (0.50)	0.29 (0.45)	0.59 (0.49)
FRESHMAN*	0.14 (0.34)	0.22 (0.42)	0.10 (0.26)
SATISFY*	6.65 (1.92)	6.53 (2.12)	6.71 (1.81)
USA	0.32 (0.47)	1	0
SPENDLOW*	0.42 (.49)	0.24 (0.42)	0.51 (0.50)
AGE*	20.77(3.82)	23.44 (5.76)	19.52 (0.96)
N	532	171	376

\*Indicates significant differences in means between U.S. and Chinese students at  $p < .05$ . Standard deviations are in parentheses.

In addition to information on academic motivation and academic performance, we gathered data on student demographic information on a wide range of items that have been shown to be correlated with academic performance. We gather self-reported data on the number of hours students study (STUDY) and the number of hours the student is employed per week (WORK). On average, the Chinese students spend twice as much time studying per week than do the U.S. students, and the U.S. students spend



more than twice the time at work. We anticipate that STUDY will be directly related to GPA (Richardson, Abraham, & Bond, 2012) and that as the number of work hours increases GPA will eventually decline (Dundes & Marx, 2006). We gathered information on the student's age (AGE) and whether the student is male or female (MALE=1 if the student is male and zero otherwise). The Chinese students are significantly younger than the U.S. students, which reflects the admission patterns and different missions of the two universities. We have no *a priori* expectation for age. Numerous studies (Duckworth & Seligman, 2006; Fortin, Marcotte, Diallo, Potvin, & Royer, 2013) have shown that females perform better than their male counterparts in all levels of schooling and in many areas of the world, thus we expect MALE to be negatively correlated with GPA. To control for different grading practices in different subject areas, we included dummy variables to differentiate the student's major field of study. We categorized responses into seven different academic colleges: Business, Social Science, Arts and Humanities, Science, Engineering and Technology, Education, and Health and Medicine. One area, Business, was found to have a significant correlation with GPA, so we include a variable BUSINESS to distinguish business students from all other students. The variable BUSINESS takes on a value of one if the student is majoring in a business-related discipline and is zero otherwise. Because it is difficult to gather data on student income, we employed a proxy for income by asking students "Approximately how much money do you spend each month excluding rent and school-related expenses?" Students responded to this question on a three category likert-scale. All spending amounts were defined in the local currency. Using this information, we created the variable SPENDLOW to differentiate students with low spending levels from students spending at the middle and upper levels. We also included a question on the student survey to measure a student's level of satisfaction with life at school (SATISFY). Students answer this question on a 1 (extremely unsatisfied) to 10 (extremely satisfied) scale. Chinese students indicate a slightly greater level of satisfaction with their school life than U.S. students. Income and academic performance are widely believed to be directly related and studies often show (Nowell, 2017) that happiness and academic performance are positively correlated. We also gathered data on the student's year in school. We believe that as a student progresses in school their GPAs will increase. Freshmen in particular are much more likely to struggle at school and are more likely to drop out of school due to their academic struggles. Based on this, we expect freshman to have lower GPAs than all other students. We created a variable, FRESHMAN to control for the expected GPA differences in freshman students. The variable FRESHMAN takes on a value of one if a student is in their first year of school and is zero otherwise. We did not gather data on race or ethnicity, as the differences between schools overwhelms any within school variation on race and ethnicity. We also include a dummy variable to differentiate the two schools. The variable USA equals one for the U.S. university and is zero for the university in China. We use this variable to account for differences in the Chinese and U.S. students not controlled for by our other explanatory variables. This dummy

variable may measure cultural or institutional differences. This variable may capture different admissions policies or different levels of student services, or it may reflect unmeasured differences between U.S. and Chinese students.

### 3. Results

We report our regression results, with our two different dependent variables GPA and ZSCORE, in Table 3. Our results are generally consistent across the different motivational constructs and across the different measures of academic performance. As expected, STUDY is consistently positively related to academic performance. The variable WORK is negatively related to academic success, although the impact is not significant. Although males are performing at a lower level than females, this impact is also not significant.

Grades given in the fields of business and economics are significantly lower than other disciplines. As expected, the estimated coefficient on FRESHMAN was negative and significant. Consistent with past evidence, we found that students who were more satisfied with their life at school earned significantly higher grades than students who were less satisfied with their life at school.

Our results with respect to motivational orientation also appear to be robust. For all measures of motivation and for all measures of academic performance, Table 3 indicates that amotivation is consistently related to lower academic performance for both Chinese and U.S. students. In addition, the coefficient associated with interaction term USAMOTIVE is consistently positive and significant, indicating that the negative impact of increasing levels of amotivation is more harmful to the Chinese students than to U.S. students.

Table 3 also shows that higher levels of external and internal motivation appear to be associated with higher levels of academic performance. Although both variables appear to have a direct relationship with academic performance, the estimated coefficients associated with the variable EXTERNAL are consistently significant and the coefficients associated with the variable INTERNAL are always insignificant. When we interacted the variable USA with EXTERNAL and INTERNAL, no evidence was found to suggest that the effects of increases in external or internal motivation were different for Chinese and U.S. students.

Finally, when we examine the impact of all of the subscales of external and internal motivation on academic performance our results are inconclusive. Although the estimated coefficient on IKNOW (internal desire to know) is negative and significant at a  $p$ -value of 0.10, the estimated coefficient on IACHIEVE (internal desire to achieve) is positive and significant with a  $p$ -value of = 0.10. The evidence that these variables are important is not overwhelming at these levels of significance. In addition, when we interact the variable USA with IKNOW and IACHIEVE, the variables did not contribute any explanatory power to the regression equation. Neither interaction term had a  $t$ -statistic of

greater than 1.0 so including these interaction terms decreases the adjusted  $R^2$  of the equation. Because of this, these interaction terms were not included in the final analysis.

**Table 3. Regression Results**

Variable Name	Dependent Variable: GPA		Dependent Variable: ZSCORE	
	Estimated Coefficient	Standard error	Estimated Coefficient	Standard Error
Constant	2.04**	0.15	-1.14**	0.390
STUDY	0.005**	0.0016	0.007**	0.003
WORK	-0.003	0.0025	-0.005	0.004
MALE	-0.05	0.05	-0.081	-0.086
BUSINESS	-0.15**	0.06	-0.190**	0.09
FRESHMAN	-0.25**	0.08	-0.27**	0.13
SATISFY	0.05**	0.01	0.07**	0.02
SPENDLOW	0.12**	0.06	0.20	0.09
USA	0.50**	0.13	0.55	0.55
INTERNAL	0.007	0.041	0.007	0.07
USAINTERNAL	-0.004	0.056	0.008	0.09
EXTERNAL	0.107**	0.042	0.16**	0.07
USAEXTERNAL	-0.088	0.063	-0.11	0.10
AMOTIVE	-0.08**	0.02	-0.12**	0.04
USAMOTIVE	0.08**	0.03	0.12**	0.06
N=532				
R-squared	0.25		0.18	
F (p-value)	11.51(.000)		6.80(.000)	
*Significant at $p < .10$				
**Significant at $p < .05$				
***Significant at $p < .01$				

The research question we ask in this paper is whether the impact of motivation on academic performance is different for U.S. and Chinese students. We found no differences in the effect of internal or external motivation on academic achievement between U.S. and Chinese students. We did find, however, that changes in amotivation do impact U.S. and Chinese students differently. Higher levels of amotivation result in a greater reduction in academic performance for the Chinese students. Our

analysis reveals that although both U.S. and Chinese have a reduced level of academic performance with higher levels of amotivation, the impact of increased amotivation is more detrimental to Chinese students than U.S. students. The latter result appears to be consistent with the impact of a lack of parental caring and feedback on academic amotivation among Chinese students as described in Chow and Chu (2007). When considered in the context of *filial piety*, this impact is important in understanding how motivational orientation impacts academic outcomes. To be sure, we are not certain if the differences in the impact of amotivation are driven primarily by the result of cultural differences or institutional differences and should be the subject of further study.

#### 4. Discussion

The objective of this paper was to explore the impact of amotivation on academic performance and to test whether the impact of motivation on academic performance differs across students from China and the U.S. With data from Chinese and U.S. students located in their home countries, we find amotivation negatively impacts academic performance of both groups of students. We also show that external motivation is positively associated with academic achievement. While these findings are consistent with results from previous studies, we extend the understanding on the relationship between motivation and academic performance by demonstrating that the magnitude of the detrimental impact of amotivation differs between students in the two countries and that the positive impact of higher levels of external motivation provides similar benefits for both groups of students.

Although we have learned that amotivation has a more detrimental effect on the academic performance of students in China than on students in the U.S., our use of the AMS motivational survey does not concisely lead to a determination that these effects are the result of different cultural norms or are created through institutional policies and practices. These findings suggest that additional research is needed to determine if institutions, cultures, or other confounding variables are responsible for the different effects of amotivation on student performance.

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