THE IMPACT OF FACULTY ON THE PERCEPTIONS STUDENTS HAVE OF THEIR PEDAGOGICAL ENVIRONMENT

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ABSTRACT

This research used a sample of 854 undergraduate students in the faculties of Arts and Sciences from a mid-Western Research-1 (Canadian) university to investigate the impact of the faculty in which these students were enrolled on the pedagogical environment they experienced, namely their experiences with the cognitive demands set by professors and the social support provided by both professors and other students. Along with faculty, which is the independent variable, three sets of control variables were included in the analyses, academic program (year, credit, GPA), demographic background (gender, age, educational resources), and the psychosocial dispositions of the students, (self-esteem, perceived academic control, and coping strategies). The results reveal that both faculty and the psychosocial dispositions of the students had significant impact on their perceptions of the pedagogical environment. In addition, the students’ psychosocial dispositions suppressed the effect of the faculty on their comprehension of information and their interaction with other students while these control variables mediated the impact of the faculty on the students’ interaction with their professors and their evaluation of arguments. Overall, these results suggest that faculties differ substantially in the pedagogical environments experienced by students. The results are interpreted from the conception of C. P. Snow (1959), who argued that, in universities, the faculties of Arts and Sciences have two separate cultures.
INTRODUCTION

C. P. Snow criticized the distinctive difference between the faculties of Science and Arts. “Once or twice I have been provoked and have asked the company how many of them could describe the Second Law of Thermodynamics. The response was cold: it was also negative. Yet I was asking something which is about the scientific equivalent of: Have you read a work of Shakespeare's?”(C.P. Snow 1959). He used two cultures to describe the two distinctively different groups and attributed the gap to the declines of quality of educational system by saying that persons educated with greatest intensity (C.P. Snow 1959).

He is not the only person who noticed the disciplinary differences. In universities, discipline has an equal name- faculty. The most popular university ranking, Maclean’s went further. In graduate survey 2004, Maclean’s broke down Degrees of satisfaction by program. Health had the highest score 84 on lasting benefits while fine and applied arts had the lowest 54. Mathematics and physical sciences had the lowest satisfaction 61 while humanities and related had the highest 69. The discrepancy here was that Mathematics and physical sciences had a second high score 79 about lasting benefit while its total satisfaction was also the second lowest 61. Those vague numbers gave us an impression that health and related had biggest lasting benefit while the humanities and related had the highest total satisfaction. Recently, though the criterion of Maclean’s ratings meets more and more severe attack, its results are widely used and referred. Students and their parents may feel confused when facing the result this time.

Maclean’s poorly designed survey is actually an implication of thin literature in field of faculty differences. “The issues related to disciplinary differences continue to be
vaguely defined and underexplored. Of the literally thousands of studies of teaching, learning, and teacher evaluation in higher education, very few have examined disciplinary differences” (Hativa, and Marincovich, 1995). This situation has not been changed ever since then.

Environmental factors can predict large amount of students’ outcomes, just a matter of more or less. So most attention was paid to find out what disciplinary differences are from faculty’s aspect and the connection between environmental variables, including faculty, and outcome variables (Astin 1990, Entnistle and Wilson 1977). Following this goal, in those limited literature related to faculty differences, researchers often followed two paths to investigate the topic. The first is to investigate the correlation between faculty variable, as well as other environment variables, and outcome variables (Astin 1997, Pascarella and Terenzini 2005). The other is to use either qualitative or quantitative methods to describe the faculty differences in types of knowledge (Donald 1987, Frediriksen 1984, Donald 1991 1995), teaching and students’ learning (Murray and Renaud 1995, Soloman 1966, Pohlmann 1976).

But that is not always reasonable. Not all students necessarily benefit to the same extent, or perhaps in the same direction when exposed in the same academic environment (Pascarella and Terenzini 2005). One possible reason is that when experiencing the same learning environment, they perceive it in different extent and in different ways. While the direct influence on the approach to learning comes from the subjective perception, rather than from the objective described environment (Entnistle and Tait 1995). Students’ rating academic disciplines differently is a clear sign that students have different perceptions on a same experience. But little attention has been paid to the quality of university students’
pedagogical environment perception, as well as factors that impact and contribute to the process. Besides, there are no measures built from students’ perspective.

To fill the gap, this study investigates the faculty impact on university students’ quality of pedagogical environment they perceive. The study also compares and contrasts the role of potential contributors during the process of faculty impact.

**CONCEPTUAL MODEL**

**Dependent Variables**

Because of lack of theory that is specifically focused on the scale of faculty impact, so many theoretical traditions that address college impact must be mined and integrated for insights into the study. Here we choose two-dimensional instruments measuring university students’ quality of life, cognitive demand dimension and social support dimension, to assess students’ pedagogical perception of the pedagogical environment (Roberts and Clifton 1991; Clifton, Etcheverry, Hasinoff and Roberts 1995; Roberts and Clifton 2004).

Cognitive demand dimension includes comprehension of information and evaluation with argument. Social support dimension includes interaction with students and interaction with professors. Among a number of assessments of the multiple environments within institutions that used widely different conceptual schemes, intellectual orientation emphasis on learning and development of intellectual abilities and community-emphasizing interaction and mutual respect among students, faculty and administrations are the most endorsed goals across all groups (Baird 2005). Faculties of Arts and Sciences differ in academic demands placed on students and in behaviors that
involve students in academic related activities. So we may infer that students differ in their pedagogical perceptions crossing disciplines.

Cognitive demand represents the performance expectations that professors communicate to students. Comprehension of information and evaluation of arguments can represent the practicum of whole Blooms’ taxonomy of pedagogical objective (Clifton 1996).

Cashin and Downey (1995) reported that there was a strong tendency for the students to report more learning on the objectives the faculty weighed more important. That is students report learning more of what the faculty think is more important (we would infer, emphasize in their teaching). Cashin and Downey (1995) also found that academic disciplines differ in the course objectives that emphasize.

Brooks and Brooks argue that learners don’t just passively receive knowledge or “truth” from faculty members. Rather, students work actively and collaboratively with faculty members and student peers to create their own knowledge by trying to make personal sense out of their material that is presented to them. In this point, cognitive ability is a more valuable and long-term effective factor than simple GPA.

Social support represents the encouragement, academic and otherwise, provided by both students and professors concerning course-related tasks and activities (Clifton, Etcheverry, Hassinoff, and Roberts 1996; Roberts and Clifton, 1992). It is a highly predictive environment variable proven by a lot of research. Literature indicates that social support is highly related to students’ satisfaction of colleges (Astin, 1991) and academic achievement: GPA (Clifton and Perry, 2004). Besides, social bonding theory
asserts that strong ties to families and schools discourage problem behavior by raising the costs that are associated with it (Hirschi 1996; Andrew 1993).

Interactions with professors and between peers are the most often considered social support factors. Denzine (1998) and Denzing & Kunalski (2002) have developed an assessment for living and learning scale that measure students’ perceptions of the academic climate in their residence halls. And the study suggested two factors: one reflecting support from staff, the other reflecting the emphasis peers place on academic efforts which is conveyed to peers by daily interaction.

Independent Variables

Like the social development model, this conceptual model organizes multiple aspects of personal development and social ecology into general theoretical categories that can be evaluated for their independent and relative contributions to these faculty impact scales. We chose three clusters of independent variables to summarize university students’ characters. Academic program includes faculty, years completed, credits finished and GPA. Demography includes age, gender and educational background. Psychosocial disposition includes perceived academic control, self-esteem and coping strategies.

Academic Program

The social development model in social bonding theory was originally formed and continuously being developed among early and late adolescence. To investigate university students’ perception of their college experience, instead of using bonding to
families and schools, we use academic program variables to measure the students’
bonding to university. The institutional involvement category is made of 4 variables.
Faculty enrolled, years of study being finished, credits being finished and GPA. Stronger
bonding means more time spent in peers and college context. We hypothesize that the
stronger the institutional bonding, the better impression the student may perceive from
his college experience.

**Demographic Category**

Demographic category is made of three variables, gender, age and educational
resources. From both feminist perspective and psychological perspective, female differs
from males about academic and social attainments. Age and the parents’ educational
resources, have been shown to influence the academic achievement as well (Clifton 1997;
Clifton, Perry, Stubbs, and Roberts 2004; Conley 2001; Etcheverry, Clifton, and Roberts
2001; Perry et al. 2001; Weaver-Hightower, 2003). So we hypothesize gender, age and
the educational resources all affect the students’ college experience.

**Psychosocial Category**

There are considerable empirical researches suggesting that the psychosocial
dispositions, academic control, self-esteem and coping strategies, have major effects on
their academic achievement. Simply put, students with better developed coping and
academic control strategies and those with higher self-estees have higher academic
achievement than students who lack these dispositions. It is also suggested that the
psychosocial dispositions act as mediating pathways between the students’ demographic
characteristics, academic backgrounds and their academic achievement in college (Clifton, 2005).

One important psychosocial variable used to explain scholastic success is academic control, the degree to which students believe they can influence and predict their academic achievements. Considerable evidence shows that students with higher academic control are more likely to engage in behaviors that lead to better academic performances than those with lower academic control (Perry et al. 2006). Clifton (1995) Furthermore, academic control was found to mediate between social support and cognitive demands to academic achievement GPA. From that literature we may assume that higher academic control would increase the interaction with professors and peers, and at the same time increase the higher-level academic skills evaluation of information. A number of studies have also shown that students with high self-esteem academically perform better than students with low self-esteem (Craparo, Hines and Kayson 1981; Liu, Kaplan and Risser 1992). Struthers, Perry and Menec (2004) found students who engaged in problem-focused coping were more likely to be motivated and perform better than students who engaged in emotion-focused coping.

In general, we hypothesize that students with higher psychological level tend to have more positive experience in college.

**METHODS**

**Sample**

The subjects were selected from the faculties of Arts and Science in a mid-western Canadian Research-1 university. Near the end of the 1997 academic year,
questionnaires with covering letters explaining the study were mailed to a random sample of 1000 students from each faculty of Arts and Science. When the total enrollment in the two faculties were 9092 undergraduate students. As an incentive, students who returned their questionnaires within one month were eligible to win a $350.00 (Cdn.) gift certificate from the university bookstore. Of the initial 2000 questionnaires mailed out, 864 completed questionnaires and 113 questionnaires with incorrect mailing addresses were returned, representing a response rate of approximately 46 percent. The students reported being registered in other faculties and were deleted from the analyses. The final sample included 854 students, 425 in the Faculty of Arts and 429 in the Faculty of Science.

Environment Perception Variables

The cognitive demands were defined as the emphasis professors placed on the students’ comprehension of information and evaluation of arguments. We use these two variables to cover the entire spectrum of Bloom’s taxonomy.

Comprehension of Information. The comprehension of information was assessed on a 6-item, 4-point Likert scale relating to the challenges students experienced in remembering and interpreting new facts and terms using statements like “I have been challenged to:” “remember an extensive number of new terms” and “interpret the meaning of new facts and terms” (Range = 9-24; M =19.55; alpha = .81) (Clifton, Etcheverry, Hasinoff and Roberts 1996). Higher scores indicated that students experienced greater challenges to comprehend and interpret new information.
**Evaluation of Arguments.** The students’ evaluation of arguments was measured on an 11-item, 4-point Likert scale relating to the challenges they experienced in applying, analyzing, synthesizing, and evaluation arguments on statements like “I have been challenged to:” “demonstrate how theories are useful in real life” and “identify the strengths and weakness of arguments” (Range = 12-44; M = 30.96; alpha = .84) (Clifton, Etcheverry, Hasinoff and Roberts 1996). Higher scores indicated that students experienced greater challenges to apply and evaluate arguments.

Previous theoretical and empirical work suggests that the social support that college students receive can be understood by considering the interaction they have with other students and with professors (Baird 2005; Roberts and Clifton 1992).

**Interaction with Students.** Interaction with students was assessed on a 5-item, 4-point Likert scale in which students were asked to respond to statements such as “I find it easy to get to know other students” and “Others students accept me as I am” (Range = 6-20; M = 14.01; alpha = .75) (Roberts and Clifton 1992). Higher scores indicated that students received greater support and encouragement from fellow students.

**Interaction with Professors.** Interaction with professors was assessed on a 9-item, 4-point Likert scale in which students were asked to respond to statements such as “Professors care about what I think” and “Professors help me do my best” (Range = 11-36; M = 25.60; alpha = .85) (Roberts and Clifton 1992). Higher scores indicated that students received greater support and encouragement professors.
Academic Program Variables

The four institutional variables included the students’ home faculty, year of college, credit hours, and GPA.

Faculty. Students enrolled in the faculty of Arts (N = 425) were coded as “1” and those enrolled in the Faculty of Science (N = 429) were coded as “2.”

Year. Year of college was determined from the students’ responses to: “How many years of university education have you completed? (If you have been a part-time student, then estimate the number of equivalent full-time years.)” The data were recoded so that students with 5 or more years of college were coded as “5.” Thus, the variable ranged from 0 to 5 and the mean was 2.11 years of college education.

Credit Hours. Credit hours were determined from the students’ responses to: “How many credit hours of university work are you taking this academic year (Sept – April)?” 0 to 4 credit hours was recoded as “3;” 5 to 6 credit hours was recoded as “6;” 8 to 10 credit hours was recoded as “9;” 18 to 20 credit hours was recoded as “18;” 24 to 26 credit hours was recoded as “24;” 33 to 36 credit hours was recoded as “33.” The mean was 21.92 hours. Approximately 75 percent of the students were enrolled in at least 18 credit hours, which is considered to be full-time by the university.

GPA. Students’ self-reported cumulative grade point averages (GPA) were based on eight response options (1 = 0.0-0.9 to 8 = 4.0-4.5). As expected, no students reported GPAs between 0 and 0.9; the next two lowest categories, “1.0-1.4” and “1.5-1.9” had few responses and were combined into a single category. To normalize the distribution, the scale was recoded from “1” (0.0-1.9) to “6” (4.0-4.5). The recoded GPA had a mean of 3.72, which translates into an average GPA of between 2.5-2.9 representing a grad
equivalent of C+. Self-reported GPAs are, in general, reliable measures of students’ actual academic achievement with correlations ranging from .76 to .91 (Beyer 1999; Frucot and Cook 1994; Goldman, Flake, and Matheson 1990; Zimmerman, Caldwell, and Bernat 2002).

**Demographic Background Variables**

Three variables, Gender, Age and Educational Resources were used to define the demographic backgrounds of the students.

**Gender.** There were 385 male students (45%) and 469 female (55%) in the study, and they closely reflected the undergraduate student population in the faculties of Arts and Science. Male is coded as 1 and female is coded as 2.

**Age.** Originally, the data for age was positively skewed and this variable was recoded to normalize the distribution while retaining the natural distribution of ages. Specifically, students who were 17 and 18 were recoded as “18”; students who were 23 and 24 were recoded as “23”; students who were between 25 and 29 were recoded as “25”; and students who were 30 and older were recoded as “30”. On average, the students were 22.35 years of age on the original scale and 21.50 on the recoded scale.

**Educational resources.** This variable reflected the amount of education attained by the students’ parents (1 = completed elementary school and 9 = completed a graduate degree). The education levels of both parents were summed to form a composite measure and scores ranged from 2 to 18 with a mean of 9.46. Only ten students did not record one or both parents’ level of education. Approximately 50 percent of the students had at least one parent with some postsecondary education and about 33 percent had at least one parent with a college degree.
Psychosocial Variables

Three variables, academic control, self-esteem and coping strategies were included. For all three scales, negatively worded items were reverse coded.

Academic Control. Academic control was derived from a 10-item, 4-point Likert scale that assessed students’ assessment with statements such as “I have a great deal of control over my academic performance in my courses” and “No matter what I do, I can’t seem to do well in my courses” (Range = 19-37; M = 31.35; alpha = .69) (Perry et al. 2001).

Coping strategies. The students’ task-focused coping strategies were comprised of a 10-item, 5-point Likert scale that assessed the extent to which they engaged in specific behaviors after having done poorly in a course, such as “I try a different study strategy” and “I routinely review my notes after class” (Range = 14-50; M=32.93; alpha = .75) (Struthers et al. 2000).

Self-esteem. Self-esteem was determined on a 10 –item, 4-point Likert scale that required students to indicate their agreement with statements such as “I feel that I have a number of good qualities” and “I feel I do not have much to be proud of “ (Range = 11-40; M = 31.34; alpha = .90) (Rosenberg 1989).

Procedures

We assessed all variables, except for faculty, for normality and homosasticity and found that none of them violated these basic assumptions. To test this assumption of collinearity, variance inflation factor coefficients (VIF) were calculate for each independent variable on each dependent variable in the fully recursive models (Neter,
Kutner, Nachtsheim, and Wasserman 1996). None of the VIF coefficients were large enough to indicate that collinearity was a problem.

Sequentially, correlation coefficients and multiple regression coefficients are computed to examine the relationships between the independent and the dependent variables. The first step, the regression procedure is used to examine the unique faculty impact on the environment perception variables (interaction with students, interaction with professors, comprehension of information and evaluation of arguments) after other academic program variables are controlled (faculty, year of college, credit hours, and GPA). The second step, demographic variables are controlled (gender, age and educational resources). The last step, psychosocial variables are added (academic control, self-esteem, coping strategies) to the model and assessed changes in the faculty impact on the environment perception variables. All path models were estimated in SPSS 13.0.

**RESULTS**

**Basic characteristics of Arts students and Sciences students**

Table 1 reports the means and standard deviations for the total sample and for Arts and Science students separately on the thirteen continuous variables in the model.

Table 1 about here

From the table, there are several differences that are more significant than the others. First Faculty of Arts has more female students (61.4%) than Faculty of Science does (41.5%). The average age of Arts students are more than one and a half years older
than Science students. Science students have a little higher average educational resources score over Arts students (0.74 higher) and they are enrolled in more credit hours of course-work than Arts students. Generally say, Arts students have higher psychosocial dispositions, especially coping strategies.

Compared with Science students, Arts students have a better perception to evaluate arguments, by more than 35% of a standard deviation, while a less demand perception to comprehend, by more than 30% of a standard deviation. Arts students have a closer interaction with professors while Science students tend to interact a little more with peers.

**Faculty Impact On Perception Of Environment**

Table 2 presents the three steps analyses for the pedagogical environment that Arts and Science students perceived, namely the comprehension of information, evaluation of arguments, interaction with students and interaction with professors.

In table 2, model 1 contains only academic program variables as predictors. In this model, Faculty has significant impact on all pedagogical environment variables except interaction with students. Individually, students from Faculty of Sciences are more capable to comprehend information ($b = .144$, $p \leq .001$). While students from Faculty of Arts have much better ability to evaluate arguments. ($b = -.184$, $p \leq .001$). Because students tend to learn more in things what they perceived to be more important, we can infer that
instructors in Faculty of Science emphasizes more how to comprehend information while professors from Faculty of Arts emphasized more in evaluation of arguments. Faculty also has impact on interaction with professors ($b = -.168$, $p \leq .001$). Students from Faculty of arts interact much more with professors. The only variable that faculty doesn’t have an significant impact is the interaction with students ($b = .06$). No matter which faculties students are in, they interact with each other without significant difference.

Year only has significant impact on the evaluation of arguments ($b = .122$, $p \leq .001$). The elder the students are, the higher evaluation demands they perceive.

Credit hour has a significant impact on the comprehension of information ($b = .146$, $p \leq .001$), evaluation of arguments ($b = .103$, $p \leq .001$) and interaction with students ($b = .130$, $p \leq .001$), but has no impact on interaction with professors ($b = .024$). That suggests that more credits the student has taken, which in a degree means more time spending with their professors and peer groups, the more positive pedagogical environment he or she may perceive, though this doesn’t increase the interaction with professors significantly.

GPA only has a strong impact on social support environment, namely interaction with students ($b = .149$, $p \leq .001$) and interaction with professors ($b = .286$, $p \leq .001$). The higher GPA the students receive, the more they interact with peers and professors. It has a marginally significant impact on evaluation of arguments ($b = .070$, $p \leq .05$) and no significant impact on comprehension of information ($b = .008$). This shows that students with higher GPA don’t necessary exhibits a better perception on comprehension of information and just a little bit more sensitive to requirements on evaluation of arguments.
The whole academic program variables explain 4.5% ($R^2 = .045$) of the difference in comprehension of information, 4.9% ($R^2 = .049$) of evaluation of argument difference, 4.7% ($R^2 = .047$) interaction with students and 10.4% ($R^2 = .104$) interaction with professors. Which shows that interaction with professors is more relative with academic program.

In model 2, we regress the demographic variables on perception of environment as well as academic program variables. Faculty impact on comprehension of information is suppressed ($b = .171$, $p \leq .001$). Faculty on evaluation of arguments ($b = -.156$, $p \leq .001$) and interaction with professors ($b = -.141$, $p \leq .05$) are still significant, but the magnitude has been lowered. That means the effects are mediated by demographic variables. More specifically, the fact that students from Faculty of Arts perceive more demand to evaluate arguments is because that female is more able to perceive the demand ($b = .074$, $p \leq .05$) and Arts Faculty has more female students. The reason that students from Faculty of Arts interact with professors more is that while older students tend to communicate more with professors ($b = .123$, $p \leq .01$) and Arts students are older than Science students. Faculty on interaction with students is still non significant ($b = .061$).

Year’s impact on evaluation of arguments ($b = .098$, $p \leq .05$) has been mediated by Gender as well. Credit’s effect on comprehension of information ($b = .160$, $p \leq .001$) and evaluation of arguments ($b = .138$, $p \leq .001$) has been suppressed. And demographic variance explained a little credit effect on interaction with students ($b = .121$, $p \leq .001$).

Females significant differ from males on both comprehension of information ($b = .128$, $p \leq .001$) and evaluation of arguments ($b = .074$, $p \leq .05$). Females have more strength to both understand information and evaluate arguments.
Over all, adding demographic background variables doesn’t dramatically increase the explanation of variances ($R^2$ is from .051 to .111).

In model 3, we evaluate the faculty influences on the perception of pedagogical environment through psychosocial dispositions.

Faculty impact on comprehension of information has been strengthened ($b= .183$, $p\leq .001$). The impact on interaction with students now is marginally significant ($b= .083$, $p\leq .05$). The effect of faculty on evaluation of arguments ($b= -.140$, $p\leq .001$) and interaction with professors ($b= -.121$, $p\leq .001$) are also mediated by psychological dispositions. Students would be more able to perceive challenges about evaluation of arguments if they have better academic control ($b= .188$, $p\leq .001$), self-esteem ($b= .091$, $p\leq .05$) and coping strategies ($b= .178$, $p\leq .001$). It is more possible that students receive support from professors if they have higher academic control ($b= .361$, $p\leq .001$). Higher academic control ($b= .074$, $p\leq .05$), self-esteem ($b= .298$, $p\leq .001$) and coping strategies ($b= .158$, $p\leq .001$) will help students to experience better interaction with students.

GPA’s impact on interaction with peers is entirely mediated by high psychosocial dispositions, while impact on interaction with professors is partly explained by academic control. Females are more able to comprehend information is partly because they have higher academic control level and coping strategies. They are a little better to evaluate arguments is almost completely because they have higher psychosocial level. The elders interact with professors more is because they have much better academic control than the youngers ($b= .366$, $p\leq .001$).

In this model, the total variance that can be explained is dramatically increased. This model explained 10.9% ($R^2= .109$) difference in comprehension of information,
15.5% (R²=.155) difference in evaluation of arguments, 20.6% (R²=.206) difference in interaction with students and 25.3% (R²=.253) in interaction with professors. In another words, psychosocial dispositions have the strongest impact on students’ perceived environment.

**DISCUSSION**

Like C.P. Snow found decades ago, the study also found that Arts students differ from Science students. Unlike C.P. Snow complained about different knowledge grasped by people from different disciplines, our study probes deeper. The study finds that Arts students differ from Science students on perceiving their pedagogical environment, though interaction with students exhibits marginally significant difference. Because the high correlation between what is learned and what is emphasized, it is probably safe to say that Arts students are more able to evaluate arguments and Science students are more capable to comprehend information. Art students interact more with professors while and Science students interact a little bit more with peer groups.

The difference on cognitive demand echoes findings in literature. Faculty in soft fields gives greater importance to goals as providing a broad general education and knowledge of oneself, however, faculty in hard disciplines accord greater importance to student career preparation as a teaching goal (Gaff and Wilson, 1971). Lattua and Stark (1995) observed that hard disciplines emphasize cognitive concerns, learning of facts, principles and concepts, whereas soft fields underscore these same goals but also attach importance to effective thinking skills such as critical thinking. Stark, Lowther, Bentley, and Martens (1990) also found that consistent with their stress on effective thinking as
the goal of the academic major, faculty in soft fields also tend to favor a more “discursive” approach to their classroom teaching than do their counterparts in hard fields. A discursive approach includes faculty classroom behaviors like discussion of points of view other than one’s own, discussion of issues beyond those covered in course readings, and the relating of course topics to other fields of study (Gaff and Wilson, 1971). A good example would be the questions faculty asks. Liberal arts college faculty in soft fields are more likely to ask examination questions requiring an analysis or synthesis of course content, whereas faculty in hard disciplines tend to ask more questions which require memorization and application of course material (Braxton and Nordvall, 1998).

The difference on interaction with professors is also consistent with literature that investigate from faculty’s behavior perspective. Faculty in soft disciplines is more likely to enact scholarly-based course activities than their hard-discipline colleagues (Braxton, 1983). For example, teachers of arts and humanities subjects were more likely than social sciences or natural science teachers to use behaviors in the interaction, rapport, and mannerisms categories, whereas teachers in the social and natural sciences were more likely than arts teachers to show behaviors loading on the organization and pacing factors (Soloman, 1966, Pohlmann, 1976, Erdle and Murray, 1986, Murray and Renaud, 1995).

Those findings show that despite the different institutional bonding levels, demographic backgrounds and psychosocial dispositions, students can effectively perceive the pedagogical environments that they are exposed to. From another aspect, this confirms that what is taught and what is learned is highly correlated (Casin and Downey, 1995), because they perceive the academic goals presented to them and accordingly work toward those goals. On the other hand, we can understand because students from faculty
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in soft areas have better pedagogical experiences (Astin, 1993, Macleans’, 2004). That is because they receive more support from professors and they are more challenged to do apply, analyze, synthesize knowledge and evaluate arguments, so build a higher cognitive skills.

This study also helps us verifies other hypothesis that other academic program factors, demographic and psychosocial dispositions also impact the students’ perception of their pedagogical environments.

Generally say, the more institutional the students experience, in another words, more years they spend in university, more courses they have taken, and higher GPA they achieve, it is more possible they would have a better academic experience. Which is consistent with findings based on hours spent per week in study. In that case, hours significantly correlated with all measures of satisfaction (Astin, 1993). And the number of credits finished is more closely related to students’ positive university experience than years they have finished.

Gender has a significant impact on perception of cognitive demand. Female is more able to perceive demands on comprehend of information and a little more on evaluation of arguments. Consequently, we may expect that females are doing better to both comprehend and evaluate. The difference is partly because females have better psychosocial dispositions. But they didn’t exhibit differences in interaction either with students or with professors.

Age only affects interaction with professors. The elder, the more the students interact with professors. This difference can be partly explained by the elder’s higher psychological dispositions.
To our surprise, this study found that educational resources only have a marginally negative significant impact on comprehension of information. That means the higher the education degree the parents have, the lower comprehension capacity the student may have. Nonetheless, educational resources have non-significant negative impact on the other pedagogical environment variables as well. Because this is against most literature, this needs further investigation to clarify the contributing mechanism.

Psychosocial dispositions have the strongest impact on perception of pedagogical environment. It also mediates the faculty impact on evaluation of information and interaction with professors. Academic control is essential to improve both cognitive demands and interaction with professors. The increased coping strategies will greatly benefit the evaluation and interaction with students. Students with raised higher self-esteem will be expected to interact more with students. So we may improve students’ quality of college experience by promoting their psychosocial dispositions.

Compared with Astin’s research, there is an inevitable restriction. To evaluate impact, we usually need a start point and an end point. By controlling all possible effecting variables at the start point and compared with the result at the end point, we can say with confidence that the change is completely caused by environment that we are observing (Astin, 1993). Here restricted by time and budget, we can only controlled the demographic and psychosocial conditions when students entered the university environment. That increases the error in our analysis.

Another restriction to this study is that because fewer studies have been conducted before about faculty impact, so the model needs more verification. In this study we used path analysis and it is found that demographic and psychosocial variables are either
mediating or suppressing faculty effect on pedagogical environment variables. In some degree, this only allows us to hypothesis that there may be some causal relations among variables. The three psychological variables were acquired by confirmatory factor analysis. If we use structure equation model to test the model, we may expect to build a more precise model and test the causal relationships between variables. for example, we can test the relation between GPA and social support is a one way or two way relation and which is the indicator in one way relation.

The overall variance on cognitive demand and social support explained by our model is from 10.9% to 25.3%. That implies that there are more contributors that interfere students’ perception of their pedagogical environment, such as the nature of the assessment procedures. Those possible contributors need more study to identify.

According to Biglan’s typology, Science and Arts are hard versus soft, only different on the basis of their level of paradigm development (1973). If possible, more faculties should be included in the model so to construct a better faculty variable.

To administer, this study helps us understand the disciplinary differences and find out why students are affected by environment in a different extent, and so provides clues about how to improve university students’ quality of university experience. Some students rely heavily on their lecture notes alone and employ a surface approach on study while other students read more widely and developed their own structure to make sense of the topic being reviewed and employ a deep approach. This is relative to the environment they experience. There was a strong tendency for the students to report more learning on the objectives the faculty weighted more important (Cashin and Xixbury 1993). So the instructors can effectively help students build cognitive skills in Bloom’s
taxonomy. Cognitive demands lead the study direction and the social support is critically important to student development. According to different student, there may be corresponding strategies that work most effectively. For example, by promoting young’s students’ academic-control, we may help young students to interact more with professors.

After we know the disciplinary differences, what is a better way to use the knowledge does not have a unique answer. Should knowledge be used to better understand and therefore better support faculty’s already existing instructional goals or to transform these goals (Marincovich, 1995). The two directions both have supporters. Some argue that students need to acquire more than just discipline-specific knowledge when studying a course in higher education; they also need to develop relevant study skills. C.P. Snow definitely favored the transformation. Because the current disciplinary differences “is serious for our creative, intellectual and, above all, our normal life. It is leading us to interpret the past wrongly, to misjudge the present, and to deny our hopes of the future. It is making it difficult or impossible for us to take good action.” While other researchers argue that all aspects of a course convey the same message to students regarding what will be rewarded through assignments and examinations and each discipline be expecting a different balance of knowledge and skills to be developed (Entwistle and Tait 1995). Some suggest put disciplinary away and accept differences and focus on instructing technologies so to improve teaching effectiveness (Smart and Ethington 1995). Or maybe we can choose a middle way, “recognize both the strength of disciplinary culture and the campus contextual factors that make faculty redefine discipline cultures to meet local needs” (Lattuca and Stark 1995).
Either way needs more knowledge of disciplinary differences and contributing mechanism. Comparative studies on faculties and students who cross-disciplinary lines with those who don’t are also needed. The current knowledge is still poor but it is growing.

Reference:


*Research in Higher Education* 41:581-592


Table 1. Descriptive statistics for the selected variables in the total sample and in the Faculties of Arts and Science

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total sample (854)</th>
<th>Arts (N=425)</th>
<th>Science (N=429)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of items</td>
<td>Actual range</td>
<td>Factor loadings</td>
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<tr>
<td>Cognitive Demands</td>
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<td></td>
<td></td>
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<tr>
<td>Comprehension of Information</td>
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<td>8-24</td>
<td>.59-.86</td>
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<tr>
<td>Evaluation of Arguments</td>
<td>11</td>
<td>12-44</td>
<td>.51-.72</td>
</tr>
<tr>
<td>Social Support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction with Students</td>
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<td>6-20</td>
<td>.66-.77</td>
</tr>
<tr>
<td>Interaction with Professors</td>
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<td>11-36</td>
<td>.38-.77</td>
</tr>
<tr>
<td>Academic Program</td>
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<td>Year of College</td>
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</tr>
<tr>
<td>Credit Hours</td>
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<td>GPA</td>
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<td>1-6</td>
<td></td>
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<tr>
<td>Demographic Background</td>
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</tr>
<tr>
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<td>Age</td>
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<td>Psychosocial Dispositions</td>
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<tr>
<td>Coping Strategies</td>
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<td>14-50</td>
<td>.36-.69</td>
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<td>Academic Control</td>
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<td>19-37</td>
<td>.38-.75</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>10</td>
<td>11-40</td>
<td>.64-.84</td>
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</table>

** p<.01; *** p<.001 (two-tailed test).
Table 2. Standardized Coefficients and $R^2$ for Comprehension of Information, Evaluation of Arguments, interaction with students and interaction with professors.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Comprehension of information</th>
<th>Dependent variables</th>
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<tr>
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</table>

*p ≤ .05, ** p ≤ .01, ***p ≤ .001 (two-tailed tests)