

Is There a Difference Between Agriculture/Natural Resources and Non-Agriculture/Natural Resources Majors' Motivation Sources?¹



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Abstract

This paper presents a unifying theory of motivation that integrates the major motivational perspectives from the field while testing the differences in student motivation between agriculture/natural resources and non-agriculture/natural resources university majors. The unifying theory features five sources of motivation: intrinsic process, instrumental, self-concept external, self-concept internal, and goal internalization. The study was based on a sample of 208 undergraduate students. Results indicate that a statistically significant difference exists between agriculture/natural resources and non-agriculture/natural resources majors for self-concept internal and goal internalization motivation. Implications for teaching, recruitment and future research are also discussed.

Introduction

The expectation for university faculty to motivate students has been on the rise over the past thirty years. More today than at other times, faculty are expected to motivate students to engage in the learning process. With this expectation comes a need for greater, more focused research on the phenomenon of student motivation (Wlodkowski and Ginsberg, 1995). Past studies indicate faculties in agricultural sciences and natural resources are faced with a real dilemma of understanding and motivating their students (Millard and Fritz, 1999; Shih and Gamon, 1999). While many agricultural students come from similar backgrounds, there appears to be a difference between the typical agriculture/natural resources student and the typical non-agriculture/natural resources student (Dean and Camp, 1998; Regan and Thompson, 1965; Torres and

Cano, 1994). Faculties in the agricultural sciences and natural resources need to consider several aspects in order to meet the motivational needs of their students. First, faculty must become aware of the ways that students can be motivated the sources of motivation. Secondly, faculty must discover how their students' motivations are similar or different from students in other disciplines in order to develop effective student recruitment, retention and teaching strategies. Once motivation source trends are established, the third step for agricultural sciences and natural resources faculty is to motivate their students. This paper examines the concept of motivation, reviewing the historical literature, and providing an integrative taxonomy of sources of motivation. Then an original study is reported that explores the differences in these sources of motivation between agriculture/natural resources and non-agriculture/natural resources majors. Finally, we discuss the teaching and recruitment implications of these findings.

An Integrative Theory of Motivation

Motivation has been examined from many perspectives including psychosocial, expectancy, need-based, intrinsic, social identity, value-based, goal setting, self concept-based, and to some extent, developmental perspectives (Barbuto and Scholl, 1998). Arguments over the merits of each viewpoint have been long and exhaustive in the social sciences literature. The results of such efforts have generally fallen short of providing an integrative framework.

Perhaps the most accepted and applied taxonomy of motivation is the trichotomy developed and operationalized by McClelland (1961; 1985). This theory of motivation emphasized three needs - need

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for power, need for affiliation, and need for achievement. Despite its general acceptance, the trichotomy and its measures (Thematic Attribute Test) have been widely criticized (Barbuto and Scholl, 1998). Recently, a new typology of motivation sources was proposed by Leonard, Beauvais, and Scholl (1999) and operationalized with scales to measure the taxonomy (Barbuto and Scholl, 1998; see Table 1). This typology was further developed and tested to predict leaders' behaviors (Barbuto and Scholl, 1999; Barbuto, Fritz and Marx, 2000). The five sources of motivation measured include intrinsic process, instrumental, self-concept-external, self-concept-internal, and goal internalization. A brief description of these five sources of motivation follows.

Table 1
Integrative Typology of Motivation Sources

Theorist	Intrinsic Process	Instrumental	S.C.-External	S.C.-Internal	Goal Internalization
Alderfer, 1969	Existence	N/A	Relatedness	Growth	N/A
Ashforth and Mael, 1989	N/A	N/A	Social Identity	N/A	N/A
Bellah, et al. 1985	N/A	N/A	N/A	Individualism	Habits of the Heart
Maslow, 1954	Physiological	Safety	Love	Esteem	Self Actualization
Herzberg, 1968	N/A	Satisfiers	Satisfiers	Motivators	N/A
Bandura, 1986	Sensory Intrinsic Physiological	Extrinsic	N/A	Personal Standards Self-Regulation	N/A
Katz and Kahn, 1978	N/A	Legal Compliance	Membership Approval	Role Performance	Internalized Values
Etzioni, 1975	N/A	Calculative/ Alienative	Social Moral	N/A	Pure Moral
Deci, 1975	Task Pleasure	Extrinsic	Interpersonal Challenges	Overcoming	Outcome Valence
Piaget, 1972	Preoperational	Concrete	Formal	Full-Formal	Post-Formal
Kohlberg, 1976	Heteronomous	Instrumental	Interpersonal	Social System	Principled
Kegan, 1982	Impulsive	Imperial	Interpersonal	Institutional	Inter-Individual
Loevinger, 1976	Impulsive	Opportunistic	Conformist	Conscientious	Autonomous
McClelland, 1961	N/A	Power	Affiliation	Achievement	N/A
Murray, 1964	Intrinsic Pleasure	Power	Affiliation	Achievement	N/A
Barnard, 1938	N/A	Material Inducements	Social Inducements	N/A	N/A

Source: Barbuto and Scholl, 1998.

Intrinsic Process Motivation

If a person is motivated to perform certain kinds of work or to engage in certain types of behavior for the sheer fun of it, then intrinsic process motivation is taking place. In this source of motivation, the work itself acts as the incentive, as students enjoy what they are doing. Similar constructs to intrinsic process motivation can be found extensively in the literature. Developmental theorists have described this type of motivation in similar ways using the terms heteronomous morality (Kohlberg, 1976), impulsive (Loevinger, 1976; Kegan, 1982), and to a lesser extent, pre-operational (Piaget, 1972). Other need-based descriptions similar to intrinsic process include

early existence needs (Alderfer, 1969), intrinsic pleasure needs (Murray, 1964) and physiological needs (Maslow, 1954). Bandura (1986) describes sensory intrinsic motivation and physiological intrinsic motivation in terms similar to those used to describe intrinsic process motivation. This motive also has been articulated as intrinsic motivation to obtain task pleasure (Deci, 1975) and as intrinsic task motivation devoid of any external controls or rewards (Staw, 1976).

Past researchers have used the term intrinsic motivation to represent personal satisfaction derived from achievement of goals or tasks. Intrinsic process is distinct from the classical interpretation of intrinsic motivation because the emphasis is on immediate enjoyment or pleasure during the activity, rather than on the satisfaction that results from its achievement. The classic intrinsic motivation is better represented in this motivation taxonomy as self-concept internal (upcoming).

Instrumental Motivation

Instrumental rewards motivate students when they perceive their behavior will lead to certain extrinsic tangible outcomes, such as pay, promotions, bonuses, etc. This source of motivation integrates Etzioni's (1961) alienative and calculative involvement, Barnard's (1938) exchange theory, and Katz and Kahn's (1978) legal compliance and external rewards. Developmental theorists have described a similar stage as concrete operational (Piaget, 1972), instrumental (Kohlberg, 1976), imperial (Kegan, 1982), and opportunistic (Loevinger, 1976). Similar instrumental motives have been described as a need for power (Murray, 1964; McClelland, 1961), a need for safety (Maslow, 1954), or later stages of existence needs (Alderfer, 1969).

Others have described extrinsic motivation (Staw, 1976; Deci, 1975; Bandura, 1986) and material inducements (Barnard, 1938) in terms similar to those used to describe instrumental motivation.

Instrumental motivation is different from the classic extrinsic or external motivation in that this motive derives from tangible external rewards, whereas the classic definition includes social rewards and interpersonal relations (in this typology, these are termed self-concept-external). Therefore, extrinsic motivation is further divided in this typology into two categories of motives, tangible (instrumental) and social (self-concept-external).

Is There a Difference

Self-Concept External Motivation

This source of motivation tends to be externally based when the student is primarily other-directed and seeking affirmation of traits, competencies, and values. The ideal self is adopted from role expectations of reference groups. The student behaves in ways that satisfy reference group members, first to gain acceptance, and after achieving that, to gain status. This source of motivation is similar to Etzioni's (1961) social moral involvement; extrinsic interpersonal motivation described by Deci (1975) and Staw (1976); and Barnard's (1938) social inducements, conformity to group attitudes, and communion. This source of motivation also resembles the basic tenets of social identity theory, where the focus is on establishing and maintaining social reference and standing (Ashforth and Mael, 1989). Developmental theorists have discussed a similar motivational stage as interpersonal (Kohlberg, 1976; Kegan, 1982), early formal operational (Piaget, 1972), and conformist (Loevinger, 1976). Other researchers have described similar motivation as need for affiliation (McClelland, 1961; Murray, 1964), need for love, affection, and belonging (Maslow, 1954), and relatedness needs (Alderfer, 1969). Katz and Kahn (1978) describe employees seeking membership and seniority in organizations, approval from leaders, and approval from groups in terms similar to those used to describe self-concept-external motivation. Classic articulations of social rewards or social exchanges are captured by this typology's self-concept-external motivation.

Self-Concept Internal Motivation

This source of motivation will be internally based when the student is inner-directed. In this type of motivation, the student sets internal standards of traits, competencies, and values that become the basis for the ideal self (Leonard et al., 1999). The person is then motivated to engage in behaviors that reinforce these standards and later achieve higher levels of competency. This source is similar to McClelland's (1961) high need for achievement, Deci's (1975) internal motivation to overcome challenges, and Katz and Kahn's (1978) ideal of internalized motivation derived from role performance. Bellah, et al. (1985) describes individualism in terms similar to self-concept internal motivation. Developmental theorists have described a similar stage as full formal operational (Piaget, 1972), social system (Kohlberg, 1976), institutional (Kegan, 1982), and conscientious (Loevinger, 1976). Similar motives are described as a need for achievement (McClelland, 1961; Murray, 1964), need for esteem (Maslow, 1954), motivating factors (Herzberg, 1968), and growth needs associated with developing one's potential (Alderfer, 1969). Bandura (1986) describes self-evaluative mechanisms, self-regulation, and personal standards in terms similar to those used to describe internal self-concept motivation. Katz and Kahn

(1978) describe a motive similar to internalized motivation as self-expression derived from role performance. This motive also has been described as intrinsic motivation to overcome challenges (Deci, 1975) and intrinsic motivation to pursue personal achievement (Staw, 1976).

Goal Internalization Motivation

Behavior motivated by goal internalization occurs when the student adopts attitudes and behaviors because their content is congruent with the student's personal value system. Strong ideals and beliefs are paramount in this motivational source (Barbuto and Scholl, 1998). The student believes in the cause and has developed a strong sense of duty and is therefore motivated to work toward the goal of the collective. This source of motivation is similar to Kelman's (1958) value system; Katz and Kahn's (1978) internalized values; Deci's internal valence for outcome (1975); and Etzioni's (1961) pure moral involvement. Each of these perspectives emphasizes a virtuous character and a desire to not compromise these virtues. Bellah et al. (1985) describe habits of the heart in terms similar to goal internalization. Developmental theorists describe a similar motivational stage as post-formal operational (Piaget, 1972), principled orientation (Kohlberg, 1976), inter-individual (Kegan, 1982), and autonomous (Loevinger, 1976). Need theorists describe a similar motive as self-actualization (Maslow, 1954).

Goal internalization is distinct from the previous four sources of motivation because it embodies the absence of self-interest (Barbuto, 2000). Motivation derived from this source occurs because students believe in the cause or purpose of a class. This is distinct from the previous four sources of motivation. With intrinsic process motivation, students need to enjoy the work being performed. With instrumental motivation, students need an incentive or contingent reward to perform the work. With self-concept-external motivation, students need to believe their reputation or image will be enhanced if they comply. With self-concept-internal motivation, students need to have a personal challenge to comply. With goal internalization, however, students do not require any strong inducements beyond a belief that the goals of the class can be attained with their assistance. If all students were extremely high in goal internalization motivation and extremely low in each of the remaining four sources of motivation, instructors would need only talk about the goals and objectives of the course and what must be done to accomplish them. If students believe in the articulated goals (perhaps a big 'if'), they will be motivated to perform whatever tasks are necessary to achieve these goals.

Just as many would make general assumptions about certain career choices and individual motives, similar assumptions are made in students' academic major choices. Students motivated in certain ways may gravitate towards certain degree programs or

colleges. Speculation on which majors attract which types of motivated individuals may be an act of stereotyping and would be far from scientific. However, a limited amount of research does inform certain expectations.

Prior research has examined motivation in business/industry settings (Barbuto and Scholl, 1999) and found distinct differences in overall means, as has a more recent study that examined agricultural industry workers (Barbuto et al., 2001). The results of the latter study indicated that midwestern and, more specifically, agricultural industry employees reported lower degrees of instrumental and self-concept external motivation, while demonstrating higher degrees of intrinsic process, self-concept internal, and goal internalization motivation. If these differences seemed to hold true in industry, then we expect they will also hold true in an academic setting where students are preparing for their chosen careers. We, therefore, expect similar differences as those found across two independent studies of business and agricultural industry workers (Barbuto, et al., 2001; Barbuto and Scholl, 1999).

Hypothesis 1: Students enrolled in degree programs within the College of Agriculture Sciences and Natural Resources will on average have a significantly higher intrinsic process motivation score than those students enrolled in degree programs in other colleges.

Hypothesis 2: Students enrolled in degree programs within the College of Agricultural Sciences and Natural Resources will on average have a significantly lower instrumental motivation score than those students enrolled in degree programs in other colleges.

Hypothesis 3: Students enrolled in degree programs within the College of Agricultural Sciences and Natural Resources will on average have a significantly lower self-concept external motivation score than those students enrolled in degree programs in other colleges.

Hypothesis 4: Students enrolled in degree programs within the College of Agricultural Sciences and Natural Resources will on average have a significantly higher self-concept internal motivation score than those students enrolled in degree programs in other colleges.

Hypothesis 5: Students enrolled in degree programs within the College of Agricultural Sciences and Natural Resources will on average have a significantly higher goal internalization motivation score than those students enrolled in degree programs in other colleges.

Materials and Methods

Participants in this study consisted of students enrolled in ten different sections of a freshman sophomore level undergraduate course offered at a midwestern U.S. state university. Data were collected

over a three-year period from 1998-2001. Average age of students was 19.5 years. Sixty-five percent of the students were male. Ninety percent of the students were Caucasian. Of the 208 students sampled, 146 were enrolled in a degree program within the College of Agriculture and Natural Resources, while the remaining 62 were enrolled in degree programs outside of the college. The course was a leadership development course, with some technical science or agricultural content. The course was a requirement for less than 20% of those students enrolled in it.

Data were collected in the classroom setting during regular class time. Students were informed that the information that they were providing would be stored in a central database and used for future research. Questionnaires did not have any identifying information, besides demographics (age, year, major, etc.). Students were given the opportunity to decline participation; however, since students received instant feedback about their motivation, 100% participated. On average, students took fifteen minutes to complete the questionnaire. Following the administering of the questionnaires, students were given a scoring sheet to self-score their results and were immediately presented with a lecture on the five sources of motivation which accompanied their self-assessment. The individual scoring sheets were not collected from the participants. The first two authors were the course instructors for six of the ten sections sampled. Distribution comparisons were made across sections to insure that instructor differences were not a factor in the study.

Motivation was measured using the Motivation Sources Inventory (Barbuto and Scholl, 1998). The self-assessment instrument consists of 30 items, measuring five subscales, on a seven point Likert-type scale ranging from 'completely agree' (6) to 'completely disagree' (0). Each of the five subscales consists of six items. Internal reliabilities for the subscales in this study were strong. Intrinsic process ('I only like to do things that are fun') earned a coefficient alpha (α) of .70; instrumental ('Job requirements will dictate how much effort I give at work') earned a coefficient alpha (α) = .67; self-concept external ('It is important to me that others approve of my behavior') earned a coefficient alpha (α) = .72; self-concept internal ('Decisions I make will reflect standards that I've set for myself') earned a coefficient alpha (α) = .78; and goal internalization ('I would not work for a company if I didn't agree with its mission') earned a coefficient alpha (α) = .71.

Data were analyzed using t-tests on the BMDP-7 statistical software package. T-tests were chosen as the method of analysis because the researchers sought to discover mean differences in motivation sources between agriculture/natural resources and non-agriculture/natural resources majors.

Results

Hypotheses were tested by first parceling the 30 items of the Motivation Sources Inventory into the previously-discussed subscales. Mean scores for each of the five subscales were calculated in two categories: CASNR (College of Agricultural Sciences and Natural Resources) and non-CASNR majors. Comparison of the means revealed two statistically significant mean differences, both consistent with expectations.

Intrinsic process was higher for CASNR than for non-CASNR majors, as expected, however, this difference was not statistically significant. Instrumental motivation was lower for CASNR than for non-CASNR majors, as expected, but this difference was not statistically significant. Self-concept external motivation was lower for CASNR than for non-CASNR majors, as expected, but this difference was not statistically significant. Self-concept internal was higher for CASNR than for non-CASNR majors, as expected; this difference was statistically significant at $p < .001$. Goal internalization motivation was higher for CASNR than for non-CASNR majors, as expected, and this difference was statistically significant at $p < .001$.

In summary, each of the five hypothesized differences were in the expected direction, however, only the self-concept internal and goal internalization mean differences produced statistically significant differences.

The differences between agriculture/natural resources and non-agriculture/natural resources majors' sources of motivation underscore the necessity of educating all students about motivation. Agriculture/natural resource majors are in many classes populated with students who share similar majors (and a college) and similar motivation sources. Therefore, when taking courses outside of their major and college, agriculture/natural resources majors may not understand differences in their interests and drives compared to non-agriculture/natural resources majors, and their reactions to the different teaching approaches used by faculty. Additionally, with little or no awareness of motivation sources, they may not develop the skills to provide the conditions to motivate individuals with primary sources of motivation other than their own. Unfortunately, they could fail in leading organizations if they rely on employing motivation strategies based solely on their own motivation needs.

Colleges of Agriculture have drawn from a historically shrinking agrarian population base. This shrinking population base has produced fewer traditional students to draw into agriculture/natural resources majors. Results of this study parallel those of another study (Barbuto et al., 2001) that indicated those in the agriculture industry or preparing for careers in the agriculture and natural resources field are more strongly motivated by self-concept internal and goal internalization than those outside of the industry or preparing for careers in these areas. This parallel establishes a pattern of motivation that likely exists in these career areas, and a pattern that may be an unintentional detractor for entering into agricultural/natural resources career preparation for those without agrarian backgrounds.

If colleges are going to attract students from other-than an agrarian population base, it would be in their best interest to determine how their strategies appeal to potential students motivated by each of the primary sources. This analysis of recruitment strategies could be a fresh look at recruitment strategies that may be falling short in attracting students from other-than traditional agrarian populations and whose primary sources of motivation may differ from the agriculture/natural resources student of today or yesterday.

However, the research base underpinning the refinement of recruitment strategies needs to be strengthened through replications of this study. Additionally, this line of research could be prove valuable to retention and teaching strategies if it became the springboard for exploring the linkage between motivation and learning styles. Linking motivation and learning styles could help faculty

Table 2

Comparison of Agriculture/Natural Resources and Non-Agriculture/Natural Resources Students' Motivation Sources

MOTIVATION SOURCES	CASNR (n=146)	OTHER (n=62)	SIGNIFICANCE OF DIFFERENCE
Intrinsic Process	24.88	24.51	NS
Instrumental	23.07	23.52	NS
Self-Concept External	22.25	22.72	NS
Self-Concept Internal	31.87	28.98	T= 15.27*
Goal Internalization	24.81	22.57	T= 7.058**

Note: N=208. CASNR= College of Agriculture and Natural Resources Students. OTHER=Majors other than CASNR. Sample size of each student type is in parentheses. NS=not significant. * $p < .001$, ** $p < .01$. ANOVA (1, 208).

Discussion

The finding that agriculture/natural resources majors differ from non-agriculture/natural resources majors is congruent with findings of previous research (Dean and Camp, 1998; Regan and Thompson, 1965; Torres and Cano, 1994). This study also extended the limited motivation research regarding differences between agriculture/natural resources and non-agriculture/natural resources majors, but uses an integrative measure that is being widely used (Millard and Fritz, 1999; Shih and Gamon, 1999). Because participants were self-selected through their enrollment in an undergraduate leadership development course and not randomly sampled, the results of this study are not generalizable.

understand what conditions motivate their students and the relationship between these conditions and learning styles. Exploring the relationship between these two theories could result in the development of teaching conditions under which students would be most energized and likely to learn.

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