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The Relationship Between Interactions with Student Affairs Professionals and Cognitive Development in the First Year of College*

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Introduction and Objectives

The *Student Personnel Point of View* (American Council on Education [ACE], 1937 advanced by early student personnel administrators), implored educators to view college students as a whole—"his [sic] intellectual capacity and achievement, his emotional make up, his physical condition, his social relationships, his vocational aptitudes and skills, his moral and religious values, his economic resources, and his aesthetic appreciations" (ACE, p. 39) and to educate students in every facet of their lives. Over 70 years later, newer documents such as *The Student Learning Imperative*, *Powerful Partnerships*, *Learning Reconsidered*, and *Learning Reconsidered 2* have recommitted the student affairs field to the student personnel philosophy of placing student learning at the center of student affairs work (American Association for Higher Education, ACPA, & National Association of Student Personnel Administrators [NASPA], 1998; ACPA, 1996; ACPA & NASPA, 2004; ACPA, Association of College and University Housing Officers International, Association of College Unions International, National Academic Advising Association, National Association of Campus Activities, NASPA, & National Intramural-Recreational Sports Association, 2006). Evans and Reason (2001) indicated that while the language of "student learning" as an outcome of student affairs professionals' engagement with students may sound new, learning has been an unwavering core value of the student affairs field for the last one hundred years.

Research on the college experience has found both in- and out-of-class engagement to be associated with student learning and development. In particular, scholars have noted positive relationships between traditional activities structured and supervised by student affairs

professionals (e.g., residing on campus, participation in community service or service-learning programs, involvement in leadership programs) and educational outcomes (see Astin 1993; Kuh, 1995; Pascarella & Terenzini, 1991; 2005). Love (1995) explained, however, that while past research has shown the indirect influence of student affairs professionals on student learning through the positive relationships between some student affairs programs and student outcomes, little empirical research has examined the direct relationship between students' interactions with student affairs professionals, who structure and supervise many of these activities, and student learning. The warrant for this study comes from this gap in the literature and a variety of guiding documents in the student affairs field that tout student learning and development as the primary goals and intended outcomes of student affairs professionals' interactions with college students (see for example, ACE, 1937; ACPA, 1996; ACPA & NASPA, 2004).

The purpose of this study is to explore the relationship between students' reflective interactions with student affairs professionals and the development of students' intellectual capacity, the first domain of holistic student learning identified by ACE (1937). We define intellectual capacity in terms of students' cognitive development in the first year of college. The following research questions guided the study: 1.) Controlling for key background characteristics and experiences (e.g., high school achievement, sex, race/ethnicity, parental education, high school involvement, institutional type, and pre-test scores), does interaction with student affairs professionals have an effect[1] on cognitive college outcomes such as critical thinking, motivation toward lifelong learning (e.g., interest to engage in effortful cognitive activities, and attitude

[1] We use the term "effect" not in the causal sense of the word but in the statistical sense. Due to the pretest-posttest longitudinal design and host of confounding influences for which we are able to statistically control, "effect" refers to that part of the variance in *y* that we can attribute to *x* (Shadish, Cook, & Campbell, 2002).

toward literacy), and academic motivation? 2.) If there is an effect, is it mediated by particular experiences (e.g., involvement in an academic living-learning community, holding a leadership position, involvement in community service, participation in co-curricular activities) students have in the first year of college theoretically exposing them to more frequent and higher quality interactions with student affairs professionals?

Guiding Frameworks and Review of Literature

Responding to calls for accountability, student affairs professionals and faculty of higher education in the latter decades of the 20th century began in earnest to document the influence out-of-class experiences had on student learning and development (Hernandez, Hogan, Hathaway, & Lovell 1999; Blake, 2007; Mann, 2008; Moore, Lovell, McCann, & Wyrick, 1998). Two watershed journal articles (Kuh, 1995; Terenzini, Pascarella, & Blimling, 1996), which examined the topic of out-of-class experiences, or the co-curriculum, have each been cited over 200 times since their publication. This clearly suggests the field of higher education remains intensely interested in understanding the relationship between out-of-class experiences and student learning and development.

Largely within the structural and supervisory purview of student affairs professionals, the relationship between out-of-class experiences or contexts and student learning and development has been well-studied (see Pascarella & Terenzini, 1991, 2005 for an extensive overview). However, the findings of past research are not always conclusive. These inconclusive results are likely due to the fact that programs and experiences differ dramatically in their planning, delivery, and assessment from campus to campus. Due to this variation, it is likely that among any type of experience in multi-institutional samples, as much variation exists within the outcome measure for students who participated in the experience as between those who did and

did not participate. In his meta-analysis of the effects of student involvement on critical thinking, Gellin (2003) notes the variation in these relationships.

We assert the inconclusive evidence of the influences of program or experience X on learning outcome Y in the literature may be the result of the focus being only on the program or experience and not on the mechanism within the experience. Drawing on Sanford's theory of challenge and support (Sanford, 1967), we argue that within any out-of-class activity or experience it is perhaps the increased reflective interaction with student affairs professionals that directly influences students' cognitive development in their first year of college. Student affairs professionals interact with students in ways that challenge them to re-examine their beliefs, values, and ideas while supporting them through what can be a cognitively dissonant process. Thus, it is plausible that the challenge and support orientation of the reflective interactions with student affairs professionals may serve as the mechanism in students' cognitive development.

From this vantage point, we review the literature of those experiences in which first-year students are more likely to have substantial contact with student affairs professionals and thus more likely to experience the mechanism of challenge and support as part of reflective interactions during the first year of college. We focus on past research that has examined the extent to which participation in living-learning communities, assuming a leadership position in a campus organization or club, hours spent participating in out-of-class activities, and engaging in community service influences students' cognitive development.

Living-learning Communities

In recent decades, living-learning communities have blossomed across the U.S. and particularly at large institutions where they serve to make the campus feel more intimate and manageable (Inkelas & Weisman, 2003). They vary in their goals and structure, organized

typically within academic affairs or student affairs and rarely as a full collaboration between the two divisions (Inkelas, Soldner, Longerbeam, Leonard, 2008). In one of the few multi-institutional studies comparing students in a living-learning program to those in a traditional residence hall, Inkelas and colleagues (2006) found students in the living-learning program reported greater critical thinking/analysis abilities and enjoyment of challenging intellectual endeavors but did not differ from their peers in their growth in cognitive complexity. This supports previous research by Tinto (2000) and Terenzini, Pascarella, & Blimling (1996) which found living-learning communities encourage participants to engage with peers, faculty, and student affairs professionals in ways that foster cognitive growth.

Leadership Positions and Overall Engagement in Out-of-Class Activities

Less research has specifically examined the connection between students who hold leadership positions and cognitive development, although Kuh (1995) found those who held a leadership position in a campus organization reported greater levels of cognitive complexity than their peers. Looking more broadly at the overall extent of engagement in out-of-class activities and cognitive development, several studies have found positive associations (Edison, 1997; Gellin, 2003; Inman & Pascarella, 1998). To the extent that academic performance is a measure of cognitive development, Mann and colleagues as part of the Eduventures Student Affairs Learning Collaborative (2008) found participation in clubs and organizations to be associated positively with academic performance. As student club and organization recognition and supervision largely falls within the purview of student affairs divisions, the more students engage in out-of-class activities and assume positions of leadership, the more likely they are to increase their frequency of contact with student affairs professionals.

Community Service

Although a considerable amount of research has focused on the relationship between engaging in service learning and cognitive outcomes, particularly in the last decade (see Novak, Markey, & Allen, 2007; Steinke & Buresh, 2002), a number of studies have investigated the influence of community service participation and volunteerism on a variety of learning outcomes including cognitive development (see Kezar, 2002). Past research has found the influence of community service participation to have significant positive relationships with cognitive academic development (Astin & Sax, 1998) and critical thinking skills (Dey, 1991) and with cognitive outcomes up to nine years after college (Astin, Sax, & Avalos, 1999). Unlike service learning which is connected to classroom instruction and thus the interactions students have while participating are more likely to be with their faculty member (Rosenberg, 2000), the organization of community service programs tends to be developed and supervised primarily by student affairs divisions.

Past literature has largely used college impact frameworks (e.g., Astin's (1993) I-E-O model, Pascarella (1985), Weidman (2006)) to suggest that students, who participate in a living-learning community, serve in a leadership position in a club or organization, engage in out-of-class activities, and/or volunteer in their community, benefit in terms of their cognitive development. The present study also uses the I-E-O model to control for potential confounding influences relative to students' input characteristics (e.g., sex, race, pre-college academic achievement, average parental education, high school involvement, and pretest score) as well as other salient environmental factors, such as participation in experiences that would provide first-year students with substantial contact with student affairs professionals. By accounting for these potentially confounding input characteristics and environmental factors, we are better able to

estimate the direct relationship between reflective interactions with student affairs professionals and students' cognitive development in their first year of college.

Method

Sample

The individuals who comprised the sample in this study consisted of first-year undergraduate students attending 26 higher education institutions participating in the Wabash National Study of Liberal Arts Education (WNS) between fall 2006 and spring 2008. The first cohort of institutions that began the study in 2006 were selected from a pool of over sixty institutions who responded to a national call to participate in the study. The second cohort of received a grant from a regional foundation which provided for their participation. The WNS is a longitudinal, multi-institutional exploration of the factors related to outcomes of a liberal arts education (Center of Inquiry in the Liberal Arts at Wabash College, 2009). Using the 2007 Carnegie Classification of Institutions, 5 out of the 26 were research universities, 5 were regional universities that did not grant the doctorate, 2 were two-year community colleges, and 14 were liberal arts colleges. The institutions varied in terms of their control, size, region, and student residential patterns.

The individuals in the sample consisted of first-year undergraduate students participating in the WNS at each of the 26 institutions. We gathered the initial student sample in one of two ways. We randomly selected students at larger institutions from the incoming first-year class. The one exception to this was at the largest institution participating in the study, where we selected students from the entering first-year class in the College of Arts and Sciences. At the smaller, liberal arts institutions, we invited all students in the first-year class to participate in the study.

Data Collection

The initial data collections occurred in the fall of 2006 and the fall of 2007 with 4,501 students from 19 institutions participating in the fall of 2006 and 3,375 students from 8 institutions participating in the fall of 2007. One institution participated in both the fall 2006 and fall 2007 data collections. Each fall data collection lasted approximately 90 minutes. Students participating in the 2006 cohort received a $50 stipend from the organization funding the research study for participating. Participants in the 2007 cohort were not incentivized directly from the organization funding the study but many institutions chose to provide some incentive to encourage student participation in the study. Collected data included a pre-college survey that gathered information on student demographic and background characteristics as well as a series of instruments that measured aspects of cognitive development along such dimensions as critical thinking, motivation toward lifelong learning, and academic motivation.

The follow-up data collections were conducted in the spring of 2007 and the spring of 2008, respectively and lasted about two hours. Participants in the spring 2007 follow-up received an additional $50 stipend from the organization funding the study while participants in the spring 2008 follow-up collection were not compensated from the study's funders but may have received an incentive from the individual institution. Two types of data were collected during the follow-up: data on students' college experiences using the National Survey of Student Engagement (NSSE) (Kuh, 2001) and the WNS Student Experiences Survey (WSES), and post-test data using the series of instruments measuring aspects of students' intellectual and personal development. The American College Testing Program (ACT) administered both data collections.

Out of the original sample of 4,501 students who chose to participate in the fall 2006 data collection[2], 3,081 students participated in the follow-up data collection in spring of 2007, for a return response rate of 68.5%. Participants in the fall 2007 data collection numbered 3,375. Of these respondents, 1,064 students participated in the follow-up data collection in spring of 2008, for a return response rate of 31.5%. Data from both cohorts resulted in usable data for 3,999 students. Of these 3,999 students, 44.7% indicated they were male and 78% of the sample identified as White or Caucasian. Because of the time involved in completing each instrument, only half of the sample completed the critical thinking module from the Collegiate Assessment of Academic Proficiency (CAAP), resulting in useable data for 1,942 students. We created a weighting algorithm to provide some adjustment for potential response bias by sex, race, academic ability, and institution in the student sample. We used information supplied by the institution on sex, race, and ACT score (or SAT score equivalent) to weight students who participated in the spring follow-up up to the first year student undergraduate population of each institution by sex (female or male), race (Caucasian, African American/Black, Hispanic/Latino, Asian/Pacific Islander, or other), and ACT (or equivalent assessment) quartile. While using this weighting procedure has the effect of making the total sample more similar to the population from which it was taken, we recognize that it cannot adjust for nonresponse bias.

Dependent Variables

Dependent variables in this study included posttest scores on the following cognitive outcomes: effective reasoning and problem solving and the inclination to inquire and lifelong

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[2] Actual response rates for the sample from invitation to actual participation are difficult to calculate. This is due to the fact that ACT, who managed the data collection, estimate between one-third and one-half of those who were invited to participate did not receive the initial invitation letter.

learning. WNS operationalized the first outcome by using the critical thinking module of the Collegiate Assessment of Academic Proficiency (CAAP) (ACT, 1991). The 32-item instrument measures one's ability to clarify, analyze, evaluate, and formulate arguments. The assessment consists of four passages, each containing a series of arguments supporting a general conclusion, followed by multiple-choice test items. The internal consistency reliabilities for the critical thinking module of the CAAP range from .81 to .82 (ACT, 1991). Prior research found the CAAP critical thinking test correlates .75 with the Watson-Glaser Critical Thinking Appraisal (Pascarella, Bohr, Nora, & Terenzini, 1995).

WNS operationalized the inclination to inquire and lifelong learning outcome with several scales. First, the 18-item Need for Cognition Scale (NCS) measures an individual's "tendency to engage in and enjoy effortful cognitive activity" (Cacioppo, Petty, Feinstein, & Jarvis, 1996, p. 197) and has been positively associated with the tendency to generate complex attributions for human behavior and engagement in evaluative responding and associated negatively with need for closure and personal need for structure (Cacioppo et al.). People with a high need for cognition "tend to seek, acquire, think about, reflect back on information to make sense of stimuli, relationships, and events in their world" (Cacioppo et al., p. 198). In contrast, those with a low need for cognition are more likely to rely on others, cognitive heuristics, or social comparison processes to make sense of their world. Cronbach alpha reliabilities range from .83 to .91 in samples of undergraduate students.

Second, the six-item Positive Attitude Toward Literacy (PATL) scale measures the extent to which students enjoy reading for pleasure across many genres and expressing their ideas in writing. The PATL scale has an internal consistency reliability of .71. The PATL score at entrance to college correlated .36 with three-year cumulative scores during college on a measure

of library use, .48 with the cumulative number of unassigned books read during three years of college, and .26 with a measure of reading comprehension administered after three years of college (Bray, Pascarella, & Pierson, 2004).

Finally, the eight-item scale of academic motivation asked participants to indicate the extent to which they agree or disagree (ranging from strongly agree to strongly disagree) with statements about their degree of academic motivation. The academic motivation scale incorporates items related to one's willingness to work hard even if it does not lead to a higher grade, the importance of getting good grades, reading more for a class than required because the material was interesting, enjoyment of academic challenge, and the importance of academic experiences in college. The internal consistency reliability for the scale ranges from .69 to .74. Precollege Academic Motivation scores in the WNS data had statistically significant, positive (though modest) correlations with end-of-first-year graduate degree plans (.19) and self-reported grades (.15). Net of such influences as precollege Need for Cognition (NFC) and precollege Positive Attitude Toward Literacy (PATL), a student's level of academic motivation at the beginning of college was a significant, positive predictor of end-of-first-year scores on both measures (NFC and PATL) of inclination to inquire and lifelong learning (Pascarella et al., 2007).

Independent Variables

The independent variable of interest was a five-item scale measuring the frequency of reflective interactions students had with student affairs professionals in their first year of college. The interaction with student affairs staff scale had an internal consistency reliability of .85. Items in the scale included: a) how often have you discussed a personal problem or concern with student affairs professionals; b) how often have you had serious discussions with staff whose

political, social, or religious opinions were different from your own; c) how often have you talked about career plans with student affairs professionals; d) how often have you discussed ideas from readings or classes with student affairs professionals; and e) how often have you discussed grades or assignments with student affairs professionals. The response set for each item was a five-point Likert scale ranging from "never" to "very often." We collected information for this scale using the Student Experiences Survey that all students completed in the spring follow-up data collections.

Because students who participate in college experiences structured and supervised by student affairs personnel may have greater frequency of interacting with them, we employed additional independent variables to explore the potential mediating effects of certain college activities in which students might have higher exposure to student affairs professionals. These potential mediating variables included participation in an academic living-learning community (coded as participated in an academic living-learning community=1 and has not participated=0), participation in community service (coded as volunteered during college=1 and has not volunteered during college=0), holding a leadership position in a student organization (coded as held a leadership position=1 and has not held a leadership position=0), and hours per week spent involved in co-curricular activities (response options include 1 = 0 hours, 2 = 1-5 hours, 3 = 6-10 hours, 4 = 11-15 hours, 5 = 16-20 hours, 6 = 21-25 hours, 7 = 26-30 hours, and 8 = More than 30 hours).

Control Variables

A particular methodological strength of the WNS is that it is longitudinal in nature (Gall, Gall, & Borg, 2003; Pascarella, 2006). This permitted us to introduce a wide range of statistical controls. We employed controls for the following background characteristics: sex (coded

male=1, female=0), race (created as a series of dichotomous variables where American Indian=1, Asian, Pacific Islander=1, Black, non-Hispanic=1, Hispanic=1, Unknown=1 and White is the reference group), pre-college academic achievement (student's ACT score or ACT equivalent score), and average parental education (computed as the average of the respondent's parents' education provided that the student gave a response for at least one parent. The item asked "What is the highest level of education each of your parents/guardians completed?" The response options are: 1 = Did not finish high school, 2 = High school graduate/GED, 3 = Attended college but no degree, 4 = Vocational/technical certificate or diploma, 5 = Associate or other 2-year degree, 6 = Bachelors or other 4-year degree, 7 = Masters, 8 = Law, 9 = Doctorate). We included two items to control for co-curricular involvement in high school including "During your last year in high school, how often did you engage in extracurricular activities?" and "During your last year in high school, how often did you engage in community service/volunteering?" Response options for both of these controls were 1=Very Often, 2=Often, 3=Occasionally, 4=Rarely, and 5=Never. We also included three dichotomous variables to control for the type of institution each respondent attended – regional university, research university, or community college – with liberal arts college as the reference group. Because our data were collected on participants in two separate academic years (e.g., fall 2006 and fall 2007 cohorts) and different compensation was offered to each cohort for their participation, we created a variable (coded as cohort07=1 and cohort06=0) to control for the cohort in which the student entered the study. Finally, and perhaps most importantly, we employed a parallel pre-college measure of each dependent variable in our study. One of the most powerful ways to account for selection bias is through a pretest-posttest longitudinal research design (Astin & Lee, 2003; Pascarella, 2006).

Analyses

We used OLS regression to estimate the relationships between student interaction with student affairs professionals and each of our four cognitive outcome measures. We ran each analysis in three stages. In the first stage, we regressed our dependent variable on students' demographic and background characteristics. In the second stage, we added the frequency of reflective interaction with student affairs staff scale to our model. In stage three, we added our four potential mediating variables of activities which would provide students with a greater exposure to student affairs professionals. This allowed us to estimate the direct effects of the frequency of reflective interaction with student affairs professionals on each outcome (Alwin & Hauser, 1975). We anticipated that with the college experiences items in the equations any significant total effects of interaction with student affairs professionals would be reduced to non-significance, indicating that the relationship between the frequency of interaction with student affairs professionals was mediated through (or accounted for) by students' involvement in these particular college experiences.

Because our data were collected across 26 institutions, we run the risk of bias in our sample due to the nested nature of students within each institution (i.e., that students within institutions are more likely to be similar than those from different institutions) (Groves, Fowler, Couper, Lepkowski, Singer, & Tourangeau, 2004). We employed statistical measures to account for the nesting or clustering effect of this complex survey design. In addition, we standardized (converted to z scores) the dependent variables and all continuous independent variables. Therefore, the b coefficients indicate the amount of change in standard deviation of each outcome score for each change in one standard deviation of the continuous independent variables. All analyses are based on the weighted sample estimates adjusted to the actual sample size to obtain correct standard errors.

Results

Table 1 provides descriptive data for variables in the fully specified regression model (Model 3) used in this study. To assess multicollinearity, we ran correlations of the independent variables used in our analyses. None of our model variables exceeded .44, indicating that the independent variables are not too correlated for inclusion in our analyses. A full correlation matrix of the independent variables in this study is available from the first author upon request. Further, the variance inflation factors (VIF) were all under 2.0, well below the suggested VIF limit of 10.0 (Stevens, 2002).

[Table 1 about here]

Table 2 summarizes the regression analyses for each model in the present study along four cognitive outcomes: critical thinking, academic motivation, need for cognition, and positive attitude toward literacy. Model 1 presents the standardized coefficients for each of the control variables included in the study. For each outcome, adding the reflective interaction with student affairs professionals scale into the model increased the amount of explained variance (see R^2 for Model 2). In three of the four outcomes, a positive relationship existed between reflective interaction with student affairs professionals and the cognitive outcomes. For example, students' reflective interactions with student affairs professionals yielded significant positive relationships on academic motivation (.14 of a standard deviation), need for cognition (.05 SD), and positive attitude toward literacy (.10 SD). Reflective interactions with student affairs professionals, however, did not always have a positive association with students' cognitive development. When we added the student reflective interaction with student affairs professionals scale to Model 2 for critical thinking, we see that student interaction with student affairs professionals yielded a small

decrease on students' critical thinking skills (-.04 of a standard deviation[3]). In other words, as students increased in the amount of time they interacted with student affairs professionals, their critical thinking scores slightly decreased in the first year of college.

[Table 2 about here]

Model 3 incorporated four college activities (participation in an academic living-learning community, number of co-curricular activities, holding a leadership position, and community service involvement) in which students would likely have a higher exposure to student affairs professionals to explore the potential mediating relationships these activities may have with students' cognitive development. While adding these variables to the model slightly decreased the magnitude of the relationship between interaction with student affairs professionals and all four cognitive outcomes, the inclusion of these variables did not reduce the relationship between the interaction with student affairs staff scale and any of the outcomes to non-significance. Further, the addition of these four college activities did not contribute a significant amount to the amount of explained variance (*R2)* in three out of the four outcomes: critical thinking, academic motivation, and need for cognition. The four activities did, however, significantly contribute to the amount of variance explained on the positive attitude toward literacy outcome measure.

Discussion

Some have questioned the role of student affairs programs, services, and professionals in advancing student learning (National Association of Scholars, 2008) and many others have called for student affairs professionals to demonstrate their influence on student learning clearly

[3] We found the OLS model for critical thinking did not meet the assumptions of normality and homegeneity of residuals. Although the OLS model yields consistent parameter estimates, they are not efficient, affecting the statistical significance and the inferences that can be made. Future research will examine these effects using ordinal logistic regression.

and directly (Blake, 2007; Hernandez, Hogan, Hathaway, & Lovell 1999; Love, 1995). This study answers both of these calls by exploring the direct relationship between students' reflective interactions with student affairs professionals and their cognitive development in the first year of college. Controlling for students' background and pre-college characteristics, we found students who reported greater reflective interactions with student affairs professionals gained on three of the four cognitive development measures. Moreover, these findings hold even when accounting for student participation in activities typically structured and supervised by student affairs professionals. This suggests that irrespective of participating in activities which increase students' opportunity to interact with student affairs professionals, reflective interactions with student affairs professionals contribute broadly to students' cognitive development.

The reflective interactions with student affairs professionals scale was positively associated with increases in students' need for cognition, positive attitude toward literacy, and academic motivation. Student affairs professionals appear to have a positive influence on students' curiosity as each of these outcomes centers around students' intrinsic desire for learning. Sometimes this influence on students' curiosity manifests in students' interest in seeking out multiple perspectives to make sense of the world around them (e.g., need for cognition) while other times it manifests through students' enjoyment of reading and writing (e.g., positive attitude toward literacy). Although the relationships between reflective interactions with student affairs professionals and students' increases in need for cognition and positive attitude toward literacy are not trivial, the strongest relationship in these findings was the positive relationship between reflective interactions with student affairs professionals and increases in students' academic motivation. This measure is primarily defined in terms of students' intrinsic motivation to work hard in academic endeavors and value academic challenge.

Considering the criticism levied against student affairs professionals as failing to contribute to postsecondary education's academic mission (National Academy of Scholars, 2008), we find this evidence particularly salient in refuting that charge. Taken together, these findings affirm the role student affairs professionals play in facilitating students' curiosity and interest in developing a more thorough and contextualized understanding of their world.

We have posited a challenge and support orientation likely serves as the foundation for the reflective interactions with student affairs professionals and thus is the mechanism behind the relationships identified in this study. One may consider the positive relationships with the measures of the inclination to inquire and lifelong learning outcome due in part to student affairs professionals challenging students to consider multiple perspectives and supporting them as they incorporate a diversified set of perspectives in their thinking and behavior. Similarly, one can envision student affairs professionals challenging and supporting students' curiosity to deepen their learning and understanding. If challenge and support is the mechanism behind these relationships, then the slight negative association between reflective interactions with student affairs professionals and critical thinking raises the question as to how student affairs professionals can best challenge and support students' critical thinking development.

Critical reflective practice calls on professionals to continually rethink the "why" behind their everyday actions and practices (Senge, 1990). Challenging and supporting students to think critically may begin with a more intentional effort on the part of student affairs professionals to critically reflect on their own practice with students as well as the processes and policies that have become tacit and unquestioned. For example, when students inquire about the reasoning behind institutional policies and attempt to critically question them, how do student affairs professionals respond? Do they take a challenge and support approach, inherent in critical

reflective practice, engaging the student in conversation to learn more about his/her perspective rationally discussing the reasons behind the policy while remaining open to learning about unintended policy consequences? Or do they simply dismiss student inquiries or worse encourage student dissent but identify any number of hurdles through which students need to overcome in order to have their voice heard? To best students' critical thinking skills, student affairs professionals should welcome and make a critical examination of policies, procedures, and practices commonplace, not a rare exception. Through their actions, student affairs professionals can challenge and support the value of critical reflective practice to students, faculty, and colleagues.

Insufficient challenge and support of critical thinking to students also could be the result of student affairs professionals receiving mixed messages about their work with students. On the one hand, student affairs professionals are encouraged or even exhorted to view all interactions with students as opportunities to foster student learning (Blake, 2007), which manifests as increased inclination to inquire and lifelong learning in the present study. On the other hand, student affairs professionals are expected to "serve the student customer" and insure student satisfaction (Sanders & Burton, 1996) through state-of-the-art facilities and services. The difficulty in adequately resolving these competing interests may stymie student affairs professionals' efforts to challenge and support students in situations that may cause cognitive dissonance but foster critical thinking in their first year of college.

Student affairs professionals are not unlike students in their need for challenge and support particularly as it relates to reconciling competing demands between "service" and fostering the institution's academic mission of student learning and development. Challenging and supporting student affairs professionals must exist within the broader organizational

structure. It is important to better understand how senior administrators, presidents, provosts, and Boards of Trustees challenge and support university staff and faculty in ways that "model the way" (Kouzes & Posner, 2002) in support of the institutional mission. A fruitful avenue for future research is to examine how senior administrators challenge and support the professional development of staff and faculty. This line of inquiry may focus on how challenge and support is role modeled by senior administrators such that those who have day-to-day contact with students are able to challenge and support student learning and development.

This study is clearly not without limitations. Although we made an effort to select institutions that were diverse in various ways (e.g., type, control, region), institutions within our sample were keen interested in being part of the WNS. Thus, the findings from our research may not generalize broadly to postsecondary institutions in the U.S. Additionally, we draw on our own backgrounds as student affairs professionals in speculating that it is the challenge and support orientation that undergirds the reflective interactions students have student affairs professionals. Future research may use qualitative inquiry to better understand the nature of reflective interactions with student affairs professionals and the mechanism within those interactions that fosters student learning and development.

In this study, we used longitudinal data from a multi-institutional study to discern the unique relationships between students' reflective interactions with student affairs professionals and students' development of effective reasoning and problem solving and inclination to inquire and lifelong learning. Taking into account a host of confounding influences, we found students' reflective interactions with student affairs professionals positively associated with increases in all measures of the inclination to inquire and lifelong learning outcome but negatively related to the effective reasoning and problem solving outcome. Increased frequency of reflective interactions

with student affairs professionals was related to increases in students' need for cognition, positive attitude toward literacy, and academic motivation but associated with lower levels of students' critical thinking skills. As the field considers the future for higher education scholarship, it is important to examine broadly the educational role student affairs professionals play specifically in fostering students' cognitive development as a part of holistic learning and development.

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Table 1. Descriptive Statistics for Direct Effects Model Variables

Variables	Mean	Standard Deviation	Minimum	Maximum
Dependent variables				
Critical thinking	62.05	5.92	47.00	73.00
Academic motivation	3.34	0.60	1.00	5.00
Need for cognition	3.36	0.62	1.00	5.00
Positive attitude toward literacy	3.13	0.82	1.00	5.00
Independent Variables				
Male (vs. Female)	0.45	NA	0.00	1.00
Asian Pacific Islander (vs. White)	0.06	NA	0.00	1.00
Black, non-Hispanic (vs. White)	0.11	NA	0.00	1.00
Hispanic (vs. White)	0.04	NA	0.00	1.00
Race unknown (vs. White)	0.01	NA	0.00	1.00
Parental education	15.14	2.20	11.00	20.00
ACT score (or equivalent)	24.38	4.94	13.00	36.00
High School (HS) volunteering	3.06	1.12	1.00	5.00
HS out-of-class activities	3.60	1.29	1.00	5.00
Cohort 2007 (vs. Cohort 2006)	0.27	NA	0.00	1.00
Critical thinking pretest	61.75	5.44	48.00	73.00
Academic motivation pretest	3.53	0.57	1.13	5.00
Need for cognition pretest	3.37	0.61	1.22	5.00
Positive attitude toward literacy pretest	3.17	0.77	1.00	5.00
Regional university (vs. Liberal Arts College)	0.29	NA	0.00	1.00
Research university (vs. LAC)	0.37	NA	0.00	1.00
Community college (vs. LAC)	0.10	NA	0.00	1.00
Interaction with student affairs staff	10.96	4.66	5.00	25.00
Living-Learning (L-L) community	0.17	0.38	0.00	1.00
College out-of-class activities	2.36	1.50	1.00	8.00
Leadership position	0.20	0.40	0.00	1.00
College community service	3.24	0.90	1.00	4.00

Table 2. Estimated Effects of Interaction with Student Affairs Professionals on Cognitive Outcomes

	Critical Thinking (*n*=1,942)			Academic Motivation (*n*=3,999)			Need for Cognition (*n*=3,999)			Positive Attitude Toward Literacy (*n*=3,999)		
Independent Variables	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Male (vs. Female)	-.075	-.072	-.062	-.026	-.046	-.042	.004	-.003	-.007	-.023	-.038	-.039
Asian Pacific Islander [a]	.046	.043	.042	.080	.084	.089	-.034	-.034	-.036	.069	.070	.065
Black, non-Hispanic [a]	.142	.144	.138	.121	.131	.124	.058	.063	.061	.135**	.142**	.136**
Hispanic [a]	-.046	-.037	-.033	.078	.065	.050	.123*	.118*	.121*	.181**	.170**	.162**
Race unknown [a]	.001	-.006	.007	-.097	-.055	-.059	-.152	-.134	-.137	.009	.040	.032
Parental education	.001	.001	.002	.010	.004	.001	.031*	.029*	.027	.017	.013	.011
ACT score [b]	.307**	.306**	.308**	-.014	.011	.010	.122**	.133**	.132**	.072**	.091**	.091**
H.S. volunteering [b]	.014	.018	.017	.010	-.004	-.014	.012	.007	.007	-.016	-.027	-.030
H.S. activities [b]	.017	.024	.030	-.016	-.031	-.036	.037**	.031**	.029**	.003	-.009	-.012
Cohort 2007	-.059	-.054	-.056	.206**	.191**	.192**	.017	.011	.015	.074**	.061**	.065**
Pretest [b]	.520**	.517**	.517**	.531**	.515**	.512**	.668**	.662**	.661**	.707**	.698**	.697**
Regional university [c]	-.199*	-.198*	-.203*	-.079	-.087	-.086	-.081	-.084	-.082	-.091*	-.095*	-.097*
Research university [c]	.007	.006	.001	-.143*	-.146**	-.156**	-.129**	-.131**	-.130**	-.118**	-.121*	-.123**
Community college [c]	-.188*	-.202*	-.224*	.249**	.296**	.334**	.109*	.127*	.130*	-.133*	-.098	-.082
Stu. Aff. interactions [b]		-.040*	-.036*		.137**	.127**		.052**	.050**		.098**	.091**
L-L community			-.009			.126*			-.026			.054
Out-of-class activities [b]			-.029			-.001			.004			-.004
Leadership position			-.064			.100*			.063			.108**
College community service			.010			.042			-.011			.004
R^2	.666	.667*	.668	.312	.329**	.334	.549	.552**	.553	.534	.542**	.544**

* $p < .05$; ** $p < .01$

[a] Reference group is White or Caucasian.

[b] Indicates variable has been standardized.

[c] Reference group is Liberal arts colleges.