Construction and Initial Validation of the Student-Professor Interaction Scale

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This article describes the development of an instrument to measure the multiple dimensions of student-faculty interactions. The sample consisted of 318 students (114 males, 203 females; 58% White, 16% African American, 9% Hispanic Americans) who completed the Student-Professor Interaction Scale (SPIS). Eight dimensions were identified, with Cronbach alphas ranging from .51 to .92. Dimensions of student-faculty interactions were related to academic motivation and academic self-concept for the majority White sample, but only academic self-concept for the ethnic minority sample. African American and Hispanic American students reported feeling less connected with professors, perceived their experiences with faculty as more negative, and perceived faculty as less respectful when compared to White students. Implications for student affairs research and practice are discussed.

The importance of student-faculty interactions in facilitating the intellectual and personal growth of college students cannot be overstated. Wlodkowski and Ginsberg (1995) make the following observation: "People who feel unsafe, unconnected, and disrespected are unlikely to be motivated to learn. This is as true in college as it is in elementary school" (p. 2). The most utilized assessment of student-faculty interactions, operationalized by 10 items on the College Student Experiences Questionnaire (CSEQ), focuses on the frequency of interactions with faculty in different situations. While frequency of interactions is certainly one important aspect of student-faculty interaction, it does not include other dimensions that we believe are central in fully conceptualizing and understanding the construct. Therefore, there is a need to develop an instrument that assesses different dimensions of student-faculty interactions.

In their influential book *Education and Identity*, Chickering and Reisser (1993) state that next to peer relations, relationships with faculty are among

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> the most important for students. Chickering and Reisser (1993) say that when faculty are committed to creating quality learning experiences, when they are consistent in showing respect, caring, and authenticity, and when they are willing to interact with students in a variety of settings, then development of competence, autonomy, purpose and integrity is fostered. (p. 320)

Universities and colleges that encourage faculty in developing closer relationships with students report substantial benefits from such efforts. Students who are able to develop a close relationship with at least one faculty member report greater satisfaction with their college experience, are more motivated and feel inspired to set higher career and educational goals (Rosenthal, et al., 2000).

Positive student-faculty interactions include situations where teachers are perceived to be easily accessible, caring, willing to spend time and serve as mentors, and encouraging student aspirations. A lack of such opportunities is associated with student dissatisfaction and likelihood of attrition (Woodside, Wong, & Dudley, 1999). Students in college experience intellectual as well as social and emotional growth. Hence, the classroom experience is only a small part of the college experience. Peer relationships play a major role in the life of a college student. However, beyond their classmates, roommates, and friends, the individuals who have the greatest impact are the teachers. Faculty interactions can become very meaningful sources of encouragement and inspiration (Astin, 1993) in creating a positive academic climate. The show of respect for students as people (e.g., showing concern for students, initiating informal gatherings), respect for students' intellect (e.g., accepting constructive criticism, taking time to offer feedback about progress), and doing more than required for the class (e.g., being available beyond class time) are some of the characteristics students have reported to be indicative of a positive academic climate (Fox & Schaefer, 1995; Schaefer & Schaefer, 1993). In essence, these characteristics are the crucial ingredients needed to promote an atmosphere of caring in the student-faculty relationship.

Another characteristic that is indicative of a positive academic climate is perceiving professors as authentic. Research indicates that someone who is able to "be real" with students, encourages students to permit faculty to see them as they truly are (Daloz, 1986; Liang, Tracy, Taylor, & Williams, 2002). As Terenzini and Pascarella (1980) pointed out, not all student-faculty relationships have equal influence on students. Alexitch (2002) added that particular qualities of faculty might contribute to the supposed threat students may feel about seeking help. It is reasonable that a lack of authenticity from professors makes a noticeable difference, and sets apart certain relationships students engage in from others. For instance, students who experienced

favorable relationships with faculty placed importance on the collaborative nature of the connection (Alexitch). Furthermore, it has been noted that relationship quality is enhanced when mutual authenticity is demonstrated, and the student is free to be who he or she is (Daloz, 1986). Perhaps the characteristic of authenticity is one of the qualities that is missing from less favorable relationships.

Perceiving faculty as caring and authentic makes it easier for students to approach faculty after class. One of the most frequently mentioned components of student-faculty interactions is informal out-of-class contact with professors. Its importance was probably first documented in the classic book *Education and Identity*, where Chickering (1969) developed an explanatory model of college student development. He hypothesized that when interactions between students and faculty are frequent and occur in various situations (formal or informal), a sense of purpose is fostered in the student. A student's general satisfaction with college is positively associated with the frequency of the student's informal and non-classroom contact with faculty (Pascarella, 1980). Informal non-classroom contact has been found to have a significant positive effect on career plans, educational aspirations, student satisfaction with college, intellectual and personal development, attrition rates, and college persistence (Lamport, 1993; Pascarella, 1980).

As faculty and student relationships develop and strengthen through formal and informal interactions, a reasonable assumption is that individual knowledge about one's social and cultural background is being shared in a reciprocal manner. The development of knowledge in relationships is typically characterized by a process of learning that occurs either through reciprocal exchange of information and/or by an interested person's pursuit to gain knowledge by seeking resources outside of the immediate relationship. One way for gaining knowledge involves self-disclosure. Indeed, for close student-faculty relationships to develop, oftentimes both students and faculty must exchange personal information. It is not surprising to learn that college students prefer to self-disclose to faculty members of their own ethnicity, however, African American and Latina/o students distinctly have a greater preference for this condition to self-disclosure compared to European American college students (Noel & Smith, 1996; Stephan, Stephan, Wenzel, & Cornelius, 1991). This finding is somewhat disconcerting given the limited representation of African American and Latino faculty. Further, if students are reluctant or refrain from self-disclosing to faculty of dissimilar ethnic backgrounds, then the probability of forming a significant relationship for ethnic minority students decreases.

Researchers have speculated on the causes of ethnic minority students' reluctance to self-disclose to faculty members of dissimilar ethnic backgrounds. Factors believed to inhibit ethnic minority student self-disclosure include anxiety, expectation of negative consequences, beliefs that faculty are biased against them or unable to understand their cultural background, and the possibility that faculty will devalue or demean their cultural traditions (Coleman, Jussim, & Issac, 1991; Noel & Smith, 1996; Trujillo, 1986). These factors taken together should encourage faculty members to seek knowledge about ethnic minority cultures so that they might demonstrate a genuine interest and respect for students from different ethnic groups. When ethnic minority students and faculty share information through self-disclosure and independent learning about each other's social and cultural backgrounds, the effect on student-faculty interaction is likely to be positive.

Given the findings that African American and Latino students having a greater preference to self-disclose to faculty of similar ethnicity, one might expect that student-faculty interactions in ethnically homogenous educational environments, which have greater numbers of ethnic minority faculty, may play an important and unique role in student development and outcomes. Support for this hypothesis has been found in a couple of studies by Cokley (2000a, 2002). In the first study, Cokley (2000a) found that grade point average was the most important variable in predicting the academic self-concept of African American students in a predominantly White college (PWC) setting, while the quality of student-faculty interactions was the most important variable for African American students in a historically Black college (HBC) setting. In an extension of his study, Cokley (2002) replicated his first study by using a larger and geographically different sample. Similar to the first study, results indicated that student-faculty interactions were still the strongest predictor of academic self-concept for African American students in an HBC setting, while grade point average remained the strongest predictor for African American students in a PWC setting. Furthermore, HBC students were more likely than PWC students to report that professors encouraged them to continue their studies. Thus, institutional differences appear to exist in the quality of student-faculty interactions for African American students.

In a recent study conducted with Latina/o students, student-faculty interactions were grouped into three categories: general, academic oriented, and personal contact (Anaya & Cole, 2001). Latino/a students reported higher frequencies of general interactions (talking with a professor, making appointments, and informal visiting after class), than academically oriented interactions (discussing ideas for term papers, asking instructor for comments about your work). By comparison, Latino/a students reported relatively low frequencies of personal interactions (discussing career plans, discussing

personal problems). Findings from the study also showed minimal evidence that informal contact with faculty facilitated academic achievement. Instead, academically oriented interactions with faculty enhanced student's academic performance.

The Anaya and Cole (2001) study, like many other studies, operationalized student-faculty interactions using items from the College Student Experiences Questionnaire (CSEQ). The CSEQ includes a general item that assesses the overall quality of relationships with faculty and 10 items that assess the frequency of interactions with faculty in various situations, including informal visits, office appointments, discussing career plans, and discussing personal problems. Given the extensive literature on the many dimensions of student-faculty interactions, there is a need for a more comprehensive measurement of the construct than is produced by the items of the CSEQ.

Purpose

Thus, there were two purposes of this study. The first purpose was to create a comprehensive measurement of student-faculty interactions and to examine its initial factor structure. Based on the literature review, we hypothesized that the preliminary Student-Professor Interaction Scale (SPIS) would consist of several dimensions. The second purpose was to provide additional evidence of the validity of scores produced by the SPIS. Specifically, we hypothesized that the SPIS scores would be related to (a) academic motivation, (b) academic self-concept, and (c) academic achievement. Previous research with African American and Latino/a students has shown that the quality of student-faculty interactions is related to academic self-concept (Cokley, 2000a), academic motivation (Cokley, 2000b), and academic achievement (Anaya & Cole, 2001). Finally, we hypothesized that ethnic minority students, on average, would report less favorable student-faculty interactions than majority students. Previous research has shown that ethnic minority students on predominantly White campuses are more likely to have negative experiences than White students (Cokley, 2000a; Feagin, Vera, and Imani, 1996).

Method

Participants

Participants were 318 students from two educational institutions located in the Midwest. The majority (n = 280) was from a large, four-year state university, while a small sample (n = 38) was from a two-year community college. The entire sample consisted of 114 males and 203 females (1 with missing data). There were 91 freshmen, 77 sophomores, 72 juniors, 60 seniors, and 4 graduate students (14 with missing data). The ages ranged from 17 to 55, with the average age being 22.09 (SD = 6.18). There were 50 African Americans,

3 African internationals, 186 European Americans, 7 European internationals, 5 Asian Americans, 5 Asian internationals, 29 Hispanic Americans, 2 Caribbeans, 6 Biracial students, and 18 who identified as "Other" (7 with missing data).

Instruments

This study used four measures: (a) the Student-Professor Interaction Scale (SPIS), (b) the Academic Self-Concept Scale, (c) the Academic Motivation Scale, and (d) a demographic sheet. The SPIS was locally developed for this study.

Student-Professor Interaction Scale

Several steps were taken to develop the SPIS. These steps included (a) defining the construct and identifying the content domain; (b) designing the scale and generating items; (c) conducting a pilot study to refine the scale; (d) administration and item analyses; and (e) finalizing the scale through validation studies (DeVellis, 1991; Netemeyer, Bearden, & Sharma, 2003).

Defining the construct. Based on the literature review, the working definition of student-professor interactions consists of student-faculty relationships that encompass several dimensions, including informal out-of-class contact, availability outside of class, and mentoring (Chickering & Reisser, 1993). Out-of-class contact includes, but is not limited to, professors being willing to discuss students' personal as well as career concerns. Mentoring involves developing a close relationship with a professor that influences the professional development of the student. Professors' consistently showing respect and caring, and possessing the ability to effectively and compassionately communicate with students characterize positive student-professor interactions (Chickering & Reisser, 1993). Although not explicitly mentioned in the literature, one question that the research team asked was whether there was a multicultural component to student-professor interactions. In other words, do positive perceptions of student-professor interactions include perceiving faculty as sensitive and open to issues of race, ethnicity, and culture?

Designing the scale. After a discussion of the working definition of student-professor interactions, 14 members of the Multicultural Research Team (MRT) were each asked to generate at least 10 items that represented the construct. The MRT members consisted of one African American male counseling psychology professor, four African American female doctoral students in clinical and counseling psychology, three Latina doctoral students in counseling psychology, two Asian Indian females (one psychology professor and one doctoral student in counseling psychology), one Asian undergraduate student, and two White students (one male master's student in counseling, one female

doctoral student in counseling psychology). The MRT members were asked to generate items based on the dimensionality of the construct as identified through the literature review, as well as their own personal experiences.

Before conducting the pilot study, the MRT met to eliminate redundant items. Fifty-two items were eliminated, leaving a total of 106 items to be used for the pilot study.

Conducting the pilot study. A pilot study was conducted to assess content validity and to identify problematic items in order to further refine the scale. Given that the scale is designed to measure a student's perception of the quality of his or her relationships with professors, a diversity of undergraduate and graduate students was sought as expert raters. The 106-item survey was given to one counseling psychology professor (European American female), eight undergraduate students (7 females, 1 male; 3 African Americans, 2 European Americans, 2 international students, and 1 Hispanic) and two female graduate students (1 European American and 1 Egyptian American, who both specialized in research methodology). The experts rated each item on clarity and content appropriateness using a 5-point scale ranging from 1 (*not at all appropriate or clear*) to 5 (*very appropriate or clear*). Another MRT meeting was held to discuss the feedback from the expert raters. Items receiving a 3 or below were reworded or dropped. Additional concerns were raised about clarifying the content domain of student-faculty interactions, and determining if the remaining items exhibited content validity. Through the discussion it was discovered that some items represented cognitions or beliefs about student-professor interactions (e.g., It is not important for me to interact with faculty), some items represented affect or feelings about student-professor interactions (e.g., I feel comfortable discussing my personal goals with faculty), and some items represented behavior or experiences with professors (e.g., I have spent time with faculty outside of the classroom). Still other items could not be classified in any of the above categories (e.g., It is important that I see professors who look like me; My professors are familiar with my culture; I have faculty that I can identity with). Items that were double-barrel statements (e.g., It is important for my professors to consider my ethnicity as well as other personality traits when they get to know me) and not directly related to the content domain (e.g., My professor is abrupt when responding to questions from students) were eliminated. The resulting scale consisted of 73 items.

Academic Self-Concept Scale (ASCS)

The ASCS (Reynolds, 1988) was designed to measure how confident students feel about their intellectual or academic skills. The scale consists of 40 items where participants respond using a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Internal consistency has been reported as .91

(Reynolds, 1988). For the current study, the internal consistency was .95. Sample items include the following: "For me, studying hard pays off," and "I feel that I am better than the average college student." Academic self-concept has been linked to grade point average (Cokley, 2000a) and intrinsic motivation (Cokley, 2000b).

Academic Motivation Scale (AMS)

The AMS (Vallerand et al., 1992) was designed to measure intrinsic motivation (IM), extrinsic motivation (EM), and amotivation (AM). The IM scales measure knowledge, accomplishment, and stimulation. The EM scales measure external regulation (regulating behavior through punishment and praise), introjected regulation (regulating behavior through guilt or self-enhancement), and identified regulation (regulating behavior through valuing and internalizing). The AM scale measures the lack of motivation. The AMS consists of 28 items to which participants respond using a 7-point Likert scale ranging from 1 (*does not correspond at all*) to 7 (*corresponds exactly*). The items are responses to the question, "Why do you go to college?" (e.g., "Because I experience pleasure and satisfaction while learning new things" – IM Stimulation; "In order to have a better salary later on" – EM – External Regulation; "I can't see why I go to college and frankly, I couldn't care less." – AMS internal consistency for the seven subscales has ranged from .83 to .86 (Vallerand et al., 1992). For the current study, the internal consistency for the seven subscales ranged from .78 to .88. Academic motivation has been linked to perceived competence and academic performance (Vallerand, et al., 1993).

Demographic Sheet

Demographic information included sex, age, year in school, school, and grade point average. Additional information included racial/cultural identification.

Procedure

Professors teaching undergraduate psychology courses and a rehabilitation course at a large Midwestern university were requested to allow their students to participate in the research. Students in a psychology research pool receiving course credit also participated. Additionally, a professor of biology at a community college agreed to allow students to participate. Participants were given an informed consent form and the instruments. Upon completion, participants kept the consent form and turned in the instruments.

Results

Principal-component and principal-axis analyses were conducted on the 73 items of the preliminary SPIS. The principal-axis analysis was ultimately chosen based on interpretability and because it is more appropriate for scale development when the goal is finding underlying dimensions (Netemeyer et al.,

2003). Both oblique and orthogonal rotations were used. The factor correlation matrix for the oblique rotation showed relatively high correlations among the factors, indicating that the oblique rotation was the more appropriate rotation to use. A .45 cutoff for inclusion of an item was used to interpret a factor. The analysis resulted in 16 factors having eigenvalues greater than 1.0. However, the scree plot suggested that there were between 8 and 12 interpretable factors. The most interpretable solution was determined to be the 9 factor solution. According to the SPSS 11 output, when factors are correlated, a total variance is unable to be obtained.

The first interpretable factor consisted of 10 items with item loadings > .45 and was labeled Respectful Interactions. A sample item from the factor included "Professors show respect for all students in the classroom."

The second interpretable factor consisted of five items with item loadings > .45 and was labeled Career Guidance. A sample item from the factor included "My professors provide information about career and academic options."

The third interpretable factor consisted of five items > .45 and was labeled Approachable. A sample item from the factor included "I feel comfortable approaching professors to discuss my grades and class work."

The fourth interpretable factor consisted of three items > .45. These three items were included as validity checks to determine if student-faculty relationships were considered important to students; therefore, it is simply labeled Validity Scale. A sample item from the factor included "The quality of my relationships with professors impacts my academic performance."

The fifth interpretable factor consisted of three item loadings > .45 and was labeled Caring Attitude. A sample item from the factor included "I believe there is at least one professor who cares about my well-being."

The sixth interpretable factor consisted of two items > .45 and was labeled Off Campus Interactions. A sample item from the factor included "I have spent time with professors outside an academic setting."

The seventh interpretable factor consisted of two items > .45 and was labeled Connectedness. A sample item included "My professors demonstrate familiarity with my culture."

The eighth interpretable factor consisted of two items > .45 and was labeled Accessibility. A sample item included "Professors are accessible outside of class." The ninth interpretable factor consisted of four items > .45 and was labeled Negative Experiences. A sample item included "I do not believe my professors treat me fairly."

Table 1 contains the rotated structure coefficients and communalities of the items. The Cronbach alphas ranged from .51 (Off Campus) to .92 (Respectful Interactions). Scores from six of the nine subscales yielded alphas above .70.

These results provide support for the internal consistency of scores from the SPIS. Scale means, standard deviations, and Cronbach alphas are presented in Table 2.

The eight dimensions of student-professor interactions were examined with academic self-concept, academic motivation, and academic achievement to provide evidence of construct validity. Using the entire sample, all eight subscales (excluding the validity subscale) were significantly correlated with academic self-concept, but none was significantly correlated with grade point average. The eight subscales were also significantly correlated with the intrinsic motivation subscales and two of the three extrinsic motivation subscales (identified regulation and introjected regulation). Results are presented in Table 3.

An exploratory analysis was also conducted with ethnic minority students (defined as African American and Hispanic students; n = 79) to determine if similar results would be obtained. Respectful Interaction (r = .35, p = .005), Guidance (r = .32, p = .005), Approachable (r = .47, p < .000), Caring Attitude (r = .33, p = .005), and Negative Experiences (r = -.32, p = .008) were all significantly correlated with academic self-concept, and one subscale (Caring Attitude) was significantly correlated with grade point average (r = .36, p = .005). However, none of the eight subscales was significantly correlated with the intrinsic motivation subscales. One of the subscales (Off Campus) was negatively correlated with an extrinsic motivation subscale (External Regulation; r = -.33, p = .004); however, there were no more significant correlations with any of the extrinsic motivation subscales.

Additional evidence of validity was also sought through an assessment of known-group validity, where differences in mean scores are expected across two groups (Netemeyer et al., 2003). Ethnic differences were assessed by a one-way ANOVA. Because of multiple tests, Bonferroni's adjustment statistic was used. An adjusted alpha level of .005 was used. There were statistically significant differences in the subscale scores Respectful Interactions, F(1, 244) = 8.92, p < .005, Connectedness, F(1, 261) = 44.31, p = .000, and Negative Experiences, F(1, 252) = 10.90, p = .000. Ethnic minority students had lower scores on the Respectful Interactions subscale (M = 4.77, SD = 1.19), and Connectedness subscale (M = 3.60, SD = 1.23) than White students (M = 5.20, SD = .93; and 4.67, SD = 1.17), and had higher scores on the Negative Experiences subscale (M = 3.17, SD = 1.18) than White students (M = 2.72, SD = 1.07). Means and standard deviations for the SPIS subscales by ethnicity are reported in Table 4.

Table 1

Rotated Factor Loadings from Principal Axis Analysis

Factor/Item	Factor Loading	h^2
Respectful Interactions		
56. Show respect for all students	.98	.63
50. Clear about expectations	.86	.72
35. Truly listens to me	.85	.85
49. Alert and Attentive	.84	.82
36. Cares about question or problem	.80	.86
51. Approachable	.63	.78
68. Show respect for ethnic minority students	.62	.62
38. Feel understood	.53	.72
61. Value contributions	.53	.69
34. Comfortable with students outside ethnicity	.48	.61
Career Guidance		
46. Provide career information	.90	.75
22. Provide career guidance	.86	.74
13. Encouraged to go to graduate school	.78	.65
41. Encouraged to achieve academic dreams	.67	.77
45. Help understand class material	.47	.67
Approachable		
21. Comfortable discussing grades and classwork	.74	.67
17. Comfortable approaching professors	.69	.75
40. Comfortable asking questions	.67	.66
42. Not felt intimidated	.54	.49
30. Comfortable discussing academic problems	.45	.70
Validity Scale		
73. Impacts academic performance	.97	.63
53. Work harder to succeed	.80	.58
63. Enhance school experience	.79	.56
Caring Orientation		
2. Cares about well-being	.85	.76
3. Concerned about future	.64	.76
4. Generally care	.56	.75
Off-Campus Interactions		
11. Outside academic setting	.72	.49
65. Outside classroom	.59	.64
Connectedness		
15. Familiarity with culture	.84	.56
16. Identify with	.67	.64

Table continues

Table 1 *continued*

Factor/Item	Factor Loading		h^2
Accessibility			
24. Accessible outside class	.79		.66
25. Available when needed	.57	.75	
Negative Experience			
60. Do not treat fairly	-.57		.57
67. Feel isolated	-.48		.63
54. Don't value talking with students out of class	-.45		.63
39. Distant and uninterested	-.45	-.41	

Note. Items with factor loadings less than .45 are not displayed.

Table 2

Means, Standard Deviations, and Cronbach Alphas for Subscales of the Student-Professor Interaction Scale

Subscale	Number of Items	*M*	*SD*	Alpha
Respectful Interactions	10	50.73	9.96	.93
Career Guidance	5	22.43	6.48	.88
Approachable	5	33.60	5.79	.84
Validity Scale	3	16.08	3.20	.74
Caring Attitude	3	15.01	3.97	.87
Off-Campus Interactions	2	6.95	2.87	.50
Connectedness	2	8.56	2.59	.67
Accessibility	2	9.62	2.48	.77
Negative Experiences	4	11.43	4.39	.68

Table 3

Intercorrelations of Student-Professor Interaction Subscales, Academic Self-Concept, Academic Motivation, and Grade Point Average

	ASC	IMTK	IMTA	IMTES	EMID	EMIN	EMER	AM	GPA
RESPECT	.42**	.23**	.22**	.18*	.20**	.09	.05	-.15*	.10
GUIDANCE	.31**	.21**	.24**	.24**	.12	.13	.02	-.03	.09
APPROACH	.48**	.22**	.25**	.16*	.14	.09	.02	-.20**	.03
VALIDITY	-.03	.19**	.20**	.17*	.22**	.23**	.10	-.10	.13
CARE	.34**	.30**	.25**	.23**	.17*	.16*	-.03	-.21**	.14
CAMPUS	.23**	.17*	.15*	.24**	.04	.07	-.05	-.03	.04
CONNECT	.21**	.13	.14	.10	.12	-.01	.01	-.11	.07
ACCESS	.19**	.04	.05	.05	.08	.06	.01	-.04	.01
NEGATIVE	-.37**	-.15*	-.12	-.07	-.07	-.03	-.02	-.26**	.02

** $p < .001$ * $p < .01$

Note. RESPECT = Respectful Interactions, GUIDANCE = Career Guidance, APPROACH = Approachable, VALIDITY = Validity Scale, CARE = Caring Attitude, CAMPUS = Off-Campus Interactions, CONNECT = Connectedness, ACCESS = Accessibility, NEGATIVE = Negative Experiences, ASC = Academic Self-Concept, IMTK – Intrinsic Motivation To Know, IMTA = Intrinsic Motivation To Achieve, IMTES = Intrinsic Motivation To Experience Stimulation, EMID = Extrinsic Motivation Identified Regulation, EMIN = Extrinsic Motivation Introjected Regulation, EMER = Extrinsic Motivation External Regulation, AM = Amotivation

Discussion

The results of the study indicated that the SPIS is currently best represented by a nine-factor structure. The nine factors include the following: respectful interactions, career guidance, approachable, validity scale, caring attitude, off campus interactions, connectedness, accessibility, and negative experiences. The validity scale should probably not be viewed as a factor per se, as it does not assess an aspect or dimension of the student-faculty relationship. It only serves to measure how important the relationship is to the student. If the student does not believe that the interactions are important, then it is reasonable to conclude that there should be no association with the student's intellectual or personal development. However, it should be noted that based on the mean score

Table 4

Means and Standard Deviations by Ethnic Group

Subscale	White Students *M (SD)*	Ethnic Minority Students *M (SD)*
RESPECTFUL INTERACTIONS	5.19* (.93)	4.77 (1.19)
CAREER GUIDANCE	4.58 (1.28)	4.47 (1.34)
APPROACHABLE	4.87 (1.11)	4.73 (1.29)
VALIDITY SCALE	5.46 (1.06)	5.17 (1.11)
CARING ATTITUDE	5.17 (1.29)	4.87 (1.32)
OFF-CAMPUS INTERACTIONS	3.52 (1.51)	3.46 (1.36)
CONNECTEDNESS	4.67** (1.17)	3.60 (1.24)
ACCESSIBILITY	4.94 (1.18)	4.78 (1.24)
NEGATIVE EXPERIENCES	2.72* (1.07)	3.17 (1.18)

** $p < .001$ * $p < .01$

of the subscale, the overwhelming majority of students believed that student-faculty interactions were important for their development.

The results of the analysis provide initial evidence for the scale as a potentially useful instrument. It is important to note that the scale consisted of 32 items (excluding the validity scale) that measure eight different dimensions of student-faculty interactions; however, there were three factors that only had two items load on them (off-campus interactions, connectedness, availability), compared to other factors that had ten, five, four, and three items. After reviewing the literature, it is apparent that these factors, especially off-campus interactions, are important, yet two items probably do not fully capture the essence of the factors. Future research should focus on adding more items to these factors. It should also be pointed out that the Cronbach alpha for the entire instrument was .93, which indicates that responses to all of the resulting items were consistent, and suggests that it would be acceptable to use a total score versus individual subscale scores. Until more items are added to the 2-item factors, it may be advisable to utilize the total score for future analyses.

Scores on all eight subscales were significantly correlated with academic self-concept for the entire sample, while five subscales were significantly correlated for the ethnic minority students. This suggests that certain aspects of student-faculty interactions are associated with how a student perceives him or herself as a student. For example, when students perceive their professors as caring, respectful, approachable, and willing to provide career guidance, they are more likely to have confidence in their own academic abilities. However, when students perceive their professors as aloof, distant, and prejudiced, their self-confidence is likely to be diminished.

In addition, there was a noteworthy difference in the association of the SPIS subscales with academic motivation for White students compared to ethnic minority students. For the White sample, the SPIS subscales were significantly correlated with the intrinsic motivation subscales. However, for the ethnic minority sample, the SPIS subscales were not significantly correlated with any of the intrinsic motivation subscales. This finding suggests that student-faculty interactions are more important for the academic motivation of White students than ethnic minority students in this sample. Initially, this finding seems somewhat counterintuitive given the literature that addresses the importance of student-faculty interactions for ethnic minority students (e.g., Anaya & Cole, 2001; Cokley, 2000a, 2000b). Even though speculative, these findings might be a reflection of the types of relationships ethnic minority students in this sample are having with White professors. For example, if ethnic minority students feel less connected, have perceptions that professors are less respectful, and have more negative experiences with professors, it makes sense that their intrinsic motivation would be disconnected from their interactions with faculty. If ethnic minority students do not feel that their professors sincerely care about them, they may focus more on the care and support from family members to motivate them to work hard and succeed at the university.

Ethnic minority students' lower scores on the Respectful Interactions and Connectedness subscales call for a contextual understanding of the fact that unlike White students, ethnic minority students have fewer faculty members of color to whom they can relate. Having fewer faculty of color might contribute to ethnic minority students' feelings of isolation, alienation, and incongruence on predominantly White college campuses (Gloria & Robinson-Kurpius, 1996). As a consequence of an alienating university environment, ethnic minority students, particularly Latino students, are faced with the dilemma of feeling that they have to choose between their cultural community and a White university community (Gloria & Pope-Davis, 1997).

It should be noted that the lower scores on the Respectful Interactions and Connectedness subscales may not necessarily be the result of a hostile or alienating environment. Ethnic minority students may feel that they are

misunderstood, or they may experience apprehension and anxiety that inhibits them from connecting with White faculty. Previous research evaluating interethnic dyads between White faculty and ethnic minority students has examined the challenges posed in developing these relationships. Noel and Smith (1996) have noted that students of color "anticipate negative consequences... believe that White faculty are biased against them [and] are unable to understand their cultural background" (p. 88). Such beliefs are certainly likely to affect one's interpretation of respectful interactions as well as the extent to which ethnic minority students believe that they can connect with White faculty. Consequently, ethnic minority students may be more prone to perceiving negative experiences in higher education if they feel that they cannot consistently experience respectful interactions and do not feel connected to White faculty.

One question that the research team wanted to answer was whether there was a multicultural component to the student-faculty interaction construct. Based on significant loadings of two items on the Respectful Interactions subscale: "Professors show respect for ethnic minority students" and "My professors seem comfortable interacting with students outside of their ethnicity," it can tentatively be concluded that for students in this sample, perceiving faculty as sensitive to issues of race, ethnicity, and culture was important in whether they viewed faculty as respectful or not. It should be pointed out that the ethnic minority sample in this study may have greatly influenced these findings. In other words, we do not know if an all-White sample would have produced factors with the same item loadings.

Limitations

The students in this study were not randomly selected. They were a convenience sample of students taking introductory psychology classes and biology classes. Thus, generalizability of these results is limited. Also, while the majority of the sample came from a large, 4-year institution, approximately 12% of the sample came from a small community college. This difference in sample size combined with collecting data from another institution introduces the possibility that differences between community colleges versus 4-year institutions (e.g. class sizes) might impact the nature of student-faculty interactions. However, a comparison of the two samples on the total score from the SPIS did not reveal any significant differences.

Taken together, the results of this study suggest that the SPIS has the potential to be a useful instrument in assessing how students perceive their relationships with faculty. As it is in its early stages of development, more studies need to be conducted to test the trustworthiness of these findings. Future research should include a larger sample of both White and ethnic minority students to increase

the reliability and generalizability of the findings. Additionally, research on this scale should continue to examine whether sensitivity to multicultural issues is an important component for all students, or only important to ethnic minority students. The process of constructing a psychometrically sound scale is lengthy; thus, more scale development work is needed. Several of the subscales need to have additional items to more fully capture the underlying dimensions. Adding items will increase the reliability of scores of the subscales.

The SPIS makes a unique contribution to the student-development literature by attempting to assess the underlying dimensions of student-faculty interactions most frequently identified in the literature. While it is conventional wisdom that student-faculty interactions are important for the academic and professional development of students, very little research has focused on identifying the specific aspects or dimensions of the student-faculty interaction. Additionally, there needs to be more research that examines how the specific aspects of student-faculty interactions relate or contribute to important correlates such as achievement, career aspiration, and retention. It is our hope that continued research using this scale will assist in conducting this important line of research.

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