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Faculty Attitudes and Interest in Conducting Research at a Teaching Institution—A View from an Evangelical Christian University

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Abstract

Since the 1990s, there has been an increased expectation at "teaching institutions" that faculty engage in academic scholarship and empirical research activities. The present study explored faculty perceptions of undergraduate students as research partners and the factors that motivate faculty-driven scholarship at a Christian university that, until the mid-2000s, has been predominantly an undergraduate-serving college. In particular, the current research focused on the experiences of early, mid- and later-career faculty who have been charged with facilitating both undergraduate and, to a lesser extent, graduate students' learning and emersion in the research enterprise. The study addressed 1) what factors influence faculty to include students in their work actively; 2) how faculty, with heavy teaching loads, organize their professional and scholarly lives incorporating research generally and student collaborations specifically, and 3) from the perspective of participating faculty, how campus factors both fiscal and institutional may hamper or support faculty efforts. Faculty in the allied health sciences endorsed more favorable attitudes than those in the natural sciences in humanities/liberal arts disciplines. Intrinsic factors such as peer recognition differed by both gender and academic discipline. Additional gender and discipline-associated differences were also detected in consideration of extrinsic factors. Differences in research and teaching orientation factors were observed, as were different experiences with funding success. Collectively, the faculty did not receive any discussions of research expectations during interviews. Last, a hierarchical regression model accounted for 62.3% of the variance in the faculty research motivation measure. The results are discussed in terms of the challenges associated with conducting research at universities with heavy teaching loads generally and, specifically, the issues that confront faculty employed at Christian institutions with research funding restrictions.

Keywords

Faculty, Research, Teaching, Student Collaborations, Personal Interest, Institutional Challenges

1. Introduction

The Massachusetts Institute of Technology was the first to establish an institution-wide effort in undergraduate research in 1969 (Merkel, 2003). Nonetheless, such institutional efforts did not begin in earnest until the 1980s and 1990s, rapidly gaining in popularity in higher education. Bolstered by the Boyer Commission report (Boyer Commission on Educating Undergraduates, 1998), the recognition of the academic benefits of student research experiences has increased, as has institutional funding (Lopatto, 2004, 2010; Seymour et al., 2004), and the growth of student-centered research organizations. For example, from its modest beginnings in 1987, the Council on Undergraduate Research (CUR) has experienced sustained growth. Currently, the organization includes more than 14,000 members representing over 650 colleges and universities, with representation from 24 member countries (Council on Undergraduate Research, 2022). Each year, CUR's National Conference on Undergraduate Research (NCUR) hosts as many as 4000 students from the U.S. and beyond, with student research presented in several formats, including traditional oral and poster presentations as well as the visual arts and live performances (Council on Undergraduate Research, 2021).

Concomitant with this shift, colleges and universities have developed and supported research internships for students. These internships typically are formed around the goal of providing support for students interested in joining an operational research laboratory and directly partnering with faculty conducting research. A few examples include the University of Chicago's Dean's Undergraduate Research Fund (n.d.) or New York University's DURF Grants (2021), as well as our Summer Undergraduate Academic Research Program (SUGAR; Palm Beach Atlantic University, 2021). In addition, colleges and universities have developed a variety of courses that provide an experiential learning component that includes course credit for participation in a research laboratory (e.g. Experiential Learning, 2021). Not surprisingly, the student benefits accumulated from such experiences are considerable. For example, research experiences improve written and oral communication and critical thinking. From the institutional standpoint, student research experiences are associated with increased retention and degree completion (Linn et al., 2015; Lopatto, 2010).

While the Boyer report supported both a change in mindset toward undergraduate education and changes in academic programs, the report lacked consideration of the many challenges colleges were required to overcome to assimilate adequately undergraduate research into the curriculum. Simply put, the real fiscal, physical, and human capital challenges associated with implementation

often have been and continue to be challenging (Hoffman, 2009; Katkin, 2003; Kuh, 2008; Malachowski, 2003; Schneider, 2008; Shanahan, 2012; Swaner & Brownell, 2008). Individually, many faculties actively seek out collaborative research with students. However, when collaborative undergraduate research becomes a campus-wide initiative, success is contingent on faculty support and faculty participation (Magee, 2014). Recognizing that mentoring students in research is often a time-intensive activity, faculty with fewer fiscal and space resources and the heavy teaching loads (Schuster & Finkelstein, 2006) associated with universities that are not designated as R1or R2 (Carnegie Classification of Institutions of Higher Education, n.d.), they may be resistant to additional commitments. As a result, according to one study using the National Survey of Student Engagement data (Webber et al., 2013), approximately 81% of US undergraduates do not participate in undergraduate research. Notably, the institutional climate is critical as the proportion of student involvement in undergraduate research is associated with higher levels of faculty who value research collaborations with students (Kuh et al., 2007; Webber et al., 2013).

As noted almost two decades ago, an environment conducive to developing academic research programs requires a fundamental change in the strategic goals and culture of the college (Mallard, 2002). Outcomes and the means to achieve them should look beyond financial incentives or alterations in teaching loads to include the physical and psychological well-being of the active researcher (Mallard & Atkins, 2004). Mallard and Atkins found that even in smaller Christian faith-based institutions, faculty with substantial teaching loads and the accompanying demands on course preparations could conduct research. The results of the study also suggested that rather than being a roadblock per se, the label as a teaching institution motivated many faculties to conduct research. Here, the majority of faculty considered their research as adding considerable value to their teaching. Conversely, even though the respondents indicated an institutional increase in research expectations, they largely felt that the academic culture of their institution did not value scholarship. Nonetheless, past research suggested that faculty employed at teaching-intensive institutions is motivated to engage in research even when time (e.g. load reductions) and financial incentives are scarce (Mallard, 2002).

Undergraduate Research Engagement

When considering how best to introduce and stimulate interest in scholarly inquiry and the research process, Healey and Jenkins (2009) have elucidated various strategic pathways to stimulate such interest. First, classify research engagement along two dimensions that vary in the degree to which undergraduates primarily serve as an audience or as participants. Second, a dimension can be described that considers the depth of the research approach, where the emphasis varies in terms of research content or research as a process. Using this framework, Healey and Jenkins outline four main approaches for creating the condi-

tions necessary for engaging undergraduates with research and inquiry. A common approach within the discipline is to emphasize a research-led engagement approach. Here, learning is centered around the current research within a specific discipline or content area. Another common pedagogic approach, focusing on developing research skills and techniques, is centered on research-oriented engagement. Naturally, in many disciplines, this involves core competencies. The other two, research-based and research-tutored engagement, involve students embarking on research and inquiry as a process and participation in research discussions, respectively. All are of value to the student, and each has its place in training within the major. However, as Healey and Jenkins (2009) noted, all too often in undergraduate training, teaching and learning means emphasizing the first two approaches, even though the student benefits associated with more additional time with the latter two approaches would be of great value to the student.

With these and other considerations in mind, the purpose of the present study was to explore the motivations of undergraduate and/or graduate faculty at a university traditionally viewed through the lens of a teaching university. Specifically, faculty perceptions of the current student population and the perceived viability of productive research collaborations with students were examined. Additional considerations involved exploring the perceived Impact of Research Activities on institutional reward systems (i.e. extrinsic rewards) and institutional barriers to such activities. Given the challenges associated with conducting research at teaching institutions, the intrinsic motivations to conduct research under less-than-optimal conditions, in terms of fiscal, support, and time demands were assessed. Further, the impact of gender, academic discipline, and work/life balance were considered to determine how each impacts motivation and associated attitudes toward research.

The ability to obtain adequate funding in support of academic research and institutional expectations when interviewing was examined as well. Following an initial examination of these areas of interest, a final analysis involved a three-step hierarchical regression analysis with a research orientation factor as the dependent variable and a number of variables such as gender, length of academic career, area of academic background, multiple scales associated with conducting research with student associates, and extrinsic and intrinsic scales of the Attitudes Toward Research and Teaching Scale.

2. Method

2.1. Participants

The present study included 99 full-time undergraduate and graduate faculty at a small Christian university in South Florida. Demographic information related to the sample is presented in **Table 1**. All (167) full-time faculty were recruited via the official campus LISTSERV, with the participants and their responses treated in a manner consistent with the standards of the American Psychological

Table 1. Descriptive statistics of the participants.

	N	%
Age		
25 - 34	8	8.1
35 - 44	29	29.3
45 - 54	28	28.3
55 - 64	26	26.3
65+	6	6.1
Total Reponses	97	98.0
Missing Reponses	2	2.0
Total N	99	100
Gender		
Female	57	57.6
Male	41	41.4
Total	98	99.0
Missing	1	1.0
Total N	99	100
Race/Ethnicity		
Asian/Pacific Islander	2	2.0
Black or African American	5	5.1
Hispanic American	4	4.0
White/Caucasian	75	75.6
Multi-Racial	4	4.0
Other	5	5.1
Total Reponses	95	95.8
Missing Reponses	4	4.2
Total N	99	100
Primary Academic Background		
Natural or Life Sciences (e.g. Physics; Chemistry; Biology)	13	13.1
Social Sciences (e.g. Psychology; Political Science)	7	7.1
Health & Medicine (e.g. Nursing, Health & Human Performance; Pharmaceutical Science/Practice)	30	30.3
Liberal Arts & Humanities (e.g. English; History; Philosophy; Foreign Language; Ministry)	16	16.2
Education: Counseling	10	10.1

Continued

Business & Leadership (e.g. Management; Accounting; Organizational Leadership)	14	14.1
Fine Arts (e.g. Music; Visual Arts; Theatre)	4	4.0
Ministry	5	5.1
Total N	99	100
Where in Academic Career		
Early career professor (<7 years)	27	27.3
Mid-career professor (7 - 20 years)	45	45.5
Later career professor (>20 years)	27	27.3
Total N	99	100
When you interviewed for a position at PBA, were any research or scholarly expectations discussed during the interview process?		
Yes	33	33.3
No	66	66.7
Total N	99	100

Association (2017). Of these, 92 individuals completed the full questionnaire, but the remaining seven were included in the analyses where possible. The details associated with the characteristics of the participants are presented in **Table 1**. Briefly, the participants included faculty from a number of disciplines with all presumably members of the Christian faith. The reported race of approximately 75% of the faculty respondents was white. The remaining 25% reported a race of Black (5.1%), Hispanic/Latino (4%), or Asian/Pacific Islander (2%), respectively. The remaining 4% reported mixed or multi-racial ancestry. This racial breakdown is noteworthy as the undergraduate campus population consists of 60% white, 16.4% Hispanic/Latino, and 10.6% Black undergraduates. The remaining population identifies as multi-racial or Asian/Pacific Islander. The majority, 57.6% of the respondents were female, with an undergraduate population that is approximately 67% female.

2.2. Measures and Instruments

2.2.1. Faculty Motivations to Collaborate with or Mentor Undergraduate Students

This section of the survey was designed to assess the perceptions of the faculty about the costs, benefits, and desirability of collaborating with undergraduate students on research rejects. Survey items in this section were adapted from Morales et al. (2017). However, unlike the Morales study where the investigators used a 4-point scale, respondents rated statements on a 7-point Likert scale. Items in this section included different aspects of past and potential future col-

laborations. Here, the statements included perceptions of the costs associated with working with undergraduate scholars (e.g. "Supervising undergraduate research is time-consuming"), dispositional factors (e.g. "I enjoy teaching students about research", situational factors (e.g. "Research by undergraduates does not help me with my annual review, tenure, and/or promotion") and previous experiences with research funding. Again, at our institution, we are unable to apply for federal research grants. Nonetheless, some of the faculty had success with federal grants before coming to our university.

2.2.2. Faculty Motivation to Conduct Research Scale (FMCR)

The Faculty Motivation to Conduct Research Scale (FMCR) was adapted from work by Chen and Zhao (2013). The scale was changed from the 2013 version to include a 7-point Likert scale, and without tenure, the tenure statement changed to a multi-year letter of agreement. The first part of the questionnaire consists of 13 statements associated with incentives, six of which are intrinsic and six of extrinsic value, with the participant asked to evaluate the importance of each statement. The remaining item was identified as of mixed value. The extrinsic incentives included receiving or having acquired a multi-year letter of agreement, achieving the rank of full professor or receiving a promotion, receiving larger increases in salary, receiving an administrative appointment, promoted to a chaired professorship, and receiving a reduction in the standard (12-semester hour) teaching load. The six intrinsic incentives include acquiring recognition from peers and gaining greater respect from students. In addition, the incentives include satisfying a personal desire to contribute to their academic field, a personal need for creativity or curiosity, a personal need for collaborations with others, and a personal need to stay current in the field of scholarship. The final incentive, enhancing the ability to find a better opportunity at another university, was considered a mix of intrinsic and extrinsic incentives (see Chen & Zhao, 2013). In addition, the participants were required to attach a value to the perceived impact of their research activities on the intrinsic rewards described above. Principal Components Analysis (PCA) with Varimax rotation led to a two-factor solution that accounted for a total of 67.42% of the variance. All intrinsic and extrinsic items loaded as intended.

2.2.3. Attitudes toward Research and Teaching Scale

In the present investigation, I used Tang and Chamberlain's (2003) 21-item scale assessing faculty attitudes towards research and teaching in higher education developed. The scale is comprised of a six-factor Likert-scale survey. In the research reported by Tang and Chamberlain, they used a four-point scale. Here, the scale was altered to include a seven-point scale, with anchors that included strongly agree and strongly disagree and the inclusion of a neither agree nor disagree response choice.

Five items were associated with the first factor, research orientation, and included statements such as, "Faculty members should view themselves primarily as researchers." The second factor, teaching orientation, consisted of 3 state-

ments (e.g. "Teaching offers the greatest satisfaction"). The third (5 items) and fourth (2 items) factors center on beliefs that rewards influence research (e.g. "Faculty members must be productive researchers or lose their jobs") and teaching (e.g. "Faculty members must be effective teachers or lose their jobs") respectively. A three-item fifth factor gauged the personal interest of the faculty respondent. Last, a three-item sixth factor involved statements about the mission of the university (e.g. Effective teaching is essential to the mission of my university). PCA Factor analysis with Varimax rotation of a six-factor solution accounted for a total of 58.54% of the variance with all items loading as intended by Tang and Chamberlain.

2.2.4. Work/Life Balance

In addition to the scales and sections described above, I included a series of four items on a 7-point Likert scale querying the respondents on the ability to balance effectively the demands associated with their role as a professor and scholar and those associated with their personal life. For example, the participants expressed their level of agreement to statements such as, "Expectations at my job do not interfere with my home/personal life".

2.2.5. Institutional Research Expectations

Given the changing expectations articulated by the administration, the participants were queried about communications and discussions they experienced during the pre-interview and interview process.

2.2.6. Experiences with Research Funding

The relation between successfully acquiring research funding and the academic background of the participants was examined within each of the three categories of length of the academic career as well as collapsed across the length of career. To reiterate, our university does not permit applications for federal research funding. However, members of our faculty may pursue federal funding indirectly, as part of a collaboration with another university.

2.2.7. Predicting Faculty Research Motivations

The final analysis involved a three-step hierarchical regression analysis with Factor I, the Research Orientation factor of the Faculty Motivation to Conduct Research (FMCR) Scale as the dependent variable and gender, length of academic career, academic background, factors associated with conducting research with student associates, factors III, V and VI of the FMCR scales, and extrinsic and intrinsic scales of the Attitudes Toward Research and Teaching Scale. In the first model, gender, length of academic career, and academic field were entered as potential predictor variables. The second model included the addition of the working with student measures. A third and final model included the addition of the Attitudes toward Research and Teaching Scales III (beliefs rewards influence research), V (personal interest), and VI (mission of the university) as well as the intrinsic and extrinsic scales of Faculty Motivation to Conduct Research Scale.

3. Results

3.1. Faculty Perceptions and Motivation to Collaborate or Mentor Undergraduate Students

Faculty perceptions of working with students on research projects were examined first. Academic discipline and stage in academic career served as the independent variables. In order to examine academic discipline at a more granular level, the disciplines included clusters of five different academic areas. The homogeneity of variance assumption was violated; Therefore, Welch's procedure was used. As seen in Figure 1, the perceived value in working with undergraduate students on research differed as a function of academic discipline, F (4, 41.10) = 3.90, p = .009, η_p^2 = .097. Subsequent pairwise comparisons revealed that Individuals in the allied health sciences endorsed more favorable attitudes than those in the natural sciences. Similarly, individuals in business or leadership programs endorsed more favorable attitudes than individuals in the natural sciences as well as in the humanities/liberal arts disciplines.

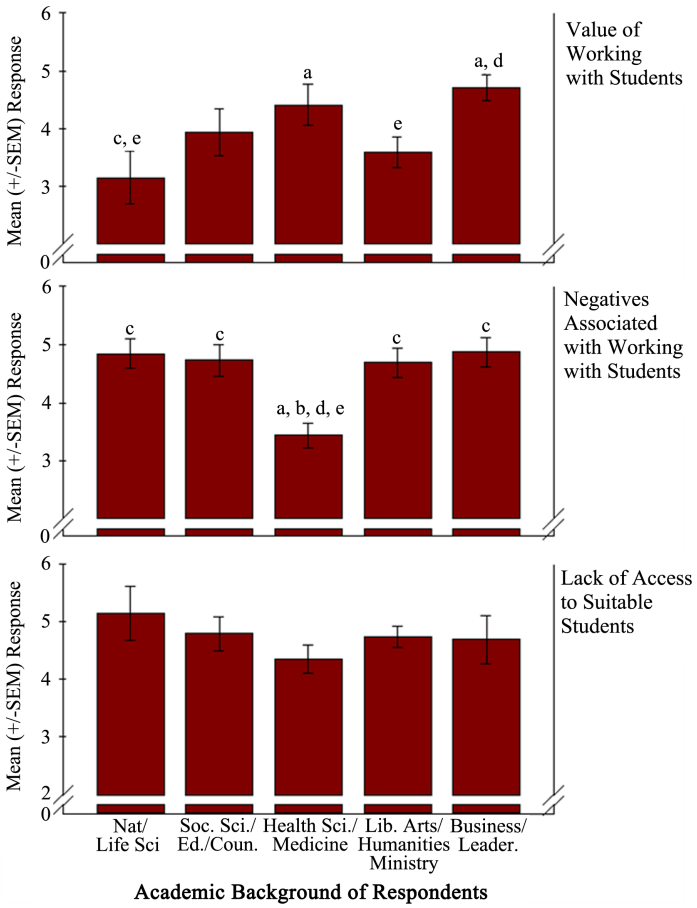

Figure 1. Faculty perceived value and issues associated with collaborating on research projects with college students. The letters a through c represent a significant difference from faculty in other academic areas, the natural or life Sciences (a), social Sciences or education (b), health sciences (c), liberal arts or ministry areas (d), and/or business/leadership (e). $p < .05$.

Turning to the negatives associated with working with undergraduate students, a significant effect of academic discipline was found, F (4, 41.08) = 6.95, $p < .001$, $\eta_p^2 = .239$. Pairwise comparisons of the means revealed that the attitudes among faculty in the allied health sciences were significantly less negative than faculty in the other academic areas where the means were similar. Finally, all academic discipline areas suggested comparable levels of difficulty in finding access to suitable students, F (4, 36.92) = .73, n.s.

When stage in academic career was considered, only the second factor, the negatives associated with research with students, was significant, F (2, 96) = 7.51, $p = .001$, $\eta_p^2 = .135$. Pairwise comparisons revealed that all three means differed significantly, with a trend toward of more negative perceptions as a function of the stage in their academic career (see Figure 2). Specifically, the perceived negatives associated with working with students increased as a function of the years of experience in the academic's career. Further, post hoc comparisons revealed that all three faculty groups differed significantly. However, while a perceived lack of suitable students was of concern, such perceptions existed across the three levels of faculty experience.

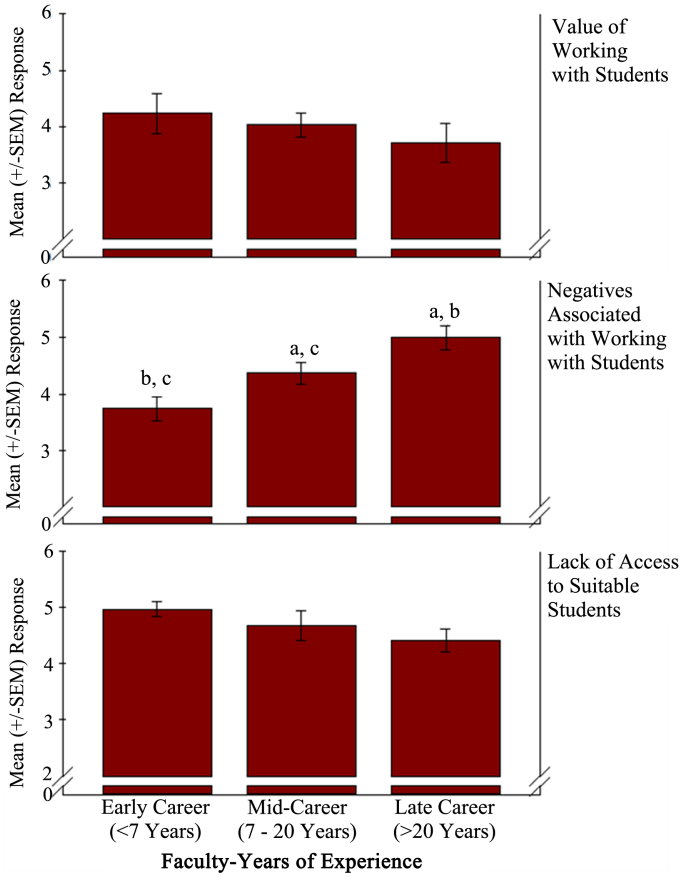

Figure 2. Faculty perceived value and issues associated with collaborating on research projects with college students as a function state in career. The letters a through c represent a significant difference from faculty at different points in their academic career, early career (a), mid-career (b), and late career (c). $p < .05$.

3.2. Faculty Motivation to Conduct Research (FMCR)

3.2.1. Perceptions of the Impact of Research Activities on Intrinsic Rewards

Following faculty perceptions of working with students on empirical research, in the interest of clarity, the five academic categories considered in the previous section were reduced to three categories, (a) the sciences (SCI), (b) the allied health sciences (AHS), and (c) liberal arts, humanities, and business areas (LAH). First, the perceived impact of research on the acquisition of intrinsic rewards was considered. The data were examined using a two-way MANCOVA with gender and academic discipline areas as independent variables and point in academic career as a covariate. The dependent variables included peer recognition, student respect, contributing to the field, satisfying curiosity, obtaining pleasure from collaborating with others, meeting a need to remain current in the discipline, and finding a job at another institution. The MANCOVA revealed the following. Significant multivariate effects of gender, Wilks' $\Lambda = .796$, $F(7, 85) = 3.10$, $p = .006$, $\eta_p^2 = .204$, and academic discipline, Wilks' $\Lambda = .629$, $F(14, 170) = 3.17$, $p < .001$, $\eta_p^2 = .207$, were found. The covariate was significant as well, Wilks' $\Lambda = .802$, $F(7, 85) = 3.00$, $p < .007$, $\eta_p^2 = .198$.

More important, a significant gender X academic discipline area was found, Wilks' $\Lambda = .613$, $F(14, 170) = 3.37$, $p < .001$, $\eta_p^2 = .217$. Prior to conducting a series of follow-up univariate ANOVAs, the homogeneity of variance assumption was tested for all nine intelligence subscales. Using a series of Levene's F tests, the homogeneity of variance assumption was considered satisfied. Gender differences emerged on the dependent measures of making a contribution to the discipline and staying current measures, with females higher than male respondents on both measures (Ms = 5.54 & 5.63 vs. 4.48 & 4.63). When the academic area of the participants was considered, significant differences were found for the dependent variables of peer recognition, contribution to the field, and collaboration with others (smallest $F = 3.33$, better job). Subsequent post hoc analyses were performed to examine individual mean difference comparisons across all three academic discipline areas. Across the three significant dependent measures, individuals in the AHS had higher levels of agreement (Ms = 5.38, 5.65, & 5.17) than individuals in the SCI (Ms = 4.19, 4.77, & 4.45) and LAH (Ms = 4.15, 4.61, & 4.08) areas. The latter two academic discipline areas were not significantly different.

Returning to the multivariate interaction effect and following data screening, subsequent univariate analyses revealed a significant interaction effect for the peer recognition, $F(2, 91) = 11.26$, $p < .001$, $\eta_p^2 = .198$, earning student respect, $F(2, 91) = 6.17$, $p = .003$, $\eta_p^2 = .119$, and curiosity, $F(2, 91) = 3.17$, $p = .046$, $\eta_p^2 = .065$, dependent measures. The results are summarized in Figure 3.

Considering peer recognition first, decomposition of the interaction revealed that among the AHS faculty, male faculty considered peer recognition to have a more significant impact than female faculty. However, the reverse was true when

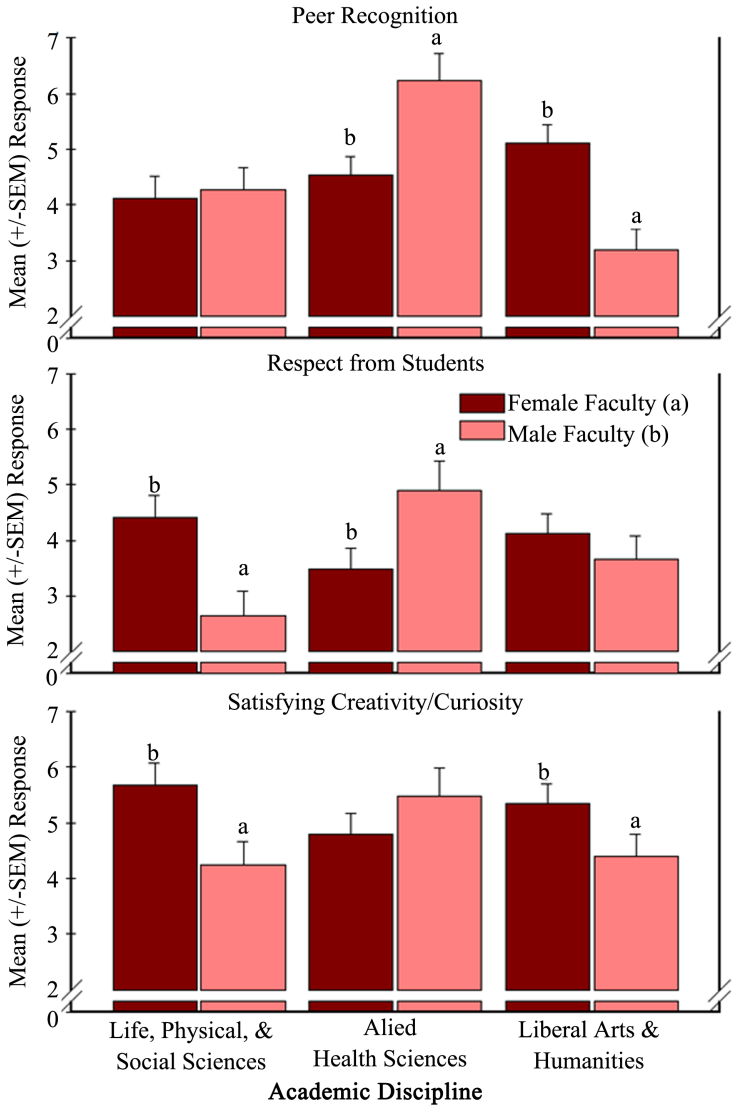

Figure 3. Faculty perceptions of the impact of the intrinsic rewards associated with conducting research on as measured on the Faculty Motivation to Conduct Research Scale. The letters (a) and (b) represent a significant difference from faculty of the opposing gender in the three areas of academic disciplines as defined earlier. $p < .05$.

LAH faculty was considered. For faculty in the sciences, no differences as a function of gender were found.

When the impact of research activities on respect from students was examined, a different pattern emerged. Here, compared to their male counterparts, female SCI faculty gave more weight to the influence of research activity on gaining respect from the students. A similar pattern held for the impact of research on satisfying faculty curiosity.

Male AHS faculty attached higher levels of impact of research to student recognition but not in satisfying a need for creativity/curiosity. Last, among the LAH faculty, gender differences were absent in consideration of gaining respect from students but female faculty ascribed more satisfaction than male faculty on

the creativity/curiosity variable.

Faculty point in their academic career was used as a covariate in the primary analysis. However, given it was significant, as a final consideration of the intrinsic factors, the three academic categories were compared. Group differences emerged on the gaining greater respect from the students and finding a better position measures. Here, mid-career faculty (M = 3.27, SD = 1.49) were significantly less interested in respect from students than faculty early (M = 4.19, SD = 1.498 or later (M = 4.41, SD = 1.74) in their careers. Perhaps unsurprisingly, faculty in their mid-career (M = 4.40, SD = 2.00) were the most interested in leveraging research activity for a better position than were faculty later in their careers (M = 2.56, SD = 1.86), with early-career faculty intermediate and significantly different from the two extremes (M = 3.27, SD = 1.49).

3.2.2. Given the Environment of the College, Perceptions of the Impact of Research Activities on Extrinsic (External) Rewards

Next, attention was turned to the perceived academic environment of the college and its impact on extrinsic rewards for conducting research. Like above, the data were examined using a two-way MANCOVA with gender and academic discipline areas as independent variables and point in academic career as a covariate. Here, the dependent variables included receiving a multi-year letter of agreement, receiving a promotion to a higher academic rank, earning higher increases in salary, receiving an administrative assignment, and earning a reduced teaching load. Analysis of the data revealed significant multivariate effects of gender, Wilks' Λ = .795, F (5, 87) = 4.49, p = .001, η_p^2 = .205, academic discipline, Wilks' Λ = .727, F (10, 174) = 2.98, p = .002, η_p^2 = .116, and a gender X academic discipline area, Wilks' Λ = .797, F (10, 174) = 2.09, p < .027, η_p^2 = .107, were found. The covariate was significant as well, Wilks' Λ = .695, F (5, 87) = 7.63, p < .001, η_p^2 = .305.

Once again, the homogeneity of variance assumption was considered satisfied. When the means associated with gender were considered, differences emerged on all five dependent measures. Motivations among female faculty were consistently higher on the dependent measures ($M_{\text{promotion}}$ for 5.66 to $M_{\text{admin. appointment}}$ = 3.45) than their male counterparts ($M_{\text{promotion}}$ = 4.67 to $M_{\text{admin. appointment}}$ = 2.45).

When the academic background of the participants was considered, significant differences appeared on the multi-year letter of agreement, promotion, and administrative appointment measures (smallest F = 3.77, promotion). Post-hoc analyses revealed the following mean difference comparisons across all three academic discipline areas. For the multi-year letter of agreement incentive, faculty in the SCI (M = 5.00, SD = 1.24) endorsed significantly higher ratings than AHS (M = 4.19, SD = 1.31) and LAH (M = 3.70, SD = 1.61) faculty, which did not differ. When the incentive of earning a promotion was considered, once again, SCI had higher ratings for this incentive (M = 5.47, SD = 1.19) than AHS (M = 4.93, SD = 1.53) faculty. LAH faculty were intermediate and not significantly different from either extreme (M = 5.29, SD = 1.32). Last, LAH faculty

saw promotions to administrative positions as a greater incentive (M = 3.47, SD = 1.52) than individuals in the SCI (M = 2.67, SD = 1.56) and AHS (M = 3.03, SD = 1.62) areas. Once again, the latter two academic discipline areas were not significantly different.

However, when considered in light of a significant multivariate interaction, univariate analyses revealed a somewhat different pattern. Significant univariate interaction effects were found for the incentives of raises, F (2, 91) = 4.02, p = .021, η_p^2 = .081, and a multiyear letter of agreement, F (2, 91) = 5.85, p = .004, η_p^2 = .114, and the prospect of reductions in teaching loads, F (2, 91) = 3.80, p = .026, η_p^2 = .077, dependent measures. The results are summarized in Figure 4.

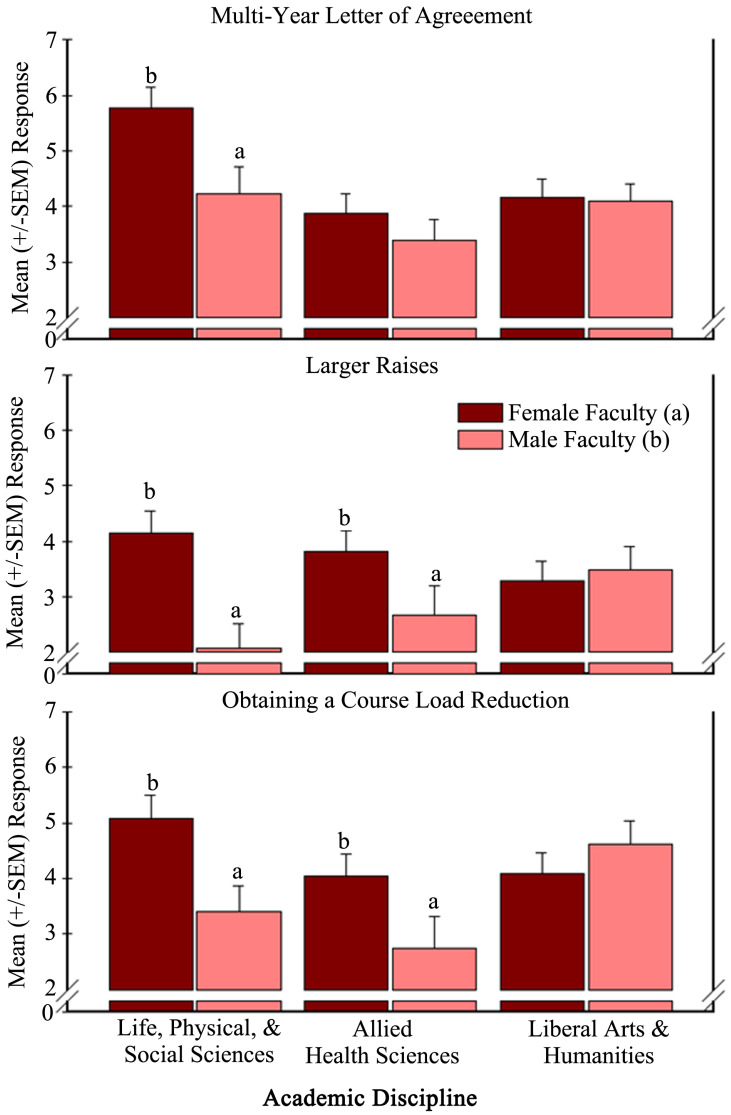

Figure 4. Faculty perceptions of the impact of the extrinsic rewards associated with conducting research on as measured on the Faculty Motivation to Conduct Research Scale. The letters (a) and (b) represent a significant difference from faculty of the opposing gender in the three areas of academic disciplines as defined earlier. $p < .05$.

Considering the incentive of raises first, decomposition of the interaction revealed that among the AHS faculty, female faculty considered the role of research as having a more significant impact on the reward of raises than male faculty. The same was true when the SCI faculty were considered. However, the responses of male and female LAH faculty were comparable.

Turning to the "mini-tenure" variable of a multi-year letter of agreement, a sex difference was observed but only among SCI faculty. Here, female faculty ascribed significantly higher value to the role of research in acquiring this type of contract (agreement; see **Figure 4**). Similarly, female SCI and AHS faculty ascribed more value associated with conducting research as a means to achieve a course load reduction. Attitudes of the LAH faculty were comparable on this variable.

Once again, the point in faculty academic career was used as the covariate. As seen in other analyses, the covariate was significant and was considered further. Similar to the results reported above, years of experience of a member of the faculty influenced faculty thoughts on the role of research on raises, $F(2, 96) = 11.10$, $p < .001$, $\eta_p^2 = .188$, and obtaining an administrative appointment, F (2, 96) = 8.31, $p < .001$, $\eta_p^2 = .148$. Post hoc comparisons revealed that young faculty endorsed higher levels to research in obtaining raises ($M = 4.11$) than did mid- ($M = 2.67$) and later-career ($M = 2.70$) faculty. This pattern held for the value of research in obtaining an administrative appointment as well ($M_{\text{early}} = 4.63$ vs. $M_{\text{mid-career}} = 2.73$ & $M_{\text{later-career}} = 2.96$).

3.3. [Faculty] Attitudes toward Research and Teaching (ATRT)

For the Tang and Chamberlin (2003) scales, I analyzed the six dependent variables with gender and academic background as independent variables and length of service as the covariate. The resulting MANOVA results showed no effect of gender of the respondent but a significant main effect of academic discipline, Wilks' $\Lambda = .674$, $F(12, 164) = 2.98$, $p = .001$, $\eta_p^2 = .179$. Subsequent univariate ANOVAs revealed differences associated with academic discipline on factors I, $F(2, 87) = 7.42$, $p = .001$, $\eta_p^2 = .146$, IV, $F(2, 87) = 5.49$, $p = .006$, $\eta_p^2 = .112$, and V, $F(2, 87) = 3.59$, $p = .043$, $\eta_p^2 = .070$. Post hoc examination for the means revealed the following.

For factor I (research orientation), attitudes differed between the SCI ($M = 4.89$) and AHS ($M = 3.98$) faculty, with the mean of LAH faculty intermediate between the two other faculties. Turning to factor IV (rewards influence teaching), LAH ($M = 3.40$) differed significantly from the SCI and AHS faculties with the means of these two similar (Ms = 2.47 & 2.78). Last, when the means for the fifth factor (personal interest) were examined, the responses of the SCI faculty ($M = 3.89$) differed significantly from that of LAH (M = 3.22) faculty. Here, AHS was intermediate ($M = 3.42$) and not significantly different from either extreme.

As noted earlier, a significant gender X academic discipline area was detected. Decomposition of the interaction revealed the following. Among the SCI disciplines, gender only differed on factor I (research orientation; $M_{\text{female}} = 3.52$, SD

= .97 vs. M_{male} = 2.81, SD = .61). Among the LAH disciplines, a gender difference was found only on the third factor (rewards influence research). Here, female responses (M = 3.71, SD = .66) were lower than that of male responses (M = 4.44, SD = .71). No gender differences were found when AHS disciplines were considered.

As before, the years of service in faculty academic career was used as a covariate and was significant, (Wilks' Λ = .758, F (6, 82) = 4.37, p = .001, η_p^2 = .242); therefore, the role of this variable was considered. Further univariate ANOVAs revealed that factor I, F (2, 92) = 7.06, p = .001, η_p^2 = .133, factor III, F (2, 92) = 5.21, p = .007, η_p^2 = .102, and Factor IV, F (2, 92) = 7.86, p = .001, η_p^2 = .146. The relevant results are presented in Figure 5. Turning to factor I, post hoc comparisons revealed that young faculty held a significantly less favorable research orientation than later-career faculty. Given the changing nature of

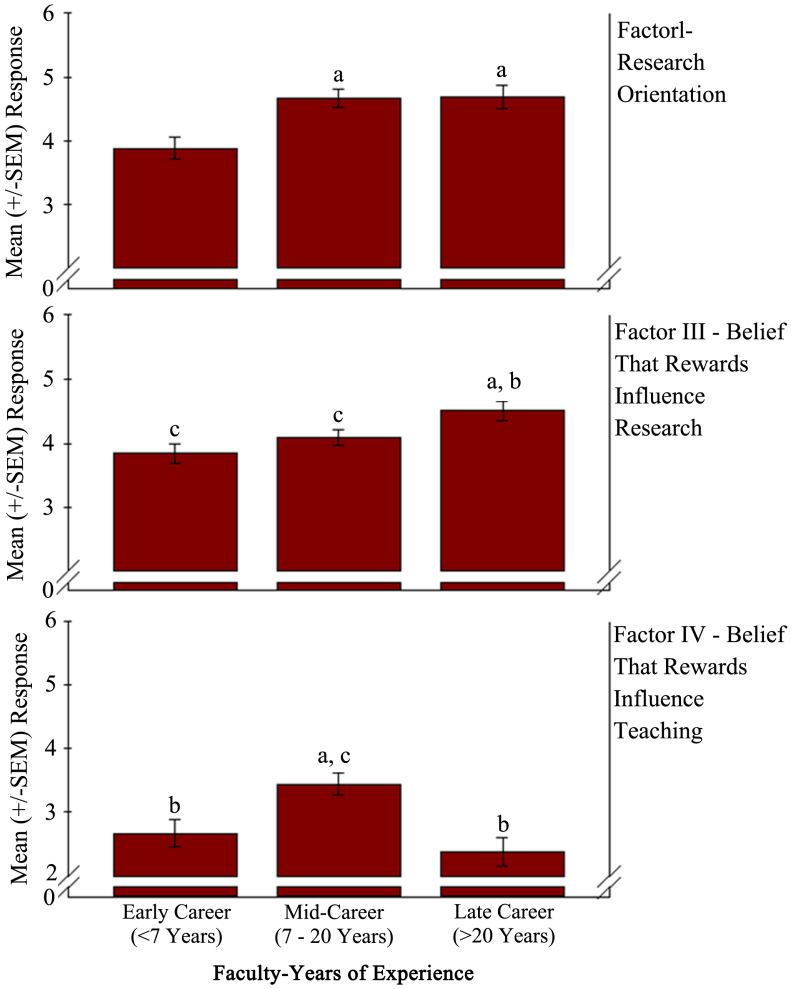

Figure 5. Faculty orientation with respect to research and perceptions of relative rewards associated with teaching and research as measured on the [Faculty] Attitudes Toward Research and Teaching Scale. The letters (a) (Early Career), (b) (Mid-Career), and (c) (Later-Career) represent a significant difference from faculty at different stages of their academic career. $p < .05$.

institutional research expectations in the past decade, this was surprising. In addition, younger faculty likely still maintains a strong sense of research for success and advancement. When factor III is considered, younger faculty and to some extent mid-career faculty held weaker beliefs that rewards influence research. Here, later-career faculty held significantly more faith in the belief that rewards influenced research. Here, given that mid- and later-career faculty were similar, this may well be a reflection of the personal experiences as they related to university expectations related to research and scholarship. Last, when factor IV is considered in greater detail, mid-career faculty help significantly more favorable attitudes that rewards influence teaching than either their early career or later-career colleagues. Here, early and later-career faculty held significantly less favorable attitudes, but these two groups were not significantly different.

3.4. Gender, Academic Discipline and Work/Life Balance

A desire to conduct research and other forms of scholarship is often at odds with competing pressures associated with heavy teaching loads, committee assignments, and, for many, minimal or absent rewards for administrative responsibilities. In addition, many programs on campus have faculty advising loads that exceed 40. All of these expectations are considered by the individual as he or she attempts to frame a measure of work/life balance, including family responsibilities and, for our faculty, church and public service expectations. Given the competing pressures, the work/life balance of the faculty was explored. The dependent variables included items on work/home life balance, the ability to have fun outside of work, maintaining a healthy lifestyle while working at the university, and whether job expectations interfered with personal life. Here, the effect of point in academic career was nonsignificant for any of the work/life measures, even when considered with gender as a second independent variable. Therefore, the data were examined using a two-way MANOVA with gender and academic discipline areas as independent variables. The multivariate main effects of gender and academic discipline were nonsignificant. However, a significant gender X academic discipline area was found, Wilks' $\Lambda = .81$, $F(8, 178) = 2.47$, $p = .015$, $\eta_p^2 = .106$. As before, the homogeneity of variance assumption was tested for the four dependent measures, with the homogeneity of variance assumption considered satisfied.

Subsequent univariate analyses revealed a significant interaction effect for three of four dependent measures of the effects of work expectations on personal life/work/home life balance, $F(2, 92) = 5.29$, $p < .007$, $\eta_p^2 = .103$, maintaining a healthy lifestyle, $F(2, 92) = 4.21$, $p = .018$, $\eta_p^2 = .084$, and the degree to which job expectations interfered with personal life, $F(2, 91) = 5.73$, $p = .005$, $\eta_p^2 = .111$, dependent measures.

The relevant results are presented in **Figure 6**. Decomposition of the interaction revealed that among the SCI faculty, when compared to their female colleagues ($M = 3.44$), male faculty ($M = 4.86$) were significantly more likely to consider their attempts at work/life balance successful. Conversely, the reverse

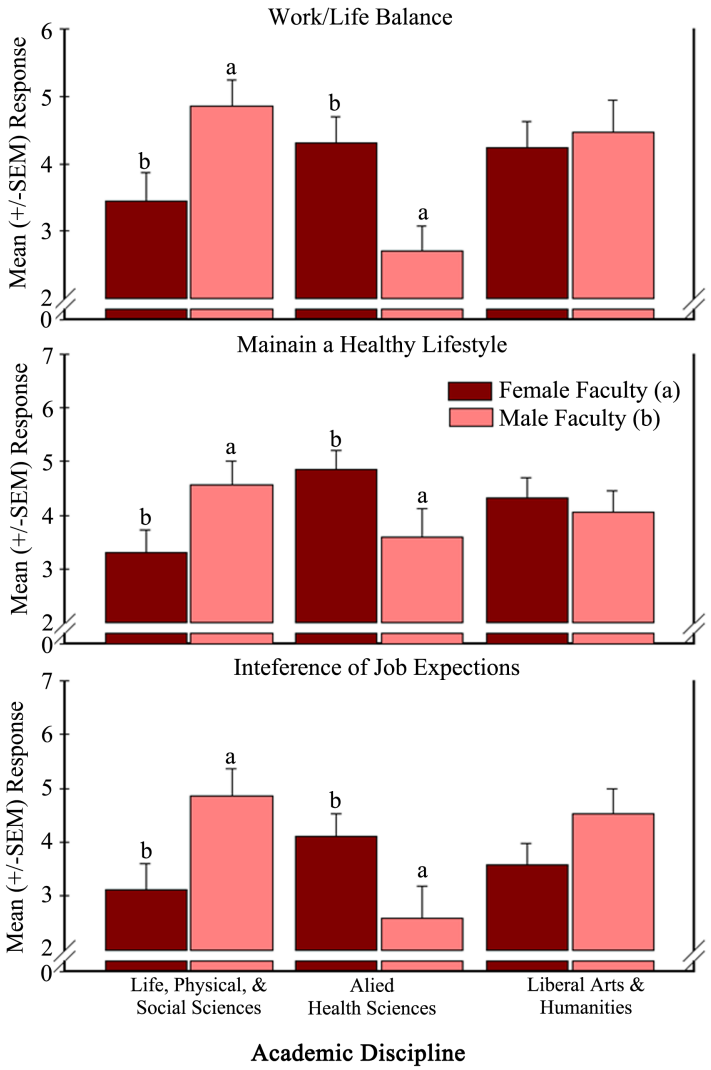

Figure 6. Faculty perceptions of the effects of the demands associated with conducting research and research expectations on their personal life. The letters (a) and (b) represent a significant difference from faculty of the opposing gender in the three areas of academic disciplines. $p < .05$.

was true when AHS faculty were considered $M_{female} = 4.30$ vs. $M_{male} = 2.70$). No gender difference was found in an examination of the LAH data.

When compared to female faculty, male faculty in the sciences considered it easier to maintain a healthy lifestyle ($M_{female} = 3.31$ vs. $M_{male} = 4.57$). When considering the AHS, the converse was true ($p = .050$). Last, among the SCI faculty, males largely did not perceive that job expectations interfered with their personal life $M_{male} = 4.57$, while females perceived greater levels of interference ($M_{female} = 3.31$). The reverse was true among the female ($M = 4.10$) and male ($M = 2.60$) AHS faculty.

3.5. Research Expectations at Interview

A chi-square test of independence was performed to examine the relationship

between academic area and whether research expectations were discussed as part of the interview process. The results are presented in Table 2. While the majority of respondents from all three academic areas reported no discussions, the association between the two variables was significant, $\chi 2$ (2, N = 99) = 7.15, p = .028. Subsequent pairwise comparisons of the proportions revealed that the proportion of individuals from the liberal arts and humanities responding in the negative was significantly higher than in the other two academic areas, which did not differ. Interestingly, the proportions of faculty reporting no such discussions was similar regardless of point in academic career (SCI = 66.7%, AHS = 68.9%, LAH = 63%).

3.6. Experience with Research Funding

The relation between successfully acquiring research funding and the academic background of the participants was examined within each of the three categories of length of the academic career as well as collapsed across the length of career (see Table 3). Using a chi-square test of independence, the relation between research funding and academic area was significant, $\chi 2$ (2, N = 97) = 8.39,

Table 2. Proportion of faculty where research expectations were discussed during the hiring process by academic area.

Academic Career	Sciences		Allied Health Sciences		Liberal Arts & Humanities	
	Yes	No	Yes	No	Yes	No
Early Career	25% (3)	75% (9)	50.0% (6)	50.0% (6)	14.3% (1)	85.7% (6)
Mid-Career	50.0% (4)	50.0% (4)	40.0% (6)	60.0% (9)	18.2% (4)	81.8% (18)
Later-Career	42.9% (6)	57.1% (8)	33.3% (1)	66.7% (2)	20.0% (2)	80% (8)
Combined	40% (12)	60% (18)	46.7% (14)*	53.3% (16)	17.9% (7)*	82.1% (32)

Note: * = proportions between Liberal Arts & Humanities vs. Allied Health Sciences were significantly different.

Table 3. Proportion of faculty who have received a research grant by academic area within different phases of their academic career.

Academic Career	Sciences		Allied Health Sciences		Liberal Arts & Humanities	
	Yes	No	Yes	No	Yes	No
Early Career	75% (6)	25% (2)	60.0% (4)	40.0% (6)	.0% (0)	100% (7)
Mid-Career	87.5% (7)	12.5% (1)	66.7% (10)	33.3% (5)	31.8% (7)	100% (15)
Later-Career	42.9% (6)	57.1% (8)	66.7% (2)	33.3% (1)	50.0% (5)	50.0% (5)
Combined	63.3% (19)*	36.7% (11)	57.1% (16)	42.9% (12)	30.8% (12)*	69.2% (27)

Note: * = proportions between Liberal Arts & Humanities vs. the Sciences were significantly different.

p = .016. When considered within each of the three levels of career length, the relation between research funding and academic career was present early in the career (p = .011) as well as in mid-career (p = .013) but not among those in their later career (p = .87). The proportion of individuals in the sciences who were successful in acquiring research funding, 63.3% (19/30), differed significantly from that of faculty in the Liberal Arts and Humanities, 30.8% (12/39). The success rate for faculty in the Allied Health Sciences was intermediate and not significantly different from individuals in the other two academic areas (57.1%, 16/28).

When past success in acquiring federal funding was considered, no proportions among academic disciplines within the three academic career periods were found. Nonetheless, collapsed across the length of academic career, the relationship between success in research funding and the academic area was significant, $\chi 2$ (2, N = 98) = 9.16, p = .010. While success rates were modest, the proportion of faculty in the sciences who were successful (33.3%, 10/30) was significantly higher than in the Allied Health Science (20%, 6/30) and Liberal Arts & Humanities (5.1%, 2/39). However, since the university does not permit receipt of federal funding for research, such successes took place at another institution prior to coming to their current post.

Since faculty is restricted from receiving federal research funding, often the faculty has turned to private foundations to fund research and scholarship. Here, a substantial minority (35.4%) of the sample has received funding from private foundations. Consideration of the proportions using chi-square tests of independence revealed that when collapsed across the length of the academic career, the relationship between research funding and the academic area was significant, $\chi 2$ (2, N = 99) = 14.59, p = .001. Here, the proportion of faculty who were successful in the sciences (46.7%, 14/30) and Allied Sciences (53.3%, 16/30) was significantly higher than that in the Liberal Arts & Humanities (12.8%, 5/39). Here, the Schools of Nursing and Pharmacy were founded following significant awards from private entities. When considered within each of the three length of career groups, only the relation between mid-career and academic discipline was significant, $\chi 2$ (2, N = 99) = 13.65, p = .001. Stark differences among the proportion of successfully funded faculty by academic discipline were observed, Allied Health Sciences (73.1%), Sciences (50%), and Liberal Arts & Humanities (13.6%). Here, all three proportions differed significantly.

The final area where success in research funding was considered was by examining success rates associated with the university's Quality Initiative [research] Grant program. A campus-wide competitive program, the total budget for this program is typically in the range of $45,000 and includes funding for faculty and students, with collaborations between the two given greater weight. Here, consideration of the data revealed that academic discipline and funding success were unrelated overall, as well as within each of the three length of career categories. Within the sample, 35.7% (35/98) of the faculty have received a Quality Initiative Grant.

3.7. The Prediction of Faculty Research Motivations

3.7.1. Bivariate Consideration of the ATRT and FMRC Scales

When intrinsic and extrinsic factors that influence faculty motivations to conduct research were considered earlier in this report, the individual items comprising the intrinsic and extrinsic factors were treated as dependent variables. However, in order to determine a model predicting faculty research motivations (see below), the intrinsic and extrinsic variables were reduced to two factors.

The bivariate correlations for the Faculty Motivation to Conduct Research (FMCR) Extrinsic and Intrinsic scales and the six scales comprising the Attitudes Toward Research and Teaching Scale (ATRT) are presented in Table 4. Considering the ATRT first, of note, the research orientation scale of the ATRT was inversely correlated with the teaching orientation scale of the ATRT and the extrinsic scale of the FMCR. Conversely, it was positively correlated with the belief that rewards influence research and the mission of the university as perceived.

The teaching orientation scale was negatively correlated with beliefs that rewards influence teaching, the perceived mission of the university, and the motivation to find another job. Related, the belief that rewards influence teaching was positively correlated with motivation to find another job. Oddly, the personal interest factor was only correlated with the mission of the university.

The sixth factor, university mission, was negatively correlated with the extrinsic scale of motivations to conduct research and positively correlated with motivations to obtain another job. Finally, the intrinsic scale of the FMRC was correlated with motivation to obtain another job.

Table 4. Bivariate correlations among the six attitudinal and three motivational factors.

	ATRT Factor I	ATRT Factor II	ATRT Factor III	ATRT Factor IV	ATRT Factor V	ATRT Factor VI	FMCR Intrinsic	FMCR Extrinsic	FMCR Mixed
Factor I	1	−.280**	.218*	.168	.040	.450**	−.172	−.560**	.057
Factor II		1	.158	−.233*	−.015	−.204*	.038	.185	−.256*
Factor III			1	−.281**	.048	−.097	−.192	.054	−.334**
Factor IV				1	−.138	.159	−.001	−117	.332**
Factor V					1	.345**	−.019	.109	.154
Factor VI						1	−.118	−.263**	.268**
Intrinsic							1	.112	.216*
Extrinsic								1	−.010
Mixed									1

Notes: Attitudes Toward Research and Teaching Scale (ATRT): Research Orientation (Factor I), Teaching Orientation (Factor II), Belief That Re-wards Influence Re-search (Factor III), Belief That Rewards Influence Teaching (Factor IV), Personal Interest (Factor V), Mission of the University (Factor VI). Faculty Motivation to Conduct Research Scale (FMCR): Faculty Motivation to Conduct Research (Intrinsic), Faculty Motivation to Conduct Research (Extrinsic), Obtain Another Job (Mixed). For Factors I through VI, a low score indicates high agreement. For the motivational measures, a high score indicates high agreement.

3.7.2. Predicting Faculty Research Motivations

The final analysis involved a three-step hierarchical regression analysis with Factor I, the Research Orientation factor of the Faculty Attitudes Toward Research and Teaching (ATRT) Scale as the dependent variable and gender, length of academic career, academic background, factors associated with conducting research with student associates, factors III, V and VI of the ATRT scales, and extrinsic and intrinsic scales of the Faculty Motivation to Conduct Research Scale (FMCR). In each of the three models considered here, the statistic of variance inflation factor (VIF) associated with each predictor. The resulting VIF values ranged from 1.270 to 2.236, suggesting no issues of multicollinearity (Howell, 2013). The results of the hierarchical regression analysis are summarized in **Table 5**.

In the first model, gender, length of academic career, and academic field were entered as potential predictor variables. The resulting regression equation accounted for 22.6% of the variance in faculty research motivation. Gender did not contribute significantly to the equation. Academic careers of shorter duration (i.e. >7 years; $\beta = -.270$, $p = .022$) and the AHS category ($\beta = -.271$, $p = .032$) contributed significantly to the equation.

The addition of the work with student measures in the second model produced a significant increase of 23.6% to the model resulting in an R^2 of 46.2%. The mid-academic career category now contributed significantly to the equation while, unlike in the first block, the early academic career category did not. The AHS category was once again significant ($\beta = -.293$, $p = .010$) as well. Turning to the student variables, the value of working with students $\beta = -.355$, $p < .001$) and access to suitable student $\beta = -.417$, $p < .001$) measures made significant contributions to the equation. Conversely, the negatives associated with research involving students did not.

The third and final model included the addition of the Attitudes Toward Research and Teaching Scales III (beliefs rewards influence research), V (personal interest), and VI (mission of the university) as well as the intrinsic and extrinsic scales of Faculty Motivation to Conduct Research Scale. The final overall model ($R = .789$, $F(13, 78) = 9.91$, $p < .001$) accounted for 62.3% of the variance in the Faculty Research Motivation measure. While academic career length was no longer a significant predictor, the AHS category remained significant ($\beta = -.224$, $p = .033$), as did recognition of the value of working with students ($\beta = -.240$, $p = .003$) and access to suitable students ($\beta = -.170$, $p = .050$) measures. A belief that rewards influence research was predictive ($\beta = .180$, $p = .028$) as perceptions concerning the mission of the university ($\beta = .336$, $p < .001$). Last, faculty motivations on the extrinsic scale contributed significantly to the equation ($\beta = -.295$, $p = .002$).

4. Discussion

The present results provide both an elucidation the factors that influence faculty research interest and engagement at a Christian university. In particular, the

Table 5. Summary of Hierarchical Regression Analysis with faculty research motivation.

Variable	*b*	*β*	R^2	ΔR^2	*F* (*df*)
Block 1			.226		5.03 (5, 86)***
Gender	.189	.095			
Length of Academic Career (<7 years)	−.575	−.270*			
Length of Academic Career (7 - 20 years)	.307	.156			
Academic Field—AHS	−.579	−.271*			
Academic Field—LAH	−.426	−.213			
Block 2			.462	.236	8.92 (8, 83)***
Gender	.250	.125			
Length of Academic Career (<7 years)	−.186	−.087			
Length of Academic Career (7 - 20 years)	.527	.268*			
Academic Field—AHS	−.625	−.293**			
Academic Field—LAH	−.462	−231*			
Value Working W/Students (I)	2.974	−.355***			
Negatives Associated with Working w/Students (II)	3.321	.054			
Access to Suitable Students (III)	2.238	−.417***			
Block 3			.623	.161	9.91 (13, 78)***
Gender	−.045	−.023			
Length of Academic Career (<7 years)	−.206	−.097			
Length of Academic Career (7 - 20 years)	.337	.172			
Academic Field—AHS	−.478	−.224*			
Academic Field—LAH	−.238	−.119			
Value of Working with Students (I)	−.140	−.240**			
Negatives Associated with Working with Students (II)	−.013	−.018			
Access to Suitable Students (III)	−.154	−.170			
Belief Rewards Influence Research (III)	.226	.180*			
Personal Interest (V)	−.014	−.016			
Mission of the University (VI)	.370	.336***			
Faculty Motivations (Intrinsic)	.008	.009			
Faculty Motivations (Extrinsic)	−.201	−.295**			

Note: ***$p < .001$, **$p < .01$, *$p < .05$. Full model $R = .789$.

results of the present study highlight several issues, some of which are more academic discipline-specific while others are a reflection of the challenges of conducting research at smaller Christian universities. First, when attitudes to-

ward collaborative activities with undergraduate students, individuals in the allied health sciences endorsed more favorable attitudes than those in the natural sciences. Similarly, individuals in business or leadership programs endorsed more favorable attitudes than individuals in the natural sciences and the humanities/liberal arts disciplines. Consistent with this, attitudes among faculty in the allied health sciences were significantly less negative than faculty in the other academic areas. Finally, all academic discipline areas suggested comparable difficulty in finding access to suitable students. Here, difficulties in recruiting suitable students and differences in resources among both departments and schools may be a partial explanation and worthy of additional investigation.

Turning to faculty perceptions of the impact of research activities on intrinsic rewards, across three significant dependent measures, individuals in the AHS had higher levels of agreement than faculty in the SCI and LAH disciplines. Further, among the AHS faculty, male faculty considered peer recognition to have a more significant impact than female faculty. However, the reverse was true when LAH faculty were considered.

Female SCI faculty gave more weight to the influence of research activity on gaining respect from the students. A similar pattern held for the impact of research on satisfying faculty curiosity. Male AHS faculty attached higher levels of impact of research to student recognition but not in satisfying a need for creativity/curiosity. Further, among the LAH faculty, gender differences were absent in consideration of gaining respect from students, but female faculty ascribed more satisfaction than male faculty on the creativity/curiosity variable. Last, mid-career faculty was significantly less interested in respect from students than faculty early in their careers. Perhaps unsurprisingly, faculty in their mid-career was the most interested in leveraging research activity for a better position than were faculty later in their careers.

Next, attention was turned to the perceived academic environment of the college and its impact on extrinsic rewards for conducting research. When raises as an external incentive were considered, among the AHS faculty, female faculty considered the role of research as having a more significant impact on the reward of raises than male faculty. The same was true when the SCI faculty were considered. On the other hand, the responses of male and female LAH faculty were comparable.

Turning to the "mini-tenure" variable of a multi-year letter of agreement, a sex difference was observed but only among SCI faculty, with female faculty ascribed significantly higher value to the role of research in acquiring this type of contract. Similarly, female SCI and AHS faculty ascribed more value associated with conducting research as a means to achieve a course load reduction. In addition, young faculty endorsed higher levels to research in obtaining raises than did mid- and later-career faculty. This pattern, too, held for the value of research in obtaining an administrative appointment.

Next, I explored faculty attitudes toward research and teaching as measured by the six scales developed by Tang and Chamberlin (2003). For the research

orientation factor, attitudes differed between the SCI (highest agreement) and AHS faculty, with the mean of LAH faculty intermediate between the two other faculties. Turning to the idea that rewards influence teaching, LAH scores were significantly than that of the SCI and AHS faculties, which were similar. Last, when the personal interest factor was examined, the responses of the SCI faculty were significantly higher than that of LAH faculty.

Young faculty held a significantly less favorable research orientation than later-career faculty. This was surprising given the changing nature of institutional research expectations in the past 10 to 15 years. In addition, younger faculty likely still maintains a strong sense of research for success and advancement. Younger faculty and to some extent mid-career faculty held weaker beliefs that rewards influence research. Later-career faculty held more faith in the belief that rewards influenced research. Reiterating earlier, given that mid- and later-career faculty were similar, I believe this to be a reflection of the personal experiences as they related to university expectations related to research and scholarship. Last, mid-career faculty help significantly more favorable attitudes that rewards influence teaching than either their early career or later-career colleagues.

In terms of work/personal life balance, a number of relevant findings emerged. Among the SCI faculty, when compared to their female colleagues, male faculty was significantly more likely to consider their attempts at work/life balance successful. However, the reverse was true when AHS faculty were considered. No gender difference was found in an examination of the LAH data. When compared to female faculty, male faculty in the sciences considered it easier to maintain a healthy lifestyle. When considering the AHS, the converse was true. Last, among the SCI faculty, males essentially did not perceive that job expectations interfered with their personal life, while females perceived more significant levels of interference. The reverse was confirmed among the female and male AHS faculty. Some differences may be driven by societal expectations and gender roles. However, such expectations broke down when AHS faculty were considered.

The experiences concerned with research expectations at the time of hiring were explored. Here, some surprises emerged. While the majority of respondents from all three academic areas reported no discussions and the proportion of faculty reporting no such discussions was similar regardless of the point in their academic career.

Early career faculty had more success obtaining research grants, but such differences were dependent on the academic discipline of the participant. When our internal (QI) grant was considered, only about 36% received funding.

A final hierarchical regression model accounted for 62.3% of the variance in the faculty research motivation measure. Significant predictors included the AHS category (the SCI category was the reference category), as did the recognition of the value of working with students and access to suitable student measures. A belief that rewards influence research was predictive, as were perceptions concerning the mission of the university. Last, faculty motivations on the extrin-

sic scale contributed significantly to the equation. Academic career length was not a significant predictor.

At least in the life sciences, research conducted by federally funded faculty is more likely to recruit and collaborate with undergraduates on research projects (Eagan Jr. et al., 2011). In addition, undergraduate students are more likely to find research opportunities with faculty who teach at liberal arts colleges or at historically Black colleges (Eagan Jr. et al., 2011). Perhaps unsurprisingly, the likelihood of doing so is heavily influenced by incentive structures. Willingness to work with undergraduates on research activities is linked to an expectation that in providing opportunities for undergraduates to work on their research projects, the efforts will be rewarded in annual evaluations and in the tenure review process (O'Meara & Braskamp, 2005).

A major goal of the current research was to examine the factors that drive faculty to engage in research and related forms of scholarship as well as the factors that serve to undermine research interest and productivity. A full discussion of these is beyond the scope of this paper. Nonetheless, some of the relevant results are considered in detail in the following sections.

4.1. The Influence of Academic Discipline

When undergraduate research experiences are examined, STEM disciplines were among the early proponents of substantive undergraduate researcher experiences (Springer et al., 2018). At first, research training in the humanities and in the fine arts areas of the campus was perceived to be of less value to the undergraduate curriculum (Springer et al., 2018). Nonetheless, the rewards associated with quality undergraduate research experiences are considerable for students majoring in the humanities or fine arts (Corley, 2013; Dean & Kaiser, 2010; DeLoach et al., 2012; DeVries, 2001; Ehrenberg, 2005; Malachowski, 1999, 2010; McDorman, 2004; Rogers, 2003). Nonetheless, among predominately undergraduate institutions, considerable variation exists, often constrained by fiscal and human resources limitations (e.g. Kuh, 2008; Malachowski, 2012; Schneider, 2008; Shanahan, 2012). Thus, the choice of academic discipline may potentially impact student experiences in learning how to competently conduct research (Madan & Teitge, 2013; Martinez, 2009), as well as how faculty members can effectively mentor undergraduate researchers (Lopatto, 2006; Malachowski, 2003).

The characteristics of the research enterprise in the academic discipline often determine the investment and the type of research collaboration. For example, when considering research in the humanities, quite often the relationship takes the form of a more intimate mentor-mentee relationship. Often, then, the faculty mentor accepts the responsibility of advising a specific student (Downs & Young, 2012; Grobman, 2007; Levenson, 2010; Lopatto, 2006). For each student, the faculty mentor facilitates the successful navigation of the research process from conceptualization through completion (Coad, 2003; Gafney, 2005; Johnson, 2007; Lopatto, 2006; Malachowski, 2003, 2012). However, since the student chooses a project of interest, the project may only be of passing interest to the

faculty mentor and unrelated to his or her research agenda, and may not be seen as worth the investment for the faculty (Levenson, 2010). Naturally, this could be true in other disciplines beyond the humanities.

Conversely, much of the research in the life, physical, and social sciences includes collaborative team efforts. Indeed, it is common for a group of undergraduate students to work as a team directly on a research project conceived by the professor. With team efforts, the students assume responsibility for specific parts of the research project (Coad, 2003; Downs & Young, 2012; Laursen et al., 2010; Lopatto, 2006, 2010; Malachowski, 2003; Martinez, 2009). For example, in biological psychology research, working in pairs, the students collect data with a subset (randomly assigned) of the total sample for the experiment (e.g. Compton et al., 2011). Often such research leads to joint authorships on publications and presentations (Levenson, 2010). Thus, when compared to scholarship in the humanities, given the normative nature of collaborative research collaborations in these areas, science faculty may be predisposed to recruit actively and include undergraduate (or graduate) students on research projects deriving additional worth to the scholarly endeavor (Chapdelaine, 2012; Levenson, 2010).

Measurement of research productivity has often included consideration of the role of faculty academic rank. Perhaps unsurprisingly, the role of academic rank is mixed. At least at institutions that grant tenure, familiar anecdotes are found about colleagues who lack significant productivity once they reach the rank of (full) professor (Levin & Stephan, 1991). Such observations have led writers to opine in mainstream outlets stating that "is there any worse policy than guaranteeing an employee the same job for 40-plus years, even if he or she meets few of the organization's needs and costs a lot in the bargain?" (Bauerlein, 2013). While there is some evidence of a relationship between academic rank and scholarly productivity (Bellas & Toutkoushian, 1999; Dundar & Lewis, 1998; Sax et al., 2002; Xie & Shauman, 1998), often such links are illusory once key relevant variables are factored into the analyses (Over, 1982; Wanner et al., 1981).

More recently, research has been reported suggesting that the five-year period following graduation is the most productive (Rodgers & Neri, 2007). Yes, research productivity can decline after earning tenure (Davis & Patterson, 2001). Nonetheless, a substantial proportion of mid and later-career faculty continue to be driven by an often complex set of intrinsic reasons, including ones that led them into academic research in the first place (Mallard & Atkins, 2004). Further, as many teaching colleges evolve to include enhanced expectations about research and scholarship, an appreciation for those who chose the institution in the first place must be considered. Finally, a relationship between the number of publications and advanced academic rank has been found among Christian college faculty (Mallard & Atkins, 2004). This observation held even under the expectations at such institutions that may often interfere with attempts to conduct research, such as prohibitive teaching loads. At tenure granting institutions, it is quite possible that a selection process biases the outcome such that highly productive faculty receive promotions, eliminating lower producing colleagues be-

fore they are eligible to earn more senior academic ranks. Indeed, Finkelstein (1984) has suggested this. However, at teaching institutions, as well as many Christian universities that lack tenure, such relationships may well not be true.

Perhaps at most colleges and universities, research productivity is strongly associated with faculty salaries with the relationship holding across Carnegie categories (Malachowski, 2012). Generally, this extends to colleges with an emphasis on student learning (Malachowski, 2010). Indeed, when systematically examined across the type of four-year institution, faculty who were the most prolific producers of academic research yet taught less commanded the highest salaries. This finding held true regardless of academic discipline (Fairweather, 1996, 2004, 2005).

However, at our institution, as well as approximately 1/3 of the Council for Christian Colleges & Universities (CCCU) roster, tenure does not exist (Harris & Lunden, 2006, 2007). Past research suggests that among CCCU faculty, at least half consider tenure as an attractive recruiting tool for superior candidates but also see the current research expectations as less onerous than their secular counterparts (Railsback et al., 2012). As an alternative to tenure, some universities offer multi-year contracts or letters of agreement. Such alternatives have been jokingly referred to as "tenure light".

4.2. A Climate of Demands

Further, while our university reviews the faculty in the three traditional areas of teaching, research, and service, raises are normally distributed evenly as a % increase among the faculty in a given discipline or academic unit. Generally, the campus climate has been to weigh scholarship more heavily when applying for promotion. There is an outstanding teaching award with a long history. Conversely, comparable recognition for outstanding research and scholarship did not exist until 2021. Of note, however, even though research release time was the strongest predictor of research productivity at CCCU schools, faculty course load reductions and other forms of release time remained rare (Mallard & Atkins, 2004). Our university has provided a mechanism for course load reductions, and this has produced a positive impact on individual productivity. However, often faculty specializing in a given area within an academic discipline lacks the ability to recruit a faculty or adjunct faculty replacement during the load reduction period. Recognizing this, they failed to apply for course load reductions even when their chance of success was quite high.

When faculty at research institutions were considered, research conducted at the turn of the millennium suggested that concerns about acquiring tenure were a substantial extrinsic source of motivation (Wolverton, 1998). More recent data suggests that among CCCU colleges and universities, almost 60% of respondents reported that expectations about research and other forms of scholarship were tied to earning tenure (Hippenhammer & Trott, 2017). Further, in Harris and Lumsden (2006), among CCCU schools with tenure, academic scholarship is emphasized. Conversely, at CCCU schools without a tenure policy, academic

scholarship is not explicitly mentioned (Harris & Lumsden, 2007).

However, even within our university, the expectations concerning scholarship, especially for promotion or multi-year letters of agreement differ considerably. It would be reasonable to assume that faculty at CCCU institutions concur with Mallard and Atkins (2004), who articulated the need for college administrations to develop financial and workload policies that foster the development of sustainable research programs, lest faculty continue to perceive that their institution does not actually value scholarship. Further, perceived failures in developing a supportive framework are a profound source of frustration among faculty at most small college campuses (Mallard & Atkins, 2004). Narrative examples of such frustrations are found here.

4.3. The Conundrum of Federal Research Funding vs. the Mission of Christian Universities

Throughout American history, the majority of colleges and universities founded as Christian institutions have moved away from their roots and become secular (Adrian, 2003; Benne, 2001). Among other societal pressures, personal beliefs about and acceptance of evolving societal opinions about human sexuality are among the most divisive issues in society. While long an arena of contentious debate, the Supreme Court's decision to legalize same-sex marriage in Obergefell v. Hodges (2015) has increased both polarization with a rapid change in the proportion of society who support the decision, increasing by 30% from 2009 (40%) to the present (70%; McCarthy, 2021). McCarthy notes that this also includes a majority of Republicans.

In recent years, legal efforts to challenge the religious exemptions to Title IX have become more numerous and supported by larger segments of the population. For example, if passed, the Equality Act would codify nondiscrimination protections for the LGBT community into federal law. However, past efforts have failed to gain traction in the U.S. Congress (Foley, 2021).

Such societal shifts have profound implications for the future of CCCU schools as well as specific questions related to campus restrictions on the pursuit of federal research funding. For example, the author's university may not directly accept federal funding (student funding is acceptable) or risk losing a grant from a private foundation. However, CCCU schools are under increasing pressure to alter their position on social issues (e.g. LGBTQ students, their own students, etc.; Pickering, 2017). In turn, this has already heightened considerable institutional anxieties about the potential loss of their tax-exempt status as well as access to federal student support programs (Berg, 2010; Russo, 2016a, 2016b). While past responses included institutional bans on the receipt of federal funding for research activities, this position seems untenable, especially following the COVID-19 pandemic and the Higher Education Emergency Relief Fund (HEERF) as part of the Coronavirus Aid, Relief, and Economic Security Act (CARES) (CARES Act: U.S. Department of Education, 2021) as well as other programs.

While the object of considerable debate, it has been suggested that the viability of Christian universities may well depend on an adaptive compromise on wedge issues such as those associated with the Christian position concerning the LGBT+ community (Pickering, 2017). According to Pickering, such compromises may persuade government representatives and officials that rather than being seen as an impediment to diversity initiatives, Christian universities are worthy partners in societal change initiatives. However, if recent history is a guide, arguments about religious freedom may lose out to civil rights issues. Eventually, Christian universities may be forced with an adaptor die choice, driven mainly by the loss of their tax-exempt status. Thus, it behooves the strategic decision-makers at Christian universities to be proactive in adjusting to a changing society and seek paths that also support the long-term viability of the institution. Here, the ability to pursue federal and state research funding is a palatable fiscal goal, even as adaptation requires the evolution of the Christian university. Nonetheless, through conformity or resistance, Christian universities will be different from the past and present (Pickering, 2017).

5. Conclusion

While research and other forms of scholarship have been an expected part of a faculty portfolio at research-intensive universities, more recently, teaching institutions have increased such expectations. Similar expectations have been developed at Christian teaching colleges and universities as well. Given this, the present study explored faculty perceptions of undergraduate students as research partners and the factors that impact a passion for or undermine attempts to increase faculty-driven scholarship at a Christian university. In the current investigation, attempts were made to ascertain the factors that influence faculty decisions to include students in their work. In addition, the present research examined how the faculty, encumbered with heavy teaching loads, organized different aspects of their professional and scholarly lives to incorporate greater research productivity generally and with student collaborations. Last, how campus factors both in terms of institutional and fiscal constraints may undermine or facilitate faculty efforts. With exceptions, the results revealed that allied health science faculty generally endorsed more favorable attitudes than those in the natural sciences in humanities/liberal arts disciplines. Intrinsic factors such as peer recognition differed by both gender and academic discipline. Additional gender and discipline-associated differences were also detected when considering extrinsic factors that influence research interest and productivity. Differences in research and teaching orientation factors were observed, as were different experiences with funding success. Again, such considerations are noteworthy given that a clear majority of the faculty did not receive any discussions of research expectations during interviews. Last, a hierarchical regression model accounted for 62.3% of the variance in the faculty research motivation measure. The results were considered within a framework of the challenges associated

with conducting research at universities with heavy teaching loads. Further, given that much of the university-based research is supported through federal research grants and considerable criticism is directed at Christian institutions on social issues, such issues are directly tied to research funding restrictions. This represents challenges that are predicted to become more acute in the future. Thus, the present research could be a helpful starting point for future researchers in studying ways of effectively supporting researchers at teaching institutions and minimizing the roadblocks that undermine interest and success.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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