INTRODUCTION

Clemson University proposes *TIGERS ADVANCE: Transforming the Institution through Gender Equity, Retention, and Support*, an innovative and systematic institutional transformation approach to reduce gender inequality and improve the status of women faculty. Inclusive of all science, technology, engineering, and mathematics (STEM) disciplines, TIGERS ADVANCE is the result of a comprehensive institutional assessment of the barriers that hinder the recruitment, advancement, and retention of Clemson's women faculty; a thorough assessment of Clemson's history, culture, and climate; an extensive review of lessons learned from ADVANCE institutions; and the tight integration of social science research with project activities to inform and support institutional transformation.

The conceptual framework for TIGERS ADVANCE is founded in organizational identification, a social-psychological theory of social identity which contends that individuals make sense of their social environment by classifying other individuals into categories (or groups) and then identifying with those groups that they perceive to be similar to themselves [106]. This results in the creation of in-groups and out-groups. To maintain and enhance self-esteem, individuals behave in a manner that favors in-group members and derogates out-group members [17]. An institutional assessment completed over an 18-month period suggested that in-group/out-group distinctions are prevalent and strong at Clemson University, resulting in the out-group faculty feeling marginalized and excluded. With TIGERS ADVANCE, we propose to create a superordinate identity at Clemson, **One Clemson**, where the success of the university as a whole drives the individual self-esteem of **all** faculty, instead of demographic subgroups with which they identify.

Few, if any, studies have explored the longitudinal relationship between large-scale policy changes and organizational identification, have informed research on the formation and reformation of organizational identification, and have provided a useful case for higher educational organizations looking to make a similar transformation. Thus, the use of social identity theory—specifically, organizational identification—to guide transformation in higher education is novel and has potential to be highly impactful. Identity is what is central, enduring, and distinctive about a university [2]. These features determine culture, and culture dictates norms that prescribe appropriate behaviors in an organizational setting [2]. Recent research in social psychology suggests that changing policies and procedures to provide fair treatment and improved support for **all** can strengthen individuals' organizational identity [89], and this (if accomplished on an institutional scale) can lead to a superordinate identity [104]. Hence, if Clemson's policies, procedures, and faculty support programs stay the same, then its organizational identity will remain unaltered, promoting the *status quo* and "old way of doing things." Institutional transformation towards a superordinate identity must therefore start by ensuring fair and supportive institutional policies and procedures. To realize our vision of **One Clemson**, we propose policy changes, procedural innovations, and institutional programs that will create fair treatment and improved support for all faculty [61, 88].

Critical to creating perceptions of fairness and support is understanding time use, as faculty members' careers are largely determined by how they spend their time [22, 69]. Institutional constraints and implicit biases differentially affect men's and women's time allocations [122]. Consequently, TIGERS ADVANCE will contribute to the understanding of the links between time use and unfair workload allocations in academic settings by measuring faculty time allocation via personal diaries, testing predictions made by organizational identity theory, advancing research in organizational psychology and gender studies, tracking the impact of institutional policy changes, and measuring the overall success of TIGERS ADVANCE.

INSTITUTIONAL CONTEXT AND DATA

Brief Institutional Profile

Clemson is a doctoral-granting university with a Carnegie Classification of R1 (highest research), and it is the leading STEM education institution in South Carolina. Clemson University employs 1,237 full- and part-time instructional faculty. Of these, 91% are employed as full-time regular employees; 732 are men (65%) and 389 (35%) are women. Clemson is currently comprised of five colleges and one school (to become seven colleges in fall 2016 through an institutional reorganization and redistribution of existing departments), with an enrollment of 17,260 undergraduates and 4,597 graduates in over 80 majors and 110 graduate degree programs covering the full range of NSF divisions. STEM departments are currently

concentrated in the College of Engineering and Science (COES); the College of Agriculture, Forestry and Life Sciences (CAFLS); and the College of Business and Behavioral Sciences (CBBS).

Many aspects of Clemson's history have contributed to the inequities and barriers faced by women faculty, especially minority women faculty. Clemson was initially an all-male military school, established in 1889 as South Carolina's land-grant institution. Clemson opened its doors to civilian students, including women, in 1955. Racial integration has progressed more slowly. Clemson admitted its first African-American student in 1963 as the result of a U.S. Supreme Court ruling after twice denying him admission. Since then, the African-American population has not constituted more than 6% of the student and 2.5% of the faculty bodies, despite comprising 28% of the state population (U.S. Census, 2010). Minority groups regularly speak out about not feeling part of the "Clemson family," and tension between minority and majority groups becomes pronounced on campus, especially after racially charged incidents in our state and nation. There is a shared belief among faculty that the campus climate at Clemson discourages the growth of diversity.

Institutional Readiness

This is an ideal time to achieve a superordinate identity at Clemson—***One Clemson***—as the university recently welcomed entirely new executive leadership with demonstrated commitment to inclusive excellence. For example, in response to students' rallies aiming to raise awareness about racial tensions, university president James Clements met the students on a pedestrian bridge and opened discussion about diversity issues. Such respectful dialog is characteristic of our new leadership. This new leadership is also driving a major reorganization of the university and has been encouraging the community to reimagine ways to fulfill the institutional mission. Given these recent developments, the decision to submit an NSF ADVANCE IT proposal has created substantial excitement on campus. Over 100 faculty, staff, and administrators have contributed to defining the goals and developing the activities presented in this proposal, bringing together expertise in psychology, sociology, organizational research, mathematics, engineering, science, and education. This enthusiastic and supportive campus community, combined with the resources that will become available and the roadmap that will be committed to through an NSF ADVANCE grant, will place Clemson in the strongest position to realize the desired transformation towards ***One Clemson***.

Identified Barriers

In preparing this proposal, we conducted a series of 75-minute focus group meetings specifically targeting demographic subgroups: women STEM faculty, men STEM faculty, non-STEM faculty, African-American faculty, and other minority faculty. These focus groups, along with the Collaborative on Academic Careers in Higher Education (COACHE) surveys (2008, 2011, 2015) and extensive organizational data collection with support from the Office of Institutional Research (OIR), helped identify five key barriers that Clemson must address to improve the academic pathways of its women faculty.

Barrier 1: Need for Cultivating Campus Climate and Institutional Culture

Climate is critical to organizational identification because employees' attachment to or identification with the organization is often predicated on their beliefs about the climate [28, 97]. Thus, when employees feel that the climate is unfavorable, the degree to which they identify with the organization decreases [97]. This is significant because Clemson's 2007 Survey of Faculty conducted by the OIR showed that women and minority faculty rated the climate significantly less favorably than did majority men faculty. It is also important to note that all demographic groups rated the institutional climate less favorably than they did departmental climates, indicating that employees tend to identify with their departments to a greater degree than they do with the institution as a whole. In the 2015 COACHE faculty survey, lack of institutional diversity was brought up as the worst aspect of Clemson University, demonstrating the persistent faculty concern regarding campus climate. These findings were supported by the anecdotal statements made by faculty during the focus group meetings, indicating that Clemson's climate and lack of diversity contribute to the high attrition rate of women faculty and deter women faculty from applying for or accepting positions at Clemson (see [100] and [118] for case studies).

Barrier 2: Low Representation of Women and Minorities on Clemson Faculty

In Clemson's 21 STEM departments, women comprise 19% of the tenured/tenure-track (T/TT) faculty: 16% in COES, 23% in CAFLS, and

Table 1: 2007 Survey of Faculty Results Showing Climate Ratings on a Scale of 1–6

How would you describe the climate overall	Department			University		
	N	Mean	Std	N	Mean	Std
for men?	319	5.16	0.88	325	5.13	0.87
for women?	319	4.81	1.07	327	4.54	1.08
for minorities?	275	4.73	1.11	295	4.26	1.12

B. Jones

24% in CBBS (Table 2). Thirteen STEM departments at Clemson can be categorized under Kanter's [55] definition of skewed groups, with women representing less than ~15–20% of the faculty (solo or token women). In five STEM departments, women comprise ~20–35% of the faculty, fitting Kanter's definition of tilted groups (minority women). Only three STEM departments have a balanced gender ratio of ~35–60% [55]). Women's representation falls below 50% of the available pool of doctoral graduates in half of the STEM departments [81]. The statistics for racial diversity within the Clemson STEM faculty are even grimmer. Out of 509 STEM faculty members, only one (0.2%) is an African-American woman, and two (0.4%) are Hispanic women faculty. All underrepresented, minority women faculty can therefore be described as "solos" in their respective departments.

Table 2: Number of Women Faculty Members in the Current STEM Departments

	College of Agriculture, Forestry & Life Sciences								College of Engineering & Science					
	Animal & Vet. Sci.		Biological Sciences		Genetics & Biochemistry		Agriculture		Automotive Engineering		Bio. Engineering		Chem. & Bio. Engineering	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Total	11	4 (36%)	41	9 (22%)	17	7 (41%)	63	10 (16%)	14	2 (14%)	22	7 (32%)	12	2 (17%)
Professor	6	2 (33%)	16	3 (19%)	6	1 (17%)	27	1 (4%)	3	0 (0%)	5	2 (40%)	6	0 (0%)
Assoc. Prof	2	1 (50%)	17	5 (29%)	6	3 (50%)	25	6 (24%)	4	1 (25%)	8	1 (13%)	1	0 (0%)
Asst. Prof	3	1 (33%)	8	1 (13%)	5	3 (60%)	11	3 (27%)	7	1 (14%)	9	4 (44%)	5	2 (40%)

	College of Engineering & Science													
	Chemistry		Civil Engineering		Electrical & Comp. Engr		Env. Engr & Earth Sci		Industrial Engineering		Materials Sci. & Engr.		Mathematical Sci.	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Total	22	3 (14%)	23	2 (9%)	31	3 (10%)	22	4 (18%)	12	3 (25%)	15	1 (7%)	47	10 (21%)
Professor	13	1 (8%)	6	0 (0%)	14	1 (7%)	8	0 (0%)	2	0 (0%)	8	0 (0%)	19	3 (16%)
Assoc. Prof	6	1 (17%)	11	2 (18%)	15	2 (13%)	6	2 (33%)	7	2 (29%)	5	1 (20%)	15	4 (27%)
Asst. Prof	3	1 (33%)	6	0 (0%)	2	0 (0%)	8	2 (25%)	3	1 (33%)	2	0 (0%)	13	3 (23%)

	College of Engineering & Science						College of Business & Behavioral Sciences							
	Mechanical Engineering		Physics & Astronomy		School of Computing		Economics		Political Science		Psychology		Sociology & Anthropology	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Total	28	2 (7%)	25	3 (12%)	31	6 (19%)	23	2 (9%)	12	2 (17%)	25	6 (24%)	13	8 (62%)
Professor	13	0 (0%)	12	1 (8%)	11	3 (27%)	12	1 (8%)	6	1 (17%)	18	4 (22%)	5	3 (60%)
Assoc. Prof	8	0 (0%)	8	0 (0%)	12	1 (8%)	6	0 (0%)	2	0 (0%)	5	1 (20%)	7	5 (71%)
Asst. Prof	7	2 (29%)	5	2 (40%)	8	2 (25%)	5	1 (20%)	4	1 (25%)	2	1 (50%)	1	0 (0%)

Our data analysis suggests that this underrepresentation of STEM women (particularly minority women) within Clemson can be explained by deficiencies in both recruitment and retention. During the assessment of Clemson's recruitment datasets, the percentage of women and, in particular, minority women faculty in the application pool, was found to be significantly lower than that of national averages. For instance, of the 14,499 applicants for all assistant professor positions from 2010–2014, only 3,333 (23%) were women, 1,554 (10.7%) were minority women, and 104 (0.7%) were African-American or Black women; these are low numbers when compared to the national statistics of women (53%), minority women (15%), and African-American women Ph.D. graduates (7%) eligible for faculty positions at Clemson [79]. Research on signaling theory [95] indicates that jobseekers use signals—such as an organization's commitment to diversity or reputation as an employer—to facilitate their decisions about accepting job offers [53, 114]. The low number of women and minority women faculty members may be alerting job candidates that Clemson is not committed to diversity and, thus, will not offer a supportive work environment.

Given that affect-based relationships that can promote retention are most likely to form between individuals who are similar [51], it is perhaps unsurprising that women faculty at Clemson turn over (and intend to turn over) at a higher rate than do men faculty. Consistent with the data from many other institutions [73, 80], Clemson's women faculty are awarded tenure and promotion at equal rates and at about the same time-in-rank,[1] but they are more likely than men faculty to leave the institution before the tenure review. Of the 43 assistant professors who left Clemson between 2011 and 2014, 24 were women (56%), and 23 were from minority groups (53%). Even after reaching tenure, women faculty continue to

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[1] Promotion and time-in-rank data were not available to compare racial demographics.

leave Clemson at significantly higher rates than do men faculty. Although women constitute 19% of the T/TT STEM faculty at Clemson, they compose 28% of faculty who left the university between 2011 and 2014. In non-STEM fields, women constitute 38% of the T/TT faculty, but 55% of those who left the university. As an exit interview system is currently not present, the reasons for departures are unknown; however, research on social networks and social identification suggests that faculty with lower levels of organizational identification are more likely to depart from an organization [52]. Retention is likely to continue to be a major problem for Clemson as the COACHE surveys reveal that women faculty have higher levels of turnover intention than do men faculty. In 2008, 25% of women faculty indicated an intent to stay at Clemson for no more than 5 years compared to 10% of men faculty. In 2011, only 9% of the women faculty respondents saw themselves retiring at Clemson, compared to 21% of the men faculty.

Barrier 3: Inequitable Workload Distribution

Organizational identification research indicates that women are generally expected to engage in higher levels of citizenship behavior (e.g., [13, 14, 35]) that facilitate organizational functioning, exceed role requirements, and are not explicitly recognized by the formal reward system [84]. In an academic context, citizenship behavior can be likened to "service" (academic activities that frequently do not contribute to an individual's performance). Numerous studies have reported women in academia to have higher service loads [24, 116]. We have observed a similar inequality at Clemson; during focus group meetings, women faculty reported difficulty with allocating the desired time and effort to scholarship due to a heavier burden of service activities, particularly those that are not compensated or rewarded during promotion (i.e., academic housekeeping), and they indicated that individual desires are constrained by institutional demands and policies in ways that produce gender inequality. An overview of the number of committee memberships reported in Clemson's Faculty Activity System demonstrates significant discrepancies between men and women in the number of committee assignments in CBBS (100% higher for women) and CAFLS (45% higher for women). However, the number of committees is only part of the picture; Clemson's women faculty also raised issues regarding significant discrepancies in the amount of time that men and women spend on completing committee-related work. Heavy service loads constrain the time that faculty members have to publish in peer-reviewed journals, to apply for grants, and to earn prestigious awards or appointments [22, 67]. At Clemson, women lag behind men in research expenditures by 15−30% (Figure 1). One reason for this may be that as women faculty spend more time on service, they spend correspondingly less time on research. Given the importance of research productivity as one's professional capital in academe, differences in time allocation between the genders have obvious consequences for the status of faculty from underrepresented groups at Clemson.
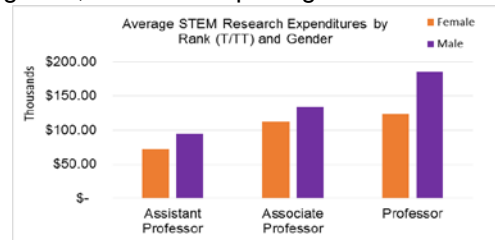

Figure 1: Research Expenditure Differences between Men and Women.

Barrier 4: Gaps in Mentoring and Leadership Development

Mentors help protégés by providing them with career-related support (sponsorship, exposure, visibility, coaching, protection, and challenging assignments) and psychosocial support (friendship, acceptance, confirmation, and counseling). While career-related support aids protégés in acclimating to the organization and earning promotions, psychosocial support enhances an individual's organizational identity [59]. Employees who have mentors have higher salaries, are more likely to be promoted, tend to be more satisfied with their jobs, and are less likely to quit than those who do not have mentors (e.g., [4, 124]). Research also shows that mentors tend to be more apt to select a protégé who is an in-group member than an out-group member [3], which creates issues for women and especially minority women faculty at Clemson, as they have fewer options for mentors and, thus, are less likely to have a mentor than are majority group members [3]. As seven out of 21 STEM departments do not have a single woman full professor, it is perhaps not surprising that women faculty (particularly minority women faculty) reported issues with isolation and lack of networking, coaching, mentoring, and sponsorship (henceforth collectively referred to as mentoring). In the three COACHE surveys conducted between 2008 and 2015, Clemson was consistently ranked in the bottom 30% of all institutions in mentoring and leadership development. Faculty also indicated that most mentoring efforts focus on pre-tenure faculty, leaving associate professors without guidance as they prepare to move to the rank of full professor and full professors without support to pursue leadership opportunities. Furthermore, women STEM faculty are poorly represented in leadership roles at Clemson. Out of 20 STEM departments, women occupy only two permanent chair/director positions (9%) and only one of the 10 dean/associate dean positions within the three colleges containing STEM departments (10%).

B. Jones

None of these positions are held by minority women. Out of 97 university-wide centers and 39 institutes at Clemson, only six are directed by women STEM faculty (4%) and none by minority women STEM faculty (0%).

Barrier 5: Lack of Family-Friendly Policies

Work−family conflict, which occurs when the demands of one's work role encroach upon one's family role [58], results in career dissatisfaction, burnout, turnover, absenteeism, and lowered physical health and mental well-being (e.g., [8]). Notably, women tend to experience higher levels of work−family conflict relative to men (e.g., [38]) and are responsible for balancing work and family roles to a greater degree than are men [85]. Men are generally more willing and able to sacrifice family-related aspects of their lives to achieve greater job-related success [109]. This is the basis of a common stereotype, which forms social categorization between men and women and creates in-groups and out-groups—with out-group members (i.e., women) typically experiencing dissatisfied social identification [108]. The data collected during focus group meetings suggest that women faculty experience dissatisfied identity as a result of work−family issues. Topics related to work−life balance policies (e.g., spousal/partner hires, childcare and eldercare facilities, flexible workloads during critical life transitions) emerged as major barriers to career success for women faculty. Many women faculty reported that their spouses had difficulties securing employment, resulting in unacceptably long commutes, relationship issues, or other hardships. These difficulties caused many women faculty members at Clemson to consider leaving academia. The 2008, 2011, and 2015 COACHE survey results also showed significant faculty dissatisfaction with Clemson's personal and family leave policies, for which Clemson ranked in the bottom 30th percentile of all participating institutions.

INSTITUTIONAL COMMITMENT AND SUSTAINABILITY

Dr. Robert Jones, Clemson's executive vice-president and chief academic officer/provost, is the PI of this proposal. Provost Jones has previously been part of two ADVANCE initiatives as a department chair at Virginia Tech and as a dean at West Virginia University (WVU). Since joining Clemson's leadership team in August 2014, Provost Jones has encouraged adoption of strategies for making the institution an equitable and family-friendly workplace. Further, he actively participated in crafting the *TIGERS ADVANCE* proposal. Dr. James Clements, Clemson's 15th president as of December 2013, also has an established record of strong commitment to and past accomplishments in increasing diversity. As the PI of a successful NSF ADVANCE grant while president of WVU, President Clements backed the WV PRIDE team in launching faculty equity and support initiatives.

Pre-Grant Period. A sign of their commitment, President Clements and Provost Jones have already been instrumental in the approval of Clemson's first childcare facility after 40 years of advocacy by women, have nearly doubled the available lactation rooms on campus, and have initiated a faculty salary equity study to be completed by external consultants. Both Provost Jones and President Clements have committed to provide concurrent funding to extend *TIGERS ADVANCE* to non-STEM departments, as we believe this is the only way to achieve institution-wide impact and sustainable transformation. The strong support of Clemson's leadership, combined with commitment from Clemson's men and women faculty over the last 18 months, has made the preparation of Clemson's *TIGERS ADVANCE* grant proposal possible. For example, the Office of the Provost allowed time buy-out for a social science faculty member (Co-PI Dr. Sarah Winslow), and funded three faculty members' participation in the 2015 ADVANCE workshop in Baltimore. In addition to support received from the provost, the project team received support from a wide range of offices across the campus. The Office of Institutional Effectiveness (OIE) devoted two full-time research staff to assist with data collection and analysis as well as $25,000 for the 2015 COACHE survey. The CBBS committed $43,258 for the preparation of a pilot time-diary study. COES assigned staff from its grants office to collect institutional data and contrast Clemson's performance in gender equity and retention with both national statistics and aspirational peer institutions.

Post-Grant Period. President Clements and Provost Jones are both committed to sustaining the positive change that will result from TIGERS ADVANCE initiatives and have agreed to institutionalize many of the programs through future resource commitments after the 5-year term of the grant. TIGERS ADVANCE programs will be subsumed under a Center for Faculty Development and Advancement that will be established under the Provost's office and funded by the university. The TIGERS ADVANCE executive director will be compensated to lead the center, and the program coordinator hired to assist the director will be converted to a full-time, permanent position. The university will also authorize the OIR to continue to collect and analyze data relevant to faculty diversity initiatives and campus climate.

ACTIVITIES DESCRIPTION

Organizational identification research considers the extent to which employees perceive that their values overlap with those of the organization, or their perceived "oneness" with the organization [9]. Employees' experiences with their organization help them form perceptions of the organization's identity. The concept of organizational identification suggests that employees identify with an organization when their personal identities and the organization's identity are similar and when affiliation with the organization increases self-esteem [9, 29, 107]. As a result, employees incorporate the organization's identity into their own social identities. The organization's successes and failures affect employees personally: successes increase and failures decrease employee self-esteem. Thus, employees with higher organizational identification tend to be more committed and less likely to leave (for a meta-analysis, see [89]). When there is a lack of identification (i.e., dissatisfied organizational identity), employees demonstrate less commitment to work groups and organizations, which leads to reduced effort, withdrawal, and turnover.

TIGERS ADVANCE uses the theory of organizational identification to guide its approach to institutional transformation and draws from recent research findings of Co-PI Dr. Tom Zagenczyk: unfair treatment reduces perceptions of support and degrades organizational identification [125]. Conversely, fair treatment, perceptions of support, positive supervisor relationships and favorable job conditions increase organizational identification and lead to many other favorable outcomes, such as retention, commitment, and job satisfaction [31, 88, 98, 124, 125]. The five identified barriers that women faculty face at Clemson may lead to the perception that Clemson University lacks procedural and distributive justice, which can in turn reduce organizational identification and commitment, increase turnover, and diminish performance. Hence, with our project activities, we propose policy changes as well as new procedures and programs to create a campus environment that practices fair treatment of **all** faculty, facilitates positive relationships between faculty and department chairs, and fosters employees' beliefs that the organization values their contributions and cares about their well-being.

*We hypothesize that our proposed activities will improve organizational identification of faculty, and that, when this is achieved on a large enough scale (i.e., institutional scale), a superordinate identity, **One Clemson**, will be established, and the success of our university as a whole will drive individual self-esteem of all faculty as opposed to the success of smaller in-groups.*

In many of the activities described below, we intentionally include non-faculty, such as students, staff, and administrators. This is a necessary step for Clemson to achieve its goals, as women may be viewed as "unsuitable" for faculty positions by students (as reflected in teaching evaluations [102], by staff [7]; and by faculty colleagues [48].

Goal 1: Transform the Culture and Improve the Campus Climate

Our goal is to help individuals recognize the negative effects that biases and stereotypes

Figure 2: Theory of Change for TIGERS ADVANCE.

can have and implement policies and procedures that will help reduce biases.

Justification. Activities that reduce bias will ultimately, spur the development of organizational identity that embrace diversity and, consequently, improve our campus climate.

Raising Awareness, Reducing Bias. Social categorization is a critical phase in the identification process because it is at this point that in-groups and out-groups tend to develop [107]. Social categorization usually occurs based on group memberships and observable demographic characteristics, such as gender, age, race, cohort, and religious affiliation [108]. Therefore, TIGERS ADVANCE activities have been developed to help faculty and staff understand how these categorizations lead to implicit biases [45, 93], pervasiveness of implicit bias in the workplace (i.e., recruitment, selection, promotion, and development), the implications of these biases [37, 55, 63, 77], and strategies to mitigate implicit bias. Consistent with research on bias-reduction interventions [27] and the malleability of implicit biases [94], Drs. Patrick Rosopa
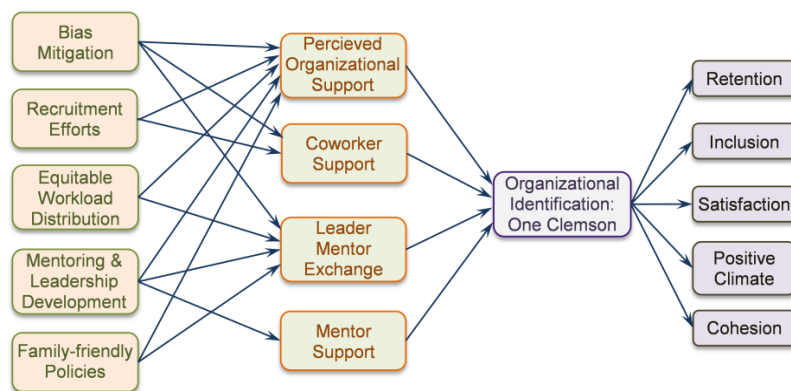
and Rhondda Thomas and their team will prepare a 60-minute, interactive, research-based information session [54] with icebreaker games designed to reduce implicit bias and encourage inclusiveness [56]. The team will leverage games, videos, and presentations that previous NSF ADVANCE initiatives have shown to be effective, as well as develop a customized online game that incorporates elements of role-playing and perspective taking [56, 112]. The expectation is that the information session will help individuals recognize when and how their thoughts may lead to damaging social categorization that hinders inclusiveness. This will occur at the department level, during a dedicated faculty meeting and an updated version based on new research will be provided annually.

TIGER Allies. Building on the successes of the NDSU FORWARD program, TIGERS ADVANCE will form TIGER Allies, a group of individuals who will be trained to recognize micro- and macro-level biases and empowered to intervene when such bias occurs. Our program will be supported by NDSU's Advocates and Allies team, who will train a cohort of Clemson men faculty. Our target is to recruit a cohort of 40 faculty members each year, with 20 faculty overlapping between 2 consecutive years. After the first year, we will expand the TIGER Allies to include women faculty by developing specialized training modules and a speaker series for women. Recognizing that the success of this program will depend on engaging highly regarded and accomplished faculty (in particular, STEM faculty), we have already recruited some of Clemson's most senior and renowned STEM faculty to be TIGER Allies. We have also budgeted small incentive funds to compensate participating faculty for their time. By the third year of our program, we plan to expand the TIGER Allies training to students, post-docs, and staff by developing specialized training modules, engaging leaders of relevant campus organizations, and training interested and qualified individuals to lead future training efforts. Training will include ways to communicate across power differentials, as bias often occurs at organizational levels above those of the individual. Participation in the TIGER Allies program will be encouraged through a carefully designed marketing campaign (with support from Clemson's marketing department) by giving away TIGER Ally stickers and pins to participants, advertising the program at football games, and using social media to spread the word. Ultimately, the program will be open to all eligible Clemson students, staff, post-docs, faculty, and administrators, where eligibility will be defined by current employment/enrollment and an interest in supporting an equitable campus environment.

Inclusiveness Index. To further increase awareness at the institutional level and to measure progress, Dr. Joe Mazer from Clemson's communication department and his team will track the social media statements made by the Clemson community (i.e., racist/sexist tweets/Facebook comments) and assign a weekly "Inclusiveness Index," which will be part of campus-wide multimedia displays. Dr. Mazer is the director of Clemson University's Social Media Listening Center, which captures in real-time more than 650 million sources of social media conversations (including Facebook, Twitter, YouTube, blogs, online communities, and mainstream news outlets) and has the ability to identify conversations that are associated with Clemson University. The collected data and the Inclusiveness Index will be conveyed with graphics showing volume, sentiment, share of voice, and trend information in cloud-based videos displayed in campus buildings.

Anticipated Challenges. Biases—especially stereotypes related to race and gender—are often learned in early childhood and, thus, may be deeply rooted, difficult to change [74], and, in some cases, unconscious [123]. Hence, participation in the proposed activities will be critical to success, and it will be encouraged through consistent messaging from department chairs, deans, provost and president. For instance, Provost Jones and select members of his staff will take part in the TIGER Allies program in the first year and encourage administrators and faculty on campus to do the same.

Goal 2: Increase the Representation of Women in STEM Disciplines

Our goal is to improve the diversity of Clemson's STEM departments by linking excellence and diversity as shared values and ensuring that diversity is central to decision-making processes.

Justification. Improving the representation of women faculty is particularly important because social ties tend to form between similar individuals [51]; such ties tend to increase organizational identification [52], which leads to a host of favorable outcomes, and, when realized on a large enough scale, tend to promote the sense of belonging to a superordinate identity—***One Clemson***.

Pathfinder Program. The Pathfinder program will bolster the recruitment of women and minority faculty while in the final 2 years of their doctoral/postdoctoral studies to T/TT positions at Clemson. To provide sufficient time for relationship building, the Pathfinder program will initiate hiring searches 2 years, rather than the customary 1 year, prior to the anticipated position start date. Once candidates are identified, the university will support their travel to Clemson to present their research and meet faculty in their

respective departments. Following the recommendations of the Rhode Island Recruitment Best Practices Tutorial on the importance of diverse search committees [43, 87], a full-time HR professional, working under Co-PI Ellen Granberg, with expertise in gender and racial discrimination and Affirmative Action policies, will serve as a diversity advocate on each search committee and will be encouraged to speak freely during committee deliberations. The HR professional will aid in diversifying each candidate pool by advertising the position using the most inclusive and inviting language [11, 115] and by carefully considering position announcement placement. As a result of the departmental bias training discussed in Goal 1, search committee members will undergo implicit bias training. In addition, help with defining selection criteria that reduce similarity attraction and evaluation bias [96] as well as with identifying suitable candidates who demonstrate potential to further the strategic plan of the university will encourage search committees to consider a stronger and broader candidate field. Throughout the process, the TIGERS ADVANCE coordinator will serve as a neutral interview ally for candidates. The coordinator will provide information to inform quality-of-life choices, such as childcare, elder care, dual-career options, and the local community. To continuously improve the Pathfinder Program, we will assess women and minority job candidates' interview experiences and, in the case of a declined offer, the reasons why a candidate turned down a faculty position at Clemson.

Pathway Program. Since 2010, Clemson has been regularly investing in cluster hires of post-doctoral fellows. In 2014 and 2015, over 80 post-docs were funded by the university to catalyze cross-cutting projects and new collaborations among faculty. Leveraging these existing resources, TIGERS ADVANCE will develop a 2-year Provost's Research Fellows program in fields in which a post-doctoral appointment is customary before moving to a T/TT position. Women (and especially minority women) will be hired into these research fellow positions with limited teaching responsibilities and will be mentored through their transition into a tenure-track position (ideally at Clemson). Historically, individual Clemson faculty were asked to submit proposals for these post-doctoral budget lines and were held responsible for recruiting suitable candidates. We plan to follow the same approach. Faculty will be asked to identify and nominate highly qualified women fellows into the program; recruit the candidates, upon approval by Provost Jones' office; and be responsible for their career development until they transition into a T/TT position. Provost Jones will personally meet once a year with each of the fellows and their mentors.

Retention through Relationship Building. Many previously successful ADVANCE projects caution against "revolving doors" and recommend that recruitment efforts be followed by extensive retention efforts. Guided by a research project helmed by Dr. Denise Anderson which examines how tenure-track women faculty balance work, family, and leisure, we will establish a university-wide informal "NetWorkshop" of women faculty (see Goal 4) through a campus listserv that will allow faculty to communicate more effectively about concerns related to childcare, healthcare, job opportunities, and other relevant areas. Dr. Anderson will also schedule brown-bag lunch gatherings to develop relationships that could help support both career development and advancement of women faculty. In addition, the HR professional in Co-PI Granberg's office will institute exit interviews to document the reasons why women faculty depart from Clemson.

Anticipated Challenges. A potential challenge is that offering special work conditions to women faculty may create perceptions of injustice among other faculty members who do not receive such favorable treatment [44]. This perceived injustice may cause employees to envy and exclude those employees who receive special considerations, leading to lower well-being [98]. This could reduce identification with the superordinate *One Clemson* identity and increase other negative outcomes. Thus, the university will need to clearly communicate the long-term professional and institutional benefits of taking these steps in the hiring and early career stages of women and minorities.

Goal 3: Ensure Equitable Workload Distribution

Our goal is to increase the fairness of workload distributions by conducting implicit bias training with department chairs tasked with executing institutional workload allocation policies.

Justification. Time use is a fundamental component of academic career success [22, 69], yet our institutional assessment indicates gender gaps in committee assignments; time spent on research and opportunities for course releases to increase this time; and the ability to balance teaching, research, and service. This is likely to lead to social categorization that causes women faculty to be viewed as out-group members working on tasks that are not aligned with organizational priorities (academic housekeeping), thus mitigating against the *One Clemson* identity that we aim to inculcate.

TIGERS Time. The TIGERS Time initiative will allow faculty to track their time allocations through the completion of time diaries, increasing their awareness of their actual time expenditures and the contexts

which may be constraining and facilitating their time use. Awareness of these individual and institutional factors is key to developing agency, defined as "strategic perspectives or actions toward goals" [110]; agency is critical for career success. The TIGERS Time initiative will target all women STEM faculty and a comparable sample of men faculty, with minority men and members of dual-career couples particularly encouraged to participate. Participants will keep time diaries on randomly selected days beginning in the fall semester and continuing for 1 year (including the summer). In addition, TIGERS Time will leverage Clemson's membership with the National Center for Faculty Development and Diversity, providing participants access to webinars and workshops on time management for career success. Insofar as agency is constrained by institutional contexts, these individual-level data will be merged with information on implicit biases and institutional workload data for a comprehensive assessment of the accuracy, efficacy, equitability, and impact of existing workload assignment and tracking mechanisms.

Toward Equitable Workloads. One mechanism producing gender gaps may be the implicit biases of department chairs charged with enacting institutional policies for workload allocation. Research consistently indicates that men academics are evaluated by selection committees and peers as more accomplished than women with identical qualifications [103, 120]. Consistent with implicit biases, women tend to be associated with the caretaking and nurturing attributes more associated with teaching and service and men with the scientific aptitude more associated with research [102, 120]. Thus, by allocating workloads according to the resulting gendered assessments of competencies, department chairs may systematically assign workloads inequitably in ways that disadvantage women faculty. With this in mind, department chairs will participate in implicit bias awareness and reduction workshops [27] organized at the college level. These workshops will emphasize pervasiveness of implicit bias, implicit bias in the workplace, and strategies to mitigate the effects of bias with a specific focus on time use and institutional policies for workload allocation and performance reviews, highlighting how implicit biases may differentially shape the assignment and evaluation of faculty time use (see the supplemental social science document for more details).

Anticipated Challenges. Faculty members may be burdened by the demands of time-diary completion and/or perceive this as additional institutional oversight (and a threat to their freedom as academics), both of which may result in refusal to participate. The research team will emphasize the anonymity of individual data and will implement safeguards to minimize participant burden, including developing a mobile phone app for data collection and randomizing the days of completion such that they will not be consecutive.

Goal 4: Enhance Faculty Mentoring and Leadership Development

Our goal is to establish a pipeline mechanism for improving the representation of women in institutional leadership roles; develop leaders committed to improving the status of women scholars; and provide opportunities for faculty development through mentorship, sponsorship, and coaching.

Justification. Leaders are viewed as agents of their organizations; they tend to embody the identity-relevant characteristics of the organization and to exert social influence upon employees [49, 65]. Clemson, however, lacks women in leadership roles, which is likely to negatively impact the organizational identification of women faculty.

Trailblazers. The Trailblazers program will make cohort-based experiential leadership training systematically available to every academic department at Clemson and focus on the unique challenges of leadership in STEM disciplines. Trailblazers will be a group composed of one representative faculty from each of Clemson's 40 departments. Trailblazers will be selected by the TIGERS ADVANCE Executive Leadership Committee via a competitive nomination/application, screening, and selection process intended to identify those who have career aspirations to become academic leaders and who demonstrate potential to contribute to and support furthering institutional diversity [121]. Applicants will submit curriculum vitae, a statement of interest, and a commitment letter from the applicant's department head. Each department chair will be asked to reduce other service responsibilities of the Trailblazers to a minimum. Trailblazers will be open to all tenured faculty as Clemson needs both women and men leaders who recognize the barriers that women face and understand the importance of an inclusive campus environment for faculty success. However, to address the current deficit of women academic leaders at Clemson, at least 50% of the Trailblazers will be women. Trailblazers will be led by Pacesetters, seven faculty selected from among the group of 40, each representing one of Clemson's seven new colleges (Clemson is currently transitioning from five colleges to seven). By utilizing both internal experts on leadership development as well as external experts through our partnership with the American Council on Education (ACE), TIGERS ADVANCE will provide Trailblazers with an on-campus Leadership Development Program. Pacesetters will be provided additional opportunities, such as shadowing higher administrators at Clemson (such as Provost Jones as

B. Jones

well as associate provosts and vice-presidents) [105]. We expect that Trailblazers will participate in the TIGER Allies program and will support the program's recruitment and expansion efforts. Trailblazers will self-identify subgroups to coordinate and lead the Mentorship and Networking Programs. In facilitating these efforts, Trailblazers will occupy a dedicated space (office and conference room) at a central location on campus, thus enabling networking among those who have an interest in furthering the goals of TIGERS ADVANCE [23], which will further promote shared identity [6].

Mentorship. Mentoring and sponsorship in higher education is pivotal to advancing women in leadership [41, 57]. Trailblazers will receive on-campus training regarding how to coach, mentor, and sponsor women faculty and will be asked to implement a functional mentorship, coaching, and sponsorship campaign within their respective departments [1, 70, 72, 111). Trailblazers, as respected members in their disciplines, will hence be disseminators of information regarding gender equity and departmental ambassadors of the TIGERS ADVANCE program. Trailblazers will also be asked to identify successful women faculty, sponsor them through nominations for awards and recognitions, and "nudge" these successful women to pursue promotion and advancement opportunities.

Working Groups for Policy Changes. Trailblazers will convene working groups of faculty in each of the colleges to identify issues of importance and potential roadblocks to promoting gender equity, as well as best practices and ways in which the faculty needs can be met. With Trailblazers serving as facilitators, stakeholders will decide for themselves the needed policy changes, with the expectation that they will see action resulting from their efforts. The working groups will be modeled after the Engineering Education Research (EER) Leaders NetWorkshop, an NSF-funded project led by Dr. Lisa Benson (EER-1314725) that provides a mechanism for mentoring and supporting midcareer faculty who want to effect change and cultivate their "voices." The model will involve face-to-face meetings followed by self-organized online discussions of readings on a secure website to allow confidential sharing of ideas. This model has been demonstrated as an effective method of faculty networking to drive policy change [12]. The group space fosters "organic" relationships and facilitates formal and informal interactions, thus strengthening social identity as members forge ties within their groups. As ideas and plans develop, Trailblazers and representatives of the working groups will meet with Co-PI Granberg to make proposals for enacting the ideas. Meetings and relationship with senior-level administrators are likely to make employees feel valued and help them identify more strongly with the organization [32].

External Networking. Following the ADVANCE Distinguished Lecture Series of Kansas State University [30], a sub-committee of Trailblazers will coordinate and manage the budget for the external networking program. The program will support career development opportunities for women STEM faculty of all ranks (assistant, associate, or, to a lesser degree, full professor) by providing the funding support necessary to invite nationally recognized scholars in their discipline for a 2-day visit to Clemson to give a campus-wide talk, guest lecture a class, participate in research meetings, discuss future collaborations, or network with other faculty. Women faculty will be encouraged to invite full professors who can later help with recommendation letters. Because the main purpose is to further women faculty members' careers, the schedules of invited speakers will include time designated for one-on-one interaction [72, 86]. Each STEM women T/TT faculty will be allowed to invite one speaker every four semesters (spring and fall), through an application process, which will entail submitting a statement explaining the credentials of the invited speaker and the value of his/her visit to campus for furthering the careers of STEM women faculty. The Trailblazers will aid in advertising these lectures and in ensuring satisfactory participation.

Anticipated Challenges. Trailblazers and stakeholders may hesitate to engage the institutional leadership in a dialog about the needs of an increasingly diverse institutional community and ways to meet those needs. This challenge will be addressed through training on communicating across power differentials. A second challenge is associated with effective leader-employee/mentor-protégé matching. Mentor-protégé relationships are more beneficial for protégés when they form informally, so we will allow the mentors to self-identify their protégés.

Goal 5: Implement Family-Friendly Policies

An important goal for sustainability is to improve existing policies and procedures to better support recruitment and retention of women faculty members as well as to provide flexibility to permit faculty to continue to engage in research during critical life transitions.

Justification. Life role values—which shape social and personal identity—are related to work–family conflict [20]. Women faculty generally bear more responsibility for family matters and household chores than do men faculty, especially during critical life transitions [16, 119]. Furthermore, spousal hire is more critical for women than men [10], as women tend to have academic partners more

frequently than do men. Clemson's remoteness from an urban center or another large high or very high research institution is a deterrent to many dual-career couples.

Modified Duty Family Support. The TIGERS ADVANCE team has been working and will continue to work with the Faculty Senate to establish a Modified Duty Family Support policy to allow department chairs to devise a short-term, modified workload and schedule through discussions with the faculty member without a reduction in salary. Here, the duties may refer to teaching, service, and/or research. The policy is intended to enable the faculty member to remain an active and productive full-time member of the university during critical life transitions. The policy will apply to faculty members who are birth mothers/fathers; same-sex/opposite sex domestic partners/spouses of the birth mothers/fathers; adoptive/foster mothers/fathers; and same-sex/opposite sex domestic partners/spouses of adoptive/foster mothers/fathers. The policy will also apply when a faculty member needs to care for a spouse/child/parent who has a serious health condition; deal with the death of a spouse/child/parent; or experiences personal health issues. Once the policy is established, Clemson University will commit to accommodating the faculty members' needs and providing the necessary resources. The Modified Duty Family Support Plan is intended to be automatic in cases that are typically covered by FMLA and is proposed to supplement sick leave and FMLA leave. For other circumstances, completion of the Modified Duties Family Support Plan form and documentation along with a statement justifying the modified duties will be needed for the support to be granted. In both circumstances, the modified duties are to be defined in consultation with the academic unit head (i.e., department chair) with the expectation that the needs of the faculty member will be met. The proposal is in the process of being drafted by the TIGERS ADVANCE team members who are also involved with the faculty senate (Mary Beth Kurz, President-elect of the Faculty Senate, and Matthew Powers, the chair of the Faculty Welfare Committee).

Dual-Career Hiring. As part of the relationship building groups in Goal 2 and the policy change groups in Goal 4, the TIGERS ADVANCE Team will identify and develop dual-career hiring policies through working groups of stakeholders. Currently, such policies guiding how colleges and departments might coordinate the hire of an academic couple are vague, inconsistent, and, in some cases, non-existent at Clemson. The working groups will support the collection of best practices across the colleges and departments, solicit input from all stakeholders, and create robust policy to support dual-career hiring. This model will allow stakeholders to feel a sense of ownership for the programs that result from the sessions. It has been emphasized repeatedly in reports of many ADVANCE institutions that family-friendly policies must be widely communicated and explained to all involved parties (faculty, department heads, etc.) to make a positive contribution to the recruitment, advancement, and retention of STEM women faculty. The TIGERS ADVANCE website, Trailblazers, and the TIGER Allies all will serve as mediums for publicizing the changes in the policies. The TIGERS ADVANCE office (the executive director and program coordinator) will serve as a central point of contact to maintain information about relevant policies, programs, and resources.

Anticipated Challenges. Faculty whose work duties are not modified may perceive the Modified Duty policy to be unfair and perceive those who benefit to be less legitimate [44]. Further, it is possible that the usage rates of these programs will be lower than the actual need, especially among men, as they may fear that taking part in the program will stigmatize them or otherwise make them appear to be less legitimate among their peers [42]. The overall goal of the project to transform the institution with respect to gender and diversity will help address this challenge by shifting the focus from individual actions to those of the institution; as the values and expectations of the institution shift, messages that new policies convey will reflect institutional transformation.

COMMUNICATION STRATEGY

TIGERS ADVANCE will aggressively seek opportunities to champion gender equity in higher education. Clemson's geographical location, with easy access to nearly 500 higher education institutions in the Southeast, offers the opportunity to create a regional network through which the TIGERS ADVANCE team can communicate its findings, provide policy recommendations, and share best practices to ensure recruitment, advancement, and retention of STEM women faculty. Many of our administrators and faculty are in close communication with the higher education institutions in the Southeast through South Carolina Women in Higher Education (SCWHE) as well as the Athletic Coast Conference Academic Consortium (ACCAC). Utilizing Clemson's state-of-the art broadcast facilities, we will reach out to the institutions in our region and invite them to our annual webinars as well as our on-campus TIGERS ADVANCE Summit. The Summit will feature round-table discussions and individual/panel presentations on the NSF ADVANCE

program and the literature that it has generated as well as the findings and guidelines resulting from TIGERS ADVANCE. In addition, the Clemson Computing and Information Technology Software Development and Integration Team will establish a TIGERS ADVANCE website that will present the program's activities and achievements. We will offer on-line toolkits as well as materials to support data collection and analysis and program building. In addition, a social media presence will be developed, offering an additional conduit for providing information as well as networking opportunities, both locally and beyond Clemson. The smart-phone app developed for time-diary data collection and other digital materials will be available for use at other universities, and the findings obtained through our study will be disseminated through publication in top-tier, peer-reviewed social science journals. The TIGERS ADVANCE team will also develop presentations for conferences and workshops focused on communicating research data from the project as well as contributing to best practices for enhancement of the status of women faculty across multiple disciplines.

PROJECT MANAGEMENT

The proposed management plan is organized around the TIGERS ADVANCE Executive Team that oversees the sub-teams assembled to achieve the proposed five goals and the evaluation team (described in the next section). The Executive Team will be responsible for project launch, implementation, research, communication, evaluation, and sustainability. The Executive Team will be chaired by Robert Jones, executive vice president for academic affairs/provost and the Executive Director (STEM Ph.D., TBD), who will be assisted by Dr. Atamturktur (Co-director) and Dr. Zagencyzk (Co-director). In addition, the Executive Team will consist of Ellen Granberg, associate provost for faculty affairs as well as faculty leaders responsible for implementation and evaluation of activities: Dr. Rosopa, Dr. Winslow, and Dr. Small. The Executive Team will also include a project coordinator, for which we have already identified a candidate with an extensive HR and inclusive excellence background as well as the ability to build key relationships on campus. The Executive Team will meet monthly.

Social Science Research. A subcommittee of social scientists along with a graduate student will be responsible for the research project described in the supplemental social science document.

Team for Transforming the Culture and Improving the Campus Climate (Goal 1). Dr. Rosopa will lead initiatives related to implicit bias, including collection and analysis of data. Dr. Zagenczyk will lead the research on organizational behavior and construct surveys to assess identity and other organizational-related concepts. Other team members include Rhondda Thomas, Joe Mazer, Stephen Moysey, and Josh Summers. Additionally, Dr. Roger Green and colleagues at NDSU will provide training for TIGER Allies.

Team for Increasing the Representation of Women in STEM Disciplines (Goal 2). As associate provost, Dr. Ellen Granberg (lead) will oversee Pathway and Pathfinders activities. As leaders of colleges, Anand Gramopadhye (dean of COES), George R. Askew, Jr. (dean of CAFLS), Brett Wright (dean of CHEHD), Richard E. Goodstein (dean of CAAH), George J. Petersen (dean of Education), and Robert McCormick (dean of CBBS) will be responsible for institutionalizing the proposed changes in Clemson's recruitment strategies. The activities related to internal networking and relationship building among Clemson faculty will be led by Dr. Anderson (parks, recreation and tourism management).

Team for Ensuring Equitable Workload Distribution (Goal 3). Dr. Winslow will oversee the faculty diary data collection and analysis and will provide feedback to inform programmatic initiatives on chair training for bias reduction, which will be directed by Dr. Rosopa.

Team for Enhancing Faculty Mentoring and Leadership Development (Goal 4). Dr. Sez Atamturktur, with support from Drs. Cynthia Sims, Dianne Perpich, Lisa Benson, and Jane C. Lindle, will lead activities related to Trailblazers, mentorship, establishing working groups for policy changes, and setting up external networking initiative.

Team for Supporting Family Commitments through Policy Adjustments (Goal 5). As associate provost, Dr. Ellen Granberg will lead and oversee efforts at creating effective policies related to modified duty family support and dual-career hiring. Dr. Granberg will be assisted by the project coordinator as well as faculty senate leaders Matthew Powers and Mary Beth Kurz.

Internal Advisory Board. Because the Executive Team will be intricately involved with the implementation of TIGERS ADVANCE programs, a separate internal advisory board consisting of a group of highly respected STEM faculty with academic expertise and demonstrated commitment to women's issues will be responsible for overseeing the implementation of activities, resolving issues and keeping track of progress. Dr. Julia Frugoli (biochemistry and genetics), Dr. Catherine Mobley (sociology and

anthropology) and Dr. Marian Kennedy (materials engineering) represent a cross section of STEM women faculty who can provide institutional perspective. The internal advisory board will meet once a semester.

Communication. The Executive Team and all who participate in TIGERS ADVANCE activities will be responsible for disseminating the project findings and spreading the knowledge gained from this project. Dr. Denise Anderson will lead communication efforts through annual webinars and an on-campus Summit.

External Advisory Board. An external advisory board will bring first-hand experience in establishing, maintaining, and evaluating programs aimed at gender equity in higher education. Members include Kerry Ann O'Meara, Ph.D. (University of Maryland); Melissa Latimer, Ph.D. (West Virginia University); Jessi Smith, Ph.D. (Montana State University) Mary Frank Fox, Ph.D. (Georgia Institute of Technology); Catherine White Berheide, Ph.D. (Skidmore College); Laura Kramer, Ph.D. (Laura Kramer Consulting); Caroline Turner, Ph.D. (Sacramento State University); and Canan Bilen-Green, Ph.D. (North Dakota State University). This group will meet annually on the Clemson campus (a remote participation option will be provided) to review progress and offer experience-based advice on meeting unanticipated challenges.

Table 3: Milestones and Timelines.

	Year 1	Year 2	Year 3	Year 4	Year 5
Transforming the Culture Primary					
Bias Reduction	Workshops established	1st Cohort	2nd Cohort	3rd Cohort	Sustained
Tiger Allies	Program established	1st Cohort	2nd Cohort	3rd Cohort	Sustained
Inclusiveness Index	Baseline media tracking	Results reported	Evaluation	Refinement	Sustained
Increase Representation of Women					
Pathfinder Program	Program established	Candidates found	Hiring success	Evaluation	Sustained
Pathway Program	Program established	Post-docs hired	PDs ten.track	Evaluation	Sustained
Relationship Building	NetWorkshop established	Listserve, lunches	Evaluation	Refinement	Sustained
Equitable Workload Distribution					
TIGERS Time	Time Diaries created	1st Cohort	2nd Cohort	Evaluation	Sustained
Toward Equitable Workload	Chairs recruited	Altered workloads	Altered workloads	Evaluation	Sustained
Mentoring & Faculty Development					
Trailblazers	Faculty selected	Leadership shadowing	Evaluation	Refinement	Sustained
Mentorship	Mentors trained	Mentees selected	Evaluation	Refinement	Sustained
Policy Changes	Working group established	Policies identified	Policy Advocacy	Evaluation	Sustained
External Networking	National speakers invited	Speaker visits	Speaker visits	Evaluation	Sustained
Adjusting Work–Life Balance					
Modified Duty Family Support	Policy advocates identified	Policies accepted	Policies implemented	Evaluation	Sustained
Dual Career Hiring	Policy advocates identified	Policies accepted	Policies implemented	Evaluation	Sustained

PROJECT EVALUATION

Guiding evaluation questions. The evaluation will be guided by the following questions: (a) Is the project being implemented effectively and according to schedule—i.e., are the proposed activities being undertaken, and are major benchmarks being met? (b) Are data being collected to provide baseline measures of desired outcomes and to track progress toward goals—i.e., are appropriate metrics being developed, and are the data being collected sufficient for measuring project outcomes? (c) How well has the project achieved goals of institutionalizing activities and policies—i.e., what is the evidence for institutional change and that any changes are the result of the project activities? (d) How effectively have results been disseminated to a broader national audience—i.e., are results being submitted for publication and presented to other institutions?

Evaluation methodology, theory of change. The evaluation will utilize both quantitative and qualitative data (for example, data from interviews and/or focus groups, surveys, institutional data, and program documentation). Using a case study approach, the team will conduct both formative and summative evaluations for the activities associated with each of the five goals. The rationale for a case study approach of each activity is to allow better replication of individual innovative strategies by future ADVANCE applicants. Because the institutional change model is based on the theory that changed perceptions can result in strengthened organizational identification, Clemson also will conduct a comprehensive climate and satisfaction survey to assess institutional transformation. Specifically, an *organizational identity climate survey* (CU) to measure **One Clemson** will consist of the following sub-scales related to theoretical constructs in Figure 2: Perceived Organizational Support [32], Perceived

Coworker Support [62], Leader–Member Exchange [68], Mentor Support [4], and Organizational Identification [71]. Relating these variables to retention, inclusion (measured by an ostracism scale [36], a burnout scale [117], a climate scale [92] and a cohesion scale [99] will allow inferences to be made regarding the robustness of the model. All measures were chosen based on the strength of their established psychometric properties. Augmenting the survey will be questions related to knowledge and awareness of TIGERS ADVANCE. Pending considerations of survey fatigue, the CU survey will be administered every other year, alternating with the COACHE survey. Continued use of the COACHE survey will allow for long-term institutional trends at Clemson to be analyzed.

Use of evaluation results. The results from both the individual activity case studies as well as the assessment of the overall initiative will be used to inform ongoing activities as well as provide summative information on the success of individual activities and the overall TIGERS ADVANCE initiative. Formative evaluation will start at the beginning of the project with collected data used to establish baseline information, inform the project management team, and guide refinement of activities. In addition to the specified outcome data identified in the proposed activities, the OIR will provide relevant data related to recruitment, retention, attrition, and all NSF toolkit indicators. As part of Clemson's *ClemsonForward* strategic plan, the university will monitor junior and early associate professor salaries, workloads, and professional development resources to ensure competitiveness with aspirational institutions and gender equity.

Roles and responsibilities. The evaluators will collect data for both formative and summative evaluation. External evaluation will be provided by Dr. Mariko Chang, a sociologist with expertise in evaluating ADVANCE Programs and working with universities to diversify their faculty. Dr. Chang, who has served on several ADVANCE third-year site visit teams, will provide regular feedback and programmatic assessment to the Executive Team. Dr. Chang will conduct an annual site visit to interview or convene focus groups with key faculty and stakeholders; she will also review all internal evaluation findings, NSF toolkit indicator data, and related program documentation for an annual external evaluation report. A final summative evaluation will be provided at the end of the grant to assess institutionalization of successful activities, dissemination, and progress toward sustainability.

Dr. Chang will be supported by the internal evaluation team of Dr. Mark Small (youth, family and community studies), a psychologist and evaluator, and one graduate student. Dr. Small will lead efforts to collect data related to all TIGERS ADVANCE activities and coordinate annual reporting. The internal evaluation team will meet weekly and will meet monthly with the project team to provide on-going feedback, enhance communication, and address unanticipated findings or challenges. The internal evaluator, project team, and external evaluator will work to approve and implement the final version of the *organizational identity climate survey*.

Logic model, theory of change, and evaluation activities. As Table 4 shows, all of the evaluation activities are linked to measuring the success of the proposed theory of change to transform Clemson. The proposed theory of change suggests that only through creating a new Clemson culture will structural barriers be removed. Conducting individualized case studies of activities will allow inferences to be made about the relative contribution of each and all activities to change Clemson culture—in faculty perceptions of climate and perceived support. Over time, success will be measured by improvement in numbers, but the long-term success and sustainability is premised on the transformation of Clemson by changing the behavior and attitudes of those belonging to Clemson. By connecting a theory of change to a logic model, TIGERS ADVANCE has that potential, both for Clemson and future ADVANCE institutions.

Table 4: Logic Model, Theory of Change and Evaluation Activities.

B. Jones

Inputs	Goals	Activities	Baseline Data & Outputs	Data Collection and Timeline	Short-Term (S) & Long-Term (L) Outcomes
Clemson Administrative Leadership	Transform culture & improve campus climate	1.Bias Reduction 2.Tiger Allies 3.Tracking Inclusivity	Scores on bias measures # of participants Social media hits Use of website	Information Sessions results (annually) Interviews (annually) Inclusiveness Index (ongoing, monthly)	↑Knowledge of bias reduction strategies (S) # of Tiger Allies (S) ↑Use of website (S) ↓Perception of bias (L)
Clemson *2020Forward* Strategic Plan	Increase number of women	Pathfinders Pathways	# of participants # of post-docs	NSF Toolkit data (new hires, promotion, etc.) Search committee & exit interview data	↑# of applicants (S) ↑# of diverse finalists (S) ↑# of diverse postdocs ↑# diverse T/TT faculty
NSF Funding	Develop mentorship and leadership opportunities	Trailblazers Mentorship Networking	# of Trailblazers # of matches Network participants	Interviews (annual) Focus groups (annual) CU/COACHE Survey (annual)	↑# of Trailblazers(S) ↑# of mentor matches (S) Pacesetters develop leadership skills (S) Mentees ↑ support (S) Satisfaction with networking promoting
External Advisory Board	Balance workload distribution	Time Diaries Chair Workshops	# of participating faculty & chairs	Social Science Team results (semi-annually) CU/COACHE Survey	↑# of participants (S) ↑use of results (S) ↑perceived balance (L)
Sustainable Resources	Implement family-friendly policies	1.Modified Duty Supprt. 2.Dual Career Hires	# of policies # use of policies	Review of policy implementation (annual) CU/COACHE Survey (annual)	↑# of policies (S) ↑# of uses of policy (S) Satisfaction with policies (L)
Theory of Change	**Transform institution**	**All combined activities**	**Organizational Identity** **COACHE Survey**	**Years 1, 3, 5** **Years 2 & 4**	**Statistically significant change on all sub-scales over time (L) Increase # of women in leadership**

BROADER IMPACTS OF THE PROPOSED WORK

TIGERS ADVANCE will contribute to the recruitment and retention of women and minorities in STEM disciplines as well as prepare them for leadership roles in their disciplines and within the institution, positively contributing to increased diversity in U.S. higher education. TIGERS ADVANCE activities will be formulated in part through lessons learned from other ADVANCE institutions and in part through innovation. The former will help assess the replicability of these successful interventions, while the latter will expand the portfolio of activities higher education institutions can implement for institutional transformation toward gender equity. Dissemination of results to other institutions through both academic leadership and disciplinary meetings will be accomplished through conference presentations, publications by team members in academic journals, and a web portal. These outreach channels will allow other universities to access details of TIGERs ADVANCE activities for change and sustainability, as well as the assessments of their success, for implementation on their own campuses.

RESULTS FROM PRIOR NSF SUPPORT

Sez Atamturktur

CMMI-2008840, "Transforming Robust Design Concept into a Novel Design Tool," ($394,664; 2012−2015). Intellectual Merit: A new design paradigm that seeks robustness by adjusting design parameters such that the engineering design is insensitive to variation in hard-to-control uncertainties is developed. Broader Impact: The team has generated 22 peer-reviewed publications. CyberSEES-1539536, "Enabling Sustainable Water Supplies Through Self-Powered Sensor-Based Monitoring," ($396,011; 2015−2017). Intellectual Merit: A combined numerical and experimental technique for monitoring water network systems is being developed. Broader Impact: One refereed paper has been published to date.